

EIS/EIR APPENDIX H
*Modeling Data and Assumptions for Air Quality
and Greenhouse Gas Analyses*

South Sac HCP
Sacramento County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	100.00	Acre	100.00	4,356,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.5	Precipitation Freq (Days)	58
Climate Zone	6			Operational Year	2016
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
 Land Use -
 Construction Phase -
 Off-road Equipment - representative equipment for preserve construction
 Operational Off-Road Equipment - maintenece equipment that could be used during operations.

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	HorsePower	400.00	255.00
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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	6.8984	74.9167	50.5226	0.0646	9.2955	3.5858	12.4873	5.0349	3.2990	6.9560	0.0000	6,652.4690	6,652.4690	1.9462	0.0000	6,693.3391
2017	6.4823	69.6841	48.0452	0.0646	8.9015	3.3187	12.2202	3.6570	3.0532	6.7102	0.0000	6,541.4879	6,541.4879	1.9447	0.0000	6,582.3255
Total	13.3807	144.6008	98.5679	0.1292	18.1969	6.9046	24.7075	8.6919	6.3522	13.6662	0.0000	13,193.9569	13,193.9569	3.8909	0.0000	13,275.6647

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	6.8925	74.8481	50.4775	0.0646	9.2955	3.5826	12.4840	5.0349	3.2959	6.9529	0.0000	6,646.5836	6,646.5836	1.9444	0.0000	6,687.4165
2017	6.4767	69.6203	48.0023	0.0645	8.9015	3.3157	12.2171	3.6570	3.0504	6.7074	0.0000	6,535.6957	6,535.6957	1.9429	0.0000	6,576.4961
Total	13.3691	144.4683	98.4798	0.1291	18.1969	6.8982	24.7011	8.6919	6.3464	13.6604	0.0000	13,182.2793	13,182.2793	3.8873	0.0000	13,263.9125

	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	0.0862	0.0916	0.0893	0.0774	0.0000	0.0918	0.0256	0.0000	0.0918	0.0426	0.0000	0.0885	0.0885	0.0915	0.0000	0.0885

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	lb/day										lb/day					
Area	109.8140	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Energy	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
Mobile	1.7675	1.2922	6.9180	0.0136	0.9100	0.0186	0.9285	0.2431	0.0171	0.2601		1,177.2236	1,177.2236	0.0483		1,178.2386
Offroad	1.6990	17.8594	10.1361	0.0202		0.9294	0.9294		0.8566	0.8566		2,079.3492	2,079.3492	0.6155		2,092.2741
Total	113.2805	19.1517	17.0646	0.0338	0.9100	0.9480	1.8580	0.2431	0.8737	1.1167		3,256.5947	3,256.5947	0.6639	0.0000	3,270.5359

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	lb/day										lb/day					
Area	109.8140	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Energy	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
Mobile	1.7675	1.2922	6.9180	0.0136	0.9100	0.0186	0.9285	0.2431	0.0171	0.2601		1,177.2236	1,177.2236	0.0483		1,178.2386
Offroad	1.6990	17.8594	10.1361	0.0202		0.9294	0.9294		0.8566	0.8566		2,079.3492	2,079.3492	0.6155		2,092.2741
Total	113.2805	19.1517	17.0646	0.0338	0.9100	0.9480	1.8580	0.2431	0.8737	1.1167		3,256.5947	3,256.5947	0.6639	0.0000	3,270.5359

	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	1.4998	93.2523	59.3983	59.7041	0.0000	98.0391	50.0234	0.0000	98.0439	76.7034	0.0000	63.8504	63.8504	92.7108	0.0000	63.9734

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	5/20/2016	8/11/2016	5	60	
2	Grading	Grading	8/12/2016	3/16/2017	5	155	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1		174	0.41
Site Preparation	Off-Highway Trucks	3	4.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	4.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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
Site Preparation	9	23.00	0.00	0.00	15.00	8.50	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	15.00	8.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

Acres of Grading: 0

	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					9.0331	0.0000	9.0331	4.9653	0.0000	4.9653			0.0000			0.0000
Off-Road	3.1461	34.9844	23.2272	0.0297		1.6308	1.6308		1.5004	1.5004		3,084.6623	3,084.6623	0.9304		3,104.2016
Total	3.1461	34.9844	23.2272	0.0297	9.0331	1.6308	10.6640	4.9653	1.5004	6.4657		3,084.6623	3,084.6623	0.9304		3,104.2016

3.2 Site Preparation - 2016

Unmitigated Construction Off-Site

Acres of Grading: 0

	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	0.4818	0.1184	1.5930	3.3200e-003	0.2623	1.8300e-003	0.2642	0.0696	1.6800e-003	0.0713		273.1115	273.1115	0.0129		273.3823
Total	0.4818	0.1184	1.5930	3.3200e-003	0.2623	1.8300e-003	0.2642	0.0696	1.6800e-003	0.0713		273.1115	273.1115	0.0129		273.3823

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					9.0331	0.0000	9.0331	4.9653	0.0000	4.9653			0.0000			0.0000
Off-Road	3.1432	34.9523	23.2059	0.0297		1.6293	1.6293		1.4990	1.4990	0.0000	3,081.8323	3,081.8323	0.9296		3,101.3537
Total	3.1432	34.9523	23.2059	0.0297	9.0331	1.6293	10.6625	4.9653	1.4990	6.4643	0.0000	3,081.8323	3,081.8323	0.9296		3,101.3537

3.2 Site Preparation - 2016

Mitigated Construction Off-Site

Acres of Grading: 0

	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	0.4818	0.1184	1.5930	3.3200e-003	0.2623	1.8300e-003	0.2642	0.0696	1.6800e-003	0.0713		273.1115	273.1115	0.0129		273.3823
Total	0.4818	0.1184	1.5930	3.3200e-003	0.2623	1.8300e-003	0.2642	0.0696	1.6800e-003	0.0713		273.1115	273.1115	0.0129		273.3823

3.3 Grading - 2016

Unmitigated Construction On-Site

Acres of Grading: 387.5

	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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.4795	74.8137	49.1374	0.0617		3.5842	3.5842		3.2975	3.2975		6,414.9807	6,414.9807	1.9350		6,455.6154
Total	6.4795	74.8137	49.1374	0.0617	8.6733	3.5842	12.2576	3.5965	3.2975	6.8940		6,414.9807	6,414.9807	1.9350		6,455.6154

3.3 Grading - 2016

Unmitigated Construction Off-Site

Acres of Grading: 387.5

	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	0.4190	0.1030	1.3852	2.8900e-003	0.2281	1.5900e-003	0.2297	0.0605	1.4600e-003	0.0620		237.4883	237.4883	0.0112		237.7237
Total	0.4190	0.1030	1.3852	2.8900e-003	0.2281	1.5900e-003	0.2297	0.0605	1.4600e-003	0.0620		237.4883	237.4883	0.0112		237.7237

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.4735	74.7451	49.0923	0.0617		3.5810	3.5810		3.2945	3.2945	0.0000	6,409.0953	6,409.0953	1.9332		6,449.6927
Total	6.4735	74.7451	49.0923	0.0617	8.6733	3.5810	12.2543	3.5965	3.2945	6.8910	0.0000	6,409.0953	6,409.0953	1.9332		6,449.6927

3.3 Grading - 2016

Mitigated Construction Off-Site

Acres of Grading: 387.5

	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	0.4190	0.1030	1.3852	2.8900e-003	0.2281	1.5900e-003	0.2297	0.0605	1.4600e-003	0.0620		237.4883	237.4883	0.0112		237.7237
Total	0.4190	0.1030	1.3852	2.8900e-003	0.2281	1.5900e-003	0.2297	0.0605	1.4600e-003	0.0620		237.4883	237.4883	0.0112		237.7237

3.3 Grading - 2017

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	6.0991	69.5920	46.8050	0.0617	8.6733	3.3172	11.9905	3.5965	3.0518	6.6483		6,313.3690	6,313.3690	1.9344		6,353.9915

3.3 Grading - 2017

Unmitigated Construction Off-Site

Acres of Grading: 387.5

	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	0.3831	0.0921	1.2402	2.8900e-003	0.2281	1.5400e-003	0.2297	0.0605	1.4200e-003	0.0619		228.1189	228.1189	0.0102		228.3340
Total	0.3831	0.0921	1.2402	2.8900e-003	0.2281	1.5400e-003	0.2297	0.0605	1.4200e-003	0.0619		228.1189	228.1189	0.0102		228.3340

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.0935	69.5281	46.7621	0.0617		3.3142	3.3142		3.0490	3.0490	0.0000	6,307.5768	6,307.5768	1.9326		6,348.1621
Total	6.0935	69.5281	46.7621	0.0617	8.6733	3.3142	11.9875	3.5965	3.0490	6.6455	0.0000	6,307.5768	6,307.5768	1.9326		6,348.1621

3.3 Grading - 2017

Mitigated Construction Off-Site

Acres of Grading: 387.5

	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	0.3831	0.0921	1.2402	2.8900e-003	0.2281	1.5400e-003	0.2297	0.0605	1.4200e-003	0.0619		228.1189	228.1189	0.0102		228.3340
Total	0.3831	0.0921	1.2402	2.8900e-003	0.2281	1.5400e-003	0.2297	0.0605	1.4200e-003	0.0619		228.1189	228.1189	0.0102		228.3340

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	lb/day										lb/day					
Mitigated	1.7675	1.2922	6.9180	0.0136	0.9100	0.0186	0.9285	0.2431	0.0171	0.2601		1,177.2236	1,177.2236	0.0483		1,178.2386
Unmitigated	1.7675	1.2922	6.9180	0.0136	0.9100	0.0186	0.9285	0.2431	0.0171	0.2601		1,177.2236	1,177.2236	0.0483		1,178.2386

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	159.00	159.00	159.00	429,813	429,813
Total	159.00	159.00	159.00	429,813	429,813

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
City Park	15.00	7.50	8.50	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.504516	0.068219	0.178179	0.147873	0.044976	0.006346	0.020386	0.015946	0.002304	0.002308	0.006193	0.000574	0.002181

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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	lb/day										lb/day					
City Park	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
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

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	lb/day										lb/day					
City Park	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
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

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	lb/day										lb/day					
Mitigated	109.8140	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Unmitigated	109.8140	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232

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	lb/day										lb/day					
Architectural Coating	16.5946					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	93.2184					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Total	109.8140	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232

6.2 Area by SubCategory

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	lb/day										lb/day					
Architectural Coating	16.5946					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	93.2184					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Total	109.8140	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Off-Highway Trucks	1	8.00	260	400	0.38	Diesel
Tractors/Loaders/Backhoes	2	8.00	260	97	0.37	Diesel
Dumpers/Tenders	1	8.00	260	16	0.38	Diesel

UnMitigated/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
Equipment Type	lb/day										lb/day					
Dumpers/Tenders	0.0740	0.4695	0.2511	7.5000e-004		0.0188	0.0188		0.0188	0.0188		60.9403	60.9403	6.6500e-003		61.0799
Off-Highway Trucks	0.9466	10.9062	5.0793	0.0132		0.4115	0.4115		0.3785	0.3785		1,373.6788	1,373.6788	0.4144		1,382.3801
Tractors/Loaders/Backhoes	0.6784	6.4837	4.8057	6.2000e-003		0.4992	0.4992		0.4593	0.4593		644.7302	644.7302	0.1945		648.8141
Total	1.6990	17.8594	10.1361	0.0202		0.9294	0.9294		0.8566	0.8566		2,079.3492	2,079.3492	0.6155		2,092.2741

10.0 Vegetation

South Sac HCP
Sacramento County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	100.00	Acre	100.00	4,356,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	3.5	Precipitation Freq (Days)	58
Climate Zone	6			Operational Year	2016
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -
 Land Use -
 Construction Phase -
 Off-road Equipment - representative equipment for preserve construction
 Operational Off-Road Equipment - maintenece equipment that could be used during operations.

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	HorsePower	400.00	255.00
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

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	tons/yr										MT/yr					
2016	0.4565	4.8374	3.2782	4.2300e-003	0.9619	0.2301	1.1920	0.4327	0.2117	0.6443	0.0000	394.3787	394.3787	0.1148	0.0000	396.7902
2017	0.1748	1.8817	1.2921	1.7400e-003	0.6781	0.0896	0.7677	0.2803	0.0824	0.3628	0.0000	159.6854	159.6854	0.0476	0.0000	160.6857
Total	0.6313	6.7191	4.5703	5.9700e-003	1.6400	0.3197	1.9597	0.7130	0.2941	1.0071	0.0000	554.0641	554.0641	0.1625	0.0000	557.4759

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	tons/yr										MT/yr					
2016	0.4560	4.8316	3.2744	4.2200e-003	0.9619	0.2298	1.1917	0.4327	0.2114	0.6441	0.0000	393.9292	393.9292	0.1147	0.0000	396.3379
2017	0.1746	1.8795	1.2905	1.7300e-003	0.6781	0.0895	0.7676	0.2803	0.0823	0.3627	0.0000	159.5014	159.5014	0.0476	0.0000	160.5005
Total	0.6306	6.7111	4.5650	5.9500e-003	1.6400	0.3193	1.9593	0.7130	0.2938	1.0067	0.0000	553.4306	553.4306	0.1623	0.0000	556.8384

	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	0.1109	0.1186	0.1157	0.3350	0.0000	0.1189	0.0194	0.0000	0.1190	0.0357	0.0000	0.1143	0.1143	0.1108	0.0000	0.1143

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	20.0410	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003
Energy	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
Mobile	0.3109	0.2538	1.1762	2.2800e-003	0.1600	3.3800e-003	0.1634	0.0429	3.1100e-003	0.0460	0.0000	179.6002	179.6002	7.9700e-003	0.0000	179.7676
Offroad	0.2209	2.3217	1.3177	2.6200e-003		0.1208	0.1208		0.1114	0.1114	0.0000	245.2260	245.2260	0.0726	0.0000	246.7503
Waste						0.0000	0.0000		0.0000	0.0000	1.7457	0.0000	1.7457	0.1032	0.0000	3.9123
Water						0.0000	0.0000		0.0000	0.0000	0.0000	111.6609	111.6609	5.4900e-003	1.1300e-003	112.1279
Total	20.5728	2.5755	2.4952	4.9000e-003	0.1600	0.1242	0.2842	0.0429	0.1145	0.1573	1.7457	536.4896	538.2353	0.1892	1.1300e-003	542.5608

2.2 Overall Operational

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	20.0410	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003
Energy	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
Mobile	0.3109	0.2538	1.1762	2.2800e-003	0.1600	3.3800e-003	0.1634	0.0429	3.1100e-003	0.0460	0.0000	179.6002	179.6002	7.9700e-003	0.0000	179.7676
Offroad	0.2209	2.3217	1.3177	2.6200e-003		0.1208	0.1208		0.1114	0.1114	0.0000	245.2260	245.2260	0.0726	0.0000	246.7503
Waste						0.0000	0.0000		0.0000	0.0000	1.7457	0.0000	1.7457	0.1032	0.0000	3.9123
Water						0.0000	0.0000		0.0000	0.0000	0.0000	111.6609	111.6609	5.4900e-003	1.1300e-003	112.1279
Total	20.5728	2.5755	2.4952	4.9000e-003	0.1600	0.1242	0.2842	0.0429	0.1145	0.1573	1.7457	536.4896	538.2353	0.1892	1.1300e-003	542.5608

	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	1.0736	90.1457	52.8094	53.4694	0.0000	97.2788	42.5188	0.0000	97.2829	70.7838	0.0000	45.7094	45.5611	38.3607	0.0000	45.4788

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	5/20/2016	8/11/2016	5	60	
2	Grading	Grading	8/12/2016	3/16/2017	5	155	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1		174	0.41
Site Preparation	Off-Highway Trucks	3	4.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	4.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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
Site Preparation	9	23.00	0.00	0.00	15.00	8.50	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	15.00	8.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2016

Unmitigated Construction On-Site

Acres of Grading: 0

	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					
Fugitive Dust					0.2710	0.0000	0.2710	0.1490	0.0000	0.1490	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0944	1.0495	0.6968	8.9000e-004		0.0489	0.0489		0.0450	0.0450	0.0000	83.9508	83.9508	0.0253	0.0000	84.4825
Total	0.0944	1.0495	0.6968	8.9000e-004	0.2710	0.0489	0.3199	0.1490	0.0450	0.1940	0.0000	83.9508	83.9508	0.0253	0.0000	84.4825

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	tons/yr										MT/yr					
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	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	0.0000	0.0000
Worker	0.0142	3.9500e-003	0.0406	9.0000e-005	7.6000e-003	6.0000e-005	7.6500e-003	2.0200e-003	5.0000e-005	2.0700e-003	0.0000	6.7131	6.7131	3.5000e-004	0.0000	6.7205
Total	0.0142	3.9500e-003	0.0406	9.0000e-005	7.6000e-003	6.0000e-005	7.6500e-003	2.0200e-003	5.0000e-005	2.0700e-003	0.0000	6.7131	6.7131	3.5000e-004	0.0000	6.7205

3.2 Site Preparation - 2016

Mitigated Construction On-Site

Acres of Grading: 0

	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					
Fugitive Dust					0.2710	0.0000	0.2710	0.1490	0.0000	0.1490	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0943	1.0483	0.6960	8.9000e-004		0.0489	0.0489		0.0450	0.0450	0.0000	83.8509	83.8509	0.0253	0.0000	84.3820
Total	0.0943	1.0483	0.6960	8.9000e-004	0.2710	0.0489	0.3199	0.1490	0.0450	0.1939	0.0000	83.8509	83.8509	0.0253	0.0000	84.3820

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	tons/yr										MT/yr					
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	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	0.0000	0.0000
Worker	0.0142	3.9500e-003	0.0406	9.0000e-005	7.6000e-003	6.0000e-005	7.6500e-003	2.0200e-003	5.0000e-005	2.0700e-003	0.0000	6.7131	6.7131	3.5000e-004	0.0000	6.7205
Total	0.0142	3.9500e-003	0.0406	9.0000e-005	7.6000e-003	6.0000e-005	7.6500e-003	2.0200e-003	5.0000e-005	2.0700e-003	0.0000	6.7131	6.7131	3.5000e-004	0.0000	6.7205

3.3 Grading - 2016

Unmitigated Construction On-Site

Acres of Grading: 387.5

	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					
Fugitive Dust					0.6722	0.0000	0.6722	0.2787	0.0000	0.2787	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3272	3.7781	2.4814	3.1200e-003		0.1810	0.1810		0.1665	0.1665	0.0000	293.8884	293.8884	0.0887	0.0000	295.7500
Total	0.3272	3.7781	2.4814	3.1200e-003	0.6722	0.1810	0.8532	0.2787	0.1665	0.4453	0.0000	293.8884	293.8884	0.0887	0.0000	295.7500

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	tons/yr										MT/yr					
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	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	0.0000	0.0000
Worker	0.0207	5.7800e-003	0.0594	1.3000e-004	0.0111	8.0000e-005	0.0112	2.9600e-003	7.0000e-005	3.0300e-003	0.0000	9.8264	9.8264	5.1000e-004	0.0000	9.8372
Total	0.0207	5.7800e-003	0.0594	1.3000e-004	0.0111	8.0000e-005	0.0112	2.9600e-003	7.0000e-005	3.0300e-003	0.0000	9.8264	9.8264	5.1000e-004	0.0000	9.8372

3.3 Grading - 2016

Mitigated Construction On-Site

Acres of Grading: 387.5

	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					
Fugitive Dust					0.6722	0.0000	0.6722	0.2787	0.0000	0.2787	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3268	3.7736	2.4785	3.1100e-003		0.1808	0.1808		0.1663	0.1663	0.0000	293.5388	293.5388	0.0885	0.0000	295.3982
Total	0.3268	3.7736	2.4785	3.1100e-003	0.6722	0.1808	0.8530	0.2787	0.1663	0.4451	0.0000	293.5388	293.5388	0.0885	0.0000	295.3982

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	tons/yr										MT/yr					
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	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	0.0000	0.0000
Worker	0.0207	5.7800e-003	0.0594	1.3000e-004	0.0111	8.0000e-005	0.0112	2.9600e-003	7.0000e-005	3.0300e-003	0.0000	9.8264	9.8264	5.1000e-004	0.0000	9.8372
Total	0.0207	5.7800e-003	0.0594	1.3000e-004	0.0111	8.0000e-005	0.0112	2.9600e-003	7.0000e-005	3.0300e-003	0.0000	9.8264	9.8264	5.1000e-004	0.0000	9.8372

3.3 Grading - 2017

Unmitigated Construction On-Site

Acres of Grading: 387.5

	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					
Fugitive Dust					0.6722	0.0000	0.6722	0.2787	0.0000	0.2787	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1647	1.8790	1.2637	1.6700e-003		0.0896	0.0896		0.0824	0.0824	0.0000	154.6396	154.6396	0.0474	0.0000	155.6346
Total	0.1647	1.8790	1.2637	1.6700e-003	0.6722	0.0896	0.7617	0.2787	0.0824	0.3611	0.0000	154.6396	154.6396	0.0474	0.0000	155.6346

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	tons/yr										MT/yr					
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	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	0.0000	0.0000
Worker	0.0101	2.7600e-003	0.0283	7.0000e-005	5.9500e-003	4.0000e-005	5.9900e-003	1.5800e-003	4.0000e-005	1.6200e-003	0.0000	5.0458	5.0458	2.5000e-004	0.0000	5.0511
Total	0.0101	2.7600e-003	0.0283	7.0000e-005	5.9500e-003	4.0000e-005	5.9900e-003	1.5800e-003	4.0000e-005	1.6200e-003	0.0000	5.0458	5.0458	2.5000e-004	0.0000	5.0511

3.3 Grading - 2017

Mitigated Construction On-Site

Acres of Grading: 387.5

	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					
Fugitive Dust					0.6722	0.0000	0.6722	0.2787	0.0000	0.2787	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1645	1.8768	1.2622	1.6600e-003		0.0895	0.0895		0.0823	0.0823	0.0000	154.4556	154.4556	0.0473	0.0000	155.4495
Total	0.1645	1.8768	1.2622	1.6600e-003	0.6722	0.0895	0.7616	0.2787	0.0823	0.3610	0.0000	154.4556	154.4556	0.0473	0.0000	155.4495

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	tons/yr										MT/yr					
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	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	0.0000	0.0000
Worker	0.0101	2.7600e-003	0.0283	7.0000e-005	5.9500e-003	4.0000e-005	5.9900e-003	1.5800e-003	4.0000e-005	1.6200e-003	0.0000	5.0458	5.0458	2.5000e-004	0.0000	5.0511
Total	0.0101	2.7600e-003	0.0283	7.0000e-005	5.9500e-003	4.0000e-005	5.9900e-003	1.5800e-003	4.0000e-005	1.6200e-003	0.0000	5.0458	5.0458	2.5000e-004	0.0000	5.0511

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					
Mitigated	0.3109	0.2538	1.1762	2.2800e-003	0.1600	3.3800e-003	0.1634	0.0429	3.1100e-003	0.0460	0.0000	179.6002	179.6002	7.9700e-003	0.0000	179.7676
Unmitigated	0.3109	0.2538	1.1762	2.2800e-003	0.1600	3.3800e-003	0.1634	0.0429	3.1100e-003	0.0460	0.0000	179.6002	179.6002	7.9700e-003	0.0000	179.7676

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	159.00	159.00	159.00	429,813	429,813
Total	159.00	159.00	159.00	429,813	429,813

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
City Park	15.00	7.50	8.50	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.504516	0.068219	0.178179	0.147873	0.044976	0.006346	0.020386	0.015946	0.002304	0.002308	0.006193	0.000574	0.002181

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

5.2 Energy by Land Use - NaturalGas

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					
City Park	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
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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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					
Mitigated	20.0410	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003
Unmitigated	20.0410	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003

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	3.0285					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	17.0124					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3000e-004	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003
Total	20.0410	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003

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	3.0285					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	17.0124					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3000e-004	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003
Total	20.0410	1.0000e-005	1.3100e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.4800e-003	2.4800e-003	1.0000e-005	0.0000	2.6300e-003

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	111.6609	5.4900e-003	1.1300e-003	112.1279
Unmitigated	111.6609	5.4900e-003	1.1300e-003	112.1279

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 119.148	111.6609	5.4900e-003	1.1300e-003	112.1279
Total		111.6609	5.4900e-003	1.1300e-003	112.1279

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 119.148	111.6609	5.4900e-003	1.1300e-003	112.1279
Total		111.6609	5.4900e-003	1.1300e-003	112.1279

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.7457	0.1032	0.0000	3.9123
Unmitigated	1.7457	0.1032	0.0000	3.9123

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	8.6	1.7457	0.1032	0.0000	3.9123
Total		1.7457	0.1032	0.0000	3.9123

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	8.6	1.7457	0.1032	0.0000	3.9123
Total		1.7457	0.1032	0.0000	3.9123

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Off-Highway Trucks	1	8.00	260	400	0.38	Diesel
Tractors/Loaders/Backhoes	2	8.00	260	97	0.37	Diesel
Dumpers/Tenders	1	8.00	260	16	0.38	Diesel

UnMitigated/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
Equipment Type	tons/yr										MT/yr					
Tractors/Loaders/Backhoes	0.0882	0.8429	0.6247	8.1000e-004		0.0649	0.0649		0.0597	0.0597	0.0000	76.0356	76.0356	0.0229	0.0000	76.5173
Dumpers/Tenders	9.6200e-003	0.0610	0.0327	1.0000e-004		2.4400e-003	2.4400e-003		2.4400e-003	2.4400e-003	0.0000	7.1869	7.1869	7.8000e-004	0.0000	7.2034
Off-Highway Trucks	0.1231	1.4178	0.6603	1.7200e-003		0.0535	0.0535		0.0492	0.0492	0.0000	162.0035	162.0035	0.0489	0.0000	163.0296
Total	0.2209	2.3217	1.3177	2.6300e-003		0.1208	0.1208		0.1114	0.1114	0.0000	245.2260	245.2260	0.0726	0.0000	246.7503

10.0 Vegetation

GHG Emissions from Land Conversion

No Project

<u>Land Cover</u>	<u>Acres</u> <u>Converted</u>	<u>MT/C/acre/year</u> ¹	<u>MT</u> <u>CO2/year</u>
Riparian Woodland	147	0.737	108.339
Riparian Shrub	189	0	0
Riparian Woodland (mine tailing)	218	0.737	160.666
Grassland	23,428	0	0
Woodland	55	0.425	23.375
Savana	86	0	0
cropland	5,703	0.081	461.943
pasture grassland	2,781	0	0
orchard	219	0.081	17.739
vineyard	1,525	0	0
Total	34,351		772.062

Proposed Project

<u>Land Cover</u>	<u>Acres</u> <u>Converted</u>	<u>MT/C/acre/year</u> ¹	<u>MT</u> <u>CO2/year</u>
Riparian Woodland	184	0.737	135.608
Riparian Shrub	189	0	0
Riparian Woodland (mine tailing)	218	0.737	160.666
Grassland	22,014	0	0
Woodland	10	0.425	4.25
Savana	38	0	0
cropland	5,285	0.081	428.085
pasture grassland	2,749	0	0
orchard	207	0.081	16.767
vineyard	1,455	0	0
Total	32,349		745.376
Difference between Alternatives			26.686

Reduce Permit Term

<u>Land Cover</u>	<u>Acres</u> <u>Converted</u>	<u>MT/C/acre/year</u> ¹	<u>MT</u> <u>CO2/year</u>
Riparian Woodland	197	0.737	145.189
Riparian Shrub	194	0	0
Riparian Woodland (mine tailing)	219	0.737	161.403
Grassland	23,672	0	0
Woodland	9	0.425	3.825
Savana	38	0	0
cropland	5,464	0.081	442.584
pasture grassland	2,665	0	0
orchard	224	0.081	18.144
vineyard	1,430	0	0
Total	34,112		771.145

	Stored Carbon				Annual Sequestration			
	2015 CAP	2012 CAP	2015 CAP	2012 CAP	2015 CAP	2012 CAP	2015 CAP	2012 CAP
Land Use Type	Carbon stored per acre (MT C/acre) (a)	Carbon stored per acre (MT C/acre)	2015 CAP Source	2012 CAP Source	Annual Net Carbon Sequestration per acre (MT C/acre/year) (b)	Annual Net Carbon Sequestration per acre (MT C/acre/year)	2015 CAP Source	2012 CAP Source
Oak Woodlands	29.5	95.1	4) EPA 2015. Western Oak. 8) has more specific oak woodland data, but reports lower carbon densities. Method consistency is vital.	1) EPA 2010. Unknown method. Western Oak is 58.1 MT C/acre.	0.425	0.425	2) hardwoods	2) Brown 2004
Riparian Woodlands	77.0	80.9	4) Straight average of Redwood, Oak, and Tanoak/Laurel per description in County GP DEIR (p. 4.5-6)	1) EPA 2010. Unknown method.	0.737	0.425	2) Straight average of Redwood and hardwood per description in County GP DEIR (p. 4.5-6)	2) Brown 2004
Coniferous Forest	78.2	58.1	4) Straight average of Ponderosa Pine, Redwood, and Mixed Conifer per description in County GP DEIR (p. 4.5-6). Weighted average would be preferable, but no available data.	1) EPA 2010. Unknown method.	0.701	0.666	2) Straight average of douglas fir, Redwood, and Mixed Conifer per description in County GP DEIR (p. 4.5-6). Weighted average would be preferable, but no available data.	2) Brown 2004
Grasslands	2.6	1.4	3) Battles et al. Table 5	2) Brown 2004	0.000	0.000	2) P. 19	2) Brown 2004
Shrublands	12.8	16.2	3) Battles et al. p. 18	2) Brown 2004	0.000	0.000	2) P. 19	2) Brown 2004
Croplands (Not Vineyards)	2.2	3.8	2) 5) 6). Scaled by Crop Report acreage	2) Brown 2004. Unknown method.	0.081	0.057	7) 5) 6) Assumes vegetables and hay have	7) Kroodsma 2006
Vineyards	1.2	1.2	2)	2) Brown 2004	0.000	0.000	2)	2) Brown 2004
Wetlands	2	NA	3) Battles et al. Table 5	not accounted	1.335	NA	9)	not accounted

Note: Change in land use patterns do not immediately change soil carbon levels. Instead, changes to soil carbon may be gradual, while change in land use patterns would have immediate impacts on above-ground and some below-ground biomass. As such, soil carbon is not included in this analysis.

ARB's current GHG Emissions Inventory is still based on sequestration factors from the 2004 Brown/CEC study. There are no regional specific studies that can yet apply to Napa County regarding sequestration rates.

1) U.S. EPA. 2010. 2010 U.S. Greenhouse Gas Inventory Report - Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008 (Annex 3). U.S. EPA # 430-R-10-006. Released April 2010. Table A 21A1v -erage carbon density b

2) CEC.200. Brown, S., T. Pearson, A. Dushku, J. Kadyzewski and Y. Qi. 2004. Baseline Greenhouse Gas Emissions for Forest, Range and Agricultural Lands in California. CEG500-04-069F. Prepared for the California Energy Commis

3) Battles et. al. 2014. Commissioned by ARB. Updates Brown et.al. 2004. Uses IPCC land categories. Table 5. 2008. Battles et. al. 2014 did not comment on sequestration rates for the different land use types.

4) U.S. EPA. 2015. 2013 U.S. Greenhouse Gas Inventory Report - Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013 (Annex 3)

5) Proietti et. al. 2014. Carbon footprint of an Olive Tree Grove

6) 2014 Napa County Crop Report

7) Kroodsma 2006. CARBON SEQUESTRATION IN CALIFORNIA AGRICULTURE, 1980–2000

8) Gaman 2008. Oaks 2040. Carbon Resources in California Oak Woodlands

9) Brevik and Homburg 2004. A 5000 year record of carbon sequestration from a coastal lagoon and wetland complex, Southern California, USA

