Appendix B:
Air Quality Supporting Information

B.1 - Air Quality Modeling Data

Warm Springs - 2005 Baseline

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hotel	600.00	Room	20.00	871,200.00	0
Elementary School	700.00	Student	1.34	58,522.36	0
Apartments Mid Rise	3,100.00	Dwelling Unit	81.58	3,100,000.00	8866
Condo/Townhouse High Rise	900.00	Dwelling Unit	14.06	900,000.00	2574
General Light Industry	3,173.00	1000sqft	72.84	3,173,000.00	0
User Defined Industrial	6,768.00	User Defined Unit	0.00	0.00	0
Office Park	8,940.00	1000sqft	205.23	8,940,000.00	0
Regional Shopping Center	45.00	1000sqft	1.03	45,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2005
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - For Industrial and Office, employees was not an option, therefore 1 ksf is a stand-in for employees

Construction Phase - No Construction

Off-road Equipment - No Construction

Vehicle Trips - Unadjusted Trip Generation from Traffic Study. "User Defined" is R&D. Default Pass-by.

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Vechicle Emission Factors -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	150
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	100
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2005
tblTripsAndVMT	WorkerTripNumber	15.00	3.00
tblVehicleTrips	CC_TTP	0.00	28.00
tblVehicleTrips	CNW_TTP	0.00	13.00
tblVehicleTrips	CW_TTP	0.00	59.00
tblVehicleTrips	DV_TP	0.00	5.00
tblVehicleTrips	PB_TP	0.00	3.00
tblVehicleTrips	PR_TP	0.00	92.00
tblVehicleTrips	ST_TR	7.16	6.40
tblVehicleTrips	ST_TR	7.16	4.02
tblVehicleTrips	ST_TR	0.00	1.29
tblVehicleTrips	ST_TR	1.32	2.96
tblVehicleTrips	ST_TR	8.19	8.17
tblVehicleTrips	ST_TR	1.64	2.18
tblVehicleTrips	ST_TR	49.97	89.81
tblVehicleTrips	ST_TR	0.00	1.90
tblVehicleTrips	SU_TR	6.07	6.10
tblVehicleTrips	SU_TR	6.07	4.02
tblVehicleTrips	SU_TR	0.00	1.29

tblVehicleTrips	SU_TR	0.68	2.96
tblVehicleTrips	SU_TR	5.95	8.17
tblVehicleTrips	SU_TR	0.76	2.18
tblVehicleTrips	SU_TR	25.24	89.81
tblVehicleTrips	SU_TR	0.00	1.90
tblVehicleTrips	WD_TR	6.59	6.10
tblVehicleTrips	WD_TR	6.59	4.02
tblVehicleTrips	WD_TR	6.97	2.96
tblVehicleTrips	WD_TR	11.42	2.18
tblVehicleTrips	WD_TR	42.94	89.81
tblVehicleTrips	WD_TR	0.00	1.90

2.0 Emissions Summary

2.1 Overall Construction

Not Applicable

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	91.2649	0.5238	39.1209	5.4000e-003		0.7923	0.7923		0.7922	0.7922	65.4698	154.6426	220.1124	0.2009	5.4600e-003	226.0245
Energy	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	69,037.8187	69,037.8187	2.6495	0.8086	69,344.1259
Mobile	135.2434	372.0833	1,410.6156	2.8410	61.6876	10.4171	72.1047	18.0683	10.4171	28.4855	0.0000	97,180.3020	97,180.3020	9.4443	0.0000	97,378.6322
Waste						0.0000	0.0000		0.0000	0.0000	2,962.0888	0.0000	2,962.0888	175.0544	0.0000	6,638.2319
Water						0.0000	0.0000		0.0000	0.0000	825.9902	5,265.4408	6,091.4310	85.0752	2.0525	8,514.2691
Total	**228.3399**	**389.1127**	**1,462.6596**	**2.9463**	**61.6876**	**12.4748**	**74.1625**	**18.0683**	**12.4748**	**30.5431**	**3,853.5488**	**171,638.2041**	**175,491.7529**	**272.4244**	**2.8665**	**182,101.2836**

3.0 Construction Detail

Not Applicable

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Unmitigated	135.2434	372.0833	1,410.6156	2.8410	61.6876	10.4171	72.1047	18.0683	10.4171	28.4855	0.0000	97,180.3020	97,180.3020	9.4443	0.0000	97,378.6322
Mitigated	135.2434	372.0833	1,410.6156	2.8410	61.6876	10.4171	72.1047	18.0683	10.4171	28.4855	0.0000	97,180.3020	97,180.3020	9.4443	0.0000	97,378.6322

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	18,910.00	19,840.00	18910.00	42,510,628	42,510,628
Condo/Townhouse High Rise	3,618.00	3,618.00	3618.00	8,076,700	8,076,700
Elementary School	903.00	903.00	903.00	1,991,060	1,991,060
General Light Industry	9,392.08	9,392.08	9392.08	27,420,282	27,420,282
Hotel	4,902.00	4,902.00	4902.00	9,313,461	9,313,461
Office Park	19,489.20	19,489.20	19489.20	48,844,756	48,844,756
Regional Shopping Center	4,041.45	4,041.45	4041.45	7,085,894	7,085,894
User Defined Industrial	12,859.20	12,859.20	12859.20	37,542,578	37,542,578
Total	74,114.93	75,044.93	74,114.93	182,785,359	182,785,359

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Condo/Townhouse High Rise	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Elementary School	9.50	7.30	7.30	65.00	30.00	5.00	63	25	12
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Office Park	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
User Defined Industrial	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.514795	0.122199	0.202623	0.071970	0.010436	0.006310	0.019893	0.038012	0.001148	0.004559	0.005916	0.000316	0.001823

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
NaturalGas Mitigated	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	18,126.2344	18,126.2344	0.3474	0.3323	18,236.5476
NaturalGas Unmitigated	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	18,126.2344	18,126.2344	0.3474	0.3323	18,236.5476
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	50,911.5844	50,911.5844	2.3021	0.4763	51,107.5783
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	50,911.5844	50,911.5844	2.3021	0.4763	51,107.5783

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Elementary School	1.00951e+006	5.4400e-003	0.0495	0.0416	3.0000e-004		3.7600e-003	3.7600e-003		3.7600e-003	3.7600e-003	0.0000	53.8713	53.8713	1.0300e-003	9.9000e-004	54.1992
General Light Industry	8.14826e+007	0.4394	3.9943	3.3552	0.0240		0.3036	0.3036		0.3036	0.3036	0.0000	4,348.2240	4,348.2240	0.0833	0.0797	4,374.6865
Hotel	3.31492e+007	0.1788	1.6250	1.3650	9.7500e-003		0.1235	0.1235		0.1235	0.1235	0.0000	1,768.9654	1,768.9654	0.0339	0.0324	1,779.7311
Office Park	1.74509e+008	0.9410	8.5544	7.1857	0.0513		0.6501	0.6501		0.6501	0.6501	0.0000	9,312.4541	9,312.4541	0.1785	0.1707	9,369.1282
Regional Shopping Center	216000	1.1600e-003	0.0106	8.8900e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.5266	11.5266	2.2000e-004	2.1000e-004	11.5967
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	2.74464e+007	0.1480	1.2647	0.5382	8.0700e-003		0.1023	0.1023		0.1023	0.1023	0.0000	1,464.6432	1,464.6432	0.0281	0.0269	1,473.5568
Condo/Townhouse High Rise	2.18603e+007	0.1179	1.0073	0.4286	6.4300e-003		0.0814	0.0814		0.0814	0.0814	0.0000	1,166.5497	1,166.5497	0.0224	0.0214	1,173.6491
Total		**1.8316**	**16.5056**	**12.9231**	**0.0999**		**1.2654**	**1.2654**		**1.2654**	**1.2654**	**0.0000**	**18,126.2344**	**18,126.2344**	**0.3474**	**0.3323**	**18,236.5476**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.12076e+007	3,260.4150	0.1474	0.0305	3,272.9666
Condo/Townhouse High Rise	3.83642e+006	1,116.0589	0.0505	0.0104	1,120.3553
Elementary School	290856	84.6134	3.8300e-003	7.9000e-004	84.9391
General Light Industry	2.62407e+007	7,633.7234	0.3452	0.0714	7,663.1109
Hotel	7.92792e+006	2,306.3228	0.1043	0.0216	2,315.2015
Office Park	1.24981e+008	36,358.4642	1.6440	0.3401	36,498.4331
Regional Shopping Center	522450	151.9867	6.8700e-003	1.4200e-003	152.5718
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**50,911.5844**	**2.3021**	**0.4763**	**51,107.5783**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Unmitigated	91.2649	0.5238	39.1209	5.4000e-003		0.7923	0.7923		0.7922	0.7922	65.4698	154.6426	220.1124	0.2009	5.4600e-003	226.0245
Mitigated	91.2649	0.5238	39.1209	5.4000e-003		0.7923	0.7923		0.7922	0.7922	65.4698	154.6426	220.1124	0.2009	5.4600e-003	226.0245

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	19.9061					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	66.7361					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.1019	0.0527	4.4388	3.8200e-003		0.6459	0.6459		0.6459	0.6459	65.4698	105.7660	171.2358	0.1216	5.4600e-003	175.4811
Landscaping	1.5208	0.4711	34.6821	1.5800e-003		0.1464	0.1464		0.1464	0.1464	0.0000	48.8766	48.8766	0.0794	0.0000	50.5434
Total	**91.2649**	**0.5238**	**39.1209**	**5.4000e-003**		**0.7923**	**0.7923**		**0.7922**	**0.7922**	**65.4698**	**154.6426**	**220.1124**	**0.2009**	**5.4600e-003**	**226.0245**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	6,091.4310	85.0752	2.0525	8,514.2691
Mitigated	6,091.4310	85.0597	2.0493	8,512.9514

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	201.977 / 127.334	511.6652	6.6017	0.1596	699.7731
Condo/Townhouse High Rise	58.6386 / 36.9678	148.5480	1.9166	0.0463	203.1599
Elementary School	1.69697 / 4.36363	7.6526	0.0556	1.3700e-003	9.2460
General Light Industry	733.756 / 0	1,387.8088	23.9617	0.5754	2,069.3657
Hotel	15.2201 / 1.69112	30.5087	0.4971	0.0120	44.6527
Office Park	1588.94 / 973.866	3,996.8632	51.9336	1.2552	5,476.5831
Regional Shopping Center	3.33326 / 2.04297	8.3846	0.1090	2.6300e-003	11.4887
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**6,091.4310**	**85.0752**	**2.0524**	**8,514.2691**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2,962.0888	175.0544	0.0000	6,638.2319
Unmitigated	2,962.0888	175.0544	0.0000	6,638.2319

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	1426	289.4651	17.1069	0.0000	648.7100
Condo/Townhouse High Rise	414	84.0383	4.9665	0.0000	188.3352
Elementary School	127.75	25.9321	1.5325	0.0000	58.1155
General Light Industry	3934.52	798.6720	47.2002	0.0000	1,789.8754
Hotel	328.5	66.6825	3.9408	0.0000	149.4399
Office Park	8314.2	1,687.7075	99.7407	0.0000	3,782.2612
Regional Shopping Center	47.25	9.5913	0.5668	0.0000	21.4948
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**2,962.0888**	**175.0544**	**0.0000**	**6,638.2319**

Warm Springs - 2035 Estimate

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hotel	600.00	Room	20.00	871,200.00	0
Elementary School	700.00	Student	1.34	58,522.36	0
Apartments Mid Rise	3,100.00	Dwelling Unit	81.58	3,100,000.00	8866
Condo/Townhouse High Rise	900.00	Dwelling Unit	14.06	900,000.00	2574
General Light Industry	3,173.00	1000sqft	72.84	3,173,000.00	0
User Defined Industrial	6,768.00	User Defined Unit	0.00	0.00	0
Office Park	8,940.00	1000sqft	205.23	8,940,000.00	0
Regional Shopping Center	45.00	1000sqft	1.03	45,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2035
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - For Industrial and Office, employees was not an option, therefore 1 ksf is a stand-in for employees

Construction Phase - No Construction

Off-road Equipment - No Construction

Vehicle Trips - Internal-trip capture and alternative transit-adjusted Trip Generation from Traffic Study. "User Defined" is R&D. Default Pass-by.

Mobile Land Use Mitigation - No Traffic Reductions, as trip generation incorporates alternative transit reductions specified in traffic study.

Area Mitigation -

Water Mitigation - Water efficiency measures per 2011 General Plan compliance

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	OperationalYear	2014	2035
tblTripsAndVMT	WorkerTripNumber	15.00	3.00
tblVehicleTrips	CC_TTP	0.00	28.00
tblVehicleTrips	CNW_TTP	0.00	13.00
tblVehicleTrips	CW_TTP	0.00	59.00
tblVehicleTrips	DV_TP	0.00	5.00
tblVehicleTrips	PB_TP	0.00	3.00
tblVehicleTrips	PR_TP	0.00	92.00
tblVehicleTrips	ST_TR	7.16	4.09
tblVehicleTrips	ST_TR	7.16	2.70
tblVehicleTrips	ST_TR	0.00	1.02
tblVehicleTrips	ST_TR	1.32	2.06
tblVehicleTrips	ST_TR	8.19	6.45
tblVehicleTrips	ST_TR	1.64	1.51
tblVehicleTrips	ST_TR	49.97	70.91
tblVehicleTrips	ST_TR	0.00	1.32
tblVehicleTrips	SU_TR	6.07	4.09
tblVehicleTrips	SU_TR	6.07	2.70
tblVehicleTrips	SU_TR	0.00	1.02
tblVehicleTrips	SU_TR	0.68	2.06
tblVehicleTrips	SU_TR	5.95	6.45
tblVehicleTrips	SU_TR	0.76	1.51
tblVehicleTrips	SU_TR	25.24	70.92
tblVehicleTrips	SU_TR	0.00	1.32
tblVehicleTrips	WD_TR	6.59	4.09

tblVehicleTrips	WD_TR	6.59	2.70
tblVehicleTrips	WD_TR	1.29	1.02
tblVehicleTrips	WD_TR	6.97	2.06
tblVehicleTrips	WD_TR	8.17	6.45
tblVehicleTrips	WD_TR	11.42	1.51
tblVehicleTrips	WD_TR	42.94	70.91
tblVehicleTrips	WD_TR	0.00	1.32

2.0 Emissions Summary

2.1 Overall Construction

Not Applicable

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	80.3800	0.3958	34.2197	5.4000e-003		0.8113	0.8113		0.8112	0.8112	65.4698	154.6426	220.1124	0.1687	5.4600e-003	225.3470
Energy	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	69,037.8187	69,037.8187	2.6495	0.8086	69,344.1259
Mobile	19.0601	48.7007	218.5435	0.7491	47.6877	1.2015	48.8891	12.8217	1.1080	13.9297	0.0000	49,819.5926	49,819.5926	1.1854	0.0000	49,844.4868
Waste						0.0000	0.0000		0.0000	0.0000	2,962.0888	0.0000	2,962.0888	175.0544	0.0000	6,638.2319
Water						0.0000	0.0000		0.0000	0.0000	825.9902	5,265.4408	6,091.4310	85.0752	2.0525	8,514.2691
Total	**101.2717**	**65.6022**	**265.6862**	**0.8544**	**47.6877**	**3.2782**	**50.9658**	**12.8217**	**3.1847**	**16.0064**	**3,853.5488**	**124,277.4947**	**128,131.0435**	**264.1332**	**2.8665**	**134,566.4607**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	77.2781	0.3431	29.7809	1.5800e-003		0.1654	0.1654		0.1654	0.1654	0.0000	48.8766	48.8766	0.0471	0.0000	49.8660
Energy	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	69,037.8187	69,037.8187	2.6495	0.8086	69,344.1259
Mobile	19.0601	48.7007	218.5435	0.7491	47.6877	1.2015	48.8891	12.8217	1.1080	13.9297	0.0000	49,819.5926	49,819.5926	1.1854	0.0000	49,844.4868
Waste						0.0000	0.0000		0.0000	0.0000	2,962.0888	0.0000	2,962.0888	175.0544	0.0000	6,638.2319
Water						0.0000	0.0000		0.0000	0.0000	660.7922	4,374.5818	5,035.3740	68.0551	1.6409	6,973.2148
Total	**98.1698**	**65.5495**	**261.2474**	**0.8505**	**47.6877**	**2.6323**	**50.3199**	**12.8217**	**2.5388**	**15.3605**	**3,622.8810**	**123,280.8697**	**126,903.7507**	**246.9916**	**2.4495**	**132,849.9254**

3.0 Construction Detail

Not Applicable

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Unmitigated	19.0601	48.7007	218.5435	0.7491	47.6877	1.2015	48.8891	12.8217	1.1080	13.9297	0.0000	49,819.5926	49,819.5926	1.1854	0.0000	49,844.4868
Mitigated	19.0601	48.7007	218.5435	0.7491	47.6877	1.2015	48.8891	12.8217	1.1080	13.9297	0.0000	49,819.5926	49,819.5926	1.1854	0.0000	49,844.4868

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	12,679.00	12,679.00	12679.00	28,304,169	28,304,169
Condo/Townhouse High Rise	2,430.00	2,430.00	2430.00	5,424,649	5,424,649
Elementary School	714.00	714.00	714.00	1,574,327	1,574,327
General Light Industry	6,536.38	6,536.38	6536.38	19,083,034	19,083,034
Hotel	3,870.00	3,870.00	3870.00	7,352,732	7,352,732
Office Park	13,499.40	13,499.40	13499.40	33,832,836	33,832,836
Regional Shopping Center	3,190.95	3,190.95	3191.40	5,594,821	5,594,821
User Defined Industrial	8,933.76	8,933.76	8933.76	26,082,212	26,082,212
Total	51,853.49	51,853.49	51,853.94	127,248,780	127,248,780

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Condo/Townhouse High Rise	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Elementary School	9.50	7.30	7.30	65.00	30.00	5.00	63	25	12
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Office Park	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
User Defined Industrial	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.534279	0.061728	0.163535	0.108433	0.030557	0.004584	0.021278	0.063079	0.001942	0.003382	0.005694	0.000164	0.001344

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
NaturalGas Mitigated	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	18,126.2344	18,126.2344	0.3474	0.3323	18,236.5476
NaturalGas Unmitigated	1.8316	16.5056	12.9231	0.0999		1.2655	1.2655		1.2655	1.2655	0.0000	18,126.2344	18,126.2344	0.3474	0.3323	18,236.5476
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	50,911.5844	50,911.5844	2.3021	0.4763	51,107.5783
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	50,911.5844	50,911.5844	2.3021	0.4763	51,107.5783

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Elementary School	1.00951e+006	5.4400e-003	0.0495	0.0416	3.0000e-004		3.7600e-003	3.7600e-003		3.7600e-003	3.7600e-003	0.0000	53.8713	53.8713	1.0300e-003	9.9000e-004	54.1992
General Light Industry	8.14826e+007	0.4394	3.9943	3.3552	0.0240		0.3036	0.3036		0.3036	0.3036	0.0000	4,348.2240	4,348.2240	0.0833	0.0797	4,374.6865
Hotel	3.31492e+007	0.1788	1.6250	1.3650	9.7500e-003		0.1235	0.1235		0.1235	0.1235	0.0000	1,768.9654	1,768.9654	0.0339	0.0324	1,779.7311
Office Park	1.74509e+008	0.9410	8.5544	7.1857	0.0513		0.6501	0.6501		0.6501	0.6501	0.0000	9,312.4541	9,312.4541	0.1785	0.1707	9,369.1282
Regional Shopping Center	216000	1.1600e-003	0.0106	8.8900e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.5266	11.5266	2.2000e-004	2.1000e-004	11.5967
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	2.74464e+007	0.1480	1.2647	0.5382	8.0700e-003		0.1023	0.1023		0.1023	0.1023	0.0000	1,464.6432	1,464.6432	0.0281	0.0269	1,473.5568
Condo/Townhouse High Rise	2.18603e+007	0.1179	1.0073	0.4286	6.4300e-003		0.0814	0.0814		0.0814	0.0814	0.0000	1,166.5497	1,166.5497	0.0224	0.0214	1,173.6491
Total		**1.8316**	**16.5056**	**12.9231**	**0.0999**		**1.2654**	**1.2654**		**1.2654**	**1.2654**	**0.0000**	**18,126.2344**	**18,126.2344**	**0.3474**	**0.3323**	**18,236.5476**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Elementary School	1.00951e+006	5.4400e-003	0.0495	0.0416	3.0000e-004		3.7600e-003	3.7600e-003		3.7600e-003	3.7600e-003	0.0000	53.8713	53.8713	1.0300e-003	9.9000e-004	54.1992
General Light Industry	8.14826e+007	0.4394	3.9943	3.3552	0.0240		0.3036	0.3036		0.3036	0.3036	0.0000	4,348.2240	4,348.2240	0.0833	0.0797	4,374.6865
Hotel	3.31492e+007	0.1788	1.6250	1.3650	9.7500e-003		0.1235	0.1235		0.1235	0.1235	0.0000	1,768.9654	1,768.9654	0.0339	0.0324	1,779.7311
Office Park	1.74509e+008	0.9410	8.5544	7.1857	0.0513		0.6501	0.6501		0.6501	0.6501	0.0000	9,312.4541	9,312.4541	0.1785	0.1707	9,369.1282
Regional Shopping Center	216000	1.1600e-003	0.0106	8.8900e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.5266	11.5266	2.2000e-004	2.1000e-004	11.5967
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	2.74464e+007	0.1480	1.2647	0.5382	8.0700e-003		0.1023	0.1023		0.1023	0.1023	0.0000	1,464.6432	1,464.6432	0.0281	0.0269	1,473.5568
Condo/Townhouse High Rise	2.18603e+007	0.1179	1.0073	0.4286	6.4300e-003		0.0814	0.0814		0.0814	0.0814	0.0000	1,166.5497	1,166.5497	0.0224	0.0214	1,173.6491
Total		**1.8316**	**16.5056**	**12.9231**	**0.0999**		**1.2654**	**1.2654**		**1.2654**	**1.2654**	**0.0000**	**18,126.2344**	**18,126.2344**	**0.3474**	**0.3323**	**18,236.5476**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.12076e+007	3,260.4150	0.1474	0.0305	3,272.9666
Condo/Townhouse High Rise	3.83642e+006	1,116.0589	0.0505	0.0104	1,120.3553
Elementary School	290856	84.6134	3.8300e-003	7.9000e-004	84.9391
General Light Industry	2.62407e+007	7,633.7234	0.3452	0.0714	7,663.1109
Hotel	7.92792e+006	2,306.3228	0.1043	0.0216	2,315.2015
Office Park	1.24981e+008	36,358.4642	1.6440	0.3401	36,498.4331
Regional Shopping Center	522450	151.9867	6.8700e-003	1.4200e-003	152.5718
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**50,911.5844**	**2.3021**	**0.4763**	**51,107.5783**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.12076e+007	3,260.4150	0.1474	0.0305	3,272.9666
Condo/Townhouse High Rise	3.83642e+006	1,116.0589	0.0505	0.0104	1,120.3553
Elementary School	290856	84.6134	3.8300e-003	7.9000e-004	84.9391
General Light Industry	2.62407e+007	7,633.7234	0.3452	0.0714	7,663.1109
Hotel	7.92792e+006	2,306.3228	0.1043	0.0216	2,315.2015
Office Park	1.24981e+008	36,358.4642	1.6440	0.3401	36,498.4331
Regional Shopping Center	522450	151.9867	6.8700e-003	1.4200e-003	152.5718
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**50,911.5844**	**2.3021**	**0.4763**	**51,107.5783**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Unmitigated	80.3800	0.3958	34.2197	5.4000e-003		0.8113	0.8113		0.8112	0.8112	65.4698	154.6426	220.1124	0.1687	5.4600e-003	225.3470
Mitigated	77.2781	0.3431	29.7809	1.5800e-003		0.1654	0.1654		0.1654	0.1654	0.0000	48.8766	48.8766	0.0471	0.0000	49.8660

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.6402					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	66.7361					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.1019	0.0527	4.4388	3.8200e-003		0.6459	0.6459		0.6459	0.6459	65.4698	105.7660	171.2358	0.1216	5.4600e-003	175.4811
Landscaping	0.9018	0.3431	29.7809	1.5800e-003		0.1654	0.1654		0.1654	0.1654	0.0000	48.8766	48.8766	0.0471	0.0000	49.8660
Total	**80.3800**	**0.3958**	**34.2197**	**5.4000e-003**		**0.8113**	**0.8113**		**0.8112**	**0.8112**	**65.4698**	**154.6426**	**220.1124**	**0.1687**	**5.4600e-003**	**225.3471**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.6402					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	66.7361					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.9018	0.3431	29.7809	1.5800e-003		0.1654	0.1654		0.1654	0.1654	0.0000	48.8766	48.8766	0.0471	0.0000	49.8660
Total	**77.2781**	**0.3431**	**29.7809**	**1.5800e-003**		**0.1654**	**0.1654**		**0.1654**	**0.1654**	**0.0000**	**48.8766**	**48.8766**	**0.0471**	**0.0000**	**49.8660**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	6,091.4310	85.0752	2.0525	8,514.2691
Mitigated	5,035.3740	68.0551	1.6409	6,973.2148

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	201.977 / 127.334	511.6652	6.6017	0.1596	699.7731
Condo/Townhouse High Rise	58.6386 / 36.9678	148.5480	1.9166	0.0463	203.1599
Elementary School	1.69697 / 4.36363	7.6526	0.0556	1.3700e-003	9.2460
General Light Industry	733.756 / 0	1,387.8088	23.9617	0.5754	2,069.3657
Hotel	15.2201 / 1.69112	30.5087	0.4971	0.0120	44.6527
Office Park	1588.94 / 973.866	3,996.8632	51.9336	1.2552	5,476.5831
Regional Shopping Center	3.33326 / 2.04297	8.3846	0.1090	2.6300e-003	11.4887
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**6,091.4310**	**85.0752**	**2.0524**	**8,514.2691**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	161.582 / 119.566	427.3535	5.2812	0.1276	577.8274
Condo/Townhouse High Rise	46.9109 / 34.7128	124.0704	1.5333	0.0371	167.7563
Elementary School	1.35757 / 4.09745	6.7397	0.0445	1.1000e-003	8.0160
General Light Industry	587.005 / 0	1,110.2471	19.1659	0.4596	1,655.1955
Hotel	12.176 / 1.58796	24.6463	0.3976	9.5500e-003	35.9562
Office Park	1271.15 / 914.46	3,335.3203	41.5455	1.0039	4,518.9834
Regional Shopping Center	2.66661 / 1.91835	6.9968	0.0872	2.1100e-003	9.4799
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**5,035.3740**	**68.0551**	**1.6409**	**6,973.2148**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2,962.0888	175.0544	0.0000	6,638.2319
Unmitigated	2,962.0888	175.0544	0.0000	6,638.2319

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	1426	289.4651	17.1069	0.0000	648.7100
Condo/Townhouse High Rise	414	84.0383	4.9665	0.0000	188.3352
Elementary School	127.75	25.9321	1.5325	0.0000	58.1155
General Light Industry	3934.52	798.6720	47.2002	0.0000	1,789.8754
Hotel	328.5	66.6825	3.9408	0.0000	149.4399
Office Park	8314.2	1,687.7075	99.7407	0.0000	3,782.2612
Regional Shopping Center	47.25	9.5913	0.5668	0.0000	21.4948
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**2,962.0888**	**175.0544**	**0.0000**	**6,638.2319**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	1426	289.4651	17.1069	0.0000	648.7100
Condo/Townhouse High Rise	414	84.0383	4.9665	0.0000	188.3352
Elementary School	127.75	25.9321	1.5325	0.0000	58.1155
General Light Industry	3934.52	798.6720	47.2002	0.0000	1,789.8754
Hotel	328.5	66.6825	3.9408	0.0000	149.4399
Office Park	8314.2	1,687.7075	99.7407	0.0000	3,782.2612
Regional Shopping Center	47.25	9.5913	0.5668	0.0000	21.4948
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**2,962.0888**	**175.0544**	**0.0000**	**6,638.2319**

B.2 - Health Risk Assessment

ENVIRON

May 22, 2013

Via Electronic Mail

Mr. Tony Morici
Warm Springs Station Group
893 Corporate Way
Fremont, CA 94539

Re: Synopsis of Air Quality and Health Risk Study for Proposed Warm Springs Development

Dear Mr. Morici:

At the request of Warm Springs Station Group, ENVIRON International Corporation (ENVIRON) is providing you a brief synopsis of the air quality and health risk assessment performed for the proposed mixed-use development at 44960 Warm Springs Boulevard, Fremont, California (herein referred to as the "Project" or the "Site").

Introduction

ENVIRON performed an air quality and health risk assessment to evaluate the potential health risk from nearby sources of toxic air contaminants (TACs) on hypothetical new sensitive receptors to be located on the currently vacant 36-acre project Site. The Site is located adjacent to the future Warm Springs BART station and is bordered by Highway I-680 to the East, Grimmer Boulevard to the North, and Warm Springs Boulevard to the West. Sources of TACs close to the proposed development area include Highway I-680, surface streets (Grimmer Blvd, Osgood Road, and Warm Springs Blvd), various industrial stationary sources, and rail activity. The air quality and health risk assessment was performed as a requirement to evaluate TAC impacts on new receptors consistent with the most recent Bay Area Air Quality Management District (BAAQMD or "the District") California Environmental Quality Act (CEQA) guidelines, as described below.

Thresholds of Significance

The BAAQMD published recommended CEQA thresholds of significance in May 2011 which include health risk thresholds for single-source and cumulative impacts on new receptors. These are summarized in Table 1:

ENVIRON International Corp. 201 California Street, Suite 1200, San Francisco, CA 94111
V +1 415.796.1950 F +1 415.398.5812

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Table 1: BAAQMD-Recommended Thresholds of Significance (May 2011)		
	Single Source Threshold	**Cumulative Threshold**
Cancer	10-in-a-million	100-in-a-million
Chronic Hazard Index	1.0	10.0
Acute Hazard Index	1.0	No threshold
PM2.5 Concentration	0.3 µg/m3	0.8 µg/m3

Source: BAAQMD. 2011. California Environmental Quality Act Air Quality Guidelines. May.

Note: On March 5, 2012 the Alameda County Superior Court issued a judgment, in California Building Industry Association v. Bay Area Air Quality Management District, finding that the BAAQMD had failed to comply with CEQA when it adopted its 2011 significance thresholds. The Court ruled that the adoption of the new significance thresholds (including new significance thresholds for toxic air contaminants [TACs]) and fine particulate matter or $PM_{2.5}$) is considered a "project" under CEQA, and, thus, the BAAQMD should have prepared the required CEQA review and documentation. The court issued a writ of mandate ordering the BAAQMD to set aside the 2011 significance thresholds and cease dissemination of them until the BAAQMD had complied with CEQA. In view of the court's order, the District is no longer recommending that the significance thresholds be used as a generally applicable measure of a project's significant air quality impacts and is recommending that lead agencies will need to determine appropriate air quality thresholds of significance based on substantial evidence in the record. Lead agencies may rely on the District's CEQA Guidelines (updated May 2012)[1] for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures.

CEQA gives lead agencies discretion to determine appropriate thresholds of significance based on substantial evidence. In the Conservation Element of its General Plan, the City of Fremont ("the City") of Fremont specifies a cancer risk threshold of significance of 100-in-a-million for infill development sites.[2] The City also establishes a separate threshold of significance for cancer risk for non-infill residential development at 10-in-a-million. We understand that the Project to be located at an infill development site because it is located within a "Regional Center" area and is also located along "Urban Corridors".[3] Thus, we believe for cancer risk, the appropriate threshold of significance should be 100-in-a-million. Other endpoints are typically considered in health risk assessments that are prepared for the BAAQMD, including chronic and acute hazards, and an evaluation of $PM_{2.5}$ (fine particulate) concentrations. Due to lack of City of Fremont-specified thresholds of significance for these endpoints, and in an abundance of caution, we apply the BAAQMD-recommended thresholds of significance for these health risk metrics.

[1] BAAQMD. 2012. California Environmental Quality Act Air Quality Guidelines. May. Available online at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en. Accessed May 2013.

[2] City of Fremont. 2011. General Plan. Conservation. Chapter 7. December. Available at: http://www.fremont.gov/DocumentView.aspx?DID=6638. Accessed May 2013. See Implementation 7-7.3.B on Page 7-50.

[3] City of Fremont. Place Types Manual. Community Character Element. City of Fremont General Plan. Available at: http://www.fremont.gov/DocumentCenter/Home/View/6221. Accessed May 2013. See maps on Pages 4 and 14.

Methods

ENVIRON performed the assessment in accordance with BAAQMD CEQA Guidelines[4] released in May 2012. Health risk from surface roads (Grimmer Blvd, Warm Springs Blvd, and Osgood Rd) was estimated using BAAQMD Roadway Screening Analysis Tables.[5] Health risk from nearby stationary sources was estimated from both the BAAQMD Stationary Source and Risk Analysis Tool[6] and from data provided directly from the District.[7] Health risk from nearby rail activity was estimated by air dispersion modeling using the United States Environmental Protection Agency's (USEPA's) AERMOD and calculation methodologies consistent with Office of Environmental Health Hazard Assessment (OEHHA)[8] and BAAQMD guidance.[9] Health risk from Highway I-680 was estimated by air dispersion modeling using USEPA's CAL3QHCR and calculation methodologies consistent with OEHHA[10] and BAAQMD guidance.[11] Stationary source locations, surface roads, rail activity, and the highway locations are shown on Figures 1 and 2. In accordance with BAAQMD CEQA Guidelines, ENVIRON evaluated sources within 1,000 feet of the proposed project, as shown by the 1,000-foot buffer in Figures 1 and 2. ENVIRON also evaluated impacts of certain sources outside of the 1,000-foot buffer including rail activity (line haul, idling, and switching as shown in Figure 2) as a level of conservatism.

Results

Maximum single-source health risk impacts on sensitive receptors is shown in Table 2. The maximum impact from each of the stationary sources, rail activity, and surface roads are all below the BAAQMD's single-source thresholds shown in Table 1. The maximum impact from Highway I-680 exceeds the BAAQMD's recommended single-source threshold for cancer risk (10-in-a-million) and $PM_{2.5}$ concentration (0.3 microgram per cubic meter [$\mu g/m^3$]). However, as noted in the Thresholds of Significance discussion, the City of Fremont specifies a cancer risk threshold of 100-in-a-million for infill development and does not specify a single contributor threshold of significance, nor does it identify a single contributor or cumulative threshold for $PM_{2.5}$.

Figure 3 shows the Project site plan with proposed building separation and orientation, illustrating where sensitive receptors may reside. Figures 4 through 7 show the cumulative cancer risk at receptors located across the Site. Four heights were modeled, corresponding to each story of a four story building. Thus, Figure 4 represents the ground floor, Figure 5 represents the 2nd floor, Figure 6 represents the 3rd floor, and Figure 7 represents the 4th floor. As can be seen in the figures, the 100-

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4 BAAQMD. 2012. California Environmental Quality Act Air Quality Guidelines. May. Available online at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en. Accessed May 2013.

5 BAAQMD. 2011. Roadway Screening Analysis Tables. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx. Accessed April 2013.

6 BAAQMD. 2011. Stationary Source Screening Analysis Tool. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx. Accessed February 2012.

7 Health risk from the Tesla Facility is not included in the assessment because sufficient data are not available from the District to make this evaluation. Moreover, Tesla is not located in the direction of the prevailing winds with respect to the Site. The prevailing winds are primarily from the northwest and the Tesla facility is located southwest of the Site.

8 Cal/EPA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August.

9 BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January. Available online at: http://baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx. Accessed May 2013.

10 Cal/EPA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August.

11 BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January. Available online at: http://baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx. Accessed May 2013.

in-a-million threshold is exceeded only at the receptors directly adjacent to the highway (magenta dots). Receptors located on building locations do not have cumulative cancer risk exceeding 100-in-a-million.[12] Thus the only areas that exceed the City of Fremont's cancer risk thresholds are within roughly 50 feet of the highway.

Figures 8 through 11 show the cumulative $PM_{2.5}$ concentration at receptors located across the Site. Similar to cancer risk, four heights were modeled. As can be seen in the figures, exceedence of the BAAQMD-recommended $PM_{2.5}$ single source threshold (0.3 $\mu g/m^3$) occurs primarily within roughly 400 feet of the east property boundary. (There is also an "exceedence" of the single-source threshold on the northern and eastern edges of the property, but these figures reflect a combination of risk from Highway I-680 and the surface streets. In these areas, the contribution to $PM_{2.5}$ from any single source does not exceed the threshold.) There is also an exceedence of the cumulative threshold for $PM_{2.5}$ (0.8 $\mu g/m^3$) (magenta dots), but this only occurs on receptors adjacent to the highway.

Implementation Policy 7-7.3.C of the Conservation Element of the City of Fremont's General Plan requires that new development projects with sensitive receptors within 1,000 feet of a freeway incorporate "to the maximum extent feasible" risk reduction measures to reduce exposure to TACs. It lists project phasing, site orientation, distance separation, landscape buffering, building air filtration systems, and modified building design or building type as possible option. Since the vast majority of the Site is within 1,000 feet of highway I-680, the implementation policy requires risk reduction measures. We address two of these measures in this study: building filtration and landscape buffering.

Building Filtration

For mitigation from building filtration, ENVIRON applied a typical reduction in cancer risk and $PM_{2.5}$ (63% reduction compared to outdoor risk/concentration) seen from the application of MERV-13 rated filters.[13] The reduced cumulative cancer risk and $PM_{2.5}$ concentrations are shown in Figures 12 - 19. As can be seen, cancer risk is reduced to levels below 79-in-a-million and $PM_{2.5}$ concentration is reduced to levels below 0.76 $\mu g/m^3$. While the unmitigated cumulative cancer risk only exceeded the 100-in-a-million threshold only at the eastern edge of the property, the mitigated cancer risk is significantly lower and does not exceed the 100-in-a-million threshold. The mitigated cumulative $PM_{2.5}$ concentration is below the BAAQMD-recommended single-source threshold of 0.3 $\mu g/m^3$ and the cumulative threshold of 0.8 $\mu g/m^3$.

Landscape Buffering

Scientific literature by Fujii et al. (2008)[14] evaluated the efficacy of three tree species (deoder, redwood and live oak) in the removal of fine particulate matter from roadway traffic exhaust at a variety of wind speeds. In general, deoder (a type of cedar) and redwood are the most effective over a range of wind speeds, with removal efficiencies of up to 50% at wind speeds in the 1 to 2 meters per second (m/s) range, decreasing to virtually zero removal at a wind speed of 3.5 m/s. Due to the

[12] Impacts from stationary sources are not included in results Figures 4-19 because their impacts are negligible compared to that of the surface roads and highway.

[13] Klug, S.E., et al. 2012. Quantifying Filtration Impacts on Indoor Exposure to Particulates. Paper 2012-A-529-AWMA. ENVIRON International Corporation. Presented at the Air and Waste Management Association (AWMA) Annual Conference. The 63% reduction is based on a number of key assumptions including: 80% filtration efficacy for both ventilation and recirculation systems, a temperature range of 60-85°F for which windows are opened, and a flow rate of 4.8 cubic feet per minute of infiltration. The reduction shown here is approximate. A refined study incorporating specific parameters for the proposed development would be required to get more accurate results.

[14] Fujii, E., J. Lawton, T. A. Cahill, D. E. Barnes, C. Hayes, and N. Spada. 2008. Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size. Final Report to Breathe California of Sacramento-Emigrant Trails' Health Effects Task Force (HETF) and Sacramento Metropolitan Air Quality Management District, April 30.

complexity of the calculation and for purposes of this study, the reduction in cancer risk and $PM_{2.5}$ from the use of landscape buffering is not quantified here. However, one would expect additional reductions in cancer risk and $PM_{2.5}$ concentration. ENVIRON can perform this calculation at your request.

Conclusions

Based upon the proposed site development plan orientation and building separation, our air quality and health risk assessment indicate that unmitigated health risk impacts from nearby TAC sources do not exceed applicable thresholds of significance for chronic and acute health indices. Since the Site is located within 1,000 feet of a highway, the City's Implementation Policy 7-7.3C requires the application of risk reduction measures to the maximum extent feasible. Typical mitigation from building filtration would reduce cancer risk to below the City of Fremont's significance threshold for cancer risk of 100-in-a-million for infill development and the BAAQMD's recommended single-source $PM_{2.5}$ concentration threshold of 0.3 $\mu g/m^3$ and cumulative threshold of 0.8 $\mu g/m^3$. Further significant reductions in cancer risk and $PM_{2.5}$ would be seen with the application of landscape buffering.

If you have any questions or need further information, please contact David Kim (415.796.1940) at your convenience. Thank you for the opportunity to assist you with this matter.

Sincerely,

David Kim, PhD
Senior Manager

Shari Libicki, PhD
Principal

Attachments:

Tables

Table 2:	Summary of Unmitigated Maximum Health Risk Impacts

Figures

Figure 1:	Locations of Cumulative Sources: Surface Streets, Highway, and Stationary Sources
Figure 2:	Rail Line and Yard Source Locations
Figure 3:	Project Site Plan
Figure 4:	Cumulative Cancer Risk Level 1 from Rail, I-680 and Surface Streets
Figure 5:	Cumulative Cancer Risk Level 2 from Rail, I-680 and Surface Streets
Figure 6:	Cumulative Cancer Risk Level 3 from Rail, I-680 and Surface Streets
Figure 7:	Cumulative Cancer Risk Level 4 from Rail, I-680 and Surface Streets
Figure 8:	Cumulative $PM_{2.5}$ Concentrations Level 1 from Rail, I-680 and Surface Streets
Figure 9:	Cumulative $PM_{2.5}$ Concentrations Level 2 from Rail, I-680 and Surface Streets
Figure 10:	Cumulative $PM_{2.5}$ Concentrations Level 3 from Rail, I-680 and Surface Streets
Figure 11:	Cumulative $PM_{2.5}$ Concentrations Level 4 from Rail, I-680 and Surface Streets
Figure 12:	Mitigated Cumulative Cancer Risk Level 1 from Rail, I-680 and Surface Streets

Figure 13: Mitigated Cumulative Cancer Risk Level 2 from Rail, I-680 and Surface Streets
Figure 14: Mitigated Cumulative Cancer Risk Level 3 from Rail, I-680 and Surface Streets
Figure 15: Mitigated Cumulative Cancer Risk Level 4 from Rail, I-680 and Surface Streets
Figure 16: Mitigated Cumulative $PM_{2.5}$ Concentrations Level 1 from Rail, I-680 and Surface Streets
Figure 17: Mitigated Cumulative $PM_{2.5}$ Concentrations Level 2 from Rail, I-680 and Surface Streets
Figure 18: Mitigated Cumulative $PM_{2.5}$ Concentrations Level 3 from Rail, I-680 and Surface Streets
Figure 19: Mitigated Cumulative $PM_{2.5}$ Concentrations Level 4 from Rail, I-680 and Surface Streets

Tables

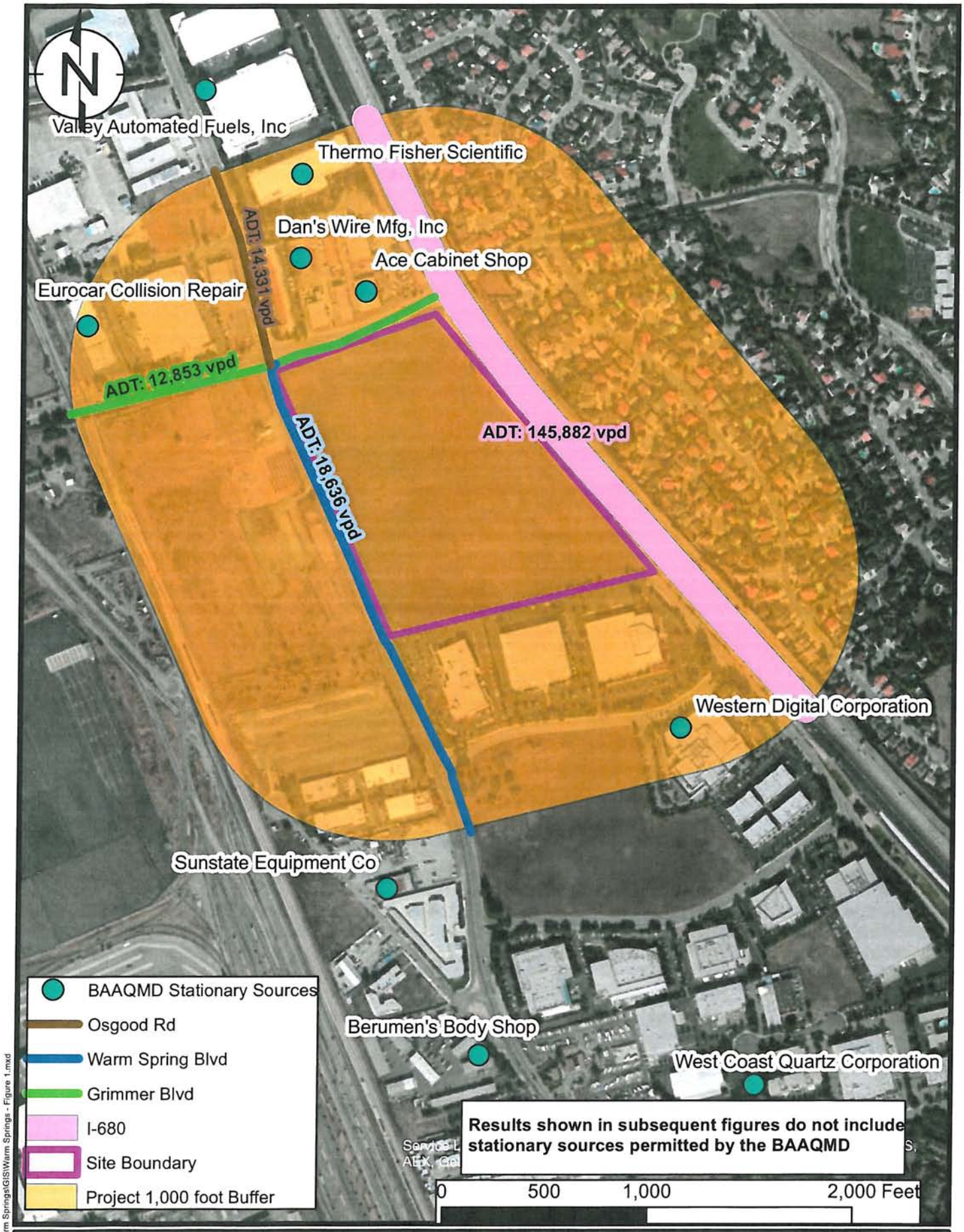
Table 2
Summary of Maximum Unmitigated Impacts
Warm Springs Station Group
Fremont, California

Source	Cancer Risk	Chronic HI	Acute HI[1]	PM2.5
	in a million			$\mu g/m^3$
Stationary Sources	0.85 Western Digital	0.01 Western Digital	--	0.04 Dan's Wire Manufacturing
Rail	0.65	0.00024	0.036	0.0011
Surface Roads	4.7 Warm Springs Blvd.	0.03 All Roads	0.03 All Roads	0.19 Warm Springs Blvd.
Highway	208	0.15	0.13	1.9
Cumulative[2] (Shown as range)	16 - 210	Not shown b/c below 10	Not shown b/c below 10	0.2 - 1.94
Mitigated Cumulative[2] (Shown as range)	8 - 79	Not shown b/c below 10	Not shown b/c below 10	0.12 - 0.76

Notes:
1. BAAQMD Stationary Sourace Screening tool does not provide Acute HI
2. Cumulative results do not include stationary sources

Abbreviations:
µg - microgram
b/c - because
BAAQMD - Bay Area Air Quality Management District
m^3 - cubic meter

Figures



ENVIRON

Locations of Cumulative Sources: Surface Streets, Highway, and Stationary Sources

Warm Springs
Fremont, CA

FIGURE
1

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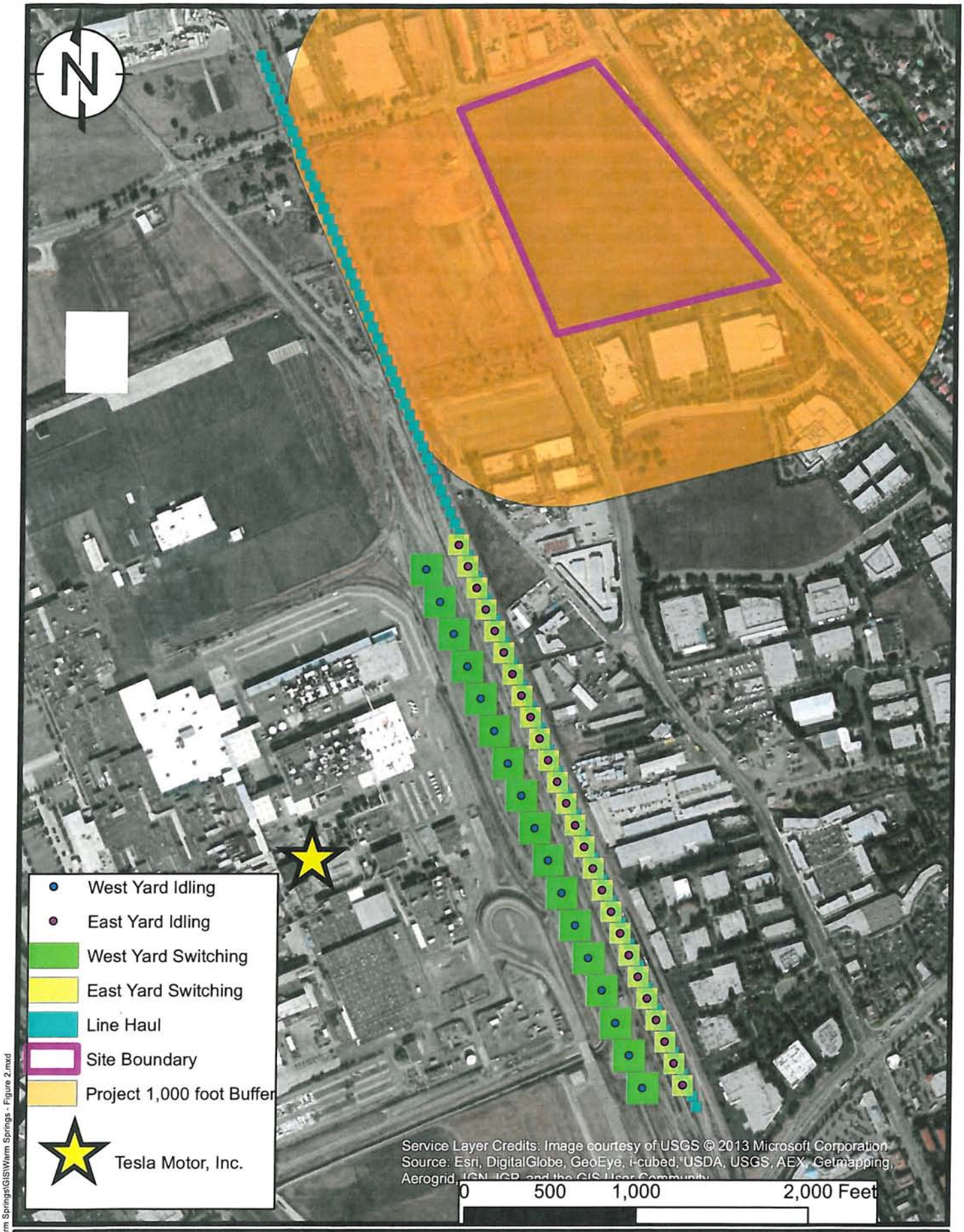
\\Env-SF-File1\Public\Air\Warm Springs\GIS\Warm Springs - Figure 1.mxd



ENVIRON

Rail Line and Yard Source Locations

Warm Springs

Fremont, CA

FIGURE

2

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DATE: 5/21/2013

Project Site Plan

Warm Springs

Fremont, CA

FIGURE

3

PROJECT

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ENVIRON

Cumulative Cancer Risk Level 1
From Rail, I-680 and Surface Streets
Warm Springs
Fremont, CA

FIGURE
4

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ENVIRON

Cumulative Cancer Risk Level 2
From Rail, I-680 and Surface Streets
Warm Springs
Fremont, CA

FIGURE
5

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ENVIRON

Cumulative Cancer Risk Level 3
From Rail, I-680 and Surface Streets
Warm Springs
Fremont, CA

FIGURE
6

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ENVIRON

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Cumulative Cancer Risk Level 4
From Rail, I-680 and Surface Streets
Warm Springs
Fremont, CA

FIGURE
7

PROJECT

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Cumulative PM2.5 Concentration Level 1 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

8

PROJECT

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ENVIRON

Cumulative PM2.5 Concentration Level 2 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

9

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ENVIRON

Cumulative PM2.5 Concentration Level 3 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

10

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ENVIRON

Cumulative PM2.5 Concentration Level 4 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

11

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ENVIRON

Mitigated Cumulative Cancer Risk Level 1 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

12

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ENVIRON

Mitigated Cumulative Cancer Risk Level 2 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

13

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ENVIRON

Mitigated Cumulative Cancer Risk Level 3 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

14

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ENVIRON

Mitigated Cumulative Cancer Risk Level 4 From Rail, I-680 and Surface Streets

Warm Springs

Fremont, CA

FIGURE

15

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ENVIRON

Mitigated Cumulative PM2.5 Concentration
Level 1
From Rail, I-680 and Surface Streets
Warm Springs

FIGURE
16

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ENVIRON

Mitigated Cumulative PM2.5 Concentration
Level 2
From Rail, I-680 and Surface Streets
Warm Springs

FIGURE
17

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ENVIRON

Mitigated Cumulative PM2.5 Concentration
Level 3
From Rail, I-680 and Surface Streets
Warm Springs

FIGURE
18

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ENVIRON

Mitigated Cumulative PM2.5 Concentration
Level 4
From Rail, I-680 and Surface Streets
Warm Springs

FIGURE
19

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