

APPENDIX 9.1-7

*Revised Construction Criteria Pollutant Emissions
and AERMOD Health Risk Analysis Calculations*

Jacumba Solar Project
San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	108.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	40
Climate Zone	13			Operational Year	2016
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Construction Phase - soil import added
 Grading - 6,300 cy import
 Trips and VMT - updated per O5 comments
 Construction Off-road Equipment Mitigation - water area 3x per day
 Off-road Equipment - no equipment for import phase

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	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
Year	lb/day										lb/day					
2016	17.8751	242.7891	145.4228	0.4208	36.7817	8.1926	44.9744	16.2861	7.5371	23.8231	0.0000	42,477.6073	42,477.6073	4.3877	0.0000	42,569.7484
Total	17.8751	242.7891	145.4228	0.4208	36.7817	8.1926	44.9744	16.2861	7.5371	23.8231	0.0000	42,477.6073	42,477.6073	4.3877	0.0000	42,569.7484

Mitigated Construction

	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
Year	lb/day										lb/day					
2016	17.8751	242.7891	145.4228	0.4208	20.2826	8.1926	28.4752	8.0136	7.5371	15.5507	0.0000	42,477.6073	42,477.6073	4.3877	0.0000	42,569.7484
Total	17.8751	242.7891	145.4228	0.4208	20.2826	8.1926	28.4752	8.0136	7.5371	15.5507	0.0000	42,477.6073	42,477.6073	4.3877	0.0000	42,569.7484

	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
Percent Reduction	0.00	0.00	0.00	0.00	44.86	0.00	36.69	50.79	0.00	34.72	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2016	5/14/2016	6	12	
2	Grading	Grading	5/15/2016	6/29/2016	6	39	
3	Grading - Soil Import	Grading	5/15/2016	6/29/2016	6	39	
4	Underground Electrical	Trenching	6/30/2016	10/20/2016	6	97	
5	PV Racks and Solar Panel Installation	Building Construction	6/30/2016	10/20/2016	6	97	
6	Substation Construction	Building Construction	8/1/2016	9/19/2016	6	43	
7	Gen-Tie Construction	Building Construction	9/5/2016	10/1/2016	6	24	

Acres of Grading (Grading Phase): 108

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
PV Racks and Solar Panel Installation	Cranes	2	4.00	226	0.29
PV Racks and Solar Panel Installation	Forklifts	2	8.00	89	0.20
PV Racks and Solar Panel Installation	Generator Sets	2	8.00	84	0.74
Substation Construction	Cranes	1	8.00	226	0.29
Gen-Tie Construction	Cranes	1	4.00	226	0.29
Grading	Rubber Tired Dozers	4	8.00	255	0.40
Substation Construction	Forklifts	1	8.00	89	0.20
Site Preparation	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Scrapers	4	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Gen-Tie Construction	Tractors/Loaders/Backhoes	3	6.00	97	0.37
PV Racks and Solar Panel Installation	Welders	2	6.00	46	0.45
Site Preparation	Excavators	2	8.00	162	0.38
Underground Electrical	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Underground Electrical	Trenchers	1	8.00	80	0.50
PV Racks and Solar Panel Installation	Air Compressors	2	6.00	78	0.48
PV Racks and Solar Panel Installation	Bore/Drill Rigs	4	8.00	205	0.50
Substation Construction	Aerial Lifts	1	8.00	62	0.31

Substation Construction	Excavators	1	8.00	162	0.38
Gen-Tie Construction	Aerial Lifts	2	8.00	62	0.31
Gen-Tie Construction	Bore/Drill Rigs	2	8.00	205	0.50
Gen-Tie Construction	Excavators	2	8.00	162	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
PV Racks and Solar Panel Installation	14	126.00	10.00	776.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Grading	12	30.00	104.00	624.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Substation Construction	4	0.00	0.00	0.00	0.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Gen-Tie Construction	10	0.00	0.00	0.00	0.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	10.00	44.00	192.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Underground Electrical	4	126.00	10.00	776.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Grading - Soil Import	0	0.00	0.00	630.00	0.00	0.00	55.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

Category	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
	lb/day										lb/day					
Fugitive Dust					12.0442	0.0000	12.0442	6.6205	0.0000	6.6205			0.0000			0.0000

Off-Road	3.2529	36.6030	27.8267	0.0283		1.7268	1.7268		1.5887	1.5887		2,946.7003	2,946.7003	0.8888		2,965.3657
Total	3.2529	36.6030	27.8267	0.0283	12.0442	1.7268	13.7710	6.6205	1.5887	8.2091		2,946.7003	2,946.7003	0.8888		2,965.3657

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.8848	17.8783	6.6622	0.0498	1.1838	0.2577	1.4415	0.3240	0.2371	0.5611		5,030.3595	5,030.3595	0.0339		5,031.0702
Vendor	1.8047	31.1390	13.2643	0.0905	2.7115	0.5653	3.2767	0.7726	0.5200	1.2926		9,120.2568	9,120.2568	0.0631		9,121.5826
Worker	0.0841	0.2051	2.2065	5.6500e-003	0.4559	3.0700e-003	0.4590	0.1209	2.8200e-003	0.1237		471.7749	471.7749	0.0225		472.2471
Total	2.7736	49.2224	22.1330	0.1459	4.3512	0.8261	5.1772	1.2175	0.7599	1.9775		14,622.3912	14,622.3912	0.1195		14,624.8999

Mitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					4.6972	0.0000	4.6972	2.5820	0.0000	2.5820			0.0000			0.0000
Off-Road	3.2529	36.6030	27.8267	0.0283		1.7268	1.7268		1.5887	1.5887	0.0000	2,946.7003	2,946.7003	0.8888		2,965.3657
Total	3.2529	36.6030	27.8267	0.0283	4.6972	1.7268	6.4241	2.5820	1.5887	4.1707	0.0000	2,946.7003	2,946.7003	0.8888		2,965.3657

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.8848	17.8783	6.6622	0.0498	1.1838	0.2577	1.4415	0.3240	0.2371	0.5611		5,030.3595	5,030.3595	0.0339		5,031.0702
Vendor	1.8047	31.1390	13.2643	0.0905	2.7115	0.5653	3.2767	0.7726	0.5200	1.2926		9,120.2568	9,120.2568	0.0631		9,121.5826
Worker	0.0841	0.2051	2.2065	5.6500e-003	0.4559	3.0700e-003	0.4590	0.1209	2.8200e-003	0.1237		471.7749	471.7749	0.0225		472.2471
Total	2.7736	49.2224	22.1330	0.1459	4.3512	0.8261	5.1772	1.2175	0.7599	1.9775		14,622.3912	14,622.3912	0.1195		14,624.8999

3.3 Grading - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					27.0251	0.0000	27.0251	13.5580	0.0000	13.5580			0.0000			0.0000
Off-Road	11.8452	138.8857	95.6759	0.1075		6.4210	6.4210		5.9073	5.9073		11,178.3393	11,178.3393	3.3718		11,249.1468
Total	11.8452	138.8857	95.6759	0.1075	27.0251	6.4210	33.4461	13.5580	5.9073	19.4653		11,178.3393	11,178.3393	3.3718		11,249.1468

Unmitigated Construction Off-Site

	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	lb/day										lb/day					

Hauling	0.8848	17.8783	6.6622	0.0498	1.1838	0.2577	1.4415	0.3240	0.2371	0.5611		5,030.3595	5,030.3595	0.0339		5,031.0702
Vendor	4.2656	73.6012	31.3519	0.2138	6.4089	1.3361	7.7450	1.8262	1.2291	3.0553		21,556.9707	21,556.9707	0.1492		21,560.1043
Worker	0.2523	0.6152	6.6195	0.0170	1.3678	9.2000e-003	1.3770	0.3626	8.4600e-003	0.3711		1,415.3247	1,415.3247	0.0675		1,416.7413
Total	5.4028	92.0947	44.6336	0.2806	8.9605	1.6030	10.5635	2.5129	1.4747	3.9875		28,002.6548	28,002.6548	0.2505		28,007.9158

Mitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					10.5398	0.0000	10.5398	5.2876	0.0000	5.2876			0.0000			0.0000
Off-Road	11.8452	138.8857	95.6759	0.1075		6.4210	6.4210		5.9073	5.9073	0.0000	11,178.3393	11,178.3393	3.3718		11,249.1468
Total	11.8452	138.8857	95.6759	0.1075	10.5398	6.4210	16.9607	5.2876	5.9073	11.1949	0.0000	11,178.3393	11,178.3393	3.3718		11,249.1468

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.8848	17.8783	6.6622	0.0498	1.1838	0.2577	1.4415	0.3240	0.2371	0.5611		5,030.3595	5,030.3595	0.0339		5,031.0702
Vendor	4.2656	73.6012	31.3519	0.2138	6.4089	1.3361	7.7450	1.8262	1.2291	3.0553		21,556.9707	21,556.9707	0.1492		21,560.1043
Worker	0.2523	0.6152	6.6195	0.0170	1.3678	9.2000e-003	1.3770	0.3626	8.4600e-003	0.3711		1,415.3247	1,415.3247	0.0675		1,416.7413
Total	5.4028	92.0947	44.6336	0.2806	8.9605	1.6030	10.5635	2.5129	1.4747	3.9875		28,002.6548	28,002.6548	0.2505		28,007.9158

3.4 Grading - Soil Import - 2016
Unmitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					0.0227	0.0000	0.0227	3.4400e-003	0.0000	3.4400e-003			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0227	0.0000	0.0227	3.4400e-003	0.0000	3.4400e-003		0.0000	0.0000	0.0000		0.0000

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.6272	11.8087	5.1133	0.0327	0.7735	0.1687	0.9421	0.2117	0.1551	0.3669		3,296.6132	3,296.6132	0.0224		3,297.0835
Vendor	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
Worker	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
Total	0.6272	11.8087	5.1133	0.0327	0.7735	0.1687	0.9421	0.2117	0.1551	0.3669		3,296.6132	3,296.6132	0.0224		3,297.0835

Mitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					8.8500e-003	0.0000	8.8500e-003	1.3400e-003	0.0000	1.3400e-003			0.0000			0.0000
Off-Road	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
Total	0.0000	0.0000	0.0000	0.0000	8.8500e-003	0.0000	8.8500e-003	1.3400e-003	0.0000	1.3400e-003	0.0000	0.0000	0.0000	0.0000		0.0000

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.6272	11.8087	5.1133	0.0327	0.7735	0.1687	0.9421	0.2117	0.1551	0.3669		3,296.6132	3,296.6132	0.0224		3,297.0835
Vendor	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
Worker	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
Total	0.6272	11.8087	5.1133	0.0327	0.7735	0.1687	0.9421	0.2117	0.1551	0.3669		3,296.6132	3,296.6132	0.0224		3,297.0835

3.5 Underground Electrical - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431		1,330.7576	1,330.7576	0.4014		1,339.1871

Total	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431		1,330.7576	1,330.7576	0.4014		1,339.1871
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Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.4424	8.9392	3.3311	0.0249	0.5919	0.1289	0.7207	0.1620	0.1185	0.2806		2,515.1797	2,515.1797	0.0169		2,515.5351
Vendor	0.4102	7.0770	3.0146	0.0206	0.6162	0.1285	0.7447	0.1756	0.1182	0.2938		2,072.7856	2,072.7856	0.0144		2,073.0870
Worker	1.0596	2.5837	27.8021	0.0712	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,944.3636	5,944.3636	0.2833		5,950.3135
Total	1.9122	18.5999	34.1478	0.1167	6.9528	0.2960	7.2488	1.8606	0.2722	2.1329		10,532.3290	10,532.3290	0.3146		10,538.9356

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431	0.0000	1,330.7576	1,330.7576	0.4014		1,339.1871
Total	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431	0.0000	1,330.7576	1,330.7576	0.4014		1,339.1871

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.4424	8.9392	3.3311	0.0249	0.5919	0.1289	0.7207	0.1620	0.1185	0.2806		2,515.1797	2,515.1797	0.0169		2,515.5351
Vendor	0.4102	7.0770	3.0146	0.0206	0.6162	0.1285	0.7447	0.1756	0.1182	0.2938		2,072.7856	2,072.7856	0.0144		2,073.0870
Worker	1.0596	2.5837	27.8021	0.0712	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,944.3636	5,944.3636	0.2833		5,950.3135
Total	1.9122	18.5999	34.1478	0.1167	6.9528	0.2960	7.2488	1.8606	0.2722	2.1329		10,532.3290	10,532.3290	0.3146		10,538.9356

3.6 PV Racks and Solar Panel Installation - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072		6,654.8292	6,654.8292	1.6238		6,688.9282
Total	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072		6,654.8292	6,654.8292	1.6238		6,688.9282

Unmitigated Construction Off-Site

	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	lb/day										lb/day					

Hauling	0.4424	8.9392	3.3311	0.0249	0.5919	0.1289	0.7207	0.1620	0.1185	0.2806		2,515.1797	2,515.1797	0.0169		2,515.5351
Vendor	0.4102	7.0770	3.0146	0.0206	0.6162	0.1285	0.7447	0.1756	0.1182	0.2938		2,072.7856	2,072.7856	0.0144		2,073.0870
Worker	1.0596	2.5837	27.8021	0.0712	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,944.3636	5,944.3636	0.2833		5,950.3135
Total	1.9122	18.5999	34.1478	0.1167	6.9528	0.2960	7.2488	1.8606	0.2722	2.1329		10,532.3290	10,532.3290	0.3146		10,538.9356

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072	0.0000	6,654.8292	6,654.8292	1.6238		6,688.9282
Total	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072	0.0000	6,654.8292	6,654.8292	1.6238		6,688.9282

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.4424	8.9392	3.3311	0.0249	0.5919	0.1289	0.7207	0.1620	0.1185	0.2806		2,515.1797	2,515.1797	0.0169		2,515.5351
Vendor	0.4102	7.0770	3.0146	0.0206	0.6162	0.1285	0.7447	0.1756	0.1182	0.2938		2,072.7856	2,072.7856	0.0144		2,073.0870
Worker	1.0596	2.5837	27.8021	0.0712	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,944.3636	5,944.3636	0.2833		5,950.3135
Total	1.9122	18.5999	34.1478	0.1167	6.9528	0.2960	7.2488	1.8606	0.2722	2.1329		10,532.3290	10,532.3290	0.3146		10,538.9356

3.7 Substation Construction - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419		1,466.4717	1,466.4717	0.4423		1,475.7609
Total	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419		1,466.4717	1,466.4717	0.4423		1,475.7609

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419	0.0000	1,466.4717	1,466.4717	0.4423		1,475.7608
Total	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419	0.0000	1,466.4717	1,466.4717	0.4423		1,475.7608

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

3.8 Gen-Tie Construction - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512		4,279.9056	4,279.9056	1.2910		4,307.0160

Total	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512		4,279.9056	4,279.9056	1.2910		4,307.0160
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Unmitigated Construction Off-Site

	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	lb/day										lb/day						
Hauling	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
Vendor	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
Worker	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
Total	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

Mitigated Construction On-Site

	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	lb/day										lb/day						
Off-Road	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512	0.0000	4,279.9056	4,279.9056	1.2910			4,307.0160
Total	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512	0.0000	4,279.9056	4,279.9056	1.2910			4,307.0160

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

Jacumba Solar Project
San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	108.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	40
Climate Zone	13			Operational Year	2016
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Construction Phase - site would be balanced; however, soil import added to be conservative

Grading - 6,300 cy import

Trips and VMT - updated per O5 comments

Construction Off-road Equipment Mitigation - water area 3x per day

Off-road Equipment - no equipment for import phase

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	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
Year	lb/day										lb/day					
2016	18.1043	246.4191	150.5223	0.4196	36.7817	8.1945	44.9763	16.2861	7.5388	23.8249	0.0000	42,365.4615	42,365.4615	4.3879	0.0000	42,457.6070
Total	18.1043	246.4191	150.5223	0.4196	36.7817	8.1945	44.9763	16.2861	7.5388	23.8249	0.0000	42,365.4615	42,365.4615	4.3879	0.0000	42,457.6070

Mitigated Construction

	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
Year	lb/day										lb/day					
2016	18.1043	246.4191	150.5223	0.4196	20.2826	8.1945	28.4771	8.0136	7.5388	15.5524	0.0000	42,365.4615	42,365.4615	4.3879	0.0000	42,457.6070
Total	18.1043	246.4191	150.5223	0.4196	20.2826	8.1945	28.4771	8.0136	7.5388	15.5524	0.0000	42,365.4615	42,365.4615	4.3879	0.0000	42,457.6070

	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
Percent Reduction	0.00	0.00	0.00	0.00	44.86	0.00	36.68	50.79	0.00	34.72	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	5/1/2016	5/14/2016	6	12	

2	Grading	Grading	5/15/2016	6/29/2016	6	39
3	Grading - Soil Import	Grading	5/15/2016	6/29/2016	6	39
4	Underground Electrical	Trenching	6/30/2016	10/20/2016	6	97
5	PV Racks and Solar Panel Installation	Building Construction	6/30/2016	10/20/2016	6	97
6	Substation Construction	Building Construction	8/1/2016	9/19/2016	6	43
7	Gen-Tie Construction	Building Construction	9/5/2016	10/1/2016	6	24

Acres of Grading (Grading Phase): 108

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
PV Racks and Solar Panel Installation	Cranes	2	4.00	226	0.29
PV Racks and Solar Panel Installation	Forklifts	2	8.00	89	0.20
PV Racks and Solar Panel Installation	Generator Sets	2	8.00	84	0.74
Substation Construction	Cranes	1	8.00	226	0.29
Gen-Tie Construction	Cranes	1	4.00	226	0.29
Grading	Rubber Tired Dozers	4	8.00	255	0.40
Substation Construction	Forklifts	1	8.00	89	0.20
Site Preparation	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Scrapers	4	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Gen-Tie Construction	Tractors/Loaders/Backhoes	3	6.00	97	0.37
PV Racks and Solar Panel Installation	Welders	2	6.00	46	0.45
Site Preparation	Excavators	2	8.00	162	0.38
Underground Electrical	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Underground Electrical	Trenchers	1	8.00	80	0.50
PV Racks and Solar Panel Installation	Air Compressors	2	6.00	78	0.48

PV Racks and Solar Panel Installation	Bore/Drill Rigs	4	8.00	205	0.50
Substation Construction	Aerial Lifts	1	8.00	62	0.31
Substation Construction	Excavators	1	8.00	162	0.38
Gen-Tie Construction	Aerial Lifts	2	8.00	62	0.31
Gen-Tie Construction	Bore/Drill Rigs	2	8.00	205	0.50
Gen-Tie Construction	Excavators	2	8.00	162	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
PV Racks and Solar Panel Installation	14	126.00	10.00	776.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Grading	12	30.00	104.00	624.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Substation Construction	4	0.00	0.00	0.00	0.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Gen-Tie Construction	10	0.00	0.00	0.00	0.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	4	10.00	44.00	192.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Underground Electrical	4	126.00	10.00	776.00	60.00	68.00	85.00	LD_Mix	HDT_Mix	HHDT
Grading - Soil Import	0	0.00	0.00	630.00	0.00	0.00	55.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

	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
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Category	lb/day										lb/day				
Fugitive Dust					12.0442	0.0000	12.0442	6.6205	0.0000	6.6205			0.0000		0.0000
Off-Road	3.2529	36.6030	27.8267	0.0283		1.7268	1.7268		1.5887	1.5887		2,946.7003	2,946.7003	0.8888	2,965.3657
Total	3.2529	36.6030	27.8267	0.0283	12.0442	1.7268	13.7710	6.6205	1.5887	8.2091		2,946.7003	2,946.7003	0.8888	2,965.3657

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.9193	18.4962	7.5662	0.0498	1.1838	0.2579	1.4417	0.3240	0.2372	0.5613		5,027.5313	5,027.5313	0.0340		5,028.2445
Vendor	1.8722	32.2111	14.8851	0.0904	2.7115	0.5659	3.2774	0.7726	0.5206	1.2933		9,112.2082	9,112.2082	0.0633		9,113.5382
Worker	0.0841	0.2300	2.0190	5.3000e-003	0.4559	3.0700e-003	0.4590	0.1209	2.8200e-003	0.1237		442.6289	442.6289	0.0225		443.1011
Total	2.8756	50.9372	24.4704	0.1455	4.3512	0.8269	5.1780	1.2175	0.7607	1.9782		14,582.3683	14,582.3683	0.1198		14,584.8837

Mitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					4.6972	0.0000	4.6972	2.5820	0.0000	2.5820			0.0000			0.0000
Off-Road	3.2529	36.6030	27.8267	0.0283		1.7268	1.7268		1.5887	1.5887	0.0000	2,946.7003	2,946.7003	0.8888		2,965.3657

Total	3.2529	36.6030	27.8267	0.0283	4.6972	1.7268	6.4241	2.5820	1.5887	4.1707	0.0000	2,946.7003	2,946.7003	0.8888		2,965.3657
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Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.9193	18.4962	7.5662	0.0498	1.1838	0.2579	1.4417	0.3240	0.2372	0.5613		5,027.5313	5,027.5313	0.0340		5,028.2445
Vendor	1.8722	32.2111	14.8851	0.0904	2.7115	0.5659	3.2774	0.7726	0.5206	1.2933		9,112.2082	9,112.2082	0.0633		9,113.5382
Worker	0.0841	0.2300	2.0190	5.3000e-003	0.4559	3.0700e-003	0.4590	0.1209	2.8200e-003	0.1237		442.6289	442.6289	0.0225		443.1011
Total	2.8756	50.9372	24.4704	0.1455	4.3512	0.8269	5.1780	1.2175	0.7607	1.9782		14,582.3683	14,582.3683	0.1198		14,584.8837

3.3 Grading - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					27.0251	0.0000	27.0251	13.5580	0.0000	13.5580			0.0000			0.0000
Off-Road	11.8452	138.8857	95.6759	0.1075		6.4210	6.4210		5.9073	5.9073		11,178.3393	11,178.3393	3.3718		11,249.1468
Total	11.8452	138.8857	95.6759	0.1075	27.0251	6.4210	33.4461	13.5580	5.9073	19.4653		11,178.3393	11,178.3393	3.3718		11,249.1468

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.9193	18.4962	7.5662	0.0498	1.1838	0.2579	1.4417	0.3240	0.2372	0.5613		5,027.5313	5,027.5313	0.0340		5,028.2445
Vendor	4.4251	76.1353	35.1830	0.2137	6.4089	1.3377	7.7466	1.8262	1.2306	3.0568		21,537.9465	21,537.9465	0.1497		21,541.0903
Worker	0.2523	0.6899	6.0571	0.0159	1.3678	9.2000e-003	1.3770	0.3626	8.4600e-003	0.3711		1,327.8866	1,327.8866	0.0675		1,329.3032
Total	5.5967	95.3214	48.8063	0.2794	8.9605	1.6047	10.5652	2.5129	1.4763	3.9891		27,893.3644	27,893.3644	0.2511		27,898.6379

Mitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					10.5398	0.0000	10.5398	5.2876	0.0000	5.2876			0.0000			0.0000
Off-Road	11.8452	138.8857	95.6759	0.1075		6.4210	6.4210		5.9073	5.9073	0.0000	11,178.3393	11,178.3393	3.3718		11,249.1468
Total	11.8452	138.8857	95.6759	0.1075	10.5398	6.4210	16.9607	5.2876	5.9073	11.1949	0.0000	11,178.3393	11,178.3393	3.3718		11,249.1468

Mitigated Construction Off-Site

	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	lb/day										lb/day					

Hauling	0.9193	18.4962	7.5662	0.0498	1.1838	0.2579	1.4417	0.3240	0.2372	0.5613		5,027.5313	5,027.5313	0.0340		5,028.2445
Vendor	4.4251	76.1353	35.1830	0.2137	6.4089	1.3377	7.7466	1.8262	1.2306	3.0568		21,537.9465	21,537.9465	0.1497		21,541.0903
Worker	0.2523	0.6899	6.0571	0.0159	1.3678	9.2000e-003	1.3770	0.3626	8.4600e-003	0.3711		1,327.8866	1,327.8866	0.0675		1,329.3032
Total	5.5967	95.3214	48.8063	0.2794	8.9605	1.6047	10.5652	2.5129	1.4763	3.9891		27,893.3644	27,893.3644	0.2511		27,898.6379

3.4 Grading - Soil Import - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					0.0227	0.0000	0.0227	3.4400e-003	0.0000	3.4400e-003			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0227	0.0000	0.0227	3.4400e-003	0.0000	3.4400e-003		0.0000	0.0000	0.0000		0.0000

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.6624	12.2120	6.0401	0.0326	0.7735	0.1688	0.9423	0.2117	0.1553	0.3670		3,293.7578	3,293.7578	0.0225		3,294.2306
Vendor	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
Worker	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
Total	0.6624	12.2120	6.0401	0.0326	0.7735	0.1688	0.9423	0.2117	0.1553	0.3670		3,293.7578	3,293.7578	0.0225		3,294.2306

Mitigated Construction On-Site

	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	lb/day										lb/day					
Fugitive Dust					8.8500e-003	0.0000	8.8500e-003	1.3400e-003	0.0000	1.3400e-003			0.0000			0.0000
Off-Road	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
Total	0.0000	0.0000	0.0000	0.0000	8.8500e-003	0.0000	8.8500e-003	1.3400e-003	0.0000	1.3400e-003	0.0000	0.0000	0.0000	0.0000		0.0000

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.6624	12.2120	6.0401	0.0326	0.7735	0.1688	0.9423	0.2117	0.1553	0.3670		3,293.7578	3,293.7578	0.0225		3,294.2306
Vendor	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
Worker	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
Total	0.6624	12.2120	6.0401	0.0326	0.7735	0.1688	0.9423	0.2117	0.1553	0.3670		3,293.7578	3,293.7578	0.0225		3,294.2306

3.5 Underground Electrical - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431		1,330.7576	1,330.7576	0.4014		1,339.1871
Total	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431		1,330.7576	1,330.7576	0.4014		1,339.1871

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.4597	9.2481	3.7831	0.0249	0.5919	0.1289	0.7208	0.1620	0.1186	0.2806		2,513.7657	2,513.7657	0.0170		2,514.1222
Vendor	0.4255	7.3207	3.3830	0.0206	0.6162	0.1286	0.7449	0.1756	0.1183	0.2939		2,070.9564	2,070.9564	0.0144		2,071.2587
Worker	1.0595	2.8974	25.4398	0.0668	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,577.1235	5,577.1235	0.2833		5,583.0734
Total	1.9446	19.4662	32.6059	0.1122	6.9528	0.2962	7.2490	1.8606	0.2725	2.1331		10,161.8456	10,161.8456	0.3147		10,168.4543

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431	0.0000	1,330.7576	1,330.7576	0.4014		1,339.1871

Total	1.5776	14.6345	10.0515	0.0128		1.1338	1.1338		1.0431	1.0431	0.0000	1,330.7576	1,330.7576	0.4014		1,339.1871
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Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.4597	9.2481	3.7831	0.0249	0.5919	0.1289	0.7208	0.1620	0.1186	0.2806		2,513.7657	2,513.7657	0.0170		2,514.1222
Vendor	0.4255	7.3207	3.3830	0.0206	0.6162	0.1286	0.7449	0.1756	0.1183	0.2939		2,070.9564	2,070.9564	0.0144		2,071.2587
Worker	1.0595	2.8974	25.4398	0.0668	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,577.1235	5,577.1235	0.2833		5,583.0734
Total	1.9446	19.4662	32.6059	0.1122	6.9528	0.2962	7.2490	1.8606	0.2725	2.1331		10,161.8456	10,161.8456	0.3147		10,168.4543

3.6 PV Racks and Solar Panel Installation - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072		6,654.8292	6,654.8292	1.6238		6,688.9282
Total	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072		6,654.8292	6,654.8292	1.6238		6,688.9282

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	0.4597	9.2481	3.7831	0.0249	0.5919	0.1289	0.7208	0.1620	0.1186	0.2806		2,513.7657	2,513.7657	0.0170		2,514.1222
Vendor	0.4255	7.3207	3.3830	0.0206	0.6162	0.1286	0.7449	0.1756	0.1183	0.2939		2,070.9564	2,070.9564	0.0144		2,071.2587
Worker	1.0595	2.8974	25.4398	0.0668	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,577.1235	5,577.1235	0.2833		5,583.0734
Total	1.9446	19.4662	32.6059	0.1122	6.9528	0.2962	7.2490	1.8606	0.2725	2.1331		10,161.8456	10,161.8456	0.3147		10,168.4543

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072	0.0000	6,654.8292	6,654.8292	1.6238		6,688.9282
Total	5.4248	50.5408	28.0322	0.0666		2.6136	2.6136		2.5072	2.5072	0.0000	6,654.8292	6,654.8292	1.6238		6,688.9282

Mitigated Construction Off-Site

	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	lb/day										lb/day					

Hauling	0.4597	9.2481	3.7831	0.0249	0.5919	0.1289	0.7208	0.1620	0.1186	0.2806		2,513.7657	2,513.7657	0.0170		2,514.1222
Vendor	0.4255	7.3207	3.3830	0.0206	0.6162	0.1286	0.7449	0.1756	0.1183	0.2939		2,070.9564	2,070.9564	0.0144		2,071.2587
Worker	1.0595	2.8974	25.4398	0.0668	5.7447	0.0386	5.7833	1.5230	0.0355	1.5585		5,577.1235	5,577.1235	0.2833		5,583.0734
Total	1.9446	19.4662	32.6059	0.1122	6.9528	0.2962	7.2490	1.8606	0.2725	2.1331		10,161.8456	10,161.8456	0.3147		10,168.4543

3.7 Substation Construction - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419		1,466.4717	1,466.4717	0.4423		1,475.7609
Total	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419		1,466.4717	1,466.4717	0.4423		1,475.7609

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419	0.0000	1,466.4717	1,466.4717	0.4423		1,475.7608
Total	1.3913	15.8384	8.7614	0.0141		0.8064	0.8064		0.7419	0.7419	0.0000	1,466.4717	1,466.4717	0.4423		1,475.7608

Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

3.8 Gen-Tie Construction - 2016

Unmitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512		4,279.9056	4,279.9056	1.2910		4,307.0160
Total	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512		4,279.9056	4,279.9056	1.2910		4,307.0160

Unmitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

Mitigated Construction On-Site

	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	lb/day										lb/day					
Off-Road	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512	0.0000	4,279.9056	4,279.9056	1.2910		4,307.0160

Total	2.7111	32.7896	20.0443	0.0412		1.5774	1.5774		1.4512	1.4512	0.0000	4,279.9056	4,279.9056	1.2910		4,307.0160
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Mitigated Construction Off-Site

	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	lb/day										lb/day					
Hauling	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
Vendor	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
Worker	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
Total	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

HARP2 - HRACalc (dated 15065) 6/27/2015 3:27:19 PM - Output Log

GLCs loaded successfully

Pollutants loaded successfully

Start Age: -0.25

Total Exposure Duration: 0.6

Exposure Duration Bin Distribution

3rd Trimester Bin: 0.25

0<2 Years Bin: 0.6

2<9 Years Bin: 0

2<16 Years Bin: 0

16<30 Years Bin: 0

16 to 70 Years Bin: 0

Pathways Enabled

Inhalation: True

Soil: False

Dermal: False

Mother's Milk: False

Water: False

Fish: False

Homegrown Crops: False

Beef: False

Dairy: False

Pig: False

Chicken: False

Egg: False

Calculating cancer risk

Cancer risk saved to: C:\Users\Lora\Documents\ILANCO\CLIENTS\Dudek\MasterServices\Jacumba Solar\HARP Files\Jacumba2CancerRisk.csv

HRA ran successfully

Air Dispersion Source Parameters												AERMOD Unit				Cancer Risk	
Source ID	Description	Source Type	Width (m)	Height (m)	Sigma y (m)	Sigma z (m)	Temp (K)	Vel (m/s)	Diam (m)	Area (m ²)	Unit Emission Rate for Polygon Source (1g/s)/(m ²)	Concentration (ug/m ³)/(1g/s) at MEIR	CalEEMod Total DPM exhaust (ton/yr)	Annualized DPM exhaust (g/s)	Annualized DPM Concentration (ug/m ³)		
Unmitigated Construction	ALL01	Combined sources	poly-area	na	5	na	1.16	na	na	na	418,325	2.39049E-06	0.0666	0.4218	0.0429157	0.002858185	3.21E-07

Notes:

All sources were modeled over the grading area polygon.

DPM=PM10

Cancer risk was calculated with HARP2, Risk Assessment Standalone Tool v. 15076: 0.5 years exposure, 3rd trimester start date.

Operating Schedule:

8 hr/day

6 day/week

4.3 week/mont

6 months/yr

Air Dispersion Modeling Source Parameters

not used - analysis was done with a single source spread over the grading area.

Source		Source Parameters									Emission Rate		Equipment Count Hours/Day Total Days (days/yr) Horsepower (hp) Load Factor					
		Parameter ID	Description	Source Type	Width (m)	Height (m)	Sigma y (m)	Sigma z (m)	Temp (K)	Vel (m/s)	Diam (m)	Area (m2)						PM10 (g/s)
LIF01	Aerial Lifts Air	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.00179	2.390E-06	3	8	67	62	0.31
COM01	Compressor Bore/Drill	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.00826	2.390E-06	2	6	97	78	0.48
BOR01	Rigs	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.01456	2.390E-06	6	8	121	205	0.5
CRN01	Cranes	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.02439	2.390E-06	4	5	164	226	0.29
EXV01	Excavators	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.01717	2.390E-06	5	8	157	162	0.38
FOR01	Forklifts Generator	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.00772	2.390E-06	3	8	164	89	0.2
GEN01	Sets Rubber	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.01067	2.390E-06	2	8	164	84	0.74
DOZ01	Tired Dozers	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.06100	2.390E-06	6	8	90	255	0.4
SCR01	Scrapers Tractors/Loaders/Backhoes	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.04469	2.390E-06	4	8	78	361	0.48
TRA01	Trenchers	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.03947	2.390E-06	10	7	351	97	0.37
TRE01	Welders	poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.00601	2.390E-06	1	8	97	80	0.5
WEL01		poly-area	na	3.048	na	0.71	na	na	na	na	418,325	0.00447	2.390E-06	2	7	164	46	0.45

Emission Factor (g/bhp-hr)	Annualized PM10 emissions (g/s)	Unit Concentration (ug/m3)/(1g/s) from BEEST	Annualized Concentration (ug/m3)
0.1119	3.290E-04	0.06669	2.19404E-05
0.397	2.194E-03	0.06669	0.00014635
0.0852	4.825E-03	0.06669	0.000321785
0.3349	1.096E-02	0.06669	0.000730787
0.2008	7.385E-03	0.06669	0.00049249
0.5203	3.468E-03	0.06669	0.000231262
0.309	4.795E-03	0.06669	0.000319749
0.3588	1.504E-02	0.06669	1.003E-03
0.2321	9.550E-03	0.06669	0.000636859
0.3959	3.796E-02	0.06669	0.002531229
0.5413	1.598E-03	0.06669	0.000106595
0.389	2.010E-03	0.06669	0.000134048

Equipment List

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Total Number of Days
Substation Cons	Aerial Lifts	1	8	62	0.31	43
Gen-Tie Constr	Aerial Lifts	2	8	62	0.31	24
PV Racks and So	Air Compress	2	6	78	0.48	97
PV Racks and So	Bore/Drill Rig	4	8	205	0.5	97
Gen-Tie Constr	Bore/Drill Rig	2	8	205	0.5	24
PV Racks and So	Cranes	2	4	226	0.29	97
Substation Cons	Cranes	1	8	226	0.29	43
Gen-Tie Constr	Cranes	1	4	226	0.29	24
Grading	Excavators	0	8	162	0.38	39
Site Preparation	Excavators	2	8	162	0.38	12
Substation Cons	Excavators	1	8	162	0.38	43
Gen-Tie Constr	Excavators	2	8	162	0.38	24
Grading - Soil Im	Excavators	0	8	162	0.38	39
PV Racks and So	Forklifts	2	8	89	0.2	97
Substation Cons	Forklifts	1	8	89	0.2	43
Gen-Tie Constr	Forklifts	0	8	89	0.2	24
PV Racks and So	Generator Se	2	8	84	0.74	97
Substation Cons	Generator Se	0	8	84	0.74	43
Gen-Tie Constr	Generator Se	0	8	84	0.74	24
Grading	Graders	0	8	174	0.41	39
Grading - Soil Im	Graders	0	8	174	0.41	39
Grading	Rubber Tired	4	8	255	0.4	39
Site Preparation	Rubber Tired	2	8	255	0.4	12
Grading - Soil Im	Rubber Tired	0	8	255	0.4	39
Grading	Scrapers	4	8	361	0.48	39
Grading - Soil Im	Scrapers	0	8	361	0.48	39
PV Racks and So	Tractors/Loa	0	7	97	0.37	97
Grading	Tractors/Loa	4	8	97	0.37	39
Substation Cons	Tractors/Loa	0	7	97	0.37	43
Gen-Tie Constr	Tractors/Loa	3	6	97	0.37	24
Site Preparation	Tractors/Loa	0	8	97	0.37	12
Underground El	Tractors/Loa	3	8	97	0.37	97
Grading - Soil Im	Tractors/Loa	0	8	97	0.37	39
Underground El	Trenchers	1	8	80	0.5	97
Substation Cons	Welders	0	8	46	0.45	43
Gen-Tie Constr	Welders	0	8	46	0.45	24
PV Racks and So	Welders	2	6	46	0.45	97

Source: CalEEMod

Phase Name	Num Days
Site Preparation	12
Grading	39
Grading - Soil Import	39
Underground Electrical	97
PV Racks and Solar Panel Installation	97
Substation Construction	43
Gen-Tie Construction	24

Source: CalEEMod

*HARP - HRACalc v15065 6/27/2015 3:27:19 PM - Cancer Risk

INDEX	GRP1	GRP2	POLID	POLABBR	CONC	RISK_SUM	SCENARIO	DETAILS	INH_RISK	SOIL_RISK	DERMAL_R	MILK_RIS
1			9901	Diesel	ExhP	0.002858	3.21E-07	0.6YrCance*	3.21E-07	0.00E+00	0.00E+00	0.00E+00
WATER_RI	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RIS	PIG_RISK	CHICKEN_F	EGG_RISK	1ST_DRIVE	2ND_DRIVE	PASTURE_C	FISH_CONC	WATER_CO
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	INHALATION		0.00E+00	0.00E+00	0.00E+00

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