APPENDIX C

Air Quality and Greenhouse Gas Emissions Data

Appendix C1
LRDP Update Air Quality and Greenhouse Gas Modeling

Climate Registry – 2018 GHG Inventory

University of California, Berkeley	Detail Report - Control (Private)	Complete Inventory 2018

Description:

Industry: 61 - Educational Services

Address: 615H University Hall building, UC Berkeley
Berkeley, California US

Contact:
Chase Sherwood
csherwood@theclimateregistry.org

Website: www.berkeley.edu

Reporting Information

Reporting Protocol: General Reporting Protocol 2.1 and associated updates and clarifications

Additional Reporting Standards: None

GWP Standard: AR5

Base Year:

Consolidation Methodology: Operational Control Only

Status: Submit Positive Verification Finding

Verification Information

Verification Body: Cameron-Cole, LLC

Level of Assurance: Reasonable

Entity Emissions | Total in metric tons of CO2e

Scope 1 - Direct Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t of CO_2e)	N_2O (t of CO_2e)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t of CO_2e)	SF_6 (t of CO_2e)
Stationary Combustion	135,607.401794	135,448.111033	76.252935	83.037827	0.	0.	0.	0.
Mobile Combustion	1,771.88331	1,750.061789	1.323047	20.498474	0.	0.	0.	0.
Fugitive	778.713782	0.	0.	0.	778.713782	0.	0.	0.
Total	138,157.998886	137,198.172822	77.575981	103.536301	778.713782	0.	0.	0.
Applied Offsets	-9,746.	-9,746.	0.	0.	0.	0.	0.	0.
NetTotal	128,411.998886	127,452.172822	77.575981	103.536301	778.713782	0.	0.	0.

Scope 2 - Location Based - Indirect Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t of CO_2e)	N_2O (t of CO_2e)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t of CO_2e)	SF_6 (t of CO_2e)
Purchased Electricity - Location Based	0.	0.	0.	0.	0.	0.	0.	0.
Total	0.	0.	0.	0.	0.	0.	0.	0.
NetTotal	0.	0.	0.	0.	0.	0.	0.	0.

Scope 2 - Market Based - Indirect Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t of CO_2e)	N_2O (t of CO_2e)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t of CO_2e)	SF_6 (t of CO_2e)
Purchased Electricity - Market Based	4,733.124465	4,688.847487	20.620931	23.656047	0.	0.	0.	0.
Purchased Heating - Market Based	47.710791	47.661799	0.02517	0.023822	0.	0.	0.	0.
Total	4,780.835256	4,736.509286	20.646102	23.679869	0.	0.	0.	0.
NetTotal	4,780.835256	4,736.509286	20.646102	23.679869	0.	0.	0.	0.

Optional - Optional Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t of CO_2e)	N_2O (t of CO_2e)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t of CO_2e)	SF_6 (t of CO_2e)
Scope 3	42,034.109702	40,562.886808	1,026.411283	444.811611	0.	0.	0.	0.
Total	42,034.109702	40,562.886808	1,026.411283	444.811611	0.	0.	0.	0.
NetTotal	42,034.109702	40,562.886808	1,026.411283	444.811611	0.	0.	0.	0.

Entity Emissions | Total in metric tons of gas

Scope 1 - Direct Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Stationary Combustion	135,607.401794	135,448.111033	2.723319	0.31335	0.	0.	0.	0.
Mobile Combustion	1,771.88331	1,750.061789	0.047252	0.077353	0.	0.	0.	0.
Fugitive	778.713782	0.	0.	0.	778.713782	0.	0.	0.
Total	138,157.998886	137,198.172822	2.770571	0.390703	778.713782	0.	0.	0.

Scope 2 - Location Based - Indirect Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Purchased Electricity - Location Based	0.	0.	0.	0.	0.	0.	0.	0.
Total	0.	0.	0.	0.	0.	0.	0.	0.

Scope 2 - Market Based - Indirect Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Purchased Electricity - Market Based	4,733.124465	4,688.847487	0.736462	0.089268	0.	0.	0.	0.
Purchased Heating - Market Based	47.710791	47.661799	0.000899	0.00009	0.	0.	0.	0.
Total	4,780.835256	4,736.509286	0.737361	0.089358	0.	0.	0.	0.

Optional - Optional Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Scope 3	42,034.109702	40,562.886808	36.657546	1.678534	0.	0.	0.	0.
Total	42,034.109702	40,562.886808	36.657546	1.678534	0.	0.	0.	0.

Simplified Estimation Methods (SEMs)

	Total Estimated CO_2e (t)	Total Emissions (t of CO_2e)	Estimated CO_2e as a Percentage of Total*
Location Based	2,050.82211	138,157.998886	1.48440345583303%
Market Based	2,050.82211	142,938.834142	1.43475502810687%

*Total based on scope 1, scope 2 & biomass emissions

Facility Emissions | UC Berkeley

Equity share - 100% | Entity controls the facility emissions - Yes
Office of Sustainability, Berkeley, California, 94720-1382, US

Scope 1 - Direct Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Stationary Combustion	135,607.401794	135,448.111033	2.723319	0.31335	0.	0.	0.	0.
Mobile Combustion	1,771.88331	1,750.061789	0.047252	0.077353	0.	0.	0.	0.
Fugitive	778.713782	0.	0.	0.	778.713782	0.	0.	0.
Total	138,157.998886	137,198.172822	2.770571	0.390703	778.713782	0.	0.	0.

Scope 2 - Location Based - Indirect Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Purchased Electricity - Location Based	0.	0.	0.	0.	0.	0.	0.	0.
Total	0.	0.	0.	0.	0.	0.	0.	0.

Scope 2 - Market Based - Indirect Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Purchased Electricity - Market Based	4,733.124465	4,688.847487	0.736462	0.089268	0.	0.	0.	0.
Purchased Heating - Market Based	47.710791	47.661799	0.000899	0.00009	0.	0.	0.	0.
Total	4,780.835256	4,736.509286	0.737361	0.089358	0.	0.	0.	0.

Optional - Optional Emissions	Total CO_2e (t)	CO2 (t)	CH_4 (t)	N_2O (t)	HFC (t of CO_2e)	PFC (t of CO_2e)	NF_3 (t)	SF_6 (t)
Scope 3	42,034.109702	40,562.886808	36.657546	1.678534	0.	0.	0.	0.
Total	42,034.109702	40,562.886808	36.657546	1.678534	0.	0.	0.	0.

Source Emissions | Business Air Travel

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Scope 3 (Optional)	CO2	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	22,615.	22,615.
Scope 3 (Optional)	CH4	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	1.271341	35.597535
Scope 3 (Optional)	N2O	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	1.039076	275.355243

Source Emissions | Cogen / Boiler Natural Gas

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Stationary Combustion	CO2	Natural Gas	Commercial	Boilers	Emission Factor	No		Unspecified (Weighted U.S. Average)	2,334,237. MMBtu	53.02 kg/MMBtu	Custom Emission Factor	123,761.24574	123,761.24574
Stationary Combustion	CH4	Natural Gas	Commercial	Boilers	Emission Factor	No		Unspecified (Weighted U.S. Average)	2,334,237. MMBtu	1 g/MMBtu	Custom Emission Factor	2.334237	65.358636
Stationary Combustion	N2O	Natural Gas	Commercial	Boilers	Emission Factor	No		Unspecified (Weighted U.S. Average)	2,334,237. MMBtu	0.1 g/MMBtu	Custom Emission Factor	0.233424	61.857281

Source Emissions | De Minimis Sources

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Stationary Combustion	CO2	PreCalculated	PreCalculated	PreCalculated	PreCalculated	Yes		PreCalculated	N/A	N/A	N/A	259.22	259.22
Stationary Combustion	CH4	PreCalculated	PreCalculated	PreCalculated	PreCalculated	Yes		PreCalculated	N/A	N/A	N/A	0.1591	4.4548
Stationary Combustion	N2O	PreCalculated	PreCalculated	PreCalculated	PreCalculated	Yes		PreCalculated	N/A	N/A	N/A	0.0576	15.264

Source Emissions | Emergency Generators

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Stationary Combustion	CO2	Petroleum Products	Commercial	Unspecified Technology	Emission Factor	No		Distillate Fuel Oil No. 2	12,167. gal	10.21 kg/gal	2019 Default Emission Factors - Table #1.1	124.22507	124.22507
Stationary Combustion	CH4	Petroleum Products	Commercial	Unspecified Technology	Emission Factor	No		Distillate Fuel Oil No. 2	12,167. gal	10 g/MMBtu	2019 Default Emission Factors - Table #1.10	0.01679	0.470133
Stationary Combustion	N2O	Petroleum Products	Commercial	Unspecified Technology	Emission Factor	No		Distillate Fuel Oil No. 2	12,167. gal	0.6 g/MMBtu	2019 Default Emission Factors - Table #1.10	0.001007	0.266968

Source Emissions | Faculty/Staff Commute

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Scope 3 (Optional)	CO2	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	11,692.36	11,692.36
Scope 3 (Optional)	CH4	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	0.691019	19.348519
Scope 3 (Optional)	N2O	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	0.417417	110.615582

Source Emissions | Fleet - Diesel

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Mobile Combustion	CO2	Diesel Fuel	Diesel Medium and Heavy-Duty Trucks and	Medium and Heavy-Duty Vehicles (Model Years 1960-2011)	Emission Factor	Yes		All	61,024. gal	10.21 kg/gal	2019 Default Emission Factors - Table #2.1	623.05504	623.05504
Mobile Combustion	CH4	Diesel Fuel	Diesel Medium and Heavy-Duty Trucks and	Medium and Heavy-Duty Vehicles (Model Years 1960-2011)	PreCalculated	Yes		All	N/A	N/A	N/A	0.016822	0.47103
Mobile Combustion	N2O	Diesel Fuel	Diesel Medium and Heavy-Duty Trucks and	Medium and Heavy-Duty Vehicles (Model Years 1960-2011)	PreCalculated	Yes		All	N/A	N/A	N/A	0.027539	7.297844

Source Emissions | Fleet - Ethanol (E100)

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Mobile Combustion	CO2	PreCalculated	PreCalculated	PreCalculated	PreCalculated	Yes		PreCalculated	N/A	N/A	N/A	3.137775	3.137775
Mobile Combustion	CH4	PreCalculated	PreCalculated	PreCalculated	PreCalculated	Yes		PreCalculated	N/A	N/A	N/A	0.000085	0.002372
Mobile Combustion	N2O	PreCalculated	PreCalculated	PreCalculated	PreCalculated	Yes		PreCalculated	N/A	N/A	N/A	0.000139	0.036753

Source Emissions | Fleet - gasoline

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Mobile Combustion	CO2	Motor Gasoline	Gasoline Passenger Cars	Cars (Model Year 2005)	Emission Factor	Yes		All	128,003.3 gal	8.78 kg/gal	2019 Default Emission Factors - Table #2.1	1,123.868974	1,123.868974
Mobile Combustion	CH4	Motor Gasoline	Gasoline Passenger Cars	Cars (Model Year 2005)	PreCalculated	Yes		All	N/A	N/A	N/A	0.030344	0.849645
Mobile Combustion	N2O	Motor Gasoline	Gasoline Passenger Cars	Cars (Model Year 2005)	PreCalculated	Yes		All	N/A	N/A	N/A	0.049675	13.163878

Source Emissions | Main campus solar PV - Location Based

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Purchased Electricity - Location Based	CO2	Source-Specific Factor	PreCalculated	PreCalculated	PreCalculated	No		PreCalculated	N/A	N/A	N/A	0.	0.

Source Emissions | Natural Gas - Scope 1

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Stationary Combustion	CO2	Natural Gas	Commercial	Boilers	Emission Factor	No		Unspecified (Weighted U.S. Average)	213,191.63 MMBtu	53.02 kg/MMBtu	Custom Emission Factor	11,303.420223	11,303.420223
Stationary Combustion	CH4	Natural Gas	Commercial	Boilers	Emission Factor	No		Unspecified (Weighted U.S. Average)	213,191.63 MMBtu	1 g/MMBtu	Custom Emission Factor	0.213192	5.969366
Stationary Combustion	N2O	Natural Gas	Commercial	Boilers	Emission Factor	No		Unspecified (Weighted U.S. Average)	213,191.63 MMBtu	0.1 g/MMBtu	Custom Emission Factor	0.021319	5.649578

Source Emissions | Purchased Electricity - EBCE - Market Based

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Purchased Electricity - Market Based	CO2	Utility-Specific Rate	2018	Special Power	Emission Factor	No		East Bay Community Energy (Brilliant	3,562,777. MWh	0 lb/MWh	2019 Default Emission Factors - Table #3.8	0.	0.
Purchased Electricity - Market Based	CH4	Utility-Specific Rate	2018	Special Power	Emission Factor	No		East Bay Community Energy (Brilliant	3,562,777. MWh	0 lb/GWh	Custom Emission Factor	0.	0.
Purchased Electricity - Market Based	N2O	Utility-Specific Rate	2018	Special Power	Emission Factor	No		East Bay Community Energy (Brilliant	3,562,777. MWh	0 lb/GWh	Custom Emission Factor	0.	0.

Source Emissions | Purchased Electricity - PG&E - Market Based

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Purchased Electricity - Market Based	CO2	Utility-Specific Rate	2017	System Average	Emission Factor	No		Pacific Gas & Electric	40,623,808. kWh	210.44 lb/MWh	2019 Default Emission Factors - Table #3.8	3,877.708701	3,877.708701
Purchased Electricity - Market Based	CH4	Utility-Specific Rate	2017	System Average	Emission Factor	No		Pacific Gas & Electric	40,623,808. kWh	33 lb/GWh	2019 Default Emission Factors - Table #3.1	0.60808	17.026244
Purchased Electricity - Market Based	N2O	Utility-Specific Rate	2017	System Average	Emission Factor	No		Pacific Gas & Electric	40,623,808. kWh	4 lb/GWh	2019 Default Emission Factors - Table #3.1	0.073707	19.532272

Source Emissions | Purchased Electricity - UCOP - Market Based

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Purchased Electricity - Market Based	CO2	Utility-Specific Rate	2017	System Average	Emission Factor	No		University of California, Office of the President	8,576,752. kWh	208.5 lb/MWh	2017 Default Emission Factors - Table #3.8	811.138787	811.138787
Purchased Electricity - Market Based	CH4	Utility-Specific Rate	2017	System Average	Emission Factor	No		University of California, Office of the President	8,576,752. kWh	33 lb/GWh	2017 Default Emission Factors - Table #3.1	0.128382	3.594687
Purchased Electricity - Market Based	N2O	Utility-Specific Rate	2017	System Average	Emission Factor	No		University of California, Office of the President	8,576,752. kWh	4 lb/GWh	2017 Default Emission Factors - Table #3.1	0.015561	4.123775

Source Emissions | Refrigerants

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Fugitive	HFC-134a	N/A	All	Unspecified Technology	PreCalculated	No		N/A	N/A	N/A	N/A	0.195952	254.737267
Fugitive	R-401A	N/A	All	Unspecified Technology	PreCalculated	No		N/A	N/A	N/A	N/A	0.019504	0.34991
Fugitive	R-404A	N/A	All	Unspecified Technology	PreCalculated	No		N/A	N/A	N/A	N/A	0.084822	334.451979
Fugitive	R-408A	N/A	All	Unspecified Technology	PreCalculated	No		N/A	N/A	N/A	N/A	0.010433	25.351257
Fugitive	R-410A	N/A	All	Unspecified Technology	PreCalculated	No		N/A	N/A	N/A	N/A	0.004082	7.854399
Fugitive	R-438A	N/A	All	Unspecified Technology	PreCalculated	No		N/A	N/A	N/A	N/A	0.07575	155.96897

Source Emissions | Solar Thermal Purchases - Scope 2 - Market Based

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Purchased Heating - Market Based	CO2	Contract-Specific Factor	PreCalculated	PreCalculated	PreCalculated	No		PreCalculated	N/A	N/A	N/A	47.661799	47.661799
Purchased Heating - Market Based	CH4	Contract-Specific Factor	PreCalculated	PreCalculated	PreCalculated	No		PreCalculated	N/A	N/A	N/A	0.000899	0.02517
Purchased Heating - Market Based	N2O	Contract-Specific Factor	PreCalculated	PreCalculated	PreCalculated	No		PreCalculated	N/A	N/A	N/A	0.00009	0.023822

Source Emissions | Student Commute

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Scope 3 (Optional)	CO2	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	6,178.60892	6,178.60892
Scope 3 (Optional)	CH4	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	0.365156	10.224362
Scope 3 (Optional)	N2O	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	0.220576	58.45273

Source Emissions | Waste

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Scope 3 (Optional)	CH4	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	26.42795	739.9826

Source Emissions | Waste Water

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Scope 3 (Optional)	CH4	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	7.89	220.92

Source Emissions | Water

Activity Type	Gas	Fuel Type	End Use Sector	Technology	Calculation Method	SEM	Aditional Information	Fuel	Fuel Quantity	Emission Factor (EF)	EF Reference	Gas Quantity	CO2e (t)
Scope 3 (Optional)	CO2	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	76.917888	76.917888
Scope 3 (Optional)	CH4	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	0.012081	0.338268
Scope 3 (Optional)	N2O	N/A	All	Unspecified Technology	PreCalculated	Yes		N/A	N/A	N/A	N/A	0.001464	0.388056

UC Berkeley LRDP
Criteria Air Pollutant and GHG Modeling & Assumptions

Land Use Statistics - UC Berkeley

Summary	CEQA Baseline (2018)	LRDP Horizon (2036)	Project Change from Baseline	Growth Factor from Baseline
Residential				
Students (all)	39,708	48,200	8,492	0.21
Beds	9,020	20,751	11,731	1.30
Gross Building SQFT	2,028,286	5,900,102	3,871,816	1.91
Non-Residential				
Faculty and Staff	15,421	19,000	3,579	0.23
Academic SQFT	9,895,901	12,132,716	2,236,815	0.23
Campus Life SQFT	1,934,270	2,840,809	906,539	0.47
Subtotal Academic SQFT	11,830,171	14,973,525	3,143,354	0.27
Service Population	55,129	67,200	12,071	0.22
Total SQFT	13,858,457	20,873,627	7,015,170	0.51
Parking				
Parking Structure SQFT	1,056,500	2,137,580	1,081,080	1.02
Parking Lot SQFT	824,000	na		
Parking Spaces	6,340	2,222	-4,118	-0.65

Forecast Analysis Methodology - Criteria Air Pollutants and GHG Emissions

	Existing 2018	2036 LRDP Forecast Analysis Methodology	BAU Growth Factor
Scope 1			
Cogeneration Plant/Boiler	Based on Fuel Use provided by UC Berkeley	Central Plant Fuel use (BAU) forecast based on the design options in the ARUP report.	ARUP
Campus Fleet	Based on Fuel Use provided by UC Berkeley	Fuel Use and associated VMT assumed to grow proportional to the increase in Faculty and Staff.	0.22
Fuel Use	Based on Fuel Use provided by UC Berkeley	Assumed to grow proportional to the increase in total square footage (excludes parking garages)	0.51
Refrigerants (GHG Only)	Based on Refrigerant Use provided by UC Berkeley	Assumed to grow proportional to the increase in total square footage (excludes parking garages)	0.51
Scope 2			
Purchased Electricity (GHG Only)	Based on Purchased Electricity Use Provided by UC Berkeley	Assumed to grow proportional to the increase in total square footage (excludes parking garages)	0.51
Scope 3			
Faculty and Staff Commute	Based on VMT provided by F&P modeled using EMFAC2017	Based on VMT provided by F&P modeled using EMFAC2017	VMT
Student Commute	Based on VMT provided by F&P modeled using EMFAC2017	Based on VMT provided by F&P modeled using EMFAC2017	VMT
Air Travel (GHG only)	Based on emissions provided by UC Berkeley	Air travel emissions assumed to grow proportional to the increase in Service Population (i.e., Students and Faculty/Staff)	0.22
Solid Waste (GHG Only)	Based on Solid Waste Disposal and Emissions provided by UC Berkeley	Assumed to grow proportional to the increase in Service Population (i.e., Students and Faculty/Staff)	0.22
Water/Wastewater (GHG Only)	Based on Water/Wastewater and Emissions provided by UC Berkeley	Water and Wastewater forecast is based on the Water and Wastewater Demand Methodology for LRDP Memorandum Dated November 2020.	Utilities
Consumer Product Use (VOC Only)	Based on residential and non-residential building square footage and emissions factors in the CalEEMod User's Guide.	Based on growth in residential and non-residential building square footage and emissions factors in the CalEEMod User's Guide.	0.51
Architectural Coatings (VOC Only)	Based on residential and non-residential building square footage and emissions factors in the CalEEMod User's Guide.	Based on growth in residential and non-residential building square footage and emissions factors in the CalEEMod User's Guide.	0.51

Construction Estimate - LRDP

County:	Alameda County
Source Receptor Area (SRA):	11- South San Gabriel Valley
Climate Zone:	5
Land Use Setting:	Urban
Operational Year:	2024
Utility Company:	EBCE - Renewable 100
Air Basin:	SFBAAB
Air District:	Bay Area Air Quality Management District (BAAQMD)
Start	Sep-21

Change from Baseline

	SQFT	Demo SQFT
Residential	3,871,816	
Non-Residential	3,143,354	-68,130
Parking Structures	1,081,080	
Soil Export (CY)	60,000	split between grading and site preparation

Construction - Unmitigated Run (CBP AIR-2)

Replace Ground Cover	PM10:	5	% Reduction
	PM25:	5	% Reduction
Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	15	mph
Clean Paved Road		9	% PM Reduction

Year	MTCO2e/YR
2021	163
2022	651
2023	851
2024	7,582
2025	7,109
2026	6,968
2027	6,843
2028	6,707
2029	6,631
2030	6,583
2031	6,509
2032	6,471
2033	6,369
2034	6,324
2035	6,092
TOTAL (2021-2035)	81,853
30-Yr Amortization	2,728

Estimate of Total Construction Emissions over LRDP

UC Berkeley GHG Inventory and Forecast

Category	1	28	265	MTCO2e															
	Existing 2018					LRDP 2036 (Adjusted Business as Usual)					Net Change		LRDP 2036 With Sustainability Plan					Net Change	
	CO	CH4	N2O	TOTAL CO2e		CO	CH4	N2O	TOTAL CO2e		TOTAL CO2e		CO	CH4	N2O	TOTAL CO2e		TOTAL CO2e	
Scope 1																			
Cogeneration Plant/Boiler	123,761	2.3	0.2	123,888	64%	111,278	2.1	0.2	111,393	59%	-12,496	-10%	16,650	0.3	0.0	16,667	19%	-107,222	-87%
Campus Fleet	1,750	0.2	0.1	1,772	1%	1,556	0.0	0.1	1,581	1%	-191	-11%	0	0.0	0.0	0	0%	-1,772	-100%
Fuel Use	11,707	0.2	0.0	11,719	6%	17,633	0.3	0.0	17,651	9%	5,932	51%	17,633	0.3	0.0	17,651	20%	5,932	51%
Refrigerants				779	0.4%				1,173	1%	394	51%				1,173	1%	394	51%
Subtotal Scope 1	137,218	2.8	0.3	138,158	72%	130,467	2.5	0.3	131,798	70%	-6,360	-5%	34,282	0.7	0.1	35,491	41%	-102,667	-74%
Scope 2																			
Purchased Electricity	4,689	0.7	0.1	4,781	2%	3,999	0.6	0.1	4,036	2%	-745	-16%	72	0.0	0.0	72	0.1%	-4,709	-98%
Subtotal Scope 2	4,689	0.7	0.1	4,781	2%	3,999	0.6	0.1	4,036	2%	-745	-16%	72	0.0	0.0	72	0.1%	-4,709	-98%
Scope 3																			
Student Commute	4,065	0.1	0.1	4,097	2.1%	3,154	0.0	0.1	3,168	1.7%	-929	-23%	3,154	0.0	0.1	3,168	4%	-929	-23%
Faculty and Staff Commute	16,390	0.4	0.5	16,520	8.6%	14,282	0.2	0.2	14,348	7.6%	-2,172	-13%	14,282	0.2	0.2	14,348	17%	-2,172	-13%
Visitors	4,947	0.1	0.1	4,986	2.6%	4,061	0.1	0.1	4,080	2.2%	-906	-18%	4,061	0.1	0.1	4,080	5%	-906	-18%
Vendors	87	0.0	0.0	89	0.0%	74	0.0	0.0	75	0.0%	-13	-15%	74	0.0	0.0	75	0.1%	-13	-15%
Air Travel				22,926	11.9%				27,946	14.7%	5,020	22%				27,946	32%	5,020	22%
Solid Waste				740	0.4%				902	0.5%	162	22%				902	1.0%	162	22%
Water/Wastewater				299	0.2%				480	0.3%	181	61%				480	0.6%	181	61%
Subtotal Scope 3	25,488	0.6	0.7	49,657	25.8%	21,570	0.3	0.4	51,000	26.9%	1,342	3%	21,570	0.3	0.4	51,000	59%	1,342	3%
Natural Lands Sector																			
Carbon Sequestration				16					16		0					16		16	
Average Annual Construction																			
Construction (average per year)				0					2,728	1%	2,728					2,728	3%	2,728	
Total UC Berkeley Campus Emissions				**192,597**	100%				**189,562**	100%	**-3,035**	-2%				**86,563**	100%	**-103,305**	-54%
No Net Increase Threshold									192,597							192,597			
Exceeds No Net Increase Goal									No							No			
Service Population (SP)				55,129					67,200		12,071	22%				67,200		12,071	22%
$MTCO_2e/SP$				3.5					2.8		-0.7	-19%				1.3		-2.2	-63%

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Fifth Assessment Report (AR5).

UC Berkeley GHG Reduction Strategies

Energy Plan - Cogeneration Plant Reductions (MT)

	CO	CH4	N2O	TOTAL CO2e
Option 2	-45,438	-0.9	-0.1	-45,485
Option 11C	-111,278	-2.1	-0.2	-111,393
Option 12	-94,629	-1.8	-0.2	-94,726

Campus Fleet - Electric Vehicles (MT)

	CO	CH4	N2O	TOTAL CO2e
Campus Fleet - Electric Vehicles	-1,556	0.0	-0.1	-1,581

100% Renewable Electricity Procurement (MT)

	CO	CH4	N2O	TOTAL CO2e
Purchase Electricity	-3,927	-1	0	-3,964

UC Berkeley Carbon Neutrality Targets for the LRDP EIR

California's commitment to carbon neutrality was accelerated to 2045 under EO B-55-18. Consequently, under the UCOP's Carbon Neutrality Initiative this EIR considers a trajectory to achieve carbon neutrality for all sources by 2045.

Forecast to Achieve Carbon Neutrality

2018		2045	2036
	0%	100%	67%

2018	MTCO2e
Cogeneration Plant/Boiler	123,888
Campus Fleet	1,772
Fuel Use	11,719
Refrigerants	779
Purchased Electricity	4,781
Student Commute	4,097
Faculty and Staff Commute	16,520
Visitors	4,986
Vendors	89
Air Travel	22,926
Solid Waste	740
Water/Wastewater	299
	192,597
67% Reduction	128,398
2036 Target	64,199

2036	BAU MTCO2e	Sustainability Scenario MTCO2e	Sustainability Scenario with Scope 1 and 2 Offsets MTCO2e
Cogeneration Plant/Boiler	111,393	16,667	0
Campus Fleet	1,581	0	0
Fuel Use	17,651	17,651	0
Refrigerants	1,173	1,173	0
Purchased Electricity	4,036	72	0
Student Commute	3,168	3,168	3,168
Faculty and Staff Commute	14,348	14,348	14,348
Visitors	4,080	4,080	4,080
Vendors	75	75	75
Air Travel	27,946	27,946	27,946
Solid Waste	902	902	902
Water/Wastewater	480	480	480
	186,834	86,563	51,000
Offsets Potentially Needed	122,635	22,364	-13,199

UC Berkeley Campus, Community Criteria Air Pollutant Emissions Inventory and Forecast

Sources

[a] Source: UC Berkeley, AP 42 for emission rates.

[b] Source: F&P 2020; EMFAC2017 Version 1.0.3. Project Level

[c] Source: CalEEMod User's Guide

EXISTING (2018)					LRDP 2036				Net Change			
Phase	Existing (2018) Criteria Air Pollutant Emissions (pounds/day)				Project (2036) Criteria Air Pollutant Emissions (pounds/day)				Delta Criteria Air Pollutant Emissions (pounds/day)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Scope 1												
Cogeneration Plant/Boiler[a]	34	303	48	48	31	273	43	43	-3	-31	-5	-5
Campus Fleet[a]	1	3	0	0	0	1	0	0	0	-2	0	0
Fuel Use[a]	3	58	4	4	5	87	7	7	2	29	2	2
Subtotal Scope 1	38	363	52	52	36	360	50	50	-2	-3	-3	-3
Scope 2 - None												
Scope 3												
Student Commute[b]	5	13	6	2	2	3	6	2	-3	-9	0	0
Faculty and Staff Commute[b]	17	45	20	8	9	14	24	10	-8	-31	4	2
Visitors[b]	4	10	4	2	2	3	5	2	-2	-7	1	0
Vendors[b]	0	1	0	0	0	0	0	0	0	-1	0	0
Consumer Products/Coatings[c]	324				490				166	0	0	0
Subtotal Scope 3	350	68	30	13	502	20	36	15	153	-48	6	2
Total lbs Per Day	**388**	**432**	**82**	**65**	**538**	**381**	**85**	**64**	**150**	**-51**	**3**	**-1**
BAAQMD Threshold									**54**	**54**	**82**	**54**
Exceeds Threshold									**Yes**	**No**	**No**	**No**

UC Berkeley Campus, Community Criteria Air Pollutant Emissions Inventory and Forecast

Phase	Existing (2018) Criteria Air Pollutant Emissions (tons/year				Project (2036) Criteria Air Pollutant Emissions (tons/year)				Delta Criteria Air Pollutant Emissions (tons/year)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$	VOC	NO_X	PM_{10}	$PM_{2.5}$
Scope 1												
Cogeneration Plant/Boiler[a]	6	55	9	9	6	50	8	8	-1	-6	-1	-1
Campus Fleet[a]	0	0	0	0	0	0	0	0	0	0	0	0
Fuel Use[a]	1	11	1	1	1	16	1	1	0	5	0	0
Subtotal Scope 1	7	66	10	10	7	66	9	9	-0.4	-1	-0.5	-0.5
Scope 2 - None												
Scope 3												
Student Commute[b]	1	1	1	0	0	0	1	0	0	-1	0	0
Faculty and Staff Commute[b]	2	6	3	1	1	2	3	1	-1	-4	1	0
Visitors[b]	1	2	1	0	0	1	1	0	0	-1	0	0
Vendors[b]	0	0	0	0	0	0	0	0				
Consumer Products/Coatings[c]	59	0	0	0	89	0	0	0	30	0	0	0
Subtotal Scope 3	63	10	4	2	91	3	5	2	28	-7	0.8	0.3
Total Tons Per Year	**70**	**76**	**14**	**11**	**98**	**69**	**14**	**11**	**28**	**-7**	**0**	**0**
BAAQMD Threshold									**10**	**10**	**15**	**10.0**
Exceeds Threshold									**Yes**	**No**	**No**	**No**

UC Berkeley Campus, Community Criteria Air Pollutant Emissions Inventory and Forecast

EXISTING (2036 Emission Rates)

Phase	Existing (2018) Criteria Air Pollutant Emissions (pounds/day)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$
Scope 1				
Cogeneration Plant/Boiler[a]	34	303	48	48
Campus Fleet[a]	0	1	0	0
Fuel Use[a]	3	58	4	4
Subtotal Scope 1	38	361	52	52
Scope 2 - None				
Scope 3				
Student Commute[b]	2	3	6	2
Faculty and Staff Commute[b]	7	11	20	8
Visitors[b]	2	2	4	2
Vendors[b]	0	0	0	0
Consumer Products/Coatings[c]	324			
Subtotal Scope 3	335	17	30	12
Total lbs Per Day	**372**	**379**	**82**	**65**
BAAQMD Threshold				
Exceeds Threshold				
Phase	**Existing (2018) Criteria Air Pollutant Emissions (tons/year**			
	VOC	NO_X	PM_{10}	$PM_{2.5}$
Scope 1				
Cogeneration Plant/Boiler[a]	6	55	9	9
Campus Fleet[a]	0	0	0	0
Fuel Use[a]	1	11	1	1
Subtotal Scope 1	7	66	10	10
Scope 2 - None				
Scope 3				
Student Commute[b]	0	0	1	0
Faculty and Staff Commute[b]	1	2	3	1
Visitors[b]	0	0	1	0
Vendors[b]	0	0	0	0
Consumer Products/Coatings[c]	59	0	0	0
Subtotal Scope 3	61	2	4	2
Total Tons Per Year	**67**	**68**	**14**	**11**
BAAQMD Threshold				
Exceeds Threshold				

[redacted]

Net Change (2036 Emission Ra

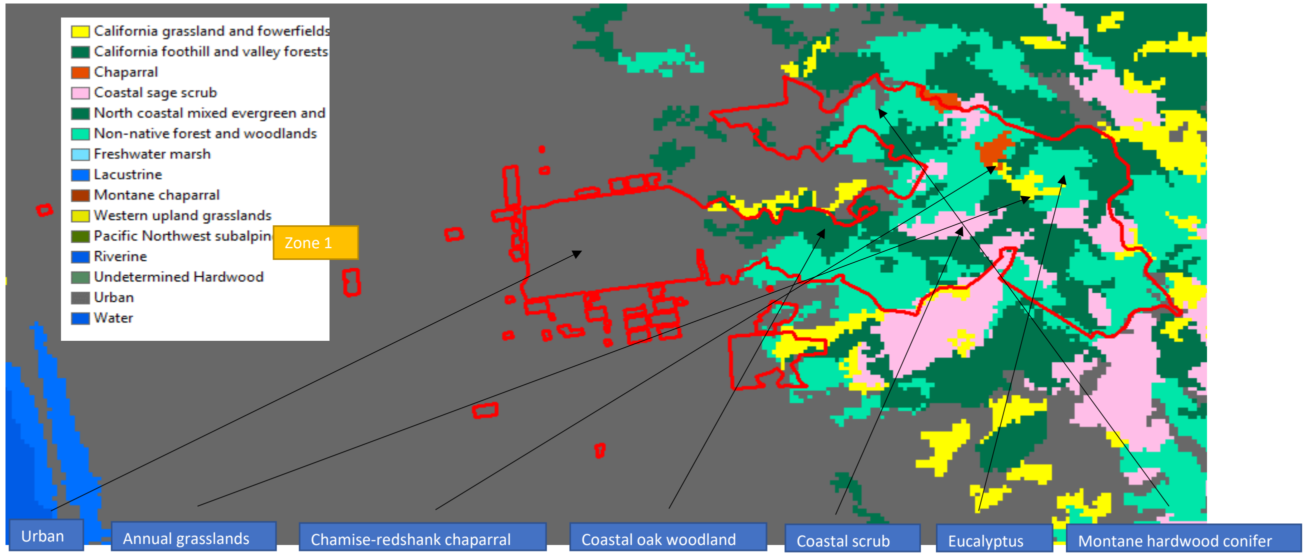
Phase	Delta Criteria Air Pollutant Emissions (pounds/day)			
	VOC	NO_X	PM_{10}	$PM_{2.5}$
Scope 1				
Cogeneration Plant/Boiler[a]	-3	-31	-5	-5
Campus Fleet[a]	0	0	0	0
Fuel Use[a]	2	29	2	2
Subtotal Scope 1	-2	-1	-3	-3
Scope 2 - None				
Scope 3				
Student Commute[b]	0	0	0	0
Faculty and Staff Commute[b]	2	3	5	2
Visitors[b]	0	0	1	0
Vendors[b]	0	0	0	0
Consumer Products/Coatings[c]	166	0	0	0
Subtotal Scope 3	168	3	6	2
Total lbs Per Day	**166**	**2**	**3**	**0**
BAAQMD Threshold	**54**	**54**	**82**	**54**
Exceeds Threshold	**Yes**	**No**	**No**	**No**
Phase	**Delta Criteria Air Pollutant Emissions (tons/year)**			
	VOC	NO_X	PM_{10}	$PM_{2.5}$
Scope 1				
Cogeneration Plant/Boiler[a]	-1	-6	-1	-1
Campus Fleet[a]	0	0	0	0
Fuel Use[a]	0	5	0	0
Subtotal Scope 1	-0.3	-0.2	-0.5	-0.5
Scope 2 - None				
Scope 3				
Student Commute[b]	0	0	0	0
Faculty and Staff Commute[b]	0	0	1	0
Visitors[b]	0	0	0	0
Vendors[b]	0	0	0	0
Consumer Products/Coatings[c]	30	0	0	0
Subtotal Scope 3	31	0	1	0
Total Tons Per Year	**30**	**0**	**0**	**-0.1**
BAAQMD Threshold	**10**	**10**	**15**	**10.0**
Exceeds Threshold	**Yes**	**No**	**No**	**No**

Natural Lands Sector

Land use types	Raster spaces in LRDP boundary
Annual grassland	124
Chamise-Redshank Chaparral	60
Coastal oak woodland	1,167
Coastal scrub	379
Eucalyptus	1,414
Montane Hardwood-Conifer	1
Urban	1,804
Total	**4,949**

Annual grassland	2.51%
Chamise-Redshank Chaparral	1.21%
Coastal oak woodland	23.58%
Coastal scrub	7.66%
Eucalyptus	28.57%
Montane Hardwood-Conifer	0.02%
Urban	36.45%

Area of Zone 1	168,539
Area of Zone 0 (everything else)	47,798,652
Total area	47,967,191



FID	Shape *	Shape_Leng	Shape_Area
0	Polygon ZM	106294.763436	47798652.3021
1	Polygon ZM	1887.713668	168538.869999

Per GIS data, area is in square feet

Natural Lands Sector - Carbon Sequestration

Total square footage	47,967,191
Square feet per hectare	107,639
Total hectares	446

Land use category	**Percent**	**Hectares**
Annual grassland	2.51%	11.17
Chamise-Redshank Chaparral	1.21%	5.40
Coastal oak woodland	23.58%	105.08
Coastal scrub	7.66%	34.13
Eucalyptus	28.57%	127.32
Montane Hardwood-Conifer	0.02%	0.09
Urban	36.45%	162.44

Increase in biomass stock in forested areas [a]

Hectares of oak (A_{oak})	105.08	
Hectares of eucalpytus (A_{euc})	127.32	
Hectares of conifers (A_{con})	0.09	
		Source Notes
Average annual above-ground biomass growth rate (G_w) [a]	4.4	Table 4.12
Ratio of below-ground to above-ground biomass for oak (R_{oak}) [a]	0.3	Table 4.4
Ratio of below-ground to above-ground biomass for eucalpytus (R_{euc}) [a]	0.28	Table 4.4
Ratio of below-ground to above-ground biomass for conifers (R_{con}) [a]	0.29	Table 4.4
Average annual biomass total for oak ($G_{TOTALoak}$)	5.72	
Average annual biomass total for eucalpytus ($G_{TOTALeuc}$)	5.632	
Average annual biomass total for conifers ($G_{TOTALcon}$)	5.676	
Carbon fraction of dry matter, default (C) [a]	0.5	Worksheet 1
Annual increase in biomass carbon stock, oak (ΔC_{oak})	300.53	
Annual increase in biomass carbon stock, eucalpytus (ΔC_{euc})	358.54	
Annual increase in biomass carbon stock, conifer (ΔC_{con})	0.26	
Annual increase in biomass carbon stock, total (ΔC)	**659.33**	

ΔC units are in tonnes (MT) of carbon (MTCO $_2$ e)

It is assumed that trees are of medium size (50-150 MT)

Source

(a) Intergovernmental Panel on Climate Change (IPCC). 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Agriculture, Forestry and Other Land Uses, Chapter 4, Forest Land. https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf

Increase in biomass stock in urban areas [b] [c]

		Source Notes
Total size of urbanized area, in hectares (A)	162.44	
Percent of urbanized area covered by tree canopies [b]	25.10%	Table 1
Average area of tree canopy (AD_{trees_k})	40.77	
Average tree removal factor (RF_k) [b]	0.389	Table 3
Years in inventory period (T)	1	
Area of tree loss cover ($AD_{treeloss\_k}$)	0	
Average emissions factor from tree loss (EF_k)	0	
Change in tree carbon (ΔC_{trees})	15.86	
Change in tree carbon frrom tree loss ($\Delta C_{treeloss}$)	0.00	
Annual increase in biomass carbon stock (ΔC)	**15.86**	

It is assumed that no trees are added or removed from the urbanized area

Source

National Greenhouse Gas Inventories. Volume 4, Agriculture, Forestry and Other Land Uses, Chapter 4, Forest Land. https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_04_Ch4_Forest_Land.pdf

(b) Nowak, David J. and Greenfield, Eric J. 2012, May 9. Tree and Impervious Cover in the United States. Landscape and Urban Planning, Volume 107. https://www.nrs.fs.fed.us/pubs/jrnl/2012/nrs_2012_nowak_002.pdf

(c) ICLEI. 2012, October. U.S. Community Protocol (USCP) for Accounting and Reporting of Greenhouse Gas Emissions. Appendix J: Forest Land and Trees. https://icleiusa.org/publications/us-community-protocol/

Scope 1: 2018 Campus Fleet

Fuel use associated with the campus fleet was provided by the university, organized by fuel type. Emissions factors for fuel are based on emissions factors by fuel type provided by the university.

	2018 Annual Fuel Use (Gallons)	Emissions Factors[a]	Units	MT	MTCO2e (AR5)	$MTCO_2e/YR$	Miles/Day [(d)]
Campus Fleet - Diesel	61,024	10.21	kg CO_2/Gal	623	623	631	5,698
		0.001	kg CH_4/Gal	0.06	1.71		
		0.0004	kg N_2O/Gal	0.02	6.47		
Campus Fleet – Ethanol (E100)[b, c]	522	5.75	kg CO_2/Gal	3	3	3	31
Campus Fleet - Gasoline	128,003	8.78	CO_2/Gal	1124	1124	1138	10,579
		0.001	kg CH_4/Gal	0.13	4		
		0.0003	kg N_2O/Gal	0.04	10		
TOTAL						**1,772**	**16,309**
					Scaling Factor [(e)]	**347**	

Notes:

a. Emissions factors for CH_4 and N_2O are derived from grams per mile (g/m) and converted to kg/Gal.

b. CO2 emissions factor for E100 based on Table G.11 of the Local Government Operations Protocol. Version 1.1. (CARB 2010). Ethanol is considered a biogenic rather than anthropogenic source of GHG emissions.

(c) Daily mileage estimated based on EMFAC2017 LDA gasoline fuel economy and assumes that ethanol vehicles are 15% to 27% fewer miles per gallon than gasoline. https://www.fueleconomy.gov/feg/ethanol.shtml

(d) Daily mileage estimated based on the average fuel economy in EMFAC2017 for LDA and LDT2.

(d) Annual data converted to daily by dividing by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement (2008).

Forecast	Fuel Use and associated VMT assumed to grow proportional to the increase in Faculty and Staff.	0.22		**Miles/Day**	**Gallons/Yr**
			LDA - Ethanol	38	636
			LDA - Gasoline	12,895	156,030
			LDT2	6,946	74,386
				19,880	**231,052**

EMFAC2017 Fuel Economy: Year 2036

Source: EMFAC2017 (v1.0.3) Emissions Inventory
Region Type: County
Region: Alameda
Calendar Year: 2036
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/year for VMT, trips/year for Trips, tons/year for Emissions, 1000 gallons/year for Fuel Consumption

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Fuel Consu	Gallons/Mile
Alameda	2036	All Other B	Aggregate	Aggregate	Diesel	502.43	8094282.83	714.9789	0.088
Alameda	2036	LDA	Aggregate	Aggregate	Gasoline	814835.6	9123363116	217438.1	0.024
Alameda	2036	LDA	Aggregate	Aggregate	Diesel	9972.511	112986293	1786.508	0.016
Alameda	2036	LDA	Aggregate	Aggregate	Electricity	48061.1	591442100	0	0.000
Alameda	2036	LDT1	Aggregate	Aggregate	Gasoline	83352.16	920565983	25670.35	0.028
Alameda	2036	LDT1	Aggregate	Aggregate	Diesel	11.1238	125518.73	3.785281	0.030
Alameda	2036	LDT1	Aggregate	Aggregate	Electricity	2662.213	33629581.3	0	0.000
Alameda	2036	LDT2	Aggregate	Aggregate	Gasoline	253482.9	2835779935	79115.17	0.028
Alameda	2036	LDT2	Aggregate	Aggregate	Diesel	2469.065	28670592.1	603.6013	0.021
Alameda	2036	LDT2	Aggregate	Aggregate	Electricity	9797.708	85391866.3	0	0.000
Alameda	2036	LHD1	Aggregate	Aggregate	Gasoline	16215.68	175384489	17579.51	0.100
Alameda	2036	LHD1	Aggregate	Aggregate	Diesel	14757.82	165965796	7457.406	0.045
Alameda	2036	LHD2	Aggregate	Aggregate	Gasoline	2497.518	26575188.2	3059.858	0.115
Alameda	2036	LHD2	Aggregate	Aggregate	Diesel	5975.83	64831897	3290.395	0.051
Alameda	2036	MCY	Aggregate	Aggregate	Gasoline	36688.28	86685536.9	2337.588	0.027
Alameda	2036	MDV	Aggregate	Aggregate	Gasoline	160078	1750056240	59166.68	0.034
Alameda	2036	MDV	Aggregate	Aggregate	Diesel	5472.335	62299847.4	1703.753	0.027
Alameda	2036	MDV	Aggregate	Aggregate	Electricity	6911.463	60859490.8	0	0.000
Alameda	2036	MH	Aggregate	Aggregate	Gasoline	2455.284	7948725.41	1339.501	0.169
Alameda	2036	MH	Aggregate	Aggregate	Diesel	1143.55	3372691.82	285.365	0.085
Alameda	2036	Motor Coa	Aggregate	Aggregate	Diesel	114.3987	4025608.1	517.3159	0.129
Alameda	2036	OBUS	Aggregate	Aggregate	Gasoline	522.5894	7254762.34	1251.954	0.173
Alameda	2036	PTO	Aggregate	Aggregate	Diesel	0	4770038.85	816.8416	0.171

Alameda	2036	SBUS	Aggregate	Aggregate	Gasoline	271.2122	4026457.98	364.572	0.091
Alameda	2036	SBUS	Aggregate	Aggregate	Diesel	315.1435	3252563.11	329.6309	0.101
Alameda	2036	T6 Ag	Aggregate	Aggregate	Diesel	2.917169	268.534767	0.086469	0.322
Alameda	2036	T6 CAIRP h	Aggregate	Aggregate	Diesel	72.87453	3868553.3	263.2553	0.068
Alameda	2036	T6 CAIRP sı	Aggregate	Aggregate	Diesel	40.43258	554215.777	42.21774	0.076
Alameda	2036	T6 instate (	Aggregate	Aggregate	Diesel	833.7048	16624102.7	1773.064	0.107
Alameda	2036	T6 instate (	Aggregate	Aggregate	Diesel	1756.728	27269766.3	2648.866	0.097
Alameda	2036	T6 instate l	Aggregate	Aggregate	Diesel	4326.699	139071813	11041.33	0.079
Alameda	2036	T6 instate :	Aggregate	Aggregate	Diesel	12487.35	178362323	14775.02	0.083
Alameda	2036	T6 OOS hea	Aggregate	Aggregate	Diesel	41.62008	2224107.98	151.1724	0.068
Alameda	2036	T6 OOS sm	Aggregate	Aggregate	Diesel	23.23265	316140.381	24.11556	0.076
Alameda	2036	T6 Public	Aggregate	Aggregate	Diesel	1623.378	7896834.79	847.9586	0.107
Alameda	2036	T6 utility	Aggregate	Aggregate	Diesel	223.9102	1165603.18	101.1502	0.087
Alameda	2036	T6TS	Aggregate	Aggregate	Gasoline	2011.084	33334276.2	5667.06	0.170
Alameda	2036	T7 Ag	Aggregate	Aggregate	Diesel	3.461125	1833.0049	0.511578	0.279
Alameda	2036	T7 CAIRP	Aggregate	Aggregate	Diesel	1847.779	122440898	12802.46	0.105
Alameda	2036	T7 CAIRP c	Aggregate	Aggregate	Diesel	209.9167	11941237.4	1552.355	0.130
Alameda	2036	T7 NNOOS	Aggregate	Aggregate	Diesel	2802.136	149251586	16195.21	0.109
Alameda	2036	T7 NOOS	Aggregate	Aggregate	Diesel	735.1029	48111764.5	5154.736	0.107
Alameda	2036	T7 other pc	Aggregate	Aggregate	Diesel	284.7301	14699444.3	1750.336	0.119
Alameda	2036	T7 POAK	Aggregate	Aggregate	Diesel	2230.308	112629123	13744.36	0.122
Alameda	2036	T7 Public	Aggregate	Aggregate	Diesel	903.185	5710314.74	855.6454	0.150
Alameda	2036	T7 Single	Aggregate	Aggregate	Diesel	1021.961	24022869.1	3203.965	0.133
Alameda	2036	T7 single c	Aggregate	Aggregate	Diesel	1267.766	29624013.5	4406.147	0.149
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Diesel	52.26014	666202.516	293.0855	0.440
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Natural Ga	549.3042	6988043.22	2401.392	0.344
Alameda	2036	T7 tractor	Aggregate	Aggregate	Diesel	6015.344	229973184	23157.88	0.101
Alameda	2036	T7 tractor (	Aggregate	Aggregate	Diesel	1052.36	24437203	3582.615	0.147
Alameda	2036	T7 utility	Aggregate	Aggregate	Diesel	142.3517	900229.132	118.7994	0.132
Alameda	2036	T7IS	Aggregate	Aggregate	Gasoline	7.830945	307871.891	57.14675	0.186
Alameda	2036	UBUS	Aggregate	Aggregate	Gasoline	8.906111	172101.334	29.86586	0.174
Alameda	2036	UBUS	Aggregate	Aggregate	Diesel	501.8445	18983385.1	2755.669	0.145
Alameda	2036	UBUS	Aggregate	Aggregate	Natural Ga	202.7748	7670408.36	1905.978	0.248

EMFAC2017 Fuel Economy: Year 2018

Source: EMFAC2017 (v1.0.3) Emissions Inventory
Region Type: County
Region: Alameda
Calendar Year: 2018
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/year for VMT, trips/year for Trips, tons/year for Emissions, 1000 gallons/year for Fuel Consumption

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Fuel Consum	Gallons/Mile
Alameda	2018	All Other B	Aggregate	Aggregate	Diesel	288.204	4596300.7	534.9099	0.116
Alameda	2018	LDA	Aggregate	Aggregate	Gasoline	611638	7872903976	274529.7	0.035
Alameda	2018	LDA	Aggregate	Aggregate	Diesel	6189.85	82396293.8	1877.877	0.023
Alameda	2018	LDA	Aggregate	Aggregate	Electricity	13240.4	169293934	0	0.000
Alameda	2018	LDT1	Aggregate	Aggregate	Gasoline	63730	793425568	31968.54	0.040
Alameda	2018	LDT1	Aggregate	Aggregate	Diesel	62.8286	355473.992	15.17232	0.043
Alameda	2018	LDT1	Aggregate	Aggregate	Electricity	141.394	1701147.45	0	0.000
Alameda	2018	LDT2	Aggregate	Aggregate	Gasoline	206732	2678451639	120501.6	0.045
Alameda	2018	LDT2	Aggregate	Aggregate	Diesel	851.889	13624464.4	420.4706	0.031
Alameda	2018	LDT2	Aggregate	Aggregate	Electricity	713.045	8728472.43	0	0.000
Alameda	2018	LHD1	Aggregate	Aggregate	Gasoline	16336.7	195346293	23997.41	0.123
Alameda	2018	LHD1	Aggregate	Aggregate	Diesel	8316.25	107308979	6143.757	0.057
Alameda	2018	LHD2	Aggregate	Aggregate	Gasoline	2424.55	28815791.2	4055.915	0.141
Alameda	2018	LHD2	Aggregate	Aggregate	Diesel	2938.76	38574655.3	2480.417	0.064
Alameda	2018	MCY	Aggregate	Aggregate	Gasoline	27551.9	76737724.1	2075.314	0.027
Alameda	2018	MDV	Aggregate	Aggregate	Gasoline	125864	1544446836	83731.17	0.054
Alameda	2018	MDV	Aggregate	Aggregate	Diesel	1924.01	29858711.9	1205.418	0.040
Alameda	2018	MDV	Aggregate	Aggregate	Electricity	67.1891	762986.248	0	0.000
Alameda	2018	MH	Aggregate	Aggregate	Gasoline	2400.35	7077911.34	1513.302	0.214
Alameda	2018	MH	Aggregate	Aggregate	Diesel	613.185	2056481.16	213.0407	0.104
Alameda	2018	Motor Coa	Aggregate	Aggregate	Diesel	84.0717	3077260.52	512.1056	0.166
Alameda	2018	OBUS	Aggregate	Aggregate	Gasoline	631.458	11545283.4	2499.689	0.217
Alameda	2018	PTO	Aggregate	Aggregate	Diesel	0	5141086.52	1096.725	0.213
Alameda	2018	SBUS	Aggregate	Aggregate	Gasoline	43.9815	758370.582	81.2772	0.107

Alameda	2018	SBUS	Aggregate	Aggregate	Diesel	282.628	3010618.7	365.1365	0.121
Alameda	2018	T6 Ag	Aggregate	Aggregate	Diesel	4.12813	16188.8281	1.835013	0.113
Alameda	2018	T6 CAIRP h	Aggregate	Aggregate	Diesel	47.0517	2962123.64	283.9896	0.096
Alameda	2018	T6 CAIRP s	Aggregate	Aggregate	Diesel	24.7943	414078.704	41.97403	0.101
Alameda	2018	T6 instate c	Aggregate	Aggregate	Diesel	514.107	10651477.1	1364.187	0.128
Alameda	2018	T6 instate c	Aggregate	Aggregate	Diesel	1127.48	17472419.2	2236.2	0.128
Alameda	2018	T6 instate h	Aggregate	Aggregate	Diesel	2199.26	97996127.9	10424.27	0.106
Alameda	2018	T6 instate s	Aggregate	Aggregate	Diesel	8042.1	126432676	14094.78	0.111
Alameda	2018	T6 OOS he	Aggregate	Aggregate	Diesel	26.9036	1699323.68	162.9329	0.096
Alameda	2018	T6 OOS sm	Aggregate	Aggregate	Diesel	14.2661	237352.214	24.07317	0.101
Alameda	2018	T6 Public	Aggregate	Aggregate	Diesel	1105.15	5337881.11	756.1782	0.142
Alameda	2018	T6 utility	Aggregate	Aggregate	Diesel	193.564	1010976.61	121.0546	0.120
Alameda	2018	T6TS	Aggregate	Aggregate	Gasoline	1596.78	27847150.8	6012.979	0.216
Alameda	2018	T7 Ag	Aggregate	Aggregate	Diesel	2.08	5019.11114	0.92116	0.184
Alameda	2018	T7 CAIRP	Aggregate	Aggregate	Diesel	1537.39	93634587.6	14699.72	0.157
Alameda	2018	T7 CAIRP c	Aggregate	Aggregate	Diesel	124.973	7651048.51	1410.918	0.184
Alameda	2018	T7 NNOOS	Aggregate	Aggregate	Diesel	1772.08	114148828	17435.89	0.153
Alameda	2018	T7 NOOS	Aggregate	Aggregate	Diesel	604.998	36788085.2	5897.619	0.160
Alameda	2018	T7 other pc	Aggregate	Aggregate	Diesel	184.468	9342144.95	1760.442	0.188
Alameda	2018	T7 POAK	Aggregate	Aggregate	Diesel	1485.98	49459779	9688.162	0.196
Alameda	2018	T7 Public	Aggregate	Aggregate	Diesel	852.788	5394203.97	1075.149	0.199
Alameda	2018	T7 Single	Aggregate	Aggregate	Diesel	1185.94	25891539.3	4399.326	0.170
Alameda	2018	T7 single cc	Aggregate	Aggregate	Diesel	889.383	18980844.1	3682.365	0.194
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Diesel	260.704	3323410.81	1481.036	0.446
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Natural Gc	308.14	3921310.88	1639.003	0.418
Alameda	2018	T7 tractor	Aggregate	Aggregate	Diesel	3701.57	164676953	24113.63	0.146
Alameda	2018	T7 tractor c	Aggregate	Aggregate	Diesel	716.862	15657525.3	3062.625	0.196
Alameda	2018	T7 utility	Aggregate	Aggregate	Diesel	122.743	777639.792	140.5631	0.181
Alameda	2018	T7IS	Aggregate	Aggregate	Gasoline	11.7041	377496.996	100.674	0.267
Alameda	2018	UBUS	Aggregate	Aggregate	Gasoline	8.67255	167588.067	37.32611	0.223
Alameda	2018	UBUS	Aggregate	Aggregate	Diesel	588.767	22834304.7	3742.97	0.164
Alameda	2018	UBUS	Aggregate	Aggregate	Electricity	12.0206	353773.681	0	0.000
Alameda	2018	UBUS	Aggregate	Aggregate	Natural Gc	85.3535	2766733.23	714.9793	0.258

Year 2018 Existing: Criteria Air Pollutants - Campus Fleet

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Daily VMT **Emission year**

				lbs/day					
Vehicle Type	**Fuel Type**	**Speed**	**VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
LDA	Gasoline	Aggregate	10,610	0.48	1.81	22.83	0.07	0.04	0.19
LDT2	Diesel	Aggregate	5,698	0.24	0.91	1.82	0.04	0.10	0.10
		lbs/day	**16,309**	**0.72**	**2.72**	**24.65**	**0.10**	**0.14**	**0.29**
		tons/year		0.13	0.50	4.50	0.02	0.03	0.05

Year 2036: Criteria Air Pollutants - Campus Fleet

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Emission year

LRDP 2036							lbs/day		
Vehicle Type	**Fuel Type**	**Speed**	**VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
LDA	Gasoline	Aggregate	12,933	0.07	0.52	10.97	0.06	0.02	0.23
LDA	Electricity	Aggregate		0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	6,946	0.22	0.45	2.24	0.03	0.06	0.12
LDT2	Electricity	Aggregate		0.00	0.00	0.00	0.00	0.00	0.00
			19,880	**0.29**	**0.97**	**13.21**	**0.09**	**0.08**	**0.35**

Existing with 2036 Emission Rates							lbs/day		
Vehicle Type	**Fuel Type**	**Speed**	**VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
LDA	Gasoline	Aggregate	10,610	0.05	0.43	9.00	0.05	0.02	0.19
LDT2	Diesel	Aggregate	5,698	0.18	0.37	1.84	0.03	0.05	0.10
			16,309	**0.23**	**0.80**	**10.84**	**0.07**	**0.07**	**0.29**

UC Berkeley Sustainability Strategies - Electric Vehicles							lbs/day		
Vehicle Type	**Fuel Type**	**Speed**	**VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
LDA	Electricity	Aggregate	12,933	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	6,946	0.00	0.00	0.00	0.00	0.00	0.00
			19,880	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Year 2036: GHG Emissions - Campus Fleet

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Daily VMT x 347 = Annual VMT

This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement (2008).

				CO_2 (Pavley)	CH_4	N_2O	
				AR5 GWP	AR5 GWP	AR5 GWP	
LRDP 2036				1	28	265	
Vehicle Type	**Fuel Type**	**Speed***	**VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
LDA	Gasoline	Aggregate	4,487,922	985.35	0.00	0.01	989
LDA	Electricity	Aggregate		0.00	0.00	0.00	0
LDT2	Diesel	Aggregate	2,410,314	570.30	0.00	0.08	592
LDT2	Electricity	Aggregate		0.00	0.00	0.00	0
			6,898,236	**1,555.64**	**0.01**	**0.09**	**1,581**

UC Berkeley Sustainability Plan Strategies - Electric Vehicles				1	28	265	
Vehicle Type	**Fuel Type**	**Speed***	**VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
LDA	Electricity	Aggregate	4,487,922	0.00	0.00	0.00	0
LDT2	Electricity	Aggregate	2,410,314	0.00	0.00	0.00	0
			6,898,236	**0.00**	**0.00**	**0.00**	**0**

AP 42 Natural Gas Emission Factors

BOILERS	lbs/10^6 scf	conversion factor	lbs/MMBtu
PM total	7.6	1020	0.0074510
SO2	0.6	1020	0.0005882
VOC	5.5	1020	0.0053922
NOx -low NOx+Flue gas recirculation	100	1020	0.0980392
CO large Boilers w/low NOx burners	84	1020	0.0823529

Source: US EPA. 1998, July. AP 42, Fifth Edition, Volume I Chapter 1: External Combustion Sources. Section 1.4, Natural Gas Combustion.
https://www.epa.gov/sites/production/files/2020-09/documents/1.4_natural_gas_combustion.pdf

FUEL OIL		lbs/10^3 gal	% Sulfur (based on 15 ppm)	lbs/10^3 gal
Distillate No. 2				
SO2	142S		0.15%	0.21

	lbs/10^3 gal	lbs/gal
SO2	0.21	0.00021
NOx - with Flue Gas Recirculation (FGR)	10	0.01000
CO	5	0.00500
PM Total	2	0.00200
PM10 Fraction (Table 1.3-7)	1.08	0.00108
PM2.5 Fraction (Table 1.3-7)	0.83	0.00083
TOC	0.556	0.00056

Source: US EPA. 2010, May (Corrected). AP 42, Fifth Edition, Volume I Chapter 1: External Combustion Sources. Section 1.3, Fuel Oil Combustion.
https://www.epa.gov/sites/production/files/2020-09/documents/1.3_fuel_oil_combustion.pdf

Scope 1: 2018 Central Plant

Prior to 2017, the university received heat for the main campus in the form of high-pressure steam from the on-campus cogeneration plant (the Central Energy Management System), which was owned and operated by a third party; and purchased electricity from PG&E to power its main campus, which constitutes 97 percent of UC Berkeley's electricity consumption. Between the opening of the plant in the 1980s and mid-2017, the third-party owner and operator had a power purchase agreement with PG&E to sell electricity generated by the cogeneration plant to PG&E. In 2017, the third-party operator's power purchase agreement with PG&E ended as did UC Berkeley's energy services contract with the third-party operator. Following the end of both contracts, UC Berkeley assumed ownership of the cogeneration plant and began to use the majority of its main campus electricity from the cogeneration plant. As a result, emissions associated with the cogeneration plant are considered to be under the sole jurisdiction of the university for all inventory years.

Natural gas use at the Central Energy Management System was provided by the university. Emissions factors for natural gas from the central plant are based emissions factors provided by the university.

2018	2018 Annual Natural Gas Use (MMBTU)	Emissions Factors[a]	Units	MT	MTCO2e (AR5)	$MTCO_2e$/YR
Central Plant	2,334,237	53.02	kg CO_2/MMBtu	123761	123761	123,888
		0.001	kg CH_4/MMBtu	2.33	65.36	
		0.0001	kg N_2O/MMBtu	0.23	61.86	

Rate	lbs/MMBTU					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Natural Gas	0.00539216	0.09803922	0.08235294	0.00058824	0.00745098	0.00745098

Note: The Central Plant is a permitted facility and subject to site-specific permit conditions. As such, the emissions factors identified are overly conservative for criteria air pollutants as they may not reflect additional emissions reductions from technology/air pollution control devices required to meet emissions limits for the turbines.

Source: AP42

	2018 lbs/day					
Estimated	ROG	NO_x (Actual)	CO (Actual)	SO_2	PM_{10}	$PM_{2.5}$
Central Plant - Daily	34	303	384	4	48	48
	2018 Tons/Yr					
	ROG	NO_x (Actual)	CO (Actual)	SO_2	PM_{10}	$PM_{2.5}$
Central Plant - Annual	6	56	70	1	9	9

Note: NOx and CO emissions are based on reported BAAQMD emissions.

Criteria Air Pollutant Emissions

	lbs/month			average /lbs day	
Actual Emissions	NOx	CO		NOx	CO
Jan-18	11,428	15,592		369	503
Feb-18	10,275	13,500		367	482
Mar-18	11,343	14,752		366	476
Apr-18	8,978	10,831		290	349
May-18	12,499	10,125		403	327
Jun-18	8,949	12,044		298	401
Jul-18	10,111	11,581		326	374
Aug-18	9,402	13,840		303	446
Sep-18	8,639	10,583		288	341
Oct-18	6,083	9,162		196	296
Nov-18	3,717	5,325		120	172
Dec-18	9,633	13,616		311	439
Total	111,057	140,953	Average Daily	303	384
Tons/Yr	56	70	Rate	4.739E-02	6.003E-02

Note: NOx and CO emissions are based on reported BAAQMD emissions

Emissions Forecast Scenarios

Motivated by aging and inefficient equipment, leaking distribution, air quality issues, high carbon emissions from natural gas, and insufficient capacity, UC Berkeley commissioned a study in 2019 to analyze options to improve or replace the cogeneration plant. Current campus peak demand is approximately 32 MW, but campus demand will increase by 158% - 189% (51 MW to 60 MW).

Source: ARUP. 2020, July 21. University of California, Berkeley Campus Energy Plan Additional Options Analysis.

Biogas: While the University has a goal to provide at least 40% of the natural gas combusted on-site at each campus and health location as biogas by 2025, biogas is not currently available at the UC Berkeley campus. The UCOP Energy Procurement Unit has developed a strategy for securing adequate sources from an emerging biogas market and is currently pursuing in-state and out-of-state supply options.

Option 0 Business. As Usual (BAU) - Cogeneration and steam distribution. Seismic upgrades, maintenance, repairs, and equipment replacement. WORST CASE SCENARIO. *However, this scenario is the least likely as the Central Plant is aging and the other alternatives are more cost effective than the BAU scenario.*

Option 2 - New Cogeneration. This system would replace the existing cogeneration system with a new central cogeneration plant with hot water distribution. The new cogeneration plant would produce electricity and hot water from natural gas. Additional space would be required within a mechanical room or on the roof of every building tied into the system for cooling equipment such as chillers or packaged units. *This option less likely to be implemented as it is not consistent with UC carbon neutrality policies.*

Option 11C- Central Heat Recovery. Electric Heat - Electric heat pump and heat recovery chiller plant with thermal storage. Cogeneration with hot water distribution. This system would replace the existing cogeneration system with a new central heat recovery system. The system would include a central electric heat pump plant supplying hot and chilled water with thermal storage. This new system would be all electric and carbon neutral, and resilient to natural gas outage and consistent with UCOP mandates.

Option 12 - Hybrid Nodal Heat Recovery. This system would upgrade the existing cogeneration plant with a new hybrid nodal heat recovery system. This system would add one or two electric heat pump plants supplying hot and chilled water on the northern side of the Campus Park. This upgraded cogeneration system would be an efficient, low-carbon system. The new systems on the north side of the Campus Park would be all-electric, while the systems on the south side of the Campus Park would remain on the existing cogeneration plant; together, the complete system would provide some resilience to *both power* and natural gas outages.

Central Plant Design Option Energy Use - LRDP Buildout

ARUP REPORT	Option 0	Option 2 (a)	Option 11C (a)	Option 12 (b)
Electricity Demand (GWH/Yr) (c)	55	0	269	263
Natural Gas (Mtherms/Yr)	20,993	12,421	0	3,141
Natural Gas (MMBTU/Yr)	2,098,798	1,241,803	0	314,025
Construction Duration (Months)	NA	23	35	26

(a) Construction of a new central plant would be at a new Evans Hall site

(b) Construction of the hybrid plant would be at a new Evans Hall site and Tolman site

Source: ARUP. 2020, July 21. University of California, Berkeley Campus Energy Plan Additional Options Analysis.

Forecast	Option 0	Option 2 (a)	Option 11C (a)	Option 12 (b)
Calculated MTCO2e (c)	111,393	65,908	0	16,667
Percent Reduction From BAU	-21%	-53%	-100%	-88%

(c) CO2 from electricity were assumed to be 0 as UC Berkeley is required to procure 100% carbon-free electricity by 2025 per University of California guidelines. Forecasted CO2 emissions are based on the emissions rate for the Central Plant provided by the University.

	MTCO2	MTCH4	MTN2O	MTCO2e
Option 0	111,278	2	0	111,393
Option 2(a)	65,840	1	0	65,908
Option 11C (a)	0	0	0	0
Option 12 (b)	16,650	0	0	16,667

Forecast	lbs/day					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
BAU (ARUP) Worst Case	31	273	345	3	43	43
Option2	18	161	204	2	25	25
Option 11C	0	0	0	0	0	0
Option 12	5	41	52	1	6	6
Option 12 Reductions	-26	-232	-294	-3	-36	-36
	Tons/Yr					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
BAU (ARUP) Worst Case	6	50	63	1	8	8
Option2	3	29	37	0	5	5
Option 11C	0	0	0	0	0	0
Option 12	1	7	9	0	1	1
Option 12 Reductions	-5	-42	-54	-1	-7	-7

Note: NOx and CO emissions are based on reported BAAQMD emissions rates and more accurately represent emissions from the Central Plant.

Scope 1: 2018 On- and Off-Campus Non-Transportation Fuel Use

Natural gas, diesel, propane, and other fuel used at the university's on- and off-campus facilities was provided by the university. Emissions factors by fuel type are based on emissions factors provided by the university.

	2018 Annual Fuel Use	Units	Emissions Factors[a]	Units	MT	MTCO2e (AR5)	$MTCO_2e$/YR
De Minimus Stationary Combustion	NA	NA	NA	NA	NA	NA	279
Emergency Generators - Distillate Fuel Oil No. 2	12,167	Gallons	10.21	kg CO_2/Gal	124	124	125
			0.0014	kg CH_4/Gal	0.02	0.48	
			0.000084	kg N_2O/Gal	0.00	0.27	
Boilers - Natural Gas	213,192	MMBtu	53.02	kg CO_2/MMBtu	11303	11303	11,315
			0.001	kg CH_4/MMBtu	0.21	6	
			0.0001	kg N_2O/MMBtu	0.02	6	
TOTAL							**11,719**

Rate	lbs/MMBTU or lbs/Gal					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Distillate Fuel Oil No. 2	0.00056	0.01000	0.00500	0.00021	0.00108	0.00083
Natural Gas Boilers	0.00539216	0.09803922	0.08235294	0.00058824	0.00745098	0.00745098

Note: Boilers on- and off-campus are permitted facilities and subject to site-specific permit conditions. As such, the emissions factors identified are overly conservative for criteria air pollutants as they may not reflect additional emissions reductions from technology/air pollution control devices required to meet emissions limits for the boilers.

Source: AP42

	2018 lbs/day					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Distillate Fuel Oil No. 2 - Daily	0.0	0.3	0.2	0.0	0.04	0.03
Boilers - Daily	3	57	48	0	4	4
TOTAL	**3**	**58**	**48**	**0**	**4**	**4**

	2018 Tons/Yr					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Distillate Fuel Oil No. 2 - Daily	0.0	0.1	0.0	0.0	0.01	0.01
Boilers - Annual	1	10	9	0	1	1
TOTAL	**1**	**11**	**9**	**0**	**1**	**1**

Forecast	Assumed to grow proportional to the increase in total square footage (excludes park	0.51

	2036 lbs/day						
	ROG	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	
Distillate Fuel Oil No. 2 - Daily	0.0	0.5	0.3	0.0	0.1	0.0	
Boilers - Daily	5	86	72	1	7	7	
TOTAL	**5**	**87**	**73**	**1**	**7**	**7**	
	2036 Tons/Yr						**MT/Yr**
	ROG	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO2e**
De minimus							420
Distillate Fuel Oil No. 2 - Daily	0.0	0.1	0.0	0.0	0.01	0.01	188
Boilers - Annual	1	16	13	0	1	1	17,043
TOTAL	**1**	**16**	**13**	**0**	**1**	**1**	**17,651**

	1	28	265	
	MTCO2	**MTCH4**	**MTN2O**	**MTCO2e**
De minimus	420			420
Distillate Fuel Oil No. 2 - Daily	187	0.03	0.002	188
Boilers - Annual	17,025	0.32	0.03	17,043
TOTAL	17633	0.35	0.03	17,651

Scope 1: 2018 Refrigerants

Refrigerant use is based on GHG emissions provided by the university in their 2018 emissions inventory associated with air conditions systems.

Source	Gas Quantity (MT)	AR5 GWP	$MTCO_2e/YR$
HFC-134a	0.195952	1,300	255
R-401A	0.019504	17.94	0.3
R-404A	0.084822	3,943	334
R-408A	0.010433	2,430	25
R-410A	0.004082	1,924	8
R-438A	0.07575	2,059	156
TOTAL	**NA**	**NA**	**779**

Forecast	Assumed to grow proportional to the increase in total square footage (excludes parking garages)

0.51

	$MTCO_2e/YR$
TOTAL	**1,173**

Scope 2: 2018 On- and Off-Campus Purchased Energy

The buildings on- and off-campus generate GHG emissions from electricity and natural gas use. Energy use for on-campus buildings owned by the university and off-campus buildings leased by the university within the LRDP are based on energy use data provided by UC Berkeley by provider (PG&E), East Bay Community Energy (EBCE), and the University of California Office of the President (UCOP) and the 2018 carbon intensity factor utilized in the 2018 emissions inventory. The carbon intensity factor for purchased electricity from PG&E, EBCE, and UCOP is derived based on the 2018 power content of the electricity supply for each utility. For EBCE, the University subscribes to EBCE's Brilliant 100 plan, which provides 100% carbon free electricity.

	2018 Energy Use (MWH)	Emissions Factors[a]	Units	MT	MTCO2e (AR5)	$MTCO_2e/YR$
Purchased Electricity						
EBCE	3,562,777.000	0	lbs CO2e/MWH	0	0	0
PG&E	40,623.808	210.44	lbs CO_2/MWH	3878	3878	3,914
		0.033	lbs CH_4/MWH	0.61	17.03	
		0.004	lbs N_2O/MWH	0.07	19.53	
UCOP	8,576.752	208.5	lbs CO_2/MWH	811	811	819
		0.033	lbs CH_4/MWH	0.13	4	
		0.004	lbs N_2O/MWH	0.02	4	
TOTAL	**3,611,978**					**4,733**
Purchased Solar Thermal Heating						
Solar Thermal Heating						48
Total						**4,781**

Carbon Intensity Forecasts

	2018 Carbon Intensity	2018 RPS	SB 100 (year 2030) Percent Renewable[c]	Assumed 2036 Percent Renewable[b]	MTCO2e/Mwh with SB 100	MTCO2e/Mwh w/ 100% Renewable Energy Procurement
EBCE	0	100%	100%	100%	0	0
PG&E[a]	212.4	39%	60%	100%	118	0
UCOP[b]	210.5	39%	60%	100%	117	0

a. PG&E 2020 Sustainability Report. (pg 16) http://www.pgecorp.com/corp_responsibility/reports/2020/assets/PGE_CRSR_2020.pdf. In accordance with the University's carbon neutrality initiative. The University will participate in PG&E's PG&E's Solar Choice program, which offers customers the opportunity to purchase up to 100 percent of their power from solar energy.

c. By 2025, each campus and health location will obtain 100% clean electricity. UCOP Wholesale Energy purchased through the UCOP Energy Procurement Unit will need to come from 100% renewable sources in accordance with this policy. For 2018, UCOP power content of purchased electricity assumed to be similar to that of PG&E.

c. In 2018, SB 100 (de León, 2018) was signed into law, which again increases the RPS to 60% by 2030 and encourages the state's electricity to come from carbon-free resources by 2045. In addition, the University under its carbon neutrality initiative will purchase 100% of their power from renewable energy.

Forecast Assumed to grow proportional to the increase in total square footage (excludes parking garages) 0.51

	2036 Energy Use (MWH)	SB 100 $MTCO_2$/YR	SB 100 MTCH4/YR	SB 100 MTN2O/YR	SB 100 $MTCO_2e$/YR	Carbon Neutral $MTCO_2e$/YR
EBCE	5,366,259.619	0	0.0	0.0	0	0
PG&E[a]	61,187.636	3,247	0.5	0.1	3,278	0
UCOP[b]	12,918.316	679	0.1	0.0	686	0
Purchased Solar Heating	NA	72			72	72
TOTAL	5,440,366	3,999	0.6	0.1	4,036	72
Reduction		-3,927	-0.6	-0.1	-3,964	

Scope 3: 2018 Business Air Travel

GHG emissions from business travel are provided by the university based on emissions identified in the 2018 emissions inventory.

2018	$MTCO_2e/YR$
Business Air Travel	22,926

Forecast	Air travel emissions assumed to grow proportional to the increase in Service P	0.22

2036	$MTCO_2e/YR$
Business Air Travel	27,946

Scope 3: 2018 Solid Waste

GHG emissions from solid waste disposed at UC Berkeley generates GHG emissions. The degradable organic component (degradable organic carbon, DOC) in waste decays slowly over a long period of time, during which CH4 and biogenic CO2 are formed. If conditions are constant, the rate of CH4 production depends solely on the amount of carbon remaining in the waste. As a result, emissions of CH4 from waste deposited in a disposal site are highest in the first few years after deposition, then gradually decline as the degradable carbon in the waste is consumed by the bacteria responsible for the decay. Significant CH4 production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Waste disposal (tons per year) and MTCO2e was provided by the university.

	2018 Tons Landfilled/Year	$MTCO_2e$/YR
Solid Waste	3,784	740

Forecast Assumed to grow proportional to the increase in Service Population (i.e., Students 0.22

	2018 Tons Landfilled/Year	$MTCO_2e$/YR
Solid Waste	4,613	902

Scope 3: 2018 Water Consumption/Wastewater Generation

Water service and wastewater service is supplied through the East Bay Municipal Utility District (EBMUD). GHG emissions from this sector include indirect GHG emissions from the embodied energy associated with water use and wastewater generation and fugitive GHG emissions from processing wastewater. Water use (gallons) is provided the university for emissions modeling.

	2018 Gallons/Year	$MTCO_2e/YR$
Water	594,404,932	78
Wastewater	416,083,452	221
TOTAL		**299**

Forecast	Water and Wastewater forecast is based on the Water and Wastewater Demand Methodology for LRDP Memorandum Dated November 2020.	0.58	0.61

	Water Gallons/Year	Wastewater
Non-residential Increase	132,312,695	51,629,589
Residential Increase	214,090,750	203,386,213
Total	346,403,445	255,015,802
Percent Increase	58%	61%

	2018 Gallons/Year	$MTCO_2e/YR$
Water	940,808,377	123
Wastewater	671,099,254	356
TOTAL		**480**

Area Sources

	2018	2036
Residential SQFT	2,028,286	5,900,102
Non-Residential SQFT	11,830,171	14,973,525
Total SQFT	**13,858,457**	**20,873,627**

Forecast Based on growth in residential and non-residential building square footage and emissions factors in the CalEEMod User's Guide.

Consumer Product Use[a]

2008 Building California Building	22,435,267,518	SQFT
2008 CARB Consumer Product Emissions	239.6	tons/day
2008 Emissions Rate	2.14E-05	lbs/day

Emissions = EF x Building Area

EF = 2.14E-05 lbs/sqft/day

Sources/Notes:

a. California Emissions Estimator Model, Version 2016.3.2, Users Guide. Appendix E

	lbs VOC/Day	
	2018	**2036**
Residential Consumer Product Use	43	126
Non-Residential Consumer Product Use	253	320
lbs VOC per day	**296**	**446**

Architectural Coatings

Emissions = EF paint x 10% Building Area / 365 Days Per Year
EF paint = VOC (g/L) /405 (g/lb) x 3.785 (L/gal) / 180 SQFT

Sources/Notes:

a. California Emissions Estimator Model, Version 2016.3.2, Users Guide.

Note: Repainting applied to interior surfaces only.

Note: Assumes interior of residential and nonresidential areas would use flat coats

EXISTING	Daily SQFT Painted	Surface Area Factor[2]	Total Paintable Surface Area	Paintable Interior Area[1]
2018 Residential	556	2.7	1,500	1,125
2018 Non-Residential	3,241	2	6,482	4,862
2018 TOTAL				**5,987**
LRDP	**Daily SQFT Painted**	**Surface Area Factor[2]**	**Total Paintable Surface Area**	**Paintable Interior Area[1]**
2036 Residential	1,616	2.7	4,364	3,273
2036 Non-Residential	4,102	2	8,205	6,154
2036 TOTAL				**9,427**

Sources/Notes:
[a] The program assumes the total surface for painting equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage defined by the user.

[b] CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively.

BAAQMD. Regulation 8, Rule 3, Architectural Coatings

Flat Coats (Matte)	100 g/L
EF Paint (lbs/SQFT)	0.00463

lbs VOC/Day

	2018	2036	2036 with Zero VOC Paints
Residential Repainting	5	15	-15
Non-Residential Repainting	23	29	-29
lbs VOC per day	**28**	**44**	**-44**

TRANSPORTATION SECTOR

Source: EMFAC2017, Web Database - https://arb.ca.gov/emfac/project-analysis. Based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) Global Warming Potentials (GWPs)

Criteria Air Pollutant Emissions

	lbs/day					
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Existing						
Students	5	13	150	0	6	2
Faculty/Staff	17	45	517	1	20	8
Visitors (average daily)	4	10	116	0	4	2
Vendors (average daily)	0	1	1	0	0	0
CEQA Baseline 2018	26	68	784	2	30	13
LRDP						
Students	2	3	66	0	6	2
Faculty/Staff	9	14	264	1	24	10
Visitors (average daily)	2	3	57	0	5	2
Vendors (average daily)	0	0	0	0	0	0
LRDP 2036	13	20	388	2	36	15
Change from Existing (2018) Conditions	**-13**	**-48**	**-397**	**0**	**6**	**2**
Existing with 2036 Emission Rates						
Students	2	3	62	0	6	2
Faculty/Staff	7	11	215	1	20	8
Visitors (average daily)	2	2	48	0	4	2
Vendors (average daily)	0	0	0	0	0	0
CEQA Baseline in 2036	11	0	0	0	0	0
Change from Existing Land Uses (2036 rates)	**2**	**20**	**387**	**2**	**36**	**15**

Annual Criteria Air Pollutant Emissions

	Tons/year					
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Existing						
Students	0.57	1.50	17.42	0.04	0.67	0.28
Faculty/Staff	2.31	6.05	70.24	0.18	2.71	1.13
Visitors (average daily)	0.70	1.82	21.20	0.05	0.82	0.34
Vendors (average daily)	0.01	0.17	0.19	0.00	0.01	0.01
CEQA Baseline 2018	3.59	9.54	109.06	0.28	4.21	1.76
LRDP						
Students	0.26	0.41	7.95	0.03	0.74	0.30
Faculty/Staff	1.19	1.86	36.02	0.14	3.33	1.35
Visitors (average daily)	0.34	0.53	10.24	0.04	0.95	0.38
Vendors (average daily)	0.00	0.07	0.07	0.00	0.01	0.00
LRDP 2036	1.80	2.87	54.28	0.21	5.02	2.03
Change from Existing (2018) Conditions	**-1.80**	**-6.67**	**-54.78**	**-0.06**	**0.81**	**0.28**
Existing with 2036 Emission Rates						
Students	0.24	0.37	7.23	0.03	0.67	0.27
Faculty/Staff	0.97	1.51	29.17	0.11	2.70	1.09
Visitors (average daily)	0.29	0.46	8.81	0.03	0.81	0.33
Vendors (average daily)	0.00	0.05	0.05	0.00	0.00	0.00
CEQA Baseline in 2036	1.50	2.39	45.27	0.18	4.19	1.70
Change from Existing Land Uses (2036 rates)	**0.30**	**0.48**	**9.01**	**0.04**	**0.83**	**0.34**

GHG EMISSIONS

	MTons/year			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Existing 2018				
Students	4,065	0.10	0.11	4,097
Faculty/Staff	16,390	0.40	0.45	16,520
Visitors (average daily)	4,947	0	0	4,986
Vendors (average daily)	87	0.00	0.01	89
Baseline 2018	25,488	1	1	25,692
LRDP 2036				
Students	3,154	0	0	3,168
Faculty/Staff	14,282	0	0	14,348
Visitors (average daily)	4,061	0	0	4,080
Vendors (average daily)	74	0	0	75
LRDP 2036	74	0	0	75
Change from Existing	**-25,414**	**-1**	**-1**	**-25,617**

Note: MTons = metric tons; CO_2e = carbon dioxide-equivalent.

UC Berkeley VMT

Source: Fehr & Peers 2020 (October 30)

	Existing				LRDP				Change	
	Total Daily VMT	Daily VMT Rate	Service Population	Annual VMT	Total Daily VMT	Daily VMT Rate	Service Population	Annual VMT	Annual VMT	Daily VMT
On-Campus Undergraduate Students	5,243	0.60	8,738	1,316,163	10,638	0.60	17,730	2,589,430	1,273,267	5,395
Off-Campus Undergraduate Students	30,943	1.46	21,194	6,823,207	25,214	1.46	17,270	5,682,540	-1,140,667	-5,729
On-Campus Graduate Students	150	0.60	250	44,400	1,389	0.60	2,315	507,786	463,386	1,239
Off-Campus Graduate Students	20,195	2.12	9,526	4,972,318	23,076	2.12	10,885	5,681,680	709,362	2,881
Total Students	56,531		39,708	13,156,088	60,317		48,200	14,461,436	1,305,348	3,786
Percent of Total VMT	19%			16%	17%			15%		
On Campus Faculty	243	7.60	32	82,688	4,416	7.60	581	1,501,304	1,418,616	4,172
Off-Campus Faculty	19,010	5.86	3,244	5,358,038	21,207	5.86	3,619	5,977,417	619,379	2,198
Staff	176,103	14.50	12,145	47,607,271	214,600	14.50	14,800	58,014,625	10,407,353	38,498
Total Employees	195,356		15,421	53,047,998	240,223		19,000	65,493,346	12,445,348	44,867
Percent of Total VMT	66%			64%	68%			66%		
Visitors (average daily)[a]	43,875	11.15	3,935	16,011,554	51,711	11.50	4,497	18,623,864	2,612,310	7,836
Percent of Total VMT	15%			19%	15%			19%		
Vendors (average daily) [(b)]	356		5,000	130,000	435		6,100	158,600	28,600	78
Percent of Total VMT	0.1%			0.2%	0%			0.2%		
TOTAL	296,118		64,064	82,345,640	352,686		77,797	98,737,246	16,391,606	56,568

Notes

(a) Visitor VMT is based on a summation of annual events and attendance of events on campus. Annual average number of visitors and VMT was divided by 365 days per year to obtain average daily visitors at UC Berkeley.

(b) Vendor trips and VMT are based on delivery data provided by the University (service population is annual deliveries). Annual annual vendor VMT was divided by 365 days per year to obtain average daily truck VMT at UC Berkeley.

Year 2018 Existing: Criteria Air Pollutants - Vendors

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

	Daily VMT										
	356					lbs/day					
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Diesel	Aggregate	0.56%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Electricity	Aggregate	1.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Gasoline	Aggregate	5.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	18.26%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.41%	1.41%	8.64%	0.01	0.02	0.11	0.00	0.01	0.00
LHD1	Diesel	Aggregate	0.78%	0.78%	4.74%	0.01	0.11	0.03	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0.21%	1.27%	0.00	0.00	0.01	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0.28%	1.71%	0.00	0.03	0.01	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gasoline	Aggregate	10.53%	10.53%	64.34%	0.02	0.09	0.75	0.00	0.02	0.01
MDV	Diesel	Aggregate	0.20%	0.20%	1.24%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0.01%	0.03%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0.74%	4.54%	0.01	0.14	0.02	0.00	0.01	0.01
T6 instate small	Diesel	Aggregate	0.96%	0.96%	5.86%	0.01	0.19	0.04	0.00	0.01	0.01
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	1.25%	7.63%	0.01	0.35	0.05	0.00	0.01	0.01
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0.12%	0.00	0.01	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0.17%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0.02%	0.00	0.00	0.01	0.00	0.00	0.00
			100%	**16%**	**100%**	**0.08**	**0.96**	**1.04**	**0.01**	**0.07**	**0.04**

Year 2018 Existing: Criteria Air Pollutants - Visitors

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Visitor Trips = Passenger Vehicles only

	Daily VMT											
	43,875								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	1.35	5.04	63.53	0.19	3.02	1.25
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	0.02	0.13	0.21	0.00	0.04	0.02
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0.00	0.00	0.00	0.00	0.06	0.02
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	0.29	1.13	11.42	0.02	0.31	0.13
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	0.57	2.94	26.53	0.08	1.03	0.43
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	0.00	0.01	0.02	0.00	0.01	0.00
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	1.59	0.76	14.49	0.00	0.01	0.00
MDV	Gasoline	Aggregate	10.53%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**80%**	**100%**	**3.82**	**10.00**	**116.20**	**0.30**	**4.48**	**1.87**

Year 2018 Existing: Criteria Air Pollutants Commute Trips - Students

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

	Daily VMT										
	56,531								lbs/day		
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	1.73	6.49	81.86	0.24	3.89	1.61
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	0.02	0.17	0.27	0.00	0.05	0.03
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0.00	0.00	0.00	0.00	0.08	0.03
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	0.37	1.45	14.71	0.03	0.40	0.17
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.01	0.01	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	0.74	3.78	34.19	0.11	1.32	0.55
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	0.00	0.01	0.02	0.00	0.01	0.00
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	2.05	0.97	18.67	0.00	0.01	0.01
MDV	Gasoline	Aggregate	10.53%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**80%**	**100%**	**4.92**	**12.88**	**149.71**	**0.38**	**5.77**	**2.41**

Year 2018 Existing: Criteria Air Pollutants Commute Trips - Faculty and Staff

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

	Daily VMT											
	195,356								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	5.99	22.42	282.87	0.84	13.44	5.58
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	0.08	0.59	0.93	0.01	0.18	0.10
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0.00	0.00	0.00	0.00	0.28	0.11
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	1.29	5.03	50.83	0.10	1.38	0.59
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.02	0.02	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	2.56	13.07	118.14	0.37	4.57	1.89
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	0.01	0.04	0.07	0.00	0.03	0.01
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0.00	0.00	0.00	0.00	0.01	0.01
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	7.08	3.36	64.51	0.01	0.05	0.02
MDV	Gasoline	Aggregate	10.53%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**80%**	**100%**	**17.01**	**44.52**	**517.37**	**1.32**	**19.95**	**8.32**

Year 2018 Existing: Criteria Air Pollutants - Vendors

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

	Annual VMT										
	130,000					lbs/year					
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Diesel	Aggregate	0.56%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Electricity	Aggregate	1.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Gasoline	Aggregate	5.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	18.26%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.41%	1.41%	8.64%	2.27	8.71	41.72	0.26	2.15	0.92
LHD1	Diesel	Aggregate	0.78%	0.78%	4.74%	2.58	40.63	11.24	0.07	1.67	0.93
LHD2	Gasoline	Aggregate	0.21%	0.21%	1.27%	0.25	1.32	4.64	0.04	0.36	0.15
LHD2	Diesel	Aggregate	0.28%	0.28%	1.71%	0.85	11.93	3.67	0.03	0.64	0.34
MCY	Gasoline	Aggregate	0.52%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gasoline	Aggregate	10.53%	10.53%	64.34%	7.12	33.06	272.54	0.83	8.58	3.58
MDV	Diesel	Aggregate	0.20%	0.20%	1.24%	0.05	0.26	0.77	0.01	0.18	0.09
MDV	Electricity	Aggregate	0.01%	0.01%	0.03%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0.74%	4.54%	3.27	51.15	8.80	0.13	3.29	2.15
T6 instate small	Diesel	Aggregate	0.96%	0.96%	5.86%	5.35	69.21	14.73	0.18	4.76	3.26
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	1.25%	7.63%	5.39	129.08	19.11	0.30	5.13	3.64
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0.12%	0.31	3.11	0.71	0.01	0.11	0.08
T7 utility	Diesel	Aggregate	0.01%	0%	0.01%	0.00	0.09	0.01	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0.00%	0.01	0.03	0.37	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0.17%	0.00	1.22	0.13	0.01	0.05	0.02
UBUS	Electricity	Aggregate	0.00%	0%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0.02%	0.01	0.03	2.89	0.00	0.01	0.00
			100%	**16%**	**100%**	**27.47**	**349.82**	**381.31**	**1.87**	**26.95**	**15.16**
						Tons/yr					
						0.01	**0.17**	**0.19**	**0.00**	**0.01**	**0.01**

Year 2018 Existing: Criteria Air Pollutants - Visitors

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Visitor Trips = Passenger Vehicles only

	Annual VMT										
	16,011,554							lbs/year			
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	491.33	1,837.48	23,184.16	68.62	1,101.87	457.30
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	6.76	48.11	75.85	0.55	15.12	8.24
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0.00	0.00	0.00	0.00	22.86	9.07
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	105.34	412.02	4,166.45	7.99	113.14	48.02
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.28	1.53	1.56	0.00	0.28	0.24
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0.00	0.00	0.00	0.00	0.23	0.09
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	209.65	1,071.46	9,683.04	30.12	374.58	155.31
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	0.79	2.99	5.95	0.12	2.16	1.04
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0.00	0.00	0.00	0.00	1.18	0.47
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	580.21	275.65	5,286.95	0.50	4.09	1.81
MDV	Gasoline	Aggregate	10.53%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**80%**	**100%**	**1,394.35**	**3,649.23**	**42,403.96**	**107.89**	**1,635.51**	**681.59**
								Tons/yr			
						0.70	**1.82**	**21.20**	**0.05**	**0.82**	**0.34**

Year 2018 Existing: Criteria Air Pollutants Commute - Faculty and Staff

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

	Annual VMT										
	53,047,998								lbs/year		
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	1,627.83	6,087.76	76,811.61	227.34	3,650.61	1,515.10
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	22.40	159.38	251.30	1.81	50.11	27.30
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0.00	0.00	0.00	0.00	75.74	30.04
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	348.99	1,365.07	13,803.89	26.46	374.85	159.08
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.92	5.06	5.18	0.01	0.92	0.79
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0.00	0.00	0.00	0.00	0.76	0.30
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	694.58	3,549.86	32,080.94	99.78	1,241.01	514.57
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	2.60	9.92	19.72	0.40	7.17	3.45
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0.00	0.00	0.00	0.00	3.91	1.55
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	1,922.29	913.27	17,516.24	1.64	13.54	5.99
MDV	Gasoline	Aggregate	10.53%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**80%**	**100%**	**4,619.63**	**12,090.30**	**140,488.87**	**357.46**	**5,418.62**	**2,258.18**
									Tons/yr		
						2.31	**6.05**	**70.24**	**0.18**	**2.71**	**1.13**

Year 2018 Existing: Criteria Air Pollutants Commute - Students

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

		Annual VMT				lbs/year					
		13,156,088									
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	403.71	1,509.78	19,049.55	56.38	905.36	375.75
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	5.56	39.53	62.32	0.45	12.43	6.77
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0.00	0.00	0.00	0.00	18.78	7.45
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	86.55	338.54	3,423.41	6.56	92.96	39.45
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.23	1.25	1.28	0.00	0.23	0.20
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0.00	0.00	0.00	0.00	0.19	0.07
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	172.26	880.38	7,956.18	24.75	307.78	127.62
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	0.65	2.46	4.89	0.10	1.78	0.85
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0.00	0.00	0.00	0.00	0.97	0.38
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	476.74	226.49	4,344.09	0.41	3.36	1.49
MDV	Gasoline	Aggregate	10.53%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate constru	Diesel	Aggregate	0.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construc	Diesel	Aggregate	0.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construc	Diesel	Aggregate	0.14%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor constru	Diesel	Aggregate	0.12%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**80%**	**100%**	**1,145.68**	**2,998.44**	**34,841.73**	**88.65**	**1,343.84**	**560.04**
						Tons/yr					
						0.57	**1.50**	**17.42**	**0.04**	**0.67**	**0.28**

Year 2018 **GHG Emissions - Vendors**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

						CO_2 (Pavley)	CH_4	N_2O	
	Annual VMT	Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	130,000					1	28	265	
Vehicle Type	**Fuel Type**	**Speed**	**Adjusted**	**Percent of VMT**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
LDA	Gasoline	Aggregate	53.67%	0%	0%	0	0.00	0.00	0
LDA	Diesel	Aggregate	0.56%	0%	0%	0	0.00	0.00	0
LDA	Electricity	Aggregate	1.15%	0%	0%	0	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.41%	0%	0%	0	0.00	0.00	0
LDT1	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
LDT1	Electricity	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
LDT2	Gasoline	Aggregate	18.26%	0%	0%	0	0.00	0.00	0
LDT2	Diesel	Aggregate	0.09%	0%	0%	0	0.00	0.00	0
LDT2	Electricity	Aggregate	0.06%	0%	0%	0	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.41%	1.41%	8.64%	12	0.00	0.00	12
LHD1	Diesel	Aggregate	0.78%	0.78%	4.74%	4	0.00	0.00	4
LHD2	Gasoline	Aggregate	0.21%	0.21%	1.27%	2	0.00	0.00	2
LHD2	Diesel	Aggregate	0.28%	0.28%	1.71%	1	0.00	0.00	1
MCY	Gasoline	Aggregate	0.52%	0%	0%	0	0.00	0.00	0
MDV	Gasoline	Aggregate	10.53%	10.53%	64.34%	38	0.00	0.00	38
MDV	Diesel	Aggregate	0.20%	0.20%	1.24%	1	0.00	0.00	1
MDV	Electricity	Aggregate	0.01%	0.01%	0.03%	0	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0	0.00	0.00	0
MH	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
PTO	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.13%	0%	0%	0	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.74%	0.74%	4.54%	6	0.00	0.00	7
T6 instate small	Diesel	Aggregate	0.96%	0.96%	5.86%	9	0.00	0.00	9
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.06%	0%	0%	0	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.14%	0%	0%	0	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.25%	1.25%	7.63%	14	0.00	0.00	15
T7 tractor construction	Diesel	Aggregate	0.12%	0%	0%	0	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Diesel	Aggregate	0.17%	0%	0%	0	0.00	0.00	0
UBUS	Electricity	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
			100%	**16%**	**100%**	**87**	**0.00**	**0.01**	**89**

Year 2018 **GHG Emissions - Visitors**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Visitor Trips = Passenger Vehicles only

						CO_2 (Pavley)	CH_4	N_2O	
	Annual VMT	Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	16,011,554					1	28	265	
Vehicle Type	**Fuel Type**	**Speed**	**Adjusted**	**Percent of VMT**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	3,145	0.05	0.08	3,167
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	26	0.00	0.00	27
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	366	0.01	0.01	370
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0	0.00	0.00	0
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0	0.00	0.00	0
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	1,381	0.02	0.04	1,391
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	6	0.00	0.00	6
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0	0.00	0.00	0
LHD1	Diesel	Aggregate	0.78%	0%	0%	0	0.00	0.00	0
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0	0.00	0.00	0
LHD2	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	23	0.04	0.01	26
MDV	Gasoline	Aggregate	10.53%	0%	0%	0	0.00	0.00	0
MDV	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
MDV	Electricity	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0	0.00	0.00	0
MH	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
PTO	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.13%	0%	0%	0	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0	0.00	0.00	0
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0	0.00	0.00	0
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.06%	0%	0%	0	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.14%	0%	0%	0	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0	0.00	0.00	0
T7 tractor construction	Diesel	Aggregate	0.12%	0%	0%	0	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Diesel	Aggregate	0.17%	0%	0%	0	0.00	0.00	0
UBUS	Electricity	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
			100%	**80%**	**100%**	**4,947**	**0.12**	**0.14**	**4,986**

Year 2018 **GHG Emissions Commute Trips - Faculty and Staff**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

						CO_2 (Pavley)	CH_4	N_2O	
	Annual VMT	Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	53,047,998					1	28	265	
Vehicle Type	**Fuel Type**	**Speed**	**Adjusted**	**Percent of VMT**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	10,421	0.17	0.25	10,491
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	87	0.00	0.01	90
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	1,213	0.03	0.04	1,225
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	1	0.00	0.00	1
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0	0.00	0.00	0
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	4,574	0.07	0.12	4,607
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	19	0.00	0.00	20
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0	0.00	0.00	0
LHD1	Diesel	Aggregate	0.78%	0%	0%	0	0.00	0.00	0
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0	0.00	0.00	0
LHD2	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	75	0.12	0.02	85
MDV	Gasoline	Aggregate	10.53%	0%	0%	0	0.00	0.00	0
MDV	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
MDV	Electricity	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0	0.00	0.00	0
MH	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
PTO	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.13%	0%	0%	0	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0	0.00	0.00	0
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0	0.00	0.00	0
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.06%	0%	0%	0	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.14%	0%	0%	0	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0	0.00	0.00	0
T7 tractor construction	Diesel	Aggregate	0.12%	0%	0%	0	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Diesel	Aggregate	0.17%	0%	0%	0	0.00	0.00	0
UBUS	Electricity	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
			100%	**80%**	**100%**	**16,390**	**0.40**	**0.45**	**16,520**

Year 2018 **GHG Emissions Commute Trips = Students**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

						CO_2 (Pavley)	CH_4	N_2O	
	Annual VMT	Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	13,156,088					1	28	265	
Vehicle Type	**Fuel Type**	**Speed**	**Adjusted**	**Percent of VMT**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
LDA	Gasoline	Aggregate	53.67%	53.67%	67.30%	2,584	0.04	0.06	2,602
LDA	Diesel	Aggregate	0.56%	0.56%	0.70%	21	0.00	0.00	22
LDA	Electricity	Aggregate	1.15%	1.15%	1.45%	0	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.41%	5.41%	6.78%	301	0.01	0.01	304
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0	0.00	0.00	0
LDT1	Electricity	Aggregate	0.01%	0.01%	0.01%	0	0.00	0.00	0
LDT2	Gasoline	Aggregate	18.26%	18.26%	22.90%	1,134	0.02	0.03	1,143
LDT2	Diesel	Aggregate	0.09%	0.09%	0.12%	5	0.00	0.00	5
LDT2	Electricity	Aggregate	0.06%	0.06%	0.07%	0	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.41%	0%	0%	0	0.00	0.00	0
LHD1	Diesel	Aggregate	0.78%	0%	0%	0	0.00	0.00	0
LHD2	Gasoline	Aggregate	0.21%	0%	0%	0	0.00	0.00	0
LHD2	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
MCY	Gasoline	Aggregate	0.52%	0.52%	0.66%	19	0.03	0.01	21
MDV	Gasoline	Aggregate	10.53%	0%	0%	0	0.00	0.00	0
MDV	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
MDV	Electricity	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0	0.00	0.00	0
MH	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
PTO	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.08%	0%	0%	0	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.13%	0%	0%	0	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.74%	0%	0%	0	0.00	0.00	0
T6 instate small	Diesel	Aggregate	0.96%	0%	0%	0	0.00	0.00	0
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.71%	0%	0%	0	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.06%	0%	0%	0	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.87%	0%	0%	0	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.28%	0%	0%	0	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.07%	0%	0%	0	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.37%	0%	0%	0	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.20%	0%	0%	0	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.14%	0%	0%	0	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.03%	0%	0%	0	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.25%	0%	0%	0	0.00	0.00	0
T7 tractor construction	Diesel	Aggregate	0.12%	0%	0%	0	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Diesel	Aggregate	0.17%	0%	0%	0	0.00	0.00	0
UBUS	Electricity	Aggregate	0.00%	0%	0%	0	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.02%	0%	0%	0	0.00	0.00	0
			100%	**80%**	**100%**	**4,065**	**0.10**	**0.11**	**4,097**

1 Source: EMFAC2017 Version 1.0.3. Project Level Emission Rates. 2018 Alameda County

g/mile

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM2_5_Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	%VMT Total
Alameda	2018	All Other Buses	Aggregate	Aggregate	Diesel	288.203773	15,741	0.5771751	6.2776932	1.4435849	0.0110753	0.2134298	0.012	0.13034	3.56E-01	0.204197	0.003	0.05586	2.63E-01	1172.30422	0.02680829	0.1842699	0.0372%
Alameda	2018	LDA	Aggregate	Aggregate	Gasoline	611638.107	22,688,484	0.0206811	0.077343	0.9758669	0.0028883	0.0016298	0.008	0.03675	4.64E-02	0.0014988	0.002	0.01575	1.92E-02	291.872771	0.004781	0.00696672	53.6703%
Alameda	2018	LDA	Aggregate	Aggregate	Diesel	6189.85467	237,453	0.0271978	0.1934782	0.3050591	0.0021931	0.0160799	0.008	0.03675	6.08E-02	0.0153843	0.002	0.01575	3.31E-02	231.987944	0.00126328	0.03646527	0.5617%
Alameda	2018	LDA	Aggregate	Aggregate	Electricity	13240.4087	487,879	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	1.1541%
Alameda	2018	LDT1	Aggregate	Aggregate	Gasoline	63730.0089	2,286,529	0.0439954	0.1720868	1.7401793	0.0033359	0.0025053	0.008	0.03675	4.73E-02	0.0023046	0.002	0.01575	2.01E-02	337.106732	0.00942297	0.01190114	5.4089%
Alameda	2018	LDT1	Aggregate	Aggregate	Diesel	62.8286463	1,024	0.2579035	1.4229147	1.4566434	0.0041072	0.2147764	0.008	0.03675	2.60E-01	0.2054853	0.002	0.01575	2.23E-01	434.460401	0.01197913	0.06829112	0.0024%
Alameda	2018	LDT1	Aggregate	Aggregate	Electricity	141.394308	4,902	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	0.0116%
Alameda	2018	LDT2	Aggregate	Aggregate	Gasoline	206731.998	7,718,881	0.0259382	0.132564	1.1980141	0.0037263	0.0015937	0.008	0.03675	4.63E-02	0.0014659	0.002	0.01575	1.92E-02	376.552536	0.00591707	0.00978698	18.2593%
Alameda	2018	LDT2	Aggregate	Aggregate	Diesel	851.888799	39,264	0.0191208	0.072799	0.144737	0.0029697	0.0078896	0.008	0.03675	5.26E-02	0.0075483	0.002	0.01575	2.53E-02	314.139152	0.00088812	0.0493783	0.0929%
Alameda	2018	LDT2	Aggregate	Aggregate	Electricity	713.044727	25,154	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	0.0595%
Alameda	2018	LHD1	Aggregate	Aggregate	Gasoline	16336.6973	597,389	0.0917843	0.3519223	1.6856439	0.0103345	0.0025627	0.008	0.07644	8.70E-02	0.0023601	0.002	0.03276	3.71E-02	1044.33007	0.01747365	0.02059387	1.4131%
Alameda	2018	LHD1	Aggregate	Aggregate	Diesel	8316.24549	328,162	0.1897417	2.9885041	0.8265176	0.0054758	0.0340544	0.012	0.07644	1.22E-01	0.0325812	0.003	0.03276	6.83E-02	579.233882	0.00881314	0.0910475	0.7763%
Alameda	2018	LHD2	Aggregate	Aggregate	Gasoline	2424.54735	88,122	0.068937	0.3613305	1.2699712	0.0118417	0.0022961	0.008	0.08918	9.95E-02	0.0021112	0.002	0.03822	4.23E-02	1196.63433	0.01445832	0.02172693	0.2085%
Alameda	2018	LHD2	Aggregate	Aggregate	Diesel	2938.76282	117,965	0.1746432	2.4421164	0.7517964	0.0061351	0.0304898	0.012	0.08918	1.32E-01	0.0291709	0.003	0.03822	7.04E-02	648.972586	0.00811184	0.10200945	0.2791%
Alameda	2018	MCY	Aggregate	Aggregate	Gasoline	27551.9013	221,146	2.5055871	1.1903843	22.831295	0.0021428	0.0018856	0.004	0.01176	1.76E-02	0.0017735	0.001	0.00504	7.81E-03	216.541105	0.35837817	0.06795117	0.5231%
Alameda	2018	MDV	Aggregate	Aggregate	Gasoline	125864.164	4,450,855	0.0386358	0.179276	1.478049	0.0044841	0.0017825	0.008	0.03675	4.65E-02	0.0016407	0.002	0.01575	1.94E-02	453.126838	0.00817376	0.01246852	10.5286%
Alameda	2018	MDV	Aggregate	Aggregate	Diesel	1924.00958	86,048	0.0144085	0.0719488	0.216112	0.0038848	0.0066647	0.008	0.03675	5.14E-02	0.0063764	0.002	0.01575	2.41E-02	410.934304	0.00066925	0.06459315	0.2035%
Alameda	2018	MDV	Aggregate	Aggregate	Electricity	67.1890716	2,199	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	0.0052%
Alameda	2018	MH	Aggregate	Aggregate	Gasoline	2400.34563	21,645	0.1537118	0.7163943	4.1928391	0.0181812	0.0024399	0.012	0.13034	1.45E-01	0.0022498	0.003	0.05586	6.11E-02	1837.2588	0.02995144	0.03797026	0.0512%
Alameda	2018	MH	Aggregate	Aggregate	Diesel	613.185171	6,289	0.1245718	5.1106794	0.4623002	0.0099688	0.1285372	0.016	0.13034	2.75E-01	0.1229768	0.004	0.05586	1.83E-01	1054.49317	0.00578612	0.16575164	0.0149%
Alameda	2018	Motor Coach	Aggregate	Aggregate	Diesel	84.0716617	10,539	0.3454473	6.2646565	1.0933326	0.0151465	0.161657	0.012	0.13034	3.04E-01	0.1546638	0.003	0.05586	2.14E-01	1603.22256	0.01604513	0.25200426	0.0249%
Alameda	2018	OBUS	Aggregate	Aggregate	Gasoline	631.457779	35,307	0.1183215	0.7680153	2.722175	0.0182445	0.0009677	0.012	0.13034	1.43E-01	0.0008915	0.003	0.05586	5.98E-02	1843.65801	0.02368938	0.03569525	0.0835%
Alameda	2018	PTO	Aggregate	Aggregate	Diesel	0	16,478	0.5871476	8.703765	1.9968042	0.0205147	0.1927789	0	0	1.93E-01	0.1844394	0	0	1.84E-01	2171.44375	0.02727149	0.34132072	0.0390%
Alameda	2018	SBUS	Aggregate	Aggregate	Gasoline	43.9815216	2,319	0.0529346	0.3542673	1.1554171	0.0085917	0.0011388	0.008	0.7448002	7.54E-01	0.0010471	0.002	0.3192001	3.22E-01	868.220211	0.01096609	0.0217424	0.0055%
Alameda	2018	SBUS	Aggregate	Aggregate	Diesel	282.62793	9,207	0.0788108	6.0163442	0.2224786	0.0106062	0.0349368	0.012	0.7448002	7.92E-01	0.0334255	0.003	0.3192001	3.56E-01	1122.64644	0.00366056	0.17646439	0.0218%
Alameda	2018	T6 Ag	Aggregate	Aggregate	Diesel	4.12813345	52	0.9267612	12.357769	2.0265631	0.0104549	0.6388029	0.012	0.13034	7.81E-01	0.6111686	0.003	0.05586	6.70E-01	1106.63044	0.04304566	0.17394689	0.0001%
Alameda	2018	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	47.0517306	9,494	0.0686609	1.9511705	0.2495956	0.009189	0.0503305	0.012	0.13034	1.93E-01	0.0481532	0.003	0.05586	1.07E-01	972.641401	0.00318912	0.15288568	0.0225%
Alameda	2018	T6 CAIRP small	Aggregate	Aggregate	Diesel	24.7942659	1,327	0.1242265	2.4561287	0.4418626	0.009631	0.0925826	0.012	0.13034	2.35E-01	0.0885775	0.003	0.05586	1.47E-01	1019.42004	0.00577	0.16023863	0.0031%
Alameda	2018	T6 instate construction heavy	Aggregate	Aggregate	Diesel	514.106714	34,139	0.7309886	6.6438012	1.3672672	0.0122205	0.234038	0.012	0.13034	3.76E-01	0.2239136	0.003	0.05586	2.83E-01	1293.51409	0.03395253	0.2033224	0.0808%
Alameda	2018	T6 instate construction small	Aggregate	Aggregate	Diesel	1127.47692	56,001	0.6544316	5.4262484	1.3567151	0.0121774	0.2007424	0.012	0.13034	3.43E-01	0.1920584	0.003	0.05586	2.51E-01	1288.95153	0.03039665	0.20260523	0.1325%
Alameda	2018	T6 instate heavy	Aggregate	Aggregate	Diesel	2199.2614	314,090	0.2514852	3.9305108	0.6764778	0.0101852	0.1108039	0.012	0.13034	2.53E-01	0.1060106	0.003	0.05586	1.65E-01	1078.08003	0.01168084	0.16945917	0.7430%
Alameda	2018	T6 instate small	Aggregate	Aggregate	Diesel	8042.10436	405,233	0.318871	4.1225291	0.8772226	0.0105931	0.1411653	0.012	0.13034	2.84E-01	0.1350585	0.003	0.05586	1.94E-01	1121.25648	0.01481073	0.1762459	0.9586%
Alameda	2018	T6 OOS heavy	Aggregate	Aggregate	Diesel	26.903573	5,447	0.0677833	1.8989888	0.2536933	0.0091898	0.0509186	0.012	0.13034	1.93E-01	0.0487159	0.003	0.05586	1.08E-01	972.726801	0.00314836	0.15289911	0.0129%
Alameda	2018	T6 OOS small	Aggregate	Aggregate	Diesel	14.2661029	761	0.1253442	2.4647741	0.4473002	0.0096359	0.0937832	0.012	0.13034	2.36E-01	0.0897262	0.003	0.05586	1.49E-01	1019.94349	0.00582191	0.16032091	0.0018%
Alameda	2018	T6 Public	Aggregate	Aggregate	Diesel	1105.15257	17,109	0.0900438	6.9042275	0.226631	0.0115112	0.0405799	0.012	0.13034	1.83E-01	0.0388244	0.003	0.05586	9.77E-02	1218.43632	0.0041823	0.19152122	0.0405%
Alameda	2018	T6 utility	Aggregate	Aggregate	Diesel	193.564201	3,240	0.0337567	2.2830337	0.1313655	0.0104776	0.0104229	0.012	0.13034	1.53E-01	0.009972	0.003	0.05586	6.88E-02	1109.033	0.00156791	0.17432454	0.0077%
Alameda	2018	T6TS	Aggregate	Aggregate	Gasoline	1596.77801	85,159	0.1639568	0.9820883	3.8824681	0.0181012	0.0015314	0.012	0.13034	1.44E-01	0.0014101	0.003	0.05586	6.03E-02	1829.17346	0.03187337	0.0431907	0.2014%
Alameda	2018	T7 Ag	Aggregate	Aggregate	Diesel	2.08	16	1.4894884	21.83299	4.2471557	0.0155529	0.5745326	0.036	0.06174	6.72E-01	0.5496786	0.009	0.02646	5.85E-01	1646.24303	0.06918288	0.25876648	0.0000%
Alameda	2018	T7 CAIRP	Aggregate	Aggregate	Diesel	1537.3927	300,111	0.1192503	4.0052426	0.4598701	0.0138428	0.0687811	0.036	0.06174	1.67E-01	0.0658057	0.009	0.02646	1.01E-01	1465.23061	0.00553887	0.23031385	0.7099%
Alameda	2018	T7 CAIRP construction	Aggregate	Aggregate	Diesel	124.973277	24,523	0.2892502	5.682709	0.9767979	0.0175421	0.0697864	0.036	0.06174	1.68E-01	0.0667675	0.009	0.02646	1.02E-01	1856.79819	0.01343492	0.29186282	0.0580%
Alameda	2018	T7 NNOOS	Aggregate	Aggregate	Diesel	1772.08492	365,862	0.1197748	3.3530127	0.492336	0.013325	0.0780294	0.036	0.06174	1.76E-01	0.0746539	0.009	0.02646	1.10E-01	1410.42253	0.00556323	0.22169878	0.8655%
Alameda	2018	T7 NOOS	Aggregate	Aggregate	Diesel	604.997756	117,911	0.1199044	4.002969	0.4618616	0.0138533	0.0691533	0.036	0.06174	1.67E-01	0.0661618	0.009	0.02646	1.02E-01	1466.34362	0.00556925	0.2304888	0.2789%
Alameda	2018	T7 other port	Aggregate	Aggregate	Diesel	184.468043	29,943	0.281246	6.1543568	0.9400992	0.017843	0.0348457	0.036	0.06174	1.33E-01	0.0333383	0.009	0.02646	6.88E-02	1888.64686	0.01306315	0.29686899	0.0708%
Alameda	2018	T7 POAK	Aggregate	Aggregate	Diesel	1485.97614	158,525	0.3248313	6.6702749	1.0401649	0.01816	0.038758	0.036	0.06174	1.36E-01	0.0370814	0.009	0.02646	7.25E-02	1922.20405	0.01508757	0.30214371	0.3750%
Alameda	2018	T7 Public	Aggregate	Aggregate	Diesel	852.788437	17,289	0.1492307	11.969639	0.4891031	0.0175917	0.064886	0.036	0.06174	1.63E-01	0.062079	0.009	0.02646	9.75E-02	1862.0426	0.00693138	0.29268717	0.0409%
Alameda	2018	T7 Single	Aggregate	Aggregate	Diesel	1185.94345	82,986	0.3893639	6.8167859	1.2263741	0.0157571	0.1648869	0.036	0.06174	2.63E-01	0.157754	0.009	0.02646	1.93E-01	1667.85697	0.01808495	0.26216389	0.1963%
Alameda	2018	T7 single construction	Aggregate	Aggregate	Diesel	889.382551	60,836	0.9068992	9.6752063	2.0415896	0.0182243	0.2690774	0.036	0.06174	3.67E-01	0.2574372	0.009	0.02646	2.93E-01	1929.00891	0.04212312	0.30321334	0.1439%
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Diesel	260.704359	10,652	0.0272875	12.955007	0.0803676	0.0417967	0.0137617	0.036	0.06174	1.12E-01	0.0131663	0.009	0.02646	4.86E-02	4424.09938	0.00126743	0.69540681	0.0252%
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Natural Gas	308.140342	12,568	0.165741	1.7789743	10.707265	0	0.0057938	0.036	0.06174	1.04E-01	0.0055432	0.009	0.02646	4.10E-02	3181.46871	3.55394296	0.64856321	0.0297%
Alameda	2018	T7 tractor	Aggregate	Aggregate	Diesel	3701.57157	527,811	0.2466576	5.9028752	0.8738091	0.0138011	0.1370045	0.036	0.06174	2.35E-01	0.1310777	0.009	0.02646	1.67E-01	1460.82406	0.01145661	0.2296212	1.2486%
Alameda	2018	T7 tractor construction	Aggregate	Aggregate	Diesel	716.862226	50,184	0.9011602	9.1419184	2.083641	0.0183207	0.2183445	0.036	0.06174	3.16E-01	0.208899	0.009	0.02646	2.44E-01	1939.2097	0.04185656	0.30481676	0.1187%
Alameda	2018	T7 utility	Aggregate	Aggregate	Diesel	122.742931	2,492	0.0826161	5.1986305	0.3143447	0.01654	0.0199899	0.036	0.06174	1.18E-01	0.0191252	0.009	0.02646	5.46E-02	1750.72703	0.0038373	0.27518991	0.0059%
Alameda	2018	T7IS	Aggregate	Aggregate	Gasoline	11.7041418	1,154	0.7667391	4.2482795	47.301755	0.0225569	0.0014308	0.02	0.06174	8.32E-02	0.0013406	0.005	0.02646	3.28E-02	2279.43488	0.13002972	0.15455726	0.0027%
Alameda	2018	UBUS	Aggregate	Aggregate	Gasoline	8.67255246	513	1.893E-02	2.317E-01	2.942E-01	0.0188967	1.045E-03	1.060E-02	1.160E-01	1.28E-01	9.605E-04	2.651E-03	4.971E-02	5.33E-02	1.910E+03	5.751E-03	2.038E-02	0.0012%
Alameda	2018	UBUS	Aggregate	Aggregate	Diesel	588.76691	69,830	2.974E-03	2.583E+00	2.700E-01	0.0157736	6.996E-03	3.137E-02	7.498E-02	1.13E-01	6.693E-03	7.842E-03	3.213E-02	4.67E-02	1.669E+03	1.174E-01	0	0.1652%
Alameda	2018	UBUS	Aggregate	Aggregate	Electricity	12.0205933	1,082	0.000E+00	0.000E+00	0.000E+00	0	0.000E+00	3.599E-02	6.177E-02	9.78E-02	0.000E+00	8.998E-03	2.647E-02	3.55E-02	0.000E+00	0.000E+00	0	0.0026%
Alameda	2018	UBUS	Aggregate	Aggregate	Natural Gas	85.3535094	8,461	9.255E-02	4.940E-01	5.030E+01	0	3.367E-03	3.430E-02	6.658E-02	1.04E-01	3.221E-03	8.575E-03	2.854E-02	4.03E-02	2.028E+03	6.471E+00	0	0.0200%
							42,273,781															Total Annual	100%

1 Source: EMFAC2017 Version 1.0.3. Project Level Emission Rates. 2018 Alameda Coun 2.205E-03

lbs/Mile

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2(Pavley+AACC)_RUNEX	CH4_RUNEX	N2O_RUNEX
Alameda	2018	All Other Buses	Aggregate	Aggregate	Diesel	1.272E-03	1.384E-02	3.183E-03	2.442E-05	4.705E-04	2.646E-05	2.873E-04	7.843E-04	4.502E-04	6.614E-06	1.231E-04	5.799E-04	2.584E+00	5.910E-05	4.062E-04
Alameda	2018	LDA	Aggregate	Aggregate	Gasoline	4.559E-05	1.705E-04	2.151E-03	6.368E-06	3.593E-06	1.764E-05	8.102E-05	1.022E-04	3.304E-06	4.409E-06	3.472E-05	4.244E-05	6.435E-01	1.054E-05	1.536E-05
Alameda	2018	LDA	Aggregate	Aggregate	Diesel	5.996E-05	4.265E-04	6.725E-04	4.835E-06	3.545E-05	1.764E-05	8.102E-05	1.341E-04	3.392E-05	4.409E-06	3.472E-05	7.305E-05	5.114E-01	2.785E-06	8.039E-05
Alameda	2018	LDA	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	LDT1	Aggregate	Aggregate	Gasoline	9.699E-05	3.794E-04	3.836E-03	7.354E-06	5.523E-06	1.764E-05	8.102E-05	1.042E-04	5.081E-06	4.409E-06	3.472E-05	4.421E-05	7.432E-01	2.077E-05	2.624E-05
Alameda	2018	LDT1	Aggregate	Aggregate	Diesel	5.686E-04	3.137E-03	3.211E-03	9.055E-06	4.735E-04	1.764E-05	8.102E-05	5.722E-04	4.530E-04	4.409E-06	3.472E-05	4.921E-04	9.578E-01	2.641E-05	1.506E-04
Alameda	2018	LDT1	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	LDT2	Aggregate	Aggregate	Gasoline	5.718E-05	2.923E-04	2.641E-03	8.215E-06	3.513E-06	1.764E-05	8.102E-05	1.022E-04	3.232E-06	4.409E-06	3.472E-05	4.236E-05	8.301E-01	1.304E-05	2.158E-05
Alameda	2018	LDT2	Aggregate	Aggregate	Diesel	4.215E-05	1.605E-04	3.191E-04	6.547E-06	1.739E-05	1.764E-05	8.102E-05	1.160E-04	1.664E-05	4.409E-06	3.472E-05	5.577E-05	6.926E-01	1.958E-06	1.089E-04
Alameda	2018	LDT2	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	LHD1	Aggregate	Aggregate	Gasoline	2.023E-04	7.758E-04	3.716E-03	2.278E-05	5.650E-06	1.764E-05	1.685E-04	1.918E-04	5.203E-06	4.409E-06	7.222E-05	8.183E-05	2.302E+00	3.852E-05	4.540E-05
Alameda	2018	LHD1	Aggregate	Aggregate	Diesel	4.183E-04	6.588E-03	1.822E-03	1.207E-05	7.508E-05	2.646E-05	1.685E-04	2.701E-04	7.183E-05	6.614E-06	7.222E-05	1.507E-04	1.277E+00	1.943E-05	2.007E-04
Alameda	2018	LHD2	Aggregate	Aggregate	Gasoline	1.520E-04	7.966E-04	2.800E-03	2.611E-05	5.062E-06	1.764E-05	1.966E-04	2.193E-04	4.654E-06	4.409E-06	8.426E-05	9.332E-05	2.638E+00	3.187E-05	4.790E-05
Alameda	2018	LHD2	Aggregate	Aggregate	Diesel	3.850E-04	5.384E-03	1.657E-03	1.353E-05	6.722E-05	2.646E-05	1.966E-04	2.903E-04	6.431E-05	6.614E-06	8.426E-05	1.552E-04	1.431E+00	1.788E-05	2.249E-04
Alameda	2018	MCY	Aggregate	Aggregate	Gasoline	5.524E-03	2.624E-03	5.033E-02	4.724E-06	4.157E-06	8.818E-06	2.593E-05	3.890E-05	3.910E-06	2.205E-06	1.111E-05	1.723E-05	4.774E-01	7.901E-04	1.498E-04
Alameda	2018	MDV	Aggregate	Aggregate	Gasoline	8.518E-05	3.952E-04	3.259E-03	9.886E-06	3.930E-06	1.764E-05	8.102E-05	1.026E-04	3.617E-06	4.409E-06	3.472E-05	4.275E-05	9.990E-01	1.802E-05	2.749E-05
Alameda	2018	MDV	Aggregate	Aggregate	Diesel	3.176E-05	1.586E-04	4.764E-04	8.564E-06	1.469E-05	1.764E-05	8.102E-05	1.133E-04	1.406E-05	4.409E-06	3.472E-05	5.319E-05	9.059E-01	1.475E-06	1.424E-04
Alameda	2018	MDV	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	MH	Aggregate	Aggregate	Gasoline	3.389E-04	1.579E-03	9.244E-03	4.008E-05	5.379E-06	2.646E-05	2.873E-04	3.192E-04	4.960E-06	6.614E-06	1.231E-04	1.347E-04	4.050E+00	6.603E-05	8.371E-05
Alameda	2018	MH	Aggregate	Aggregate	Diesel	2.746E-04	1.127E-02	1.019E-03	2.198E-05	2.834E-04	3.527E-05	2.873E-04	6.060E-04	2.711E-04	8.818E-06	1.231E-04	4.031E-04	2.325E+00	1.276E-05	3.654E-04
Alameda	2018	Motor Coach	Aggregate	Aggregate	Diesel	7.616E-04	1.381E-02	2.410E-03	3.339E-05	3.564E-04	2.646E-05	2.873E-04	6.702E-04	3.410E-04	6.614E-06	1.231E-04	4.707E-04	3.534E+00	3.537E-05	5.556E-04
Alameda	2018	OBUS	Aggregate	Aggregate	Gasoline	2.609E-04	1.693E-03	6.001E-03	4.022E-05	2.133E-06	2.646E-05	2.873E-04	3.159E-04	1.965E-06	6.614E-06	1.231E-04	1.317E-04	4.065E+00	5.223E-05	7.869E-05
Alameda	2018	PTO	Aggregate	Aggregate	Diesel	1.294E-03	1.919E-02	4.402E-03	4.523E-05	4.250E-04	0.000E+00	0.000E+00	4.250E-04	4.066E-04	0.000E+00	0.000E+00	4.066E-04	4.787E+00	6.012E-05	7.525E-04
Alameda	2018	SBUS	Aggregate	Aggregate	Gasoline	1.167E-04	7.810E-04	2.547E-03	1.894E-05	2.511E-06	1.764E-05	1.642E-03	1.662E-03	2.308E-06	4.409E-06	7.037E-04	7.104E-04	1.914E+00	2.418E-05	4.793E-05
Alameda	2018	SBUS	Aggregate	Aggregate	Diesel	1.737E-04	1.326E-02	4.905E-04	2.338E-05	7.702E-05	2.646E-05	1.642E-03	1.745E-03	7.369E-05	6.614E-06	7.037E-04	7.840E-04	2.475E+00	8.070E-06	3.890E-04
Alameda	2018	T6 Ag	Aggregate	Aggregate	Diesel	2.043E-03	2.724E-02	4.468E-03	2.305E-05	1.408E-03	2.646E-05	2.873E-04	1.722E-03	1.347E-03	6.614E-06	1.231E-04	1.477E-03	2.440E+00	9.490E-05	3.835E-04
Alameda	2018	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	1.514E-04	4.302E-03	5.503E-04	2.026E-05	1.110E-04	2.646E-05	2.873E-04	4.248E-04	1.062E-04	6.614E-06	1.231E-04	2.359E-04	2.144E+00	7.031E-06	3.371E-04
Alameda	2018	T6 CAIRP small	Aggregate	Aggregate	Diesel	2.739E-04	5.415E-03	9.741E-04	2.123E-05	2.041E-04	2.646E-05	2.873E-04	5.179E-04	1.953E-04	6.614E-06	1.231E-04	3.250E-04	2.247E+00	1.272E-05	3.533E-04
Alameda	2018	T6 instate construction heavy	Aggregate	Aggregate	Diesel	1.612E-03	1.465E-02	3.014E-03	2.694E-05	5.160E-04	2.646E-05	2.873E-04	8.298E-04	4.936E-04	6.614E-06	1.231E-04	6.234E-04	2.852E+00	7.485E-05	4.482E-04
Alameda	2018	T6 instate construction small	Aggregate	Aggregate	Diesel	1.443E-03	1.196E-02	2.991E-03	2.685E-05	4.426E-04	2.646E-05	2.873E-04	7.564E-04	4.234E-04	6.614E-06	1.231E-04	5.532E-04	2.842E+00	6.701E-05	4.467E-04
Alameda	2018	T6 instate heavy	Aggregate	Aggregate	Diesel	5.544E-04	8.665E-03	1.491E-03	2.245E-05	2.443E-04	2.646E-05	2.873E-04	5.581E-04	2.337E-04	6.614E-06	1.231E-04	3.635E-04	2.377E+00	2.575E-05	3.736E-04
Alameda	2018	T6 instate small	Aggregate	Aggregate	Diesel	7.030E-04	9.089E-03	1.934E-03	2.335E-05	3.112E-04	2.646E-05	2.873E-04	6.250E-04	2.978E-04	6.614E-06	1.231E-04	4.275E-04	2.472E+00	3.265E-05	3.886E-04
Alameda	2018	T6 OOS heavy	Aggregate	Aggregate	Diesel	1.494E-04	4.187E-03	5.593E-04	2.026E-05	1.123E-04	2.646E-05	2.873E-04	4.261E-04	1.074E-04	6.614E-06	1.231E-04	2.372E-04	2.144E+00	6.941E-06	3.371E-04
Alameda	2018	T6 OOS small	Aggregate	Aggregate	Diesel	2.763E-04	5.434E-03	9.861E-04	2.124E-05	2.068E-04	2.646E-05	2.873E-04	5.206E-04	1.978E-04	6.614E-06	1.231E-04	3.276E-04	2.249E+00	1.283E-05	3.534E-04
Alameda	2018	T6 Public	Aggregate	Aggregate	Diesel	1.985E-04	1.522E-02	4.996E-04	2.538E-05	8.946E-05	2.646E-05	2.873E-04	4.033E-04	8.559E-05	6.614E-06	1.231E-04	2.154E-04	2.686E+00	9.220E-06	4.222E-04
Alameda	2018	T6 utility	Aggregate	Aggregate	Diesel	7.442E-05	5.033E-03	2.896E-04	2.310E-05	2.298E-05	2.646E-05	2.873E-04	3.368E-04	2.198E-05	6.614E-06	1.231E-04	1.517E-04	2.445E+00	3.457E-06	3.843E-04
Alameda	2018	T6TS	Aggregate	Aggregate	Gasoline	3.615E-04	2.165E-03	8.559E-03	3.991E-05	3.376E-06	2.646E-05	2.873E-04	3.172E-04	3.109E-06	6.614E-06	1.231E-04	1.329E-04	4.033E+00	7.027E-05	9.522E-05
Alameda	2018	T7 Ag	Aggregate	Aggregate	Diesel	3.284E-03	4.813E-02	9.363E-03	3.429E-05	1.267E-03	7.937E-05	1.361E-04	1.482E-03	1.212E-03	1.984E-05	5.833E-05	1.290E-03	3.629E+00	1.525E-04	5.705E-04
Alameda	2018	T7 CAIRP	Aggregate	Aggregate	Diesel	2.629E-04	8.830E-03	1.014E-03	3.052E-05	1.516E-04	7.937E-05	1.361E-04	3.671E-04	1.451E-04	1.984E-05	5.833E-05	2.233E-04	3.230E+00	1.221E-05	5.077E-04
Alameda	2018	T7 CAIRP construction	Aggregate	Aggregate	Diesel	6.377E-04	1.253E-02	2.153E-03	3.867E-05	1.539E-04	7.937E-05	1.361E-04	3.693E-04	1.472E-04	1.984E-05	5.833E-05	2.254E-04	4.093E+00	2.962E-05	6.434E-04
Alameda	2018	T7 NNOOS	Aggregate	Aggregate	Diesel	2.641E-04	7.392E-03	1.085E-03	2.938E-05	1.720E-04	7.937E-05	1.361E-04	3.875E-04	1.646E-04	1.984E-05	5.833E-05	2.428E-04	3.109E+00	1.226E-05	4.888E-04
Alameda	2018	T7 NOOS	Aggregate	Aggregate	Diesel	2.643E-04	8.825E-03	1.018E-03	3.054E-05	1.525E-04	7.937E-05	1.361E-04	3.679E-04	1.459E-04	1.984E-05	5.833E-05	2.240E-04	3.233E+00	1.228E-05	5.081E-04
Alameda	2018	T7 other port	Aggregate	Aggregate	Diesel	6.200E-04	1.357E-02	2.073E-03	3.934E-05	7.682E-05	7.937E-05	1.361E-04	2.923E-04	7.350E-05	1.984E-05	5.833E-05	1.517E-04	4.164E+00	2.880E-05	6.545E-04
Alameda	2018	T7 POAK	Aggregate	Aggregate	Diesel	7.161E-04	1.471E-02	2.293E-03	4.004E-05	8.545E-05	7.937E-05	1.361E-04	3.009E-04	8.175E-05	1.984E-05	5.833E-05	1.599E-04	4.238E+00	3.326E-05	6.661E-04
Alameda	2018	T7 Public	Aggregate	Aggregate	Diesel	3.290E-04	2.639E-02	1.078E-03	3.878E-05	1.430E-04	7.937E-05	1.361E-04	3.585E-04	1.369E-04	1.984E-05	5.833E-05	2.150E-04	4.105E+00	1.528E-05	6.453E-04
Alameda	2018	T7 Single	Aggregate	Aggregate	Diesel	8.584E-04	1.503E-02	2.704E-03	3.474E-05	3.635E-04	7.937E-05	1.361E-04	5.790E-04	3.478E-04	1.984E-05	5.833E-05	4.260E-04	3.677E+00	3.987E-05	5.780E-04
Alameda	2018	T7 single construction	Aggregate	Aggregate	Diesel	1.999E-03	2.133E-02	4.501E-03	4.018E-05	5.932E-04	7.937E-05	1.361E-04	8.087E-04	5.675E-04	1.984E-05	5.833E-05	6.457E-04	4.253E+00	9.286E-05	6.685E-04
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Diesel	6.016E-05	2.856E-02	1.772E-04	9.214E-05	3.034E-05	7.937E-05	1.361E-04	2.458E-04	2.903E-05	1.984E-05	5.833E-05	1.072E-04	9.753E+00	2.794E-06	1.533E-03
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Natural Gas	3.654E-04	3.922E-03	2.361E-02	0.000E+00	1.277E-05	7.937E-05	1.361E-04	2.283E-04	1.222E-05	1.984E-05	5.833E-05	9.040E-05	7.014E+00	7.835E-03	1.430E-03
Alameda	2018	T7 tractor	Aggregate	Aggregate	Diesel	5.438E-04	1.301E-02	1.926E-03	3.043E-05	3.020E-04	7.937E-05	1.361E-04	5.175E-04	2.890E-04	1.984E-05	5.833E-05	3.671E-04	3.221E+00	2.526E-05	5.062E-04
Alameda	2018	T7 tractor construction	Aggregate	Aggregate	Diesel	1.987E-03	2.015E-02	4.594E-03	4.039E-05	4.814E-04	7.937E-05	1.361E-04	6.968E-04	4.605E-04	1.984E-05	5.833E-05	5.387E-04	4.275E+00	9.228E-05	6.720E-04
Alameda	2018	T7 utility	Aggregate	Aggregate	Diesel	1.821E-04	1.146E-02	6.930E-04	3.646E-05	4.407E-05	7.937E-05	1.361E-04	2.595E-04	4.216E-05	1.984E-05	5.833E-05	1.203E-04	3.860E+00	8.460E-06	6.067E-04
Alameda	2018	T7IS	Aggregate	Aggregate	Gasoline	1.690E-03	9.366E-03	1.043E-01	4.973E-05	3.154E-06	4.409E-05	1.361E-04	1.834E-04	2.955E-06	1.102E-05	5.833E-05	7.231E-05	5.025E+00	2.867E-04	3.407E-04
Alameda	2018	UBUS	Aggregate	Aggregate	Gasoline	4.173E-05	5.108E-04	6.485E-04	4.166E-05	2.303E-06	2.338E-05	2.557E-04	2.814E-04	2.117E-06	5.845E-06	1.096E-04	1.175E-04	4.210E+00	1.268E-05	4.493E-05
Alameda	2018	UBUS	Aggregate	Aggregate	Diesel	6.556E-06	5.695E-03	5.953E-04	3.477E-05	1.542E-05	6.915E-05	1.653E-04	2.499E-04	1.476E-05	1.729E-05	7.084E-05	1.029E-04	3.678E+00	2.588E-04	5.782E-04
Alameda	2018	UBUS	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.934E-05	1.362E-04	2.155E-04	0.000E+00	1.984E-05	5.836E-05	7.820E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	UBUS	Aggregate	Aggregate	Natural Gas	2.040E-04	1.089E-03	1.109E-01	0.000E+00	7.423E-06	7.562E-05	1.468E-04	2.298E-04	7.102E-06	1.890E-05	6.291E-05	8.892E-05	4.471E+00	1.427E-02	9.115E-04

1 Source: EMFAC2017 Version 1.0.3. Project Level Emission Rates. 2018 Alameda Coun 1.0E-06 MTons/Mile

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2(Pavley+AACC)_RUNEX	CH4_RUNEX	N2O_RUNEX
Alameda	2018	All Other Buses	Aggregate	Aggregate	Diesel	5.772E-07	6.278E-06	1.444E-06	1.108E-08	2.134E-07	1.200E-08	1.303E-07	3.558E-07	2.042E-07	3.000E-09	5.586E-08	2.631E-07	1.172E-03	2.681E-08	1.843E-07
Alameda	2018	LDA	Aggregate	Aggregate	Gasoline	2.068E-08	7.734E-08	9.759E-07	2.888E-09	1.630E-09	8.000E-09	3.675E-08	4.638E-08	1.499E-09	2.000E-09	1.575E-08	1.925E-08	2.919E-04	4.781E-09	6.967E-09
Alameda	2018	LDA	Aggregate	Aggregate	Diesel	2.720E-08	1.935E-07	3.051E-07	2.193E-09	1.608E-08	8.000E-09	3.675E-08	6.083E-08	1.538E-08	2.000E-09	1.575E-08	3.313E-08	2.320E-04	1.263E-09	3.647E-08
Alameda	2018	LDA	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	LDT1	Aggregate	Aggregate	Gasoline	4.400E-08	1.721E-07	1.740E-06	3.336E-09	2.505E-09	8.000E-09	3.675E-08	4.726E-08	2.305E-09	2.000E-09	1.575E-08	2.005E-08	3.371E-04	9.423E-09	1.190E-08
Alameda	2018	LDT1	Aggregate	Aggregate	Diesel	2.579E-07	1.423E-06	1.457E-06	4.107E-09	2.148E-07	8.000E-09	3.675E-08	2.595E-07	2.055E-07	2.000E-09	1.575E-08	2.232E-07	4.345E-04	1.198E-08	6.829E-08
Alameda	2018	LDT1	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	LDT2	Aggregate	Aggregate	Gasoline	2.594E-08	1.326E-07	1.198E-06	3.726E-09	1.594E-09	8.000E-09	3.675E-08	4.634E-08	1.466E-09	2.000E-09	1.575E-08	1.922E-08	3.766E-04	5.917E-09	9.787E-09
Alameda	2018	LDT2	Aggregate	Aggregate	Diesel	1.912E-08	7.280E-08	1.447E-07	2.970E-09	7.890E-09	8.000E-09	3.675E-08	5.264E-08	7.548E-09	2.000E-09	1.575E-08	2.530E-08	3.141E-04	8.881E-10	4.938E-08
Alameda	2018	LDT2	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	LHD1	Aggregate	Aggregate	Gasoline	9.178E-08	3.519E-07	1.686E-06	1.033E-08	2.563E-09	8.000E-09	7.644E-08	8.700E-08	2.360E-09	2.000E-09	3.276E-08	3.712E-08	1.044E-03	1.747E-08	2.059E-08
Alameda	2018	LHD1	Aggregate	Aggregate	Diesel	1.897E-07	2.989E-06	8.265E-07	5.476E-09	3.405E-08	1.200E-08	7.644E-08	1.225E-07	3.258E-08	3.000E-09	3.276E-08	6.834E-08	5.792E-04	8.813E-09	9.105E-08
Alameda	2018	LHD2	Aggregate	Aggregate	Gasoline	6.894E-08	3.613E-07	1.270E-06	1.184E-08	2.296E-09	8.000E-09	8.918E-08	9.948E-08	2.111E-09	2.000E-09	3.822E-08	4.233E-08	1.197E-03	1.446E-08	2.173E-08
Alameda	2018	LHD2	Aggregate	Aggregate	Diesel	1.746E-07	2.442E-06	7.518E-07	6.135E-09	3.049E-08	1.200E-08	8.918E-08	1.317E-07	2.917E-08	3.000E-09	3.822E-08	7.039E-08	6.490E-04	8.112E-09	1.020E-07
Alameda	2018	MCY	Aggregate	Aggregate	Gasoline	2.506E-06	1.190E-06	2.283E-05	2.143E-09	1.886E-09	4.000E-09	1.176E-08	1.765E-08	1.773E-09	1.000E-09	5.040E-09	7.813E-09	2.165E-04	3.584E-07	6.795E-08
Alameda	2018	MDV	Aggregate	Aggregate	Gasoline	3.864E-08	1.793E-07	1.478E-06	4.484E-09	1.782E-09	8.000E-09	3.675E-08	4.653E-08	1.641E-09	2.000E-09	1.575E-08	1.939E-08	4.531E-04	8.174E-09	1.247E-08
Alameda	2018	MDV	Aggregate	Aggregate	Diesel	1.441E-08	7.195E-08	2.161E-07	3.885E-09	6.665E-09	8.000E-09	3.675E-08	5.141E-08	6.376E-09	2.000E-09	1.575E-08	2.413E-08	4.109E-04	6.692E-10	6.459E-08
Alameda	2018	MDV	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	MH	Aggregate	Aggregate	Gasoline	1.537E-07	7.164E-07	4.193E-06	1.818E-08	2.440E-09	1.200E-08	1.303E-07	1.448E-07	2.250E-09	3.000E-09	5.586E-08	6.111E-08	1.837E-03	2.995E-08	3.797E-08
Alameda	2018	MH	Aggregate	Aggregate	Diesel	1.246E-07	5.111E-06	4.623E-07	9.969E-09	1.285E-07	1.600E-08	1.303E-07	2.749E-07	1.230E-07	4.000E-09	5.586E-08	1.828E-07	1.054E-03	5.786E-09	1.658E-07
Alameda	2018	Motor Coach	Aggregate	Aggregate	Diesel	3.454E-07	6.265E-06	1.093E-06	1.515E-08	1.617E-07	1.200E-08	1.303E-07	3.040E-07	1.547E-07	3.000E-09	5.586E-08	2.135E-07	1.603E-03	1.605E-08	2.520E-07
Alameda	2018	OBUS	Aggregate	Aggregate	Gasoline	1.183E-07	7.680E-07	2.722E-06	1.824E-08	9.677E-10	1.200E-08	1.303E-07	1.433E-07	8.915E-10	3.000E-09	5.586E-08	5.975E-08	1.844E-03	2.369E-08	3.570E-08
Alameda	2018	PTO	Aggregate	Aggregate	Diesel	5.871E-07	8.704E-06	1.997E-06	2.051E-08	1.928E-07	0.000E+00	0.000E+00	1.928E-07	1.844E-07	0.000E+00	0.000E+00	1.844E-07	2.171E-03	2.727E-08	3.413E-07
Alameda	2018	SBUS	Aggregate	Aggregate	Gasoline	5.293E-08	3.543E-07	1.155E-06	8.592E-09	1.139E-09	8.000E-09	7.448E-07	7.539E-07	1.047E-09	2.000E-09	3.192E-07	3.222E-07	8.682E-04	1.097E-08	2.174E-08
Alameda	2018	SBUS	Aggregate	Aggregate	Diesel	7.881E-08	6.016E-06	2.225E-07	1.061E-08	3.494E-08	1.200E-08	7.448E-07	7.917E-07	3.343E-08	3.000E-09	3.192E-07	3.556E-07	1.123E-03	3.661E-09	1.765E-07
Alameda	2018	T6 Ag	Aggregate	Aggregate	Diesel	9.268E-07	1.236E-05	2.027E-06	1.045E-08	6.388E-07	1.200E-08	1.303E-07	7.811E-07	6.112E-07	3.000E-09	5.586E-08	6.700E-07	1.107E-03	4.305E-08	1.739E-07
Alameda	2018	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	6.866E-08	1.951E-06	2.496E-07	9.189E-09	5.033E-08	1.200E-08	1.303E-07	1.927E-07	4.815E-08	3.000E-09	5.586E-08	1.070E-07	9.726E-04	3.189E-09	1.529E-07
Alameda	2018	T6 CAIRP small	Aggregate	Aggregate	Diesel	1.242E-07	2.456E-06	4.419E-07	9.631E-09	9.258E-08	1.200E-08	1.303E-07	2.349E-07	8.858E-08	3.000E-09	5.586E-08	1.474E-07	1.019E-03	5.770E-09	1.602E-07
Alameda	2018	T6 instate construction heavy	Aggregate	Aggregate	Diesel	7.310E-07	6.644E-06	1.367E-06	1.222E-08	2.340E-07	1.200E-08	1.303E-07	3.764E-07	2.239E-07	3.000E-09	5.586E-08	2.828E-07	1.294E-03	3.395E-08	2.033E-07
Alameda	2018	T6 instate construction small	Aggregate	Aggregate	Diesel	6.544E-07	5.426E-06	1.357E-06	1.218E-08	2.007E-07	1.200E-08	1.303E-07	3.431E-07	1.921E-07	3.000E-09	5.586E-08	2.509E-07	1.289E-03	3.040E-08	2.026E-07
Alameda	2018	T6 instate heavy	Aggregate	Aggregate	Diesel	2.515E-07	3.931E-06	6.765E-07	1.019E-08	1.108E-07	1.200E-08	1.303E-07	2.531E-07	1.060E-07	3.000E-09	5.586E-08	1.649E-07	1.078E-03	1.168E-08	1.695E-07
Alameda	2018	T6 instate small	Aggregate	Aggregate	Diesel	3.189E-07	4.123E-06	8.772E-07	1.059E-08	1.412E-07	1.200E-08	1.303E-07	2.835E-07	1.351E-07	3.000E-09	5.586E-08	1.939E-07	1.121E-03	1.481E-08	1.762E-07
Alameda	2018	T6 OOS heavy	Aggregate	Aggregate	Diesel	6.778E-08	1.899E-06	2.537E-07	9.190E-09	5.092E-08	1.200E-08	1.303E-07	1.933E-07	4.872E-08	3.000E-09	5.586E-08	1.076E-07	9.727E-04	3.148E-09	1.529E-07
Alameda	2018	T6 OOS small	Aggregate	Aggregate	Diesel	1.253E-07	2.465E-06	4.473E-07	9.636E-09	9.378E-08	1.200E-08	1.303E-07	2.361E-07	8.973E-08	3.000E-09	5.586E-08	1.486E-07	1.020E-03	5.822E-09	1.603E-07
Alameda	2018	T6 Public	Aggregate	Aggregate	Diesel	9.004E-08	6.904E-06	2.266E-07	1.151E-08	4.058E-08	1.200E-08	1.303E-07	1.829E-07	3.882E-08	3.000E-09	5.586E-08	9.768E-08	1.218E-03	4.182E-09	1.915E-07
Alameda	2018	T6 utility	Aggregate	Aggregate	Diesel	3.376E-08	2.283E-06	1.314E-07	1.048E-08	1.042E-08	1.200E-08	1.303E-07	1.528E-07	9.972E-09	3.000E-09	5.586E-08	6.883E-08	1.109E-03	1.568E-09	1.743E-07
Alameda	2018	T6TS	Aggregate	Aggregate	Gasoline	1.640E-07	9.821E-07	3.882E-06	1.810E-08	1.531E-09	1.200E-08	1.303E-07	1.439E-07	1.410E-09	3.000E-09	5.586E-08	6.027E-08	1.829E-03	3.187E-08	4.319E-08
Alameda	2018	T7 Ag	Aggregate	Aggregate	Diesel	1.489E-06	2.183E-05	4.247E-06	1.555E-08	5.745E-07	3.600E-08	6.174E-08	6.723E-07	5.497E-07	9.000E-09	2.646E-08	5.851E-07	1.646E-03	6.918E-08	2.588E-07
Alameda	2018	T7 CAIRP	Aggregate	Aggregate	Diesel	1.193E-07	4.005E-06	4.599E-07	1.384E-08	6.878E-08	3.600E-08	6.174E-08	1.665E-07	6.581E-08	9.000E-09	2.646E-08	1.013E-07	1.465E-03	5.539E-09	2.303E-07
Alameda	2018	T7 CAIRP construction	Aggregate	Aggregate	Diesel	2.893E-07	5.683E-06	9.768E-07	1.754E-08	6.979E-08	3.600E-08	6.174E-08	1.675E-07	6.677E-08	9.000E-09	2.646E-08	1.022E-07	1.857E-03	1.343E-08	2.919E-07
Alameda	2018	T7 NNOOS	Aggregate	Aggregate	Diesel	1.198E-07	3.353E-06	4.923E-07	1.332E-08	7.803E-08	3.600E-08	6.174E-08	1.758E-07	7.465E-08	9.000E-09	2.646E-08	1.101E-07	1.410E-03	5.563E-09	2.217E-07
Alameda	2018	T7 NOOS	Aggregate	Aggregate	Diesel	1.199E-07	4.003E-06	4.619E-07	1.385E-08	6.915E-08	3.600E-08	6.174E-08	1.669E-07	6.616E-08	9.000E-09	2.646E-08	1.016E-07	1.466E-03	5.569E-09	2.305E-07
Alameda	2018	T7 other port	Aggregate	Aggregate	Diesel	2.812E-07	6.154E-06	9.401E-07	1.784E-08	3.485E-08	3.600E-08	6.174E-08	1.326E-07	3.334E-08	9.000E-09	2.646E-08	6.880E-08	1.889E-03	1.306E-08	2.969E-07
Alameda	2018	T7 POAK	Aggregate	Aggregate	Diesel	3.248E-07	6.670E-06	1.040E-06	1.816E-08	3.876E-08	3.600E-08	6.174E-08	1.365E-07	3.708E-08	9.000E-09	2.646E-08	7.254E-08	1.922E-03	1.509E-08	3.021E-07
Alameda	2018	T7 Public	Aggregate	Aggregate	Diesel	1.492E-07	1.197E-05	4.891E-07	1.759E-08	6.489E-08	3.600E-08	6.174E-08	1.626E-07	6.208E-08	9.000E-09	2.646E-08	9.754E-08	1.862E-03	6.931E-09	2.927E-07
Alameda	2018	T7 Single	Aggregate	Aggregate	Diesel	3.894E-07	6.817E-06	1.226E-06	1.576E-08	1.649E-07	3.600E-08	6.174E-08	2.626E-07	1.578E-07	9.000E-09	2.646E-08	1.932E-07	1.668E-03	1.808E-08	2.622E-07
Alameda	2018	T7 single construction	Aggregate	Aggregate	Diesel	9.069E-07	9.675E-06	2.042E-06	1.822E-08	2.691E-07	3.600E-08	6.174E-08	3.668E-07	2.574E-07	9.000E-09	2.646E-08	2.929E-07	1.929E-03	4.212E-08	3.032E-07
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Diesel	2.729E-08	1.296E-05	8.037E-08	4.180E-08	1.376E-08	3.600E-08	6.174E-08	1.115E-07	1.317E-08	9.000E-09	2.646E-08	4.863E-08	4.424E-03	1.267E-09	6.954E-07
Alameda	2018	T7 SWCV	Aggregate	Aggregate	Natural Gas	1.657E-07	1.779E-06	1.071E-05	0.000E+00	5.794E-09	3.600E-08	6.174E-08	1.035E-07	5.543E-09	9.000E-09	2.646E-08	4.100E-08	3.181E-03	3.554E-06	6.486E-07
Alameda	2018	T7 tractor	Aggregate	Aggregate	Diesel	2.467E-07	5.903E-06	8.738E-07	1.380E-08	1.370E-07	3.600E-08	6.174E-08	2.347E-07	1.311E-07	9.000E-09	2.646E-08	1.665E-07	1.461E-03	1.146E-08	2.296E-07
Alameda	2018	T7 tractor construction	Aggregate	Aggregate	Diesel	9.012E-07	9.142E-06	2.084E-06	1.832E-08	2.183E-07	3.600E-08	6.174E-08	3.161E-07	2.089E-07	9.000E-09	2.646E-08	2.444E-07	1.939E-03	4.186E-08	3.048E-07
Alameda	2018	T7 utility	Aggregate	Aggregate	Diesel	8.262E-08	5.199E-06	3.143E-07	1.654E-08	1.999E-08	3.600E-08	6.174E-08	1.177E-07	1.913E-08	9.000E-09	2.646E-08	5.459E-08	1.751E-03	3.837E-09	2.752E-07
Alameda	2018	T7IS	Aggregate	Aggregate	Gasoline	7.667E-07	4.248E-06	4.730E-05	2.256E-08	1.431E-09	2.000E-08	6.174E-08	8.317E-08	1.341E-09	5.000E-09	2.646E-08	3.280E-08	2.279E-03	1.300E-07	1.546E-07
Alameda	2018	UBUS	Aggregate	Aggregate	Gasoline	1.893E-08	2.317E-07	2.942E-07	1.890E-08	1.045E-09	1.060E-08	1.160E-07	1.276E-07	9.605E-10	2.651E-09	4.971E-08	5.332E-08	1.910E-03	5.751E-09	2.038E-08
Alameda	2018	UBUS	Aggregate	Aggregate	Diesel	2.974E-09	2.583E-06	2.700E-07	1.577E-08	6.996E-09	3.137E-08	7.498E-08	1.133E-07	6.693E-09	7.842E-09	3.213E-08	4.667E-08	1.669E-03	1.174E-07	2.623E-07
Alameda	2018	UBUS	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.599E-08	6.177E-08	9.776E-08	0.000E+00	8.998E-09	2.647E-08	3.547E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2018	UBUS	Aggregate	Aggregate	Natural Gas	9.255E-08	4.940E-07	5.030E-05	0.000E+00	3.367E-09	3.430E-08	6.658E-08	1.042E-07	3.221E-09	8.575E-09	2.854E-08	4.033E-08	2.028E-03	6.471E-06	4.135E-07

Source: EMFAC2017 Version 1.0.3 Project Level Emission Rates. 2036. Alameda County

								g/mile																
Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM2_5_Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	%VMT Total
Alameda	2036	All Other Buses	Aggregate	Aggregate	Diesel	502.430011	27,720	0.010154	1.9076734	0.1309344	0.0084028	0.0050237	0.012	0.13034	1.47E-01	0.0048064	0.003	0.05586	6.37E-02	889.4	0.00047163	0.13980497	0.0548%
Alameda	2036	LDA	Aggregate	Aggregate	Gasoline	814835.569	26,292,113	0.0023275	0.0182682	0.382129	0.0019678	0.0006953	0.008	0.03675	4.54E-02	0.0006393	0.002	0.01575	1.84E-02	198.854587	0.00076372	0.0029653	51.9816%
Alameda	2036	LDA	Aggregate	Aggregate	Diesel	9972.51062	325,609	0.0050398	0.0113543	0.1502894	0.0015215	0.0011296	0.008	0.03675	4.59E-02	0.0010807	0.002	0.01575	1.88E-02	160.947866	0.00023409	0.02529876	0.6438%
Alameda	2036	LDA	Aggregate	Aggregate	Electricity	48061.0965	1,704,444	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	3.3698%
Alameda	2036	LDT1	Aggregate	Aggregate	Gasoline	83352.1588	2,652,928	0.0032378	0.0218257	0.4120201	0.0023021	0.0007628	0.008	0.03675	4.55E-02	0.0007014	0.002	0.01575	1.85E-02	232.635284	0.00097227	0.00323248	5.2451%
Alameda	2036	LDT1	Aggregate	Aggregate	Diesel	11.1237999	362	0.0150155	0.0478355	0.1567613	0.002902	0.0047037	0.008	0.03675	4.95E-02	0.0045002	0.002	0.01575	2.23E-02	306.969724	0.00069744	0.04825137	0.0007%
Alameda	2036	LDT1	Aggregate	Aggregate	Electricity	2662.21251	96,915	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	0.1916%
Alameda	2036	LDT2	Aggregate	Aggregate	Gasoline	253482.862	8,172,276	0.0039283	0.023261	0.4649955	0.002302	0.0007244	0.008	0.03675	4.55E-02	0.0006661	0.002	0.01575	1.84E-02	232.620851	0.00117308	0.00320852	16.1572%
Alameda	2036	LDT2	Aggregate	Aggregate	Diesel	2469.06518	82,624	0.0141844	0.0291234	0.1455294	0.0020259	0.00414	0.008	0.03675	4.89E-02	0.0039609	0.002	0.01575	2.17E-02	214.29865	0.00065884	0.03368476	0.1634%
Alameda	2036	LDT2	Aggregate	Aggregate	Electricity	9797.70792	246,086	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	0.4865%
Alameda	2036	LHD1	Aggregate	Aggregate	Gasoline	16215.6821	536,344	0.0093989	0.0610075	0.2053796	0.0084201	0.0022035	0.008	0.07644	8.66E-02	0.002026	0.002	0.03276	3.68E-02	850.871616	0.00262011	0.00498313	1.0604%
Alameda	2036	LHD1	Aggregate	Aggregate	Diesel	14757.8181	507,541	0.1277305	0.2569753	0.5791368	0.0042932	0.0094323	0.012	0.07644	9.79E-02	0.0090243	0.003	0.03276	4.48E-02	454.138634	0.00593284	0.07138427	1.0034%
Alameda	2036	LHD2	Aggregate	Aggregate	Gasoline	2497.51803	81,270	0.0079025	0.0606207	0.173197	0.0096708	0.0021343	0.008	0.08918	9.93E-02	0.0019624	0.002	0.03822	4.22E-02	977.265632	0.00233297	0.00535522	0.1607%
Alameda	2036	LHD2	Aggregate	Aggregate	Diesel	5975.83017	198,263	0.128998	0.2861402	0.5877778	0.0048325	0.0173016	0.012	0.08918	1.18E-01	0.0165532	0.003	0.03822	5.78E-02	511.178209	0.00599171	0.0803501	0.3920%
Alameda	2036	MCY	Aggregate	Aggregate	Gasoline	36688.2797	249,814	2.2106129	1.1497238	18.013471	0.0021224	0.0023012	0.004	0.01176	1.81E-02	2.146E-03	1.000E-03	0.00504	8.19E-03	214.473199	0.33078581	0.06612206	0.4939%
Alameda	2036	MDV	Aggregate	Aggregate	Gasoline	160077.953	5,043,390	0.0041216	0.0244963	0.4660529	0.0027876	0.0007337	0.008	0.03675	4.55E-02	0.0006746	0.002	0.01575	1.84E-02	281.697621	0.00121244	0.00329917	9.9712%
Alameda	2036	MDV	Aggregate	Aggregate	Diesel	5472.33492	179,538	0.0054049	0.0110983	0.1613626	0.0026316	0.0012196	0.008	0.03675	4.60E-02	0.0011668	0.002	0.01575	1.89E-02	278.372082	0.00025105	0.04375621	0.3550%
Alameda	2036	MDV	Aggregate	Aggregate	Electricity	6911.46346	175,388	0	0	0	0	0	0.008	0.03675	4.48E-02	0	0.002	0.01575	1.78E-02	0	0	0	0.3468%
Alameda	2036	MH	Aggregate	Aggregate	Gasoline	2455.28428	24,308	0.0121554	0.1148668	0.1957223	0.0143304	0.0013867	0.012	0.13034	1.44E-01	0.001275	0.003	0.05586	6.01E-02	1448.12495	0.00413986	0.01283998	0.0481%
Alameda	2036	MH	Aggregate	Aggregate	Diesel	1143.55006	10,314	0.0782764	2.7273545	0.2388823	0.0081419	0.0322281	0.016	0.13034	1.79E-01	0.030834	0.004	0.05586	9.07E-02	861.251345	0.00363579	0.13537672	0.0204%
Alameda	2036	Motor Coach	Aggregate	Aggregate	Diesel	114.398726	13,786	0.0184075	1.8466848	0.1710576	0.0116502	0.0236032	0.012	0.13034	1.66E-01	0.0225822	0.003	0.05586	8.14E-02	1233.15341	0.00085498	0.19383454	0.0273%
Alameda	2036	OBUS	Aggregate	Aggregate	Gasoline	522.589382	22,186	0.0227862	0.1754275	0.4602372	0.014492	0.0013561	0.012	0.13034	1.44E-01	0.0012469	0.003	0.05586	6.01E-02	1464.45677	0.00530624	0.01209404	0.0439%
Alameda	2036	PTO	Aggregate	Aggregate	Diesel	0	15,289	0.0267493	4.8995893	0.4286443	0.0164679	0.0054379	0	0	5.44E-03	0.0052027	0	0	5.20E-03	1743.09815	0.00124244	0.27399075	0.0302%
Alameda	2036	SBUS	Aggregate	Aggregate	Gasoline	271.212192	12,313	0.0118371	0.1137625	0.201555	0.0071859	0.0015587	0.008	0.7448002	7.54E-01	0.0014331	0.002	0.3192001	3.23E-01	726.151888	0.00274948	0.0115648	0.0243%
Alameda	2036	SBUS	Aggregate	Aggregate	Diesel	315.14353	9,947	0.0262544	1.9593412	0.1362066	0.008812	0.0131886	0.012	0.7448002	7.70E-01	0.0126181	0.003	0.3192001	3.35E-01	932.732076	0.00121945	0.14661249	0.0197%
Alameda	2036	T6 Ag	Aggregate	Aggregate	Diesel	2.91716923	1	0.0114736	2.375689	0.089409	0.0100307	0.0244831	0.012	0.13034	1.67E-01	0.023424	0.003	0.05586	8.23E-02	1061.73316	0.00053292	0.16688967	0.0000%
Alameda	2036	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	72.8745296	12,399	0.0077593	0.9123304	0.064307	0.0065167	0.0098451	0.012	0.13034	1.52E-01	0.0094192	0.003	0.05586	6.83E-02	689.782231	0.0003604	0.10842416	0.0245%
Alameda	2036	T6 CAIRP small	Aggregate	Aggregate	Diesel	40.4325761	1,776	0.0078913	0.9417056	0.065401	0.0072196	0.0102807	0.012	0.13034	1.53E-01	0.0098359	0.003	0.05586	6.87E-02	764.182438	0.00036653	0.12011884	0.0035%
Alameda	2036	T6 instate construction heavy	Aggregate	Aggregate	Diesel	833.704761	53,282	0.018079	2.5380952	0.2110699	0.0101743	0.0115804	0.012	0.13034	1.54E-01	0.0110795	0.003	0.05586	6.99E-02	1076.93303	0.00083972	0.16927888	0.1053%
Alameda	2036	T6 instate construction small	Aggregate	Aggregate	Diesel	1756.72784	87,403	0.0148932	2.0771244	0.1858844	0.0092424	0.0087042	0.012	0.13034	1.51E-01	0.0083276	0.003	0.05586	6.72E-02	978.285694	0.00069175	0.15377289	0.1728%
Alameda	2036	T6 instate heavy	Aggregate	Aggregate	Diesel	4326.69861	445,743	0.0094336	1.5655153	0.1073458	0.0075853	0.0076186	0.012	0.13034	1.50E-01	0.007289	0.003	0.05586	6.61E-02	802.890748	0.00043817	0.12620324	0.8813%
Alameda	2036	T6 instate small	Aggregate	Aggregate	Diesel	12487.3549	571,674	0.0090358	1.4540656	0.1028175	0.0078594	0.0069138	0.012	0.13034	1.49E-01	0.0066147	0.003	0.05586	6.55E-02	831.904395	0.00041969	0.13076379	1.1302%
Alameda	2036	T6 OOS heavy	Aggregate	Aggregate	Diesel	41.6200773	7,129	0.0077497	0.9100006	0.0642276	0.0065092	0.0098136	0.012	0.13034	1.52E-01	0.0093891	0.003	0.05586	6.82E-02	688.990999	0.00035995	0.10829979	0.0141%
Alameda	2036	T6 OOS small	Aggregate	Aggregate	Diesel	23.2326457	1,013	0.0079067	0.9459126	0.0655288	0.0072288	0.0103311	0.012	0.13034	1.53E-01	0.0098842	0.003	0.05586	6.87E-02	765.152288	0.00036725	0.12027128	0.0020%
Alameda	2036	T6 Public	Aggregate	Aggregate	Diesel	1623.37805	25,310	0.0159422	1.5996963	0.1211896	0.0086491	0.0062732	0.012	0.13034	1.49E-01	0.0060019	0.003	0.05586	6.49E-02	915.486597	0.00074048	0.14390174	0.0500%
Alameda	2036	T6 utility	Aggregate	Aggregate	Diesel	223.910159	3,736	0.0072647	0.9362321	0.0850242	0.0075799	0.0033854	0.012	0.13034	1.46E-01	0.0032389	0.003	0.05586	6.21E-02	802.319891	0.00033743	0.12611351	0.0074%
Alameda	2036	T6TS	Aggregate	Aggregate	Gasoline	2011.08422	101,940	0.0128792	0.1033048	0.2390594	0.014248	0.0013928	0.012	0.13034	1.44E-01	0.0012806	0.003	0.05586	6.01E-02	1439.80149	0.00336883	0.00915105	0.2015%
Alameda	2036	T7 Ag	Aggregate	Aggregate	Diesel	3.46112542	6	0.0239816	4.0558994	0.2039879	0.0153751	0.0450011	0.036	0.06174	1.43E-01	0.0430543	0.009	0.02646	7.85E-02	1627.42231	0.00111389	0.25580812	0.0000%
Alameda	2036	T7 CAIRP	Aggregate	Aggregate	Diesel	1847.77916	392,439	0.0199312	2.04704	0.1852169	0.0091514	0.0279148	0.036	0.06174	1.26E-01	0.0267072	0.009	0.02646	6.22E-02	968.655599	0.00092575	0.15225917	0.7759%
Alameda	2036	T7 CAIRP construction	Aggregate	Aggregate	Diesel	209.916724	38,273	0.0352825	3.9779881	0.49158	0.0123423	0.0208437	0.036	0.06174	1.19E-01	0.019942	0.009	0.02646	5.54E-02	1306.40596	0.00163878	0.20534882	0.0757%
Alameda	2036	T7 NNOOS	Aggregate	Aggregate	Diesel	2802.13555	478,370	0.0186274	1.8508521	0.1731011	0.0090557	0.0242415	0.036	0.06174	1.22E-01	0.0231928	0.009	0.02646	5.87E-02	958.533564	0.00086519	0.15066813	0.9458%
Alameda	2036	T7 NOOS	Aggregate	Aggregate	Diesel	735.102898	154,204	0.0199579	2.0514417	0.1854657	0.0091654	0.02799	0.036	0.06174	1.26E-01	0.0267792	0.009	0.02646	6.22E-02	970.142	0.00092699	0.15249281	0.3049%
Alameda	2036	T7 other port	Aggregate	Aggregate	Diesel	284.730082	47,114	0.0288907	3.9460648	0.4124291	0.01127	0.0155488	0.036	0.06174	1.13E-01	0.0148761	0.009	0.02646	5.03E-02	1192.90589	0.0013419	0.18750819	0.0931%
Alameda	2036	T7 POAK	Aggregate	Aggregate	Diesel	2230.30785	360,991	0.0292485	4.0153515	0.4175366	0.011438	0.0159132	0.036	0.06174	1.14E-01	0.0152248	0.009	0.02646	5.07E-02	1210.69162	0.00135852	0.19030386	0.7137%
Alameda	2036	T7 Public	Aggregate	Aggregate	Diesel	903.184967	18,302	0.0502571	3.8041788	0.2986513	0.0131549	0.0146977	0.036	0.06174	1.12E-01	0.0140619	0.009	0.02646	4.95E-02	1392.42414	0.00233431	0.21886968	0.0362%
Alameda	2036	T7 Single	Aggregate	Aggregate	Diesel	1021.96083	76,996	0.0188629	2.3384583	0.2306295	0.0122157	0.0144681	0.036	0.06174	1.12E-01	0.0138422	0.009	0.02646	4.93E-02	1293.00377	0.00087613	0.20324219	0.1522%
Alameda	2036	T7 single construction	Aggregate	Aggregate	Diesel	1267.76628	94,949	0.0323496	3.3072793	0.4319848	0.0138756	0.0159461	0.036	0.06174	1.14E-01	0.0152563	0.009	0.02646	5.07E-02	1468.70822	0.00150256	0.23086048	0.1877%
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Diesel	52.2601358	2,135	0.0345051	11.431113	0.0966673	0.0412374	0.011598	0.036	0.06174	1.09E-01	0.0110963	0.009	0.02646	4.66E-02	4364.89648	0.00160267	0.68610094	0.0042%
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Natural Gas	549.304195	22,398	0.0576047	0.4814961	11.159326	0	0.0031007	0.036	0.06174	1.01E-01	0.0029666	0.009	0.02646	3.84E-02	2616.50421	3.09945091	0.5333915	0.0443%
Alameda	2036	T7 tractor	Aggregate	Aggregate	Diesel	6015.34449	737,094	0.0182793	1.7972709	0.1581855	0.009382	0.0271456	0.036	0.06174	1.25E-01	0.0259713	0.009	0.02646	6.14E-02	993.068223	0.00084903	0.1560965	1.4573%
Alameda	2036	T7 tractor construction	Aggregate	Aggregate	Diesel	1052.35978	78,324	0.0373397	4.2508389	0.5143885	0.0136771	0.0227899	0.036	0.06174	1.21E-01	2.180E-02	9.000E-03	0.02646	5.73E-02	1447.69534	0.00173433	0.22755755	0.1549%
Alameda	2036	T7 utility	Aggregate	Aggregate	Diesel	142.351746	2,885	0.0156989	1.7289585	0.2045957	0.0120566	0.0068614	0.036	0.06174	1.05E-01	0.0065645	0.009	0.02646	4.20E-02	1276.16362	0.00072917	0.20059515	0.0057%
Alameda	2036	T7IS	Aggregate	Aggregate	Gasoline	7.83094548	942	0.3112742	3.0635172	29.458493	0.0157246	0.0011558	0.02	0.06174	8.29E-02	0.0010627	0.005	0.02646	3.25E-02	1589.01753	0.07048533	0.13306077	0.0019%
Alameda	2036	UBUS	Aggregate	Aggregate	Gasoline	8.90611055	526	1.658E-02	2.467E-01	3.246E-01	1.472E-02	2.351E-03	1.060E-02	1.160E-01	1.29E-01	2.161E-03	2.651E-03	4.971E-02	5.45E-02	1.488E+03	5.024E-03	2.085E-02	0.0010%
Alameda	2036	UBUS	Aggregate	Aggregate	Diesel	501.844484	58,053	1.065E-03	7.758E-01	1.249E-01	1.397E-02	5.732E-03	3.174E-02	7.391E-02	1.11E-01	5.484E-03	7.936E-03	3.167E-02	4.51E-02	1.478E+03	7.390E-02	2.323E-01	0.1148%
Alameda	2036	UBUS	Aggregate	Aggregate	Natural Gas	202.774801	23,457	8.710E-02	4.705E-01	4.708E+01	0.000E+00	3.210E-03	3.174E-02	7.391E-02	1.09E-01	3.071E-03	7.936E-03	3.167E-02	4.27E-02	1.950E+03	6.096E+00	3.976E-01	0.0464%
							50,579,633															Annual	

Source: EMFAC2017 Version 1.0.3 Project Level Emission Rates. 2036. Alc 2.205E-03 lbs/Mile

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2(Pavley+AACC)_RUNEX	CH4_RUNEX	N2O_RUNEX
Alameda	2036	All Other Buses	Aggregate	Aggregate	Diesel	2.239E-05	4.206E-03	2.887E-04	1.852E-05	1.108E-05	2.646E-05	2.873E-04	3.249E-04	1.060E-05	6.614E-06	1.231E-04	1.404E-04	1.961E+00	1.040E-06	3.082E-04
Alameda	2036	LDA	Aggregate	Aggregate	Gasoline	5.131E-06	4.027E-05	8.424E-04	4.338E-06	1.533E-06	1.764E-05	8.102E-05	1.002E-04	1.409E-06	4.409E-06	3.472E-05	4.054E-05	4.384E-01	1.684E-06	6.537E-06
Alameda	2036	LDA	Aggregate	Aggregate	Diesel	1.111E-05	2.503E-05	3.313E-04	3.354E-06	2.490E-06	1.764E-05	8.102E-05	1.011E-04	2.383E-06	4.409E-06	3.472E-05	4.151E-05	3.548E-01	5.161E-07	5.577E-05
Alameda	2036	LDA	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	LDT1	Aggregate	Aggregate	Gasoline	7.138E-06	4.812E-05	9.083E-04	5.075E-06	1.682E-06	1.764E-05	8.102E-05	1.003E-04	1.546E-06	4.409E-06	3.472E-05	4.068E-05	5.129E-01	2.143E-06	7.126E-06
Alameda	2036	LDT1	Aggregate	Aggregate	Diesel	3.310E-05	1.055E-04	3.456E-04	6.398E-06	1.037E-05	1.764E-05	8.102E-05	1.090E-04	9.921E-06	4.409E-06	3.472E-05	4.905E-05	6.767E-01	1.538E-06	1.064E-04
Alameda	2036	LDT1	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	LDT2	Aggregate	Aggregate	Gasoline	8.660E-06	5.128E-05	1.025E-03	5.075E-06	1.597E-06	1.764E-05	8.102E-05	1.003E-04	1.468E-06	4.409E-06	3.472E-05	4.060E-05	5.128E-01	2.586E-06	7.074E-06
Alameda	2036	LDT2	Aggregate	Aggregate	Diesel	3.127E-05	6.421E-05	3.208E-04	4.466E-06	9.127E-06	1.764E-05	8.102E-05	1.078E-04	8.732E-06	4.409E-06	3.472E-05	4.786E-05	4.724E-01	1.452E-06	7.426E-05
Alameda	2036	LDT2	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	LHD1	Aggregate	Aggregate	Gasoline	2.072E-05	1.345E-04	4.528E-04	1.856E-05	4.858E-06	1.764E-05	1.685E-04	1.910E-04	4.467E-06	4.409E-06	7.222E-05	8.110E-05	1.876E+00	5.776E-06	1.099E-05
Alameda	2036	LHD1	Aggregate	Aggregate	Diesel	2.816E-04	5.665E-04	1.277E-03	9.465E-06	2.079E-05	2.646E-05	1.685E-04	2.158E-04	1.989E-05	6.614E-06	7.222E-05	9.873E-05	1.001E+00	1.308E-05	1.574E-04
Alameda	2036	LHD2	Aggregate	Aggregate	Gasoline	1.742E-05	1.336E-04	3.818E-04	2.132E-05	4.705E-06	1.764E-05	1.966E-04	2.189E-04	4.326E-06	4.409E-06	8.426E-05	9.300E-05	2.154E+00	5.143E-06	1.181E-05
Alameda	2036	LHD2	Aggregate	Aggregate	Diesel	2.844E-04	6.308E-04	1.296E-03	1.065E-05	3.814E-05	2.646E-05	1.966E-04	2.612E-04	3.649E-05	6.614E-06	8.426E-05	1.274E-04	1.127E+00	1.321E-05	1.771E-04
Alameda	2036	MCY	Aggregate	Aggregate	Gasoline	4.874E-03	2.535E-03	3.971E-02	4.679E-06	5.073E-06	8.818E-06	2.593E-05	3.982E-05	4.730E-06	2.205E-06	1.111E-05	1.805E-05	4.728E-01	7.293E-04	1.458E-04
Alameda	2036	MDV	Aggregate	Aggregate	Gasoline	9.086E-06	5.400E-05	1.027E-03	6.146E-06	1.618E-06	1.764E-05	8.102E-05	1.003E-04	1.487E-06	4.409E-06	3.472E-05	4.062E-05	6.210E-01	2.673E-06	7.273E-06
Alameda	2036	MDV	Aggregate	Aggregate	Diesel	1.192E-05	2.447E-05	3.557E-04	5.802E-06	2.689E-06	1.764E-05	8.102E-05	1.013E-04	2.572E-06	4.409E-06	3.472E-05	4.170E-05	6.137E-01	5.535E-07	9.646E-05
Alameda	2036	MDV	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.102E-05	9.866E-05	0.000E+00	4.409E-06	3.472E-05	3.913E-05	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	MH	Aggregate	Aggregate	Gasoline	2.680E-05	2.532E-04	4.315E-04	3.159E-05	3.057E-06	2.646E-05	2.873E-04	3.169E-04	2.811E-06	6.614E-06	1.231E-04	1.326E-04	3.193E+00	9.127E-06	2.831E-05
Alameda	2036	MH	Aggregate	Aggregate	Diesel	1.726E-04	6.013E-03	5.266E-04	1.795E-05	7.105E-05	3.527E-05	2.873E-04	3.937E-04	6.798E-05	8.818E-06	1.231E-04	1.999E-04	1.899E+00	8.015E-06	2.985E-04
Alameda	2036	Motor Coach	Aggregate	Aggregate	Diesel	4.058E-05	4.071E-03	3.771E-04	2.568E-05	5.204E-05	2.646E-05	2.873E-04	3.658E-04	4.978E-05	6.614E-06	1.231E-04	1.795E-04	2.719E+00	1.885E-06	4.273E-04
Alameda	2036	OBUS	Aggregate	Aggregate	Gasoline	5.023E-05	3.867E-04	1.015E-03	3.195E-05	2.990E-06	2.646E-05	2.873E-04	3.168E-04	2.749E-06	6.614E-06	1.231E-04	1.325E-04	3.229E+00	1.170E-05	2.666E-05
Alameda	2036	PTO	Aggregate	Aggregate	Diesel	5.897E-05	1.080E-02	9.450E-04	3.631E-05	1.199E-05	0.000E+00	0.000E+00	1.199E-05	1.147E-05	0.000E+00	0.000E+00	1.147E-05	3.843E+00	2.739E-06	6.040E-04
Alameda	2036	SBUS	Aggregate	Aggregate	Gasoline	2.610E-05	2.508E-04	4.443E-04	1.584E-05	3.436E-06	1.764E-05	1.642E-03	1.663E-03	3.159E-06	4.409E-06	7.037E-04	7.113E-04	1.601E+00	6.061E-06	2.550E-05
Alameda	2036	SBUS	Aggregate	Aggregate	Diesel	5.788E-05	4.320E-03	3.003E-04	1.943E-05	2.908E-05	2.646E-05	1.642E-03	1.698E-03	2.782E-05	6.614E-06	7.037E-04	7.381E-04	2.056E+00	2.688E-06	3.232E-04
Alameda	2036	T6 Ag	Aggregate	Aggregate	Diesel	2.529E-05	5.237E-03	1.971E-04	2.211E-05	5.398E-05	2.646E-05	2.873E-04	3.678E-04	5.164E-05	6.614E-06	1.231E-04	1.814E-04	2.341E+00	1.175E-06	3.679E-04
Alameda	2036	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	1.711E-05	2.011E-03	1.418E-04	1.437E-05	2.170E-05	2.646E-05	2.873E-04	3.355E-04	2.077E-05	6.614E-06	1.231E-04	1.505E-04	1.521E+00	7.945E-07	2.390E-04
Alameda	2036	T6 CAIRP small	Aggregate	Aggregate	Diesel	1.740E-05	2.076E-03	1.442E-04	1.592E-05	2.266E-05	2.646E-05	2.873E-04	3.365E-04	2.168E-05	6.614E-06	1.231E-04	1.514E-04	1.685E+00	8.080E-07	2.648E-04
Alameda	2036	T6 instate construction heavy	Aggregate	Aggregate	Diesel	3.986E-05	5.595E-03	4.653E-04	2.243E-05	2.553E-05	2.646E-05	2.873E-04	3.393E-04	2.443E-05	6.614E-06	1.231E-04	1.542E-04	2.374E+00	1.851E-06	3.732E-04
Alameda	2036	T6 instate construction small	Aggregate	Aggregate	Diesel	3.283E-05	4.579E-03	4.098E-04	2.038E-05	1.919E-05	2.646E-05	2.873E-04	3.330E-04	1.836E-05	6.614E-06	1.231E-04	1.481E-04	2.157E+00	1.525E-06	3.390E-04
Alameda	2036	T6 instate heavy	Aggregate	Aggregate	Diesel	2.080E-05	3.451E-03	2.367E-04	1.672E-05	1.680E-05	2.646E-05	2.873E-04	3.306E-04	1.607E-05	6.614E-06	1.231E-04	1.458E-04	1.770E+00	9.660E-07	2.782E-04
Alameda	2036	T6 instate small	Aggregate	Aggregate	Diesel	1.992E-05	3.206E-03	2.267E-04	1.733E-05	1.524E-05	2.646E-05	2.873E-04	3.290E-04	1.458E-05	6.614E-06	1.231E-04	1.443E-04	1.834E+00	9.252E-07	2.883E-04
Alameda	2036	T6 OOS heavy	Aggregate	Aggregate	Diesel	1.708E-05	2.006E-03	1.416E-04	1.435E-05	2.164E-05	2.646E-05	2.873E-04	3.354E-04	2.070E-05	6.614E-06	1.231E-04	1.505E-04	1.519E+00	7.936E-07	2.388E-04
Alameda	2036	T6 OOS small	Aggregate	Aggregate	Diesel	1.743E-05	2.085E-03	1.445E-04	1.594E-05	2.278E-05	2.646E-05	2.873E-04	3.366E-04	2.179E-05	6.614E-06	1.231E-04	1.516E-04	1.687E+00	8.096E-07	2.652E-04
Alameda	2036	T6 Public	Aggregate	Aggregate	Diesel	3.515E-05	3.527E-03	2.672E-04	1.907E-05	1.383E-05	2.646E-05	2.873E-04	3.276E-04	1.323E-05	6.614E-06	1.231E-04	1.430E-04	2.018E+00	1.632E-06	3.172E-04
Alameda	2036	T6 utility	Aggregate	Aggregate	Diesel	1.602E-05	2.064E-03	1.874E-04	1.671E-05	7.463E-06	2.646E-05	2.873E-04	3.213E-04	7.141E-06	6.614E-06	1.231E-04	1.369E-04	1.769E+00	7.439E-07	2.780E-04
Alameda	2036	T6TS	Aggregate	Aggregate	Gasoline	2.839E-05	2.277E-04	5.270E-04	3.141E-05	3.071E-06	2.646E-05	2.873E-04	3.169E-04	2.823E-06	6.614E-06	1.231E-04	1.326E-04	3.174E+00	7.427E-06	2.017E-05
Alameda	2036	T7 Ag	Aggregate	Aggregate	Diesel	5.287E-05	8.942E-03	4.497E-04	3.390E-05	9.921E-05	7.937E-05	1.361E-04	3.147E-04	9.492E-05	1.984E-05	5.833E-05	1.731E-04	3.588E+00	2.456E-06	5.640E-04
Alameda	2036	T7 CAIRP	Aggregate	Aggregate	Diesel	4.394E-05	4.513E-03	4.083E-04	2.018E-05	6.154E-05	7.937E-05	1.361E-04	2.770E-04	5.888E-05	1.984E-05	5.833E-05	1.371E-04	2.135E+00	2.041E-06	3.357E-04
Alameda	2036	T7 CAIRP construction	Aggregate	Aggregate	Diesel	7.778E-05	8.770E-03	1.084E-03	2.721E-05	4.595E-05	7.937E-05	1.361E-04	2.614E-04	4.396E-05	1.984E-05	5.833E-05	1.221E-04	2.880E+00	3.613E-06	4.527E-04
Alameda	2036	T7 NNOOS	Aggregate	Aggregate	Diesel	4.107E-05	4.080E-03	3.816E-04	1.996E-05	5.344E-05	7.937E-05	1.361E-04	2.689E-04	5.113E-05	1.984E-05	5.833E-05	1.293E-04	2.113E+00	1.907E-06	3.322E-04
Alameda	2036	T7 NOOS	Aggregate	Aggregate	Diesel	4.400E-05	4.523E-03	4.089E-04	2.021E-05	6.171E-05	7.937E-05	1.361E-04	2.772E-04	5.904E-05	1.984E-05	5.833E-05	1.372E-04	2.139E+00	2.044E-06	3.362E-04
Alameda	2036	T7 other port	Aggregate	Aggregate	Diesel	6.369E-05	8.699E-03	9.092E-04	2.485E-05	3.428E-05	7.937E-05	1.361E-04	2.498E-04	3.280E-05	1.984E-05	5.833E-05	1.110E-04	2.630E+00	2.958E-06	4.134E-04
Alameda	2036	T7 POAK	Aggregate	Aggregate	Diesel	6.448E-05	8.852E-03	9.205E-04	2.522E-05	3.508E-05	7.937E-05	1.361E-04	2.506E-04	3.356E-05	1.984E-05	5.833E-05	1.117E-04	2.669E+00	2.995E-06	4.195E-04
Alameda	2036	T7 Public	Aggregate	Aggregate	Diesel	1.108E-04	8.387E-03	6.584E-04	2.900E-05	3.240E-05	7.937E-05	1.361E-04	2.479E-04	3.100E-05	1.984E-05	5.833E-05	1.092E-04	3.070E+00	5.146E-06	4.825E-04
Alameda	2036	T7 Single	Aggregate	Aggregate	Diesel	4.159E-05	5.155E-03	5.084E-04	2.693E-05	3.190E-05	7.937E-05	1.361E-04	2.474E-04	3.052E-05	1.984E-05	5.833E-05	1.087E-04	2.851E+00	1.932E-06	4.481E-04
Alameda	2036	T7 single construction	Aggregate	Aggregate	Diesel	7.132E-05	7.291E-03	9.524E-04	3.059E-05	3.515E-05	7.937E-05	1.361E-04	2.506E-04	3.363E-05	1.984E-05	5.833E-05	1.118E-04	3.238E+00	3.313E-06	5.090E-04
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Diesel	7.607E-05	2.520E-02	2.131E-04	9.091E-05	2.557E-05	7.937E-05	1.361E-04	2.410E-04	2.446E-05	1.984E-05	5.833E-05	1.026E-04	9.623E+00	3.533E-06	1.513E-03
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Natural Gas	1.270E-04	1.062E-03	2.460E-02	0.000E+00	6.836E-06	7.937E-05	1.361E-04	2.223E-04	6.540E-06	1.984E-05	5.833E-05	8.472E-05	5.768E+00	6.833E-03	1.176E-03
Alameda	2036	T7 tractor	Aggregate	Aggregate	Diesel	4.030E-05	3.962E-03	3.487E-04	2.068E-05	5.985E-05	7.937E-05	1.361E-04	2.753E-04	5.726E-05	1.984E-05	5.833E-05	1.354E-04	2.189E+00	1.872E-06	3.441E-04
Alameda	2036	T7 tractor construction	Aggregate	Aggregate	Diesel	8.232E-05	9.371E-03	1.134E-03	3.015E-05	5.024E-05	7.937E-05	1.361E-04	2.657E-04	4.807E-05	1.984E-05	5.833E-05	1.262E-04	3.192E+00	3.824E-06	5.017E-04
Alameda	2036	T7 utility	Aggregate	Aggregate	Diesel	3.461E-05	3.812E-03	4.511E-04	2.658E-05	1.513E-05	7.937E-05	1.361E-04	2.306E-04	1.447E-05	1.984E-05	5.833E-05	9.265E-05	2.813E+00	1.608E-06	4.422E-04
Alameda	2036	T7IS	Aggregate	Aggregate	Gasoline	6.862E-04	6.754E-03	6.494E-02	3.467E-05	2.548E-06	4.409E-05	1.361E-04	1.828E-04	2.343E-06	1.102E-05	5.833E-05	7.170E-05	3.503E+00	1.554E-04	2.933E-04
Alameda	2036	UBUS	Aggregate	Aggregate	Gasoline	3.654E-05	5.439E-04	7.156E-04	3.246E-05	5.182E-06	2.338E-05	2.557E-04	2.843E-04	4.765E-06	5.845E-06	1.096E-04	1.202E-04	3.280E+00	1.108E-05	4.596E-05
Alameda	2036	UBUS	Aggregate	Aggregate	Diesel	2.348E-06	1.710E-03	2.754E-04	3.080E-05	1.264E-05	6.998E-05	1.629E-04	2.455E-04	1.209E-05	1.750E-05	6.983E-05	9.941E-05	3.258E+00	1.629E-04	5.120E-04
Alameda	2036	UBUS	Aggregate	Aggregate	Natural Gas	1.920E-04	1.037E-03	1.038E-01	0.000E+00	7.077E-06	6.998E-05	1.629E-04	2.400E-04	6.771E-06	1.750E-05	6.983E-05	9.409E-05	4.300E+00	1.344E-02	8.765E-04

Source: EMFAC2017 Version 1.0.3 Project Level Emission Rates. 2036. Alc 1.0E-06

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2(Pavley+AACC)_RUNEX	CH4_RUNEX	N2O_RUNEX
						MTons/Mile														
Alameda	2036	All Other Buses	Aggregate	Aggregate	Diesel	1.015E-08	1.908E-06	1.309E-07	8.403E-09	5.024E-09	1.200E-08	1.303E-07	1.474E-07	4.806E-09	3.000E-09	5.586E-08	6.367E-08	8.894E-04	4.716E-10	1.398E-07
Alameda	2036	LDA	Aggregate	Aggregate	Gasoline	2.328E-09	1.827E-08	3.821E-07	1.968E-09	6.953E-10	8.000E-09	3.675E-08	4.545E-08	6.393E-10	2.000E-09	1.575E-08	1.839E-08	1.989E-04	7.637E-10	2.965E-09
Alameda	2036	LDA	Aggregate	Aggregate	Diesel	5.040E-09	1.135E-08	1.503E-07	1.522E-09	1.130E-09	8.000E-09	3.675E-08	4.588E-08	1.081E-09	2.000E-09	1.575E-08	1.883E-08	1.609E-04	2.341E-10	2.530E-08
Alameda	2036	LDA	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	LDT1	Aggregate	Aggregate	Gasoline	3.238E-09	2.183E-08	4.120E-07	2.302E-09	7.628E-10	8.000E-09	3.675E-08	4.551E-08	7.014E-10	2.000E-09	1.575E-08	1.845E-08	2.326E-04	9.723E-10	3.232E-09
Alameda	2036	LDT1	Aggregate	Aggregate	Diesel	1.502E-08	4.784E-08	1.568E-07	2.902E-09	4.704E-09	8.000E-09	3.675E-08	4.945E-08	4.500E-09	2.000E-09	1.575E-08	2.225E-08	3.070E-04	6.974E-10	4.825E-08
Alameda	2036	LDT1	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	LDT2	Aggregate	Aggregate	Gasoline	3.928E-09	2.326E-08	4.650E-07	2.302E-09	7.244E-10	8.000E-09	3.675E-08	4.547E-08	6.661E-10	2.000E-09	1.575E-08	1.842E-08	2.326E-04	1.173E-09	3.209E-09
Alameda	2036	LDT2	Aggregate	Aggregate	Diesel	1.418E-08	2.912E-08	1.455E-07	2.026E-09	4.140E-09	8.000E-09	3.675E-08	4.889E-08	3.961E-09	2.000E-09	1.575E-08	2.171E-08	2.143E-04	6.588E-10	3.368E-08
Alameda	2036	LDT2	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	LHD1	Aggregate	Aggregate	Gasoline	9.399E-09	6.101E-08	2.054E-07	8.420E-09	2.203E-09	8.000E-09	7.644E-08	8.664E-08	2.026E-09	2.000E-09	3.276E-08	3.679E-08	8.509E-04	2.620E-09	4.983E-09
Alameda	2036	LHD1	Aggregate	Aggregate	Diesel	1.277E-07	2.570E-07	5.791E-07	4.293E-09	9.432E-09	1.200E-08	7.644E-08	9.787E-08	9.024E-09	3.000E-09	3.276E-08	4.478E-08	4.541E-04	5.933E-09	7.138E-08
Alameda	2036	LHD2	Aggregate	Aggregate	Gasoline	7.903E-09	6.062E-08	1.732E-07	9.671E-09	2.134E-09	8.000E-09	8.918E-08	9.931E-08	1.962E-09	2.000E-09	3.822E-08	4.218E-08	9.773E-04	2.333E-09	5.355E-09
Alameda	2036	LHD2	Aggregate	Aggregate	Diesel	1.290E-07	2.861E-07	5.878E-07	4.832E-09	1.730E-08	1.200E-08	8.918E-08	1.185E-07	1.655E-08	3.000E-09	3.822E-08	5.777E-08	5.112E-04	5.992E-09	8.035E-08
Alameda	2036	MCY	Aggregate	Aggregate	Gasoline	2.211E-06	1.150E-06	1.801E-05	2.122E-09	2.301E-09	4.000E-09	1.176E-08	1.806E-08	2.146E-09	1.000E-09	5.040E-09	8.186E-09	2.145E-04	3.308E-07	6.612E-08
Alameda	2036	MDV	Aggregate	Aggregate	Gasoline	4.122E-09	2.450E-08	4.661E-07	2.788E-09	7.337E-10	8.000E-09	3.675E-08	4.548E-08	6.746E-10	2.000E-09	1.575E-08	1.842E-08	2.817E-04	1.212E-09	3.299E-09
Alameda	2036	MDV	Aggregate	Aggregate	Diesel	5.405E-09	1.110E-08	1.614E-07	2.632E-09	1.220E-09	8.000E-09	3.675E-08	4.597E-08	1.167E-09	2.000E-09	1.575E-08	1.892E-08	2.784E-04	2.510E-10	4.376E-08
Alameda	2036	MDV	Aggregate	Aggregate	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.675E-08	4.475E-08	0.000E+00	2.000E-09	1.575E-08	1.775E-08	0.000E+00	0.000E+00	0.000E+00
Alameda	2036	MH	Aggregate	Aggregate	Gasoline	1.216E-08	1.149E-07	1.957E-07	1.433E-08	1.387E-09	1.200E-08	1.303E-07	1.437E-07	1.275E-09	3.000E-09	5.586E-08	6.014E-08	1.448E-03	4.140E-09	1.284E-08
Alameda	2036	MH	Aggregate	Aggregate	Diesel	7.828E-08	2.727E-06	2.389E-07	8.142E-09	3.223E-08	1.600E-08	1.303E-07	1.786E-07	3.083E-08	4.000E-09	5.586E-08	9.069E-08	8.613E-04	3.636E-09	1.354E-07
Alameda	2036	Motor Coach	Aggregate	Aggregate	Diesel	1.841E-08	1.847E-06	1.711E-07	1.165E-08	2.360E-08	1.200E-08	1.303E-07	1.659E-07	2.258E-08	3.000E-09	5.586E-08	8.144E-08	1.233E-03	8.550E-10	1.938E-07
Alameda	2036	OBUS	Aggregate	Aggregate	Gasoline	2.279E-08	1.754E-07	4.602E-07	1.449E-08	1.356E-09	1.200E-08	1.303E-07	1.437E-07	1.247E-09	3.000E-09	5.586E-08	6.011E-08	1.464E-03	5.306E-09	1.209E-08
Alameda	2036	PTO	Aggregate	Aggregate	Diesel	2.675E-08	4.900E-06	4.286E-07	1.647E-08	5.438E-09	0.000E+00	0.000E+00	5.438E-09	5.203E-09	0.000E+00	0.000E+00	5.203E-09	1.743E-03	1.242E-09	2.740E-07
Alameda	2036	SBUS	Aggregate	Aggregate	Gasoline	1.184E-08	1.138E-07	2.016E-07	7.186E-09	1.559E-09	8.000E-09	7.448E-07	7.544E-07	1.433E-09	2.000E-09	3.192E-07	3.226E-07	7.262E-04	2.749E-09	1.156E-08
Alameda	2036	SBUS	Aggregate	Aggregate	Diesel	2.625E-08	1.959E-06	1.362E-07	8.812E-09	1.319E-08	1.200E-08	7.448E-07	7.700E-07	1.262E-08	3.000E-09	3.192E-07	3.348E-07	9.327E-04	1.219E-09	1.466E-07
Alameda	2036	T6 Ag	Aggregate	Aggregate	Diesel	1.147E-08	2.376E-06	8.941E-08	1.003E-08	2.448E-08	1.200E-08	1.303E-07	1.668E-07	2.342E-08	3.000E-09	5.586E-08	8.228E-08	1.062E-03	5.329E-10	1.669E-07
Alameda	2036	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	7.759E-09	9.123E-07	6.431E-08	6.517E-09	9.845E-09	1.200E-08	1.303E-07	1.522E-07	9.419E-09	3.000E-09	5.586E-08	6.828E-08	6.898E-04	3.604E-10	1.084E-07
Alameda	2036	T6 CAIRP small	Aggregate	Aggregate	Diesel	7.891E-09	9.417E-07	6.540E-08	7.220E-09	1.028E-08	1.200E-08	1.303E-07	1.526E-07	9.836E-09	3.000E-09	5.586E-08	6.870E-08	7.642E-04	3.665E-10	1.201E-07
Alameda	2036	T6 instate construction heavy	Aggregate	Aggregate	Diesel	1.808E-08	2.538E-06	2.111E-07	1.017E-08	1.158E-08	1.200E-08	1.303E-07	1.539E-07	1.108E-08	3.000E-09	5.586E-08	6.994E-08	1.077E-03	8.397E-10	1.693E-07
Alameda	2036	T6 instate construction small	Aggregate	Aggregate	Diesel	1.489E-08	2.077E-06	1.859E-07	9.242E-09	8.704E-09	1.200E-08	1.303E-07	1.510E-07	8.328E-09	3.000E-09	5.586E-08	6.719E-08	9.783E-04	6.918E-10	1.538E-07
Alameda	2036	T6 instate heavy	Aggregate	Aggregate	Diesel	9.434E-09	1.566E-06	1.073E-07	7.585E-09	7.619E-09	1.200E-08	1.303E-07	1.500E-07	7.289E-09	3.000E-09	5.586E-08	6.615E-08	8.029E-04	4.382E-10	1.262E-07
Alameda	2036	T6 instate small	Aggregate	Aggregate	Diesel	9.036E-09	1.454E-06	1.028E-07	7.859E-09	6.914E-09	1.200E-08	1.303E-07	1.493E-07	6.615E-09	3.000E-09	5.586E-08	6.547E-08	8.319E-04	4.197E-10	1.308E-07
Alameda	2036	T6 OOS heavy	Aggregate	Aggregate	Diesel	7.750E-09	9.100E-07	6.423E-08	6.509E-09	9.814E-09	1.200E-08	1.303E-07	1.522E-07	9.389E-09	3.000E-09	5.586E-08	6.825E-08	6.890E-04	3.600E-10	1.083E-07
Alameda	2036	T6 OOS small	Aggregate	Aggregate	Diesel	7.907E-09	9.459E-07	6.553E-08	7.229E-09	1.033E-08	1.200E-08	1.303E-07	1.527E-07	9.884E-09	3.000E-09	5.586E-08	6.874E-08	7.652E-04	3.672E-10	1.203E-07
Alameda	2036	T6 Public	Aggregate	Aggregate	Diesel	1.594E-08	1.600E-06	1.212E-07	8.649E-09	6.273E-09	1.200E-08	1.303E-07	1.486E-07	6.002E-09	3.000E-09	5.586E-08	6.486E-08	9.155E-04	7.405E-10	1.439E-07
Alameda	2036	T6 utility	Aggregate	Aggregate	Diesel	7.265E-09	9.362E-07	8.502E-08	7.580E-09	3.385E-09	1.200E-08	1.303E-07	1.457E-07	3.239E-09	3.000E-09	5.586E-08	6.210E-08	8.023E-04	3.374E-10	1.261E-07
Alameda	2036	T6TS	Aggregate	Aggregate	Gasoline	1.288E-08	1.033E-07	2.391E-07	1.425E-08	1.393E-09	1.200E-08	1.303E-07	1.437E-07	1.281E-09	3.000E-09	5.586E-08	6.014E-08	1.440E-03	3.369E-09	9.151E-09
Alameda	2036	T7 Ag	Aggregate	Aggregate	Diesel	2.398E-08	4.056E-06	2.040E-07	1.538E-08	4.500E-08	3.600E-08	6.174E-08	1.427E-07	4.305E-08	9.000E-09	2.646E-08	7.851E-08	1.627E-03	1.114E-09	2.558E-07
Alameda	2036	T7 CAIRP	Aggregate	Aggregate	Diesel	1.993E-08	2.047E-06	1.852E-07	9.151E-09	2.791E-08	3.600E-08	6.174E-08	1.257E-07	2.671E-08	9.000E-09	2.646E-08	6.217E-08	9.687E-04	9.258E-10	1.523E-07
Alameda	2036	T7 CAIRP construction	Aggregate	Aggregate	Diesel	3.528E-08	3.978E-06	4.916E-07	1.234E-08	2.084E-08	3.600E-08	6.174E-08	1.186E-07	1.994E-08	9.000E-09	2.646E-08	5.540E-08	1.306E-03	1.639E-09	2.053E-07
Alameda	2036	T7 NNOOS	Aggregate	Aggregate	Diesel	1.863E-08	1.851E-06	1.731E-07	9.056E-09	2.424E-08	3.600E-08	6.174E-08	1.220E-07	2.319E-08	9.000E-09	2.646E-08	5.865E-08	9.585E-04	8.652E-10	1.507E-07
Alameda	2036	T7 NOOS	Aggregate	Aggregate	Diesel	1.996E-08	2.051E-06	1.855E-07	9.165E-09	2.799E-08	3.600E-08	6.174E-08	1.257E-07	2.678E-08	9.000E-09	2.646E-08	6.224E-08	9.701E-04	9.270E-10	1.525E-07
Alameda	2036	T7 other port	Aggregate	Aggregate	Diesel	2.889E-08	3.946E-06	4.124E-07	1.127E-08	1.555E-08	3.600E-08	6.174E-08	1.133E-07	1.488E-08	9.000E-09	2.646E-08	5.034E-08	1.193E-03	1.342E-09	1.875E-07
Alameda	2036	T7 POAK	Aggregate	Aggregate	Diesel	2.925E-08	4.015E-06	4.175E-07	1.144E-08	1.591E-08	3.600E-08	6.174E-08	1.137E-07	1.522E-08	9.000E-09	2.646E-08	5.068E-08	1.211E-03	1.359E-09	1.903E-07
Alameda	2036	T7 Public	Aggregate	Aggregate	Diesel	5.026E-08	3.804E-06	2.987E-07	1.315E-08	1.470E-08	3.600E-08	6.174E-08	1.124E-07	1.406E-08	9.000E-09	2.646E-08	4.952E-08	1.392E-03	2.334E-09	2.189E-07
Alameda	2036	T7 Single	Aggregate	Aggregate	Diesel	1.886E-08	2.338E-06	2.306E-07	1.222E-08	1.447E-08	3.600E-08	6.174E-08	1.122E-07	1.384E-08	9.000E-09	2.646E-08	4.930E-08	1.293E-03	8.761E-10	2.032E-07
Alameda	2036	T7 single construction	Aggregate	Aggregate	Diesel	3.235E-08	3.307E-06	4.320E-07	1.388E-08	1.595E-08	3.600E-08	6.174E-08	1.137E-07	1.526E-08	9.000E-09	2.646E-08	5.072E-08	1.469E-03	1.503E-09	2.309E-07
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Diesel	3.451E-08	1.143E-05	9.667E-08	4.124E-08	1.160E-08	3.600E-08	6.174E-08	1.093E-07	1.110E-08	9.000E-09	2.646E-08	4.656E-08	4.365E-03	1.603E-09	6.861E-07
Alameda	2036	T7 SWCV	Aggregate	Aggregate	Natural Gas	5.760E-08	4.815E-07	1.116E-05	0.000E+00	3.101E-09	3.600E-08	6.174E-08	1.008E-07	2.967E-09	9.000E-09	2.646E-08	3.843E-08	2.617E-03	3.099E-06	5.334E-07
Alameda	2036	T7 tractor	Aggregate	Aggregate	Diesel	1.828E-08	1.797E-06	1.582E-07	9.382E-09	2.715E-08	3.600E-08	6.174E-08	1.249E-07	2.597E-08	9.000E-09	2.646E-08	6.143E-08	9.931E-04	8.490E-10	1.561E-07
Alameda	2036	T7 tractor construction	Aggregate	Aggregate	Diesel	3.734E-08	4.251E-06	5.144E-07	1.368E-08	2.279E-08	3.600E-08	6.174E-08	1.205E-07	2.180E-08	9.000E-09	2.646E-08	5.726E-08	1.448E-03	1.734E-09	2.276E-07
Alameda	2036	T7 utility	Aggregate	Aggregate	Diesel	1.570E-08	1.729E-06	2.046E-07	1.206E-08	6.861E-09	3.600E-08	6.174E-08	1.046E-07	6.565E-09	9.000E-09	2.646E-08	4.202E-08	1.276E-03	7.292E-10	2.006E-07
Alameda	2036	T7IS	Aggregate	Aggregate	Gasoline	3.113E-07	3.064E-06	2.946E-05	1.572E-08	1.156E-09	2.000E-08	6.174E-08	8.290E-08	1.063E-09	5.000E-09	2.646E-08	3.252E-08	1.589E-03	7.049E-08	1.331E-07
Alameda	2036	UBUS	Aggregate	Aggregate	Gasoline	1.658E-08	2.467E-07	3.246E-07	1.472E-08	2.351E-09	1.060E-08	1.160E-07	1.289E-07	2.161E-09	2.651E-09	4.971E-08	5.452E-08	1.488E-03	5.024E-09	2.085E-08
Alameda	2036	UBUS	Aggregate	Aggregate	Diesel	1.065E-09	7.758E-07	1.249E-07	1.397E-08	5.732E-09	3.174E-08	7.391E-08	1.114E-07	5.484E-09	7.936E-09	3.167E-08	4.509E-08	1.478E-03	7.390E-08	2.323E-07
Alameda	2036	UBUS	Aggregate	Aggregate	Natural Gas	8.710E-08	4.705E-07	4.708E-05	0.000E+00	3.210E-09	3.174E-08	7.391E-08	1.089E-07	3.071E-09	7.936E-09	3.167E-08	4.268E-08	1.950E-03	6.096E-06	3.976E-07

Existing with Year 2036 Rates: Criteria Air Pollutants - Vendor

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

356						lbs/day					
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Diesel	Aggregate	0.64%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Electricity	Aggregate	3.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Gasoline	Aggregate	5.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	16.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.06%	1.06%	6.33%	0.00	0.00	0.01	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	1.00%	5.99%	0.01	0.01	0.03	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0.16%	0.96%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0.39%	2.34%	0.00	0.01	0.01	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	9.97%	59.50%	0.00	0.01	0.22	0.00	0.02	0.01
MDV	Diesel	Aggregate	0.35%	0.35%	2.12%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0.35%	2.07%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0.88%	5.26%	0.00	0.06	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	1.13%	6.74%	0.00	0.08	0.01	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	1%	8.70%	0.00	0.12	0.01	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**17%**	**100%**	**0.01**	**0.30**	**0.30**	**0.00**	**0.03**	**0.01**

Existing with Year 2036 Rates: Criteria Air Pollutants - Visitor

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

43,875						lbs/day					
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	0.15	1.18	25.00	0.13	2.97	1.20
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	0.00	0.01	0.12	0.00	0.04	0.02
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	0.19	0.08
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	0.02	0.14	2.72	0.01	0.30	0.12
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	0.01	0.00
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	0.08	0.47	9.46	0.05	0.92	0.37
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.00	0.01	0.03	0.00	0.01	0.00
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	0.03	0.01
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	1.34	0.70	10.93	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**1.60**	**2.50**	**48.26**	**0.19**	**4.47**	**1.81**

Existing with Year 2036 Rates: Criteria Air Pollutants Commute - Faculty and Staff

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

195,356								lbs/day			
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	`
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	0.67	5.24	111.31	0.56	13.21	5.35
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	0.02	0.04	0.54	0.01	0.17	0.07
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	0.84	0.33
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	0.09	0.63	12.11	0.07	1.33	0.54
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	0.05	0.02
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	0.35	2.07	42.10	0.20	4.11	1.66
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.01	0.03	0.13	0.00	0.04	0.02
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	0.12	0.05
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	5.97	3.11	48.67	0.01	0.01	0.01
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**7.11**	**11.12**	**214.86**	**0.84**	**19.88**	**8.05**

Existing with Year 2036 Rates: Criteria Air Pollutants Commute - Students

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

56,531						lbs/day					
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	`
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	0.19	1.52	32.21	0.16	3.82	1.55
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	0.01	0.01	0.16	0.00	0.05	0.02
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	0.24	0.10
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	0.03	0.18	3.50	0.02	0.39	0.16
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	0.01	0.01
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	0.10	0.60	12.18	0.06	1.19	0.48
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.00	0.01	0.04	0.00	0.01	0.01
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	0.04	0.01
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	1.73	0.90	14.08	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**2.06**	**3.22**	**62.18**	**0.24**	**5.75**	**2.33**

Existing with Year 2036 Rates: Criteria Air Pollutants - Vendors

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Annual VMT

130,000								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Diesel	Aggregate	0.64%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Electricity	Aggregate	3.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Gasoline	Aggregate	5.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	16.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.06%	1.06%	6.33%	0.17	1.11	3.72	0.15	0.04	0.15
LHD1	Diesel	Aggregate	1.00%	1.00%	5.99%	2.19	4.41	9.94	0.07	0.16	0.21
LHD2	Gasoline	Aggregate	0.16%	0.16%	0.96%	0.02	0.17	0.48	0.03	0.01	0.02
LHD2	Diesel	Aggregate	0.39%	0.39%	2.34%	0.86	1.92	3.94	0.03	0.12	0.08
MCY	Gasoline	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	9.97%	59.50%	0.70	4.21	81.41	0.48	7.93	3.21
MDV	Diesel	Aggregate	0.35%	0.35%	2.12%	0.03	0.07	1.00	0.02	0.29	0.12
MDV	Electricity	Aggregate	0.35%	0.35%	2.07%	0.00	0.00	0.00	0.00	0.27	0.11
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0.88%	5.26%	0.14	23.59	1.62	0.11	0.11	0.18
T6 instate small	Diesel	Aggregate	1.13%	1.13%	6.74%	0.17	28.11	1.99	0.15	0.13	0.23
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	1%	8.70%	0.46	44.79	3.94	0.23	0.68	0.90
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**17%**	**100%**	**4.76**	**108.38**	**108.04**	**1.28**	**9.73**	**5.20**
								Tons/yr			
						0.00	**0.05**	**0.05**	**0.00**	**0.00**	**0.00**

Existing with Year 2036 Rates: Criteria Air Pollutants - Visitors

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Visitor Trips = Passenger Vehicles only

Annual VMT

16,011,554						lbs/day					
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	54.62	429.49	9,122.89	45.86	1,082.73	438.12
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	1.46	3.31	44.43	0.44	13.54	5.56
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	69.12	27.41
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	7.67	51.78	992.52	5.41	109.41	44.36
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.02	0.05	0.00	0.02	0.01
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	3.93	1.56
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	28.65	169.98	3,450.55	16.68	336.76	136.38
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	1.05	2.15	10.92	0.15	3.66	1.63
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	9.98	3.96
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	489.51	254.59	3,988.80	0.47	0.51	0.89
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**582.96**	**911.31**	**17,610.17**	**69.01**	**1,629.65**	**659.87**
						Tons/yr					
						0.29	**0.46**	**8.81**	**0.03**	**0.81**	**0.33**

Existing with 2036 Emissions Rates: Criteria Air Pollutants Commute - Faculty and Staff

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

Annual VMT			Emission year								
53,047,998								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	180.96	1,422.95	30,225.12	151.94	3,587.20	1,451.55
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	4.85	10.95	147.22	1.45	44.85	18.41
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	228.99	90.83
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	25.40	171.54	3,288.34	17.94	362.49	146.96
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.02	0.05	0.17	0.00	0.05	0.02
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	13.02	5.16
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	94.93	563.17	11,432.05	55.25	1,115.71	451.84
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	3.47	7.13	36.17	0.49	12.13	5.39
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	33.06	13.11
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	1,621.78	843.48	13,215.32	1.56	1.69	2.93
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**1,931.40**	**3,019.27**	**58,344.38**	**228.63**	**5,399.20**	**2,186.21**
								Tons/yr			
						0.97	**1.51**	**29.17**	**0.11**	**2.70**	**1.09**

Exising with 2036 Emissions Rates: Criteria Air Pollutants Commute - Students

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

Annual VMT | Emission year

13,156,088										lbs/day	
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	44.88	352.90	7,495.93	37.68	889.64	359.99
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	1.20	2.72	36.51	0.36	11.12	4.57
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	56.79	22.53
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	6.30	42.54	815.52	4.45	89.90	36.45
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.01	0.04	0.00	0.01	0.01
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	3.23	1.28
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	23.54	139.67	2,835.19	13.70	276.70	112.06
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.86	1.77	8.97	0.12	3.01	1.34
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	8.20	3.25
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	402.21	209.19	3,277.44	0.39	0.42	0.73
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**478.99**	**748.79**	**14,469.61**	**56.70**	**1,339.02**	**542.19**
									Tons/yr		
						0.24	**0.37**	**7.23**	**0.03**	**0.67**	**0.27**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants - Vendors

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

		Emission year									
435								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Diesel	Aggregate	0.64%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Electricity	Aggregate	3.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Gasoline	Aggregate	5.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	16.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.06%	1.06%	6.33%	0.00	0.00	0.01	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	1.00%	5.99%	0.01	0.01	0.03	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0.16%	0.96%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0.39%	2.34%	0.00	0.01	0.01	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	9.97%	59.50%	0.00	0.01	0.27	0.00	0.03	0.01
MDV	Diesel	Aggregate	0.35%	0.35%	2.12%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0.35%	2.07%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0.88%	5.26%	0.00	0.08	0.01	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	1.13%	6.74%	0.00	0.09	0.01	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	1%	8.70%	0.00	0.15	0.01	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**17%**	**100%**	**0.02**	**0.36**	**0.36**	**0.00**	**0.03**	**0.02**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants - Visitors

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

			Emission year								
51,711								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	0.18	1.39	29.46	0.15	3.50	1.41
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	0.00	0.01	0.14	0.00	0.04	0.02
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	0.22	0.09
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	0.02	0.17	3.21	0.02	0.35	0.14
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	0.01	0.01
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	0.09	0.55	11.14	0.05	1.09	0.44
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.00	0.01	0.04	0.00	0.01	0.01
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	0.03	0.01
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	1.58	0.82	12.88	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**1.88**	**2.94**	**56.87**	**0.22**	**5.26**	**2.13**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants Commute - Faculty and Staff

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

240,223		Emission year				lbs/day					
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	0.82	6.44	136.87	0.69	16.24	6.57
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	0.02	0.05	0.67	0.01	0.20	0.08
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	1.04	0.41
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	0.12	0.78	14.89	0.08	1.64	0.67
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	0.06	0.02
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	0.43	2.55	51.77	0.25	5.05	2.05
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.02	0.03	0.16	0.00	0.05	0.02
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	0.15	0.06
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	7.34	3.82	59.84	0.01	0.01	0.01
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**8.75**	**13.67**	**264.21**	**1.04**	**24.45**	**9.90**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants Commute - Students

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

		Emission year									
60,317								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	0.21	1.62	34.37	0.17	4.08	1.65
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	0.01	0.01	0.17	0.00	0.05	0.02
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	0.26	0.10
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	0.03	0.20	3.74	0.02	0.41	0.17
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	0.01	0.01
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	0.11	0.64	13.00	0.06	1.27	0.51
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.00	0.01	0.04	0.00	0.01	0.01
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	0.04	0.01
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	1.84	0.96	15.03	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**2.20**	**3.43**	**66.34**	**0.26**	**6.14**	**2.49**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants - Vendors

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Annual VMT			Emission year								
158,600								lbs/day			
Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Diesel	Aggregate	0.64%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Electricity	Aggregate	3.37%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Gasoline	Aggregate	5.25%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregate	16.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Diesel	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Electricity	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Gasoline	Aggregate	1.06%	1.06%	6.33%	0.21	1.35	4.54	0.19	0.05	0.18
LHD1	Diesel	Aggregate	1.00%	1.00%	5.99%	2.67	5.38	12.12	0.09	0.20	0.25
LHD2	Gasoline	Aggregate	0.16%	0.16%	0.96%	0.03	0.20	0.58	0.03	0.01	0.03
LHD2	Diesel	Aggregate	0.39%	0.39%	2.34%	1.06	2.34	4.81	0.04	0.14	0.10
MCY	Gasoline	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Gasoline	Aggregate	9.97%	9.97%	59.50%	0.86	5.14	99.32	0.58	9.67	3.92
MDV	Diesel	Aggregate	0.35%	0.35%	2.12%	0.04	0.08	1.22	0.02	0.35	0.14
MDV	Electricity	Aggregate	0.35%	0.35%	2.07%	0.00	0.00	0.00	0.00	0.33	0.13
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0.88%	5.26%	0.17	28.79	1.97	0.14	0.14	0.22
T6 instate small	Diesel	Aggregate	1.13%	1.13%	6.74%	0.21	34.29	2.42	0.19	0.16	0.28
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	1%	8.70%	0.56	54.65	4.81	0.29	0.83	1.09
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**17%**	**100%**	**5.81**	**132.22**	**131.81**	**1.56**	**11.88**	**6.34**
								Tons/yr			
						0.00	**0.07**	**0.07**	**0.00**	**0.01**	**0.00**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants - Visitors

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Visitor Trips = Passenger Vehicles only

Annual VMT — Emission year

18,623,864

Vehicle Type	Fuel Type	Speed	County Percent of VMT	Adjusted	Percent of VMT	ROG (lbs/day)	NOx (lbs/day)	CO (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	63.53	499.56	10,611.30	53.34	1,259.38	509.60
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	1.70	3.85	51.68	0.51	15.75	6.46
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	80.39	31.89
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	8.92	60.22	1,154.46	6.30	127.26	51.59
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.01	0.02	0.06	0.00	0.02	0.01
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	4.57	1.81
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	33.33	197.72	4,013.52	19.40	391.70	158.63
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	1.22	2.50	12.70	0.17	4.26	1.89
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	11.61	4.60
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	569.37	296.12	4,639.58	0.55	0.59	1.03
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**678.07**	**1,059.99**	**20,483.30**	**80.27**	**1,895.53**	**767.52**
						Tons/yr					
						0.34	**0.53**	**10.24**	**0.04**	**0.95**	**0.38**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants Commute - Faculty and Staff

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

Annual VMT Emission year

65,493,346						lbs/day					
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	223.41	1,756.78	37,316.09	187.59	4,428.78	1,792.09
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	5.99	13.52	181.75	1.80	55.37	22.73
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	282.71	112.14
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	31.36	211.78	4,059.80	22.14	447.54	181.44
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.02	0.06	0.21	0.00	0.07	0.03
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	16.08	6.38
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	117.20	695.29	14,114.08	68.21	1,377.46	557.84
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	4.28	8.80	44.66	0.61	14.97	6.65
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	40.82	16.19
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	2,002.26	1,041.36	16,315.70	1.92	2.08	3.62
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**2,384.52**	**3,727.60**	**72,032.29**	**282.27**	**6,665.88**	**2,699.10**
								Tons/yr			
						1.19	**1.86**	**36.02**	**0.14**	**3.33**	**1.35**

LRDP Update 2036 Emissions Rates: Criteria Air Pollutants Commute - Students

Based on EMFAC2017, Version 1.0.3 Webdata -Emission Rates. Alameda County.

Commute Trips = Passenger Vehicles only

Annual VMT | Emission year

14,461,436						lbs/day					
Vehicle Type	**Fuel Type**	**Speed**	**County Percent of VMT**	**Adjusted**	**Percent of VMT**	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	49.33	387.91	8,239.68	41.42	977.91	395.71
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	1.32	2.99	40.13	0.40	12.23	5.02
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0.00	62.43	24.76
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	6.92	46.76	896.44	4.89	98.82	40.06
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.00	0.01	0.05	0.00	0.01	0.01
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0.00	3.55	1.41
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	25.88	153.53	3,116.50	15.06	304.15	123.18
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	0.94	1.94	9.86	0.13	3.31	1.47
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0.00	9.01	3.57
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	442.12	229.94	3,602.63	0.42	0.46	0.80
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00
			100%	**79%**	**100%**	**526.52**	**823.08**	**15,905.29**	**62.33**	**1,471.88**	**595.98**
						Tons/yr					
						0.26	**0.41**	**7.95**	**0.03**	**0.74**	**0.30**

2036 Emission Rates **GHG Emissions: LRDP 2036 - Vendor**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

						CO_2 (Pavley)	CH_4	N_2O	
		Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	158,600					1	28	265	
Vehicle Type	**Fuel Type**	**Speed***	**Percent of VMT**	**Adjusted**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
LDA	Gasoline	Aggregate	51.98%	0%	0%	0.00	0.00	0.00	0
LDA	Diesel	Aggregate	0.64%	0%	0%	0.00	0.00	0.00	0
LDA	Electricity	Aggregate	3.37%	0%	0%	0.00	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.25%	0%	0%	0.00	0.00	0.00	0
LDT1	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
LDT1	Electricity	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0
LDT2	Gasoline	Aggregate	16.16%	0%	0%	0.00	0.00	0.00	0
LDT2	Diesel	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0
LDT2	Electricity	Aggregate	0.49%	0.49%	2.82%	0.00	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.06%	1.06%	6.15%	8.30	0.00	0.00	8
LHD1	Diesel	Aggregate	1.00%	1.00%	5.82%	4.19	0.00	0.00	4
LHD2	Gasoline	Aggregate	0.16%	0.16%	0.93%	1.44	0.00	0.00	1
LHD2	Diesel	Aggregate	0.39%	0.39%	2.27%	1.84	0.00	0.00	2
MCY	Gasoline	Aggregate	0.49%	0%	0%	0.00	0.00	0.00	0
MDV	Gasoline	Aggregate	9.97%	9.97%	57.82%	28.52	0.00	0.00	29
MDV	Diesel	Aggregate	0.35%	0.35%	2.06%	1.00	0.00	0.00	1
MDV	Electricity	Aggregate	0.35%	0.35%	2.01%	0.00	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.88%	0.88%	5.11%	6.51	0.00	0.00	7
T6 instate small	Diesel	Aggregate	1.13%	1.13%	6.55%	8.65	0.00	0.00	9
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.46%	1.46%	8.45%	13.31	0.00	0.00	14
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
			100%	**17%**	**100%**	**73.77**	**0.00**	**0.01**	**75**

2036 Emission Rates **GHG Emissions: LRDP 2036 - Visitors**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Visitor Trips = Passenger Vehicles only

						CO_2 (Pavley)	CH_4	N_2O	
		Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	18,623,864					1	28	265	
Vehicle Type	**Fuel Type**	**Speed***	**Percent of VMT**	**Adjusted**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	2,699.63	0.01	0.04	2,710
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	27.06	0.00	0.00	28
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	318.67	0.00	0.00	320
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.06	0.00	0.00	0
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	981.60	0.00	0.01	985
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	9.14	0.00	0.00	9
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	25.06	0.04	0.01	28
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
			100%	**79%**	**100%**	**4,061.21**	**0.05**	**0.07**	**4,080**

2036 Emission Rates **GHG Emissions: LRDP 2036 Commute - Faculty and Staff**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

						CO_2 (Pavley)	CH_4	N_2O	
		Emission year				AR5 GWP	AR5 GWP	AR5 GWP	
	65,493,346					1	28	265	
Vehicle Type	**Fuel Type**	**Speed***	**Percent of VMT**	**Adjusted**	**Percent of VMT**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	9,493.60	0.03	0.13	9,529
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	95.16	0.00	0.01	99
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	1,120.65	0.00	0.01	1,125
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.20	0.00	0.00	0
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	3,451.93	0.02	0.04	3,464
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	32.15	0.00	0.00	33
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	88.12	0.14	0.03	99
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
			100%	**79%**	**100%**	**14,281.80**	**0.19**	**0.23**	**14,348**

2036 Emission Rates **GHG Emissions: LRDP 2036 Commute - Students**

Based on EMFAC2017, Version 1.0.3 Webdata - Emission Rates. Alameda County

Commute Trips = Passenger Vehicles only

Vehicle Type	Fuel Type	Speed*	County Percent of VMT	Adjusted	Percent of VMT	CO_2	CH_4	N_2O	CO_2e
		Emission year				CO_2 (Pavley)	CH_4	N_2O	
						AR5 GWP	AR5 GWP	AR5 GWP	
	14,461,436					1	28	265	
All Other Buses	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
LDA	Gasoline	Aggregate	51.98%	51.98%	66.02%	2,096.26	0.01	0.03	2,104
LDA	Diesel	Aggregate	0.64%	0.64%	0.82%	21.01	0.00	0.00	22
LDA	Electricity	Aggregate	3.37%	3.37%	4.28%	0.00	0.00	0.00	0
LDT1	Gasoline	Aggregate	5.25%	5.25%	6.66%	247.45	0.00	0.00	248
LDT1	Diesel	Aggregate	0.00%	0.00%	0.00%	0.04	0.00	0.00	0
LDT1	Electricity	Aggregate	0.19%	0.19%	0.24%	0.00	0.00	0.00	0
LDT2	Gasoline	Aggregate	16.16%	16.16%	20.52%	762.21	0.00	0.01	765
LDT2	Diesel	Aggregate	0.16%	0.16%	0.21%	7.10	0.00	0.00	7
LDT2	Electricity	Aggregate	0.49%	0.49%	0.62%	0.00	0.00	0.00	0
LHD1	Gasoline	Aggregate	1.06%	0%	0%	0.00	0.00	0.00	0
LHD1	Diesel	Aggregate	1.00%	0%	0%	0.00	0.00	0.00	0
LHD2	Gasoline	Aggregate	0.16%	0%	0%	0.00	0.00	0.00	0
LHD2	Diesel	Aggregate	0.39%	0%	0%	0.00	0.00	0.00	0
MCY	Gasoline	Aggregate	0.49%	0.49%	0.63%	19.46	0.03	0.01	22
MDV	Gasoline	Aggregate	9.97%	0%	0%	0.00	0.00	0.00	0
MDV	Diesel	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0
MDV	Electricity	Aggregate	0.35%	0%	0%	0.00	0.00	0.00	0
MH	Gasoline	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
MH	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
Motor Coach	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
OBUS	Gasoline	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
PTO	Diesel	Aggregate	0.03%	0%	0%	0.00	0.00	0.00	0
SBUS	Gasoline	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
SBUS	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP heavy	Diesel	Aggregate	0.02%	0%	0%	0.00	0.00	0.00	0
T6 CAIRP small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 instate construction heavy	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
T6 instate construction small	Diesel	Aggregate	0.17%	0%	0%	0.00	0.00	0.00	0
T6 instate heavy	Diesel	Aggregate	0.88%	0%	0%	0.00	0.00	0.00	0
T6 instate small	Diesel	Aggregate	1.13%	0%	0%	0.00	0.00	0.00	0
T6 OOS heavy	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6 OOS small	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T6 Public	Diesel	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
T6 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T6TS	Gasoline	Aggregate	0.20%	0%	0%	0.00	0.00	0.00	0
T7 Ag	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP	Diesel	Aggregate	0.78%	0%	0%	0.00	0.00	0.00	0
T7 CAIRP construction	Diesel	Aggregate	0.08%	0%	0%	0.00	0.00	0.00	0
T7 NNOOS	Diesel	Aggregate	0.95%	0%	0%	0.00	0.00	0.00	0
T7 NOOS	Diesel	Aggregate	0.30%	0%	0%	0.00	0.00	0.00	0
T7 other port	Diesel	Aggregate	0.09%	0%	0%	0.00	0.00	0.00	0
T7 POAK	Diesel	Aggregate	0.71%	0%	0%	0.00	0.00	0.00	0
T7 Public	Diesel	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 Single	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 single construction	Diesel	Aggregate	0.19%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Diesel	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
T7 SWCV	Natural Gas	Aggregate	0.04%	0%	0%	0.00	0.00	0.00	0
T7 tractor	Diesel	Aggregate	1.46%	0%	0%	0.00	0.00	0.00	0
T7 tractor construction	Diesel	Aggregate	0.15%	0%	0%	0.00	0.00	0.00	0
T7 utility	Diesel	Aggregate	0.01%	0%	0%	0.00	0.00	0.00	0
T7IS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Gasoline	Aggregate	0.00%	0%	0%	0.00	0.00	0.00	0
UBUS	Diesel	Aggregate	0.11%	0%	0%	0.00	0.00	0.00	0
UBUS	Natural Gas	Aggregate	0.05%	0%	0%	0.00	0.00	0.00	0
			100%	**79%**	**100%**	**3,153.53**	**0.04**	**0.05**	**3,168**

EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One and Part 2

CARB. 2019, November.

https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf?utm_medium=email&utm_source=govdelivery

CARB. 2020, June 26

https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery

Effects Post-Year 2020 Annual Emissions for LDA, LDT1, LDT2, and MDV only.

EMFAC2017 Exhaust Adjustment Factors

	TOG	NOx	PM	CO	CO2
2036	1.0069	1.0088	1.0223	1.0244	1.1041

Notes:

EMFAC2017 Emissions Rates are still accurate. However, the % of EV vehicles compared to the total population changes slightly

3 % decrease in VMT from EVs.

UC Berkeley LRDP
CalEEMod Construction Estimate

LRDPAnnualConstructionEstimate

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government (Civic Center)	3,143.35	1000sqft	72.16	3,143,354.00	0
Apartments High Rise	3,871.82	Dwelling Unit	62.45	3,871,816.00	11073
Enclosed Parking with Elevator	1,081.08	1000sqft	24.82	1,081,080.00	0

1.2 Other Project Characteristics

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

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - CalEEMod Defaults. Coating and Paving phase moved to 2024

Demolition - estimate

Trips and VMT - Added Water Trucks

Grading - Export estimate for soil export for subterranean floors/parking.

Construction Off-road Equipment Mitigation - BAAQMD BMPs (CBPs AIR-2)

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	PhaseEndDate	8/25/2037	11/1/2024
tblConstructionPhase	PhaseEndDate	10/21/2036	11/1/2024
tblConstructionPhase	PhaseStartDate	10/22/2036	1/1/2024
tblConstructionPhase	PhaseStartDate	12/19/2035	1/1/2024
tblGrading	MaterialExported	0.00	30,000.00
tblGrading	MaterialExported	0.00	30,000.00
tblLandUse	LandUseSquareFeet	3,143,350.00	3,143,354.00
tblLandUse	LandUseSquareFeet	3,871,820.00	3,871,816.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00

LRDPAnnualConstructionEstimate

Alameda County, Annual

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					
2021	0.1422	1.4127	0.9700	1.8400e-003	0.0228	0.0684	0.0912	4.3800e-003	0.0635	0.0679	0.0000	161.5429	161.5429	0.0426	0.0000	162.6078
2022	0.4121	4.5293	2.8992	7.2000e-003	1.6790	0.1909	1.8699	0.7105	0.1764	0.8868	0.0000	647.4545	647.4545	0.1515	0.0000	651.2414
2023	0.4475	4.7740	3.7708	9.4900e-003	1.2482	0.1858	1.4340	0.4892	0.1709	0.6601	0.0000	844.6738	844.6738	0.2347	0.0000	850.5419
2024	46.0488	14.5335	17.5769	0.0819	6.1596	0.1874	6.3471	1.6121	0.1749	1.7870	0.0000	7,572.2722	7,572.2722	0.3730	0.0000	7,581.5974
2025	1.8154	13.6337	14.0190	0.0764	5.3312	0.1076	5.4388	1.4403	0.1008	1.5411	0.0000	7,102.0821	7,102.0821	0.2840	0.0000	7,109.1823
2026	1.7367	13.4737	13.2884	0.0748	5.3312	0.1066	5.4378	1.4403	0.0999	1.5402	0.0000	6,961.4454	6,961.4454	0.2767	0.0000	6,968.3638
2027	1.6621	13.3175	12.6441	0.0735	5.3313	0.1051	5.4363	1.4403	0.0985	1.5388	0.0000	6,835.9830	6,835.9830	0.2704	0.0000	6,842.7427
2028	1.5792	13.1414	12.0330	0.0720	5.3108	0.1028	5.4136	1.4348	0.0964	1.5311	0.0000	6,700.7705	6,700.7705	0.2635	0.0000	6,707.3588
2029	1.5052	13.0367	11.5417	0.0711	5.3313	0.1014	5.4327	1.4403	0.0951	1.5354	0.0000	6,624.8118	6,624.8118	0.2598	0.0000	6,631.3075
2030	1.4209	12.3285	11.0787	0.0707	5.3313	0.0503	5.3816	1.4403	0.0482	1.4885	0.0000	6,578.2974	6,578.2974	0.1980	0.0000	6,583.2467
2031	1.3405	12.2327	10.6351	0.0699	5.3313	0.0488	5.3802	1.4403	0.0469	1.4872	0.0000	6,504.1532	6,504.1532	0.1940	0.0000	6,509.0026
2032	1.2763	12.1999	10.2937	0.0694	5.3518	0.0477	5.3994	1.4458	0.0458	1.4916	0.0000	6,466.3232	6,466.3232	0.1914	0.0000	6,471.1073
2033	1.2086	12.0395	9.8894	0.0683	5.3109	0.0461	5.3570	1.4348	0.0444	1.4791	0.0000	6,363.9518	6,363.9518	0.1872	0.0000	6,368.6317
2034	1.1585	11.9813	9.5832	0.0678	5.3109	0.0450	5.3559	1.4348	0.0433	1.4781	0.0000	6,319.0286	6,319.0286	0.1848	0.0000	6,323.6476
2035	1.0689	11.4669	9.0273	0.0653	5.1475	0.0354	5.1829	1.3906	0.0338	1.4245	0.0000	6,087.9020	6,087.9020	0.1761	0.0000	6,092.3055
Maximum	**46.0488**	**14.5335**	**17.5769**	**0.0819**	**6.1596**	**0.1909**	**6.3471**	**1.6121**	**0.1764**	**1.7870**	**0.0000**	**7,572.2722**	**7,572.2722**	**0.3730**	**0.0000**	**7,581.5974**

LRDPAnnualConstructionEstimate

Alameda County, Annual

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					
2021	0.1422	1.4127	0.9700	1.8400e-003	0.0137	0.0684	0.0821	2.9500e-003	0.0635	0.0665	0.0000	161.5427	161.5427	0.0426	0.0000	162.6077
2022	0.4121	4.5293	2.8992	7.2000e-003	0.7563	0.1909	0.9472	0.3141	0.1764	0.4904	0.0000	647.4540	647.4540	0.1515	0.0000	651.2408
2023	0.4475	4.7740	3.7708	9.4900e-003	0.5600	0.1858	0.7458	0.2163	0.1709	0.3873	0.0000	844.6729	844.6729	0.2347	0.0000	850.5410
2024	46.0488	14.5335	17.5769	0.0819	5.4561	0.1874	5.6436	1.4603	0.1749	1.6352	0.0000	7,572.2715	7,572.2715	0.3730	0.0000	7,581.5967
2025	1.8154	13.6337	14.0190	0.0764	4.9304	0.1076	5.0380	1.3419	0.1008	1.4427	0.0000	7,102.0818	7,102.0818	0.2840	0.0000	7,109.1820
2026	1.7367	13.4737	13.2884	0.0748	4.9304	0.1066	5.0370	1.3419	0.0999	1.4418	0.0000	6,961.4451	6,961.4451	0.2767	0.0000	6,968.3635
2027	1.6621	13.3175	12.6441	0.0735	4.9304	0.1051	5.0355	1.3419	0.0985	1.4404	0.0000	6,835.9827	6,835.9827	0.2704	0.0000	6,842.7424
2028	1.5792	13.1414	12.0330	0.0720	4.9116	0.1028	5.0143	1.3368	0.0964	1.4331	0.0000	6,700.7701	6,700.7701	0.2635	0.0000	6,707.3585
2029	1.5052	13.0367	11.5417	0.0711	4.9305	0.1014	5.0319	1.3419	0.0951	1.4370	0.0000	6,624.8114	6,624.8114	0.2598	0.0000	6,631.3071
2030	1.4209	12.3285	11.0787	0.0707	4.9305	0.0503	4.9808	1.3419	0.0482	1.3901	0.0000	6,578.2970	6,578.2970	0.1980	0.0000	6,583.2463
2031	1.3405	12.2327	10.6351	0.0699	4.9305	0.0488	4.9793	1.3419	0.0469	1.3888	0.0000	6,504.1528	6,504.1528	0.1940	0.0000	6,509.0022
2032	1.2763	12.1999	10.2937	0.0694	4.9494	0.0477	4.9971	1.3471	0.0458	1.3929	0.0000	6,466.3228	6,466.3228	0.1914	0.0000	6,471.1069
2033	1.2086	12.0395	9.8894	0.0683	4.9116	0.0461	4.9578	1.3368	0.0444	1.3811	0.0000	6,363.9514	6,363.9514	0.1872	0.0000	6,368.6313
2034	1.1585	11.9813	9.5832	0.0678	4.9116	0.0450	4.9567	1.3368	0.0433	1.3801	0.0000	6,319.0282	6,319.0282	0.1848	0.0000	6,323.6472
2035	1.0689	11.4669	9.0273	0.0653	4.7605	0.0354	4.7959	1.2957	0.0338	1.3295	0.0000	6,087.9016	6,087.9016	0.1761	0.0000	6,092.3051
Maximum	**46.0488**	**14.5335**	**17.5769**	**0.0819**	**5.4561**	**0.1909**	**5.6436**	**1.4603**	**0.1764**	**1.6352**	**0.0000**	**7,572.2715**	**7,572.2715**	**0.3730**	**0.0000**	**7,581.5967**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**9.94**	**0.00**	**9.74**	**10.22**	**0.00**	**9.53**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**9-1-2021**	**11-30-2021**	1.1486	1.1486
2	**12-1-2021**	**2-28-2022**	1.0034	1.0034
3	**3-1-2022**	**5-31-2022**	0.9540	0.9540
4	**6-1-2022**	**8-31-2022**	1.4205	1.4205
5	**9-1-2022**	**11-30-2022**	1.4507	1.4507
6	**12-1-2022**	**2-28-2023**	1.3547	1.3547
7	**3-1-2023**	**5-31-2023**	1.3192	1.3192
8	**6-1-2023**	**8-31-2023**	1.3187	1.3187
9	**9-1-2023**	**11-30-2023**	1.3053	1.3053
10	**12-1-2023**	**2-29-2024**	11.0590	11.0590
11	**3-1-2024**	**5-31-2024**	17.6118	17.6118
12	**6-1-2024**	**8-31-2024**	17.5788	17.5788

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13	9-1-2024	11-30-2024	13.1566	13.1566
14	12-1-2024	2-28-2025	3.8917	3.8917
15	3-1-2025	5-31-2025	3.8894	3.8894
16	6-1-2025	8-31-2025	3.8630	3.8630
17	9-1-2025	11-30-2025	3.8730	3.8730
18	12-1-2025	2-28-2026	3.8152	3.8152
19	3-1-2026	5-31-2026	3.8292	3.8292
20	6-1-2026	8-31-2026	3.8042	3.8042
21	9-1-2026	11-30-2026	3.8119	3.8119
22	12-1-2026	2-28-2027	3.7547	3.7547
23	3-1-2027	5-31-2027	3.7708	3.7708
24	6-1-2027	8-31-2027	3.7474	3.7474
25	9-1-2027	11-30-2027	3.7528	3.7528
26	12-1-2027	2-29-2028	3.7403	3.7403
27	3-1-2028	5-31-2028	3.7195	3.7195
28	6-1-2028	8-31-2028	3.6974	3.6974
29	9-1-2028	11-30-2028	3.7007	3.7007
30	12-1-2028	2-28-2029	3.6413	3.6413
31	3-1-2029	5-31-2029	3.6599	3.6599
32	6-1-2029	8-31-2029	3.6392	3.6392
33	9-1-2029	11-30-2029	3.6404	3.6404
34	12-1-2029	2-28-2030	3.4904	3.4904
35	3-1-2030	5-31-2030	3.4598	3.4598
36	6-1-2030	8-31-2030	3.4403	3.4403
37	9-1-2030	11-30-2030	3.4413	3.4413
38	12-1-2030	2-28-2031	3.3917	3.3917
39	3-1-2031	5-31-2031	3.4147	3.4147
40	6-1-2031	8-31-2031	3.3965	3.3965
41	9-1-2031	11-30-2031	3.3955	3.3955
42	12-1-2031	2-29-2032	3.3871	3.3871
43	3-1-2032	5-31-2032	3.3767	3.3767
44	6-1-2032	8-31-2032	3.3595	3.3595
45	9-1-2032	11-30-2032	3.3569	3.3569
46	12-1-2032	2-28-2033	3.3147	3.3147
47	3-1-2033	5-31-2033	3.3445	3.3445
48	6-1-2033	8-31-2033	3.3281	3.3281
49	9-1-2033	11-30-2033	3.3241	3.3241
50	12-1-2033	2-28-2034	3.2845	3.2845
51	3-1-2034	5-31-2034	3.3165	3.3165
52	6-1-2034	8-31-2034	3.3008	3.3008
53	9-1-2034	11-30-2034	3.2958	3.2958
54	12-1-2034	2-28-2035	3.2401	3.2401
55	3-1-2035	5-31-2035	3.2639	3.2639
56	6-1-2035	8-31-2035	3.2487	3.2487

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57	**9-1-2035**	**9-30-2035**	1.0594	1.0594
		Highest	17.6118	17.6118

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/1/2021	6/7/2022	5	200	
2	Site Preparation	Site Preparation	6/8/2022	11/22/2022	5	120	
3	Grading	Grading	11/23/2022	1/30/2024	5	310	
4	Building Construction	Building Construction	1/31/2024	12/18/2035	5	3100	
5	Paving	Paving	1/1/2024	11/1/2024	5	220	
6	Architectural Coating	Architectural Coating	1/1/2024	11/1/2024	5	220	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 775

Acres of Paving: 24.82

Residential Indoor: 7,840,427; Residential Outdoor: 2,613,476; Non-Residential Indoor: 4,715,031; Non-Residential Outdoor: 1,571,677;

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

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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
Demolition	6	15.00	2.00	310.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	2.00	3,750.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	2.00	3,750.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	4,248.00	1,106.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	850.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2021

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	tons/yr										MT/yr					
Fugitive Dust					0.0148	0.0000	0.0148	2.2300e-003	0.0000	2.2300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1393	1.3834	0.9489	1.7100e-003		0.0683	0.0683		0.0634	0.0634	0.0000	149.6035	149.6035	0.0421	0.0000	150.6561
Total	**0.1393**	**1.3834**	**0.9489**	**1.7100e-003**	**0.0148**	**0.0683**	**0.0830**	**2.2300e-003**	**0.0634**	**0.0656**	**0.0000**	**149.6035**	**149.6035**	**0.0421**	**0.0000**	**150.6561**

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	5.5000e-004	0.0184	3.4100e-003	5.0000e-005	2.2500e-003	6.0000e-005	2.3100e-003	5.9000e-004	5.0000e-005	6.4000e-004	0.0000	5.1562	5.1562	2.6000e-004	0.0000	5.1626
Vendor	2.7000e-004	9.4100e-003	1.9900e-003	2.0000e-005	5.8000e-004	2.0000e-005	6.0000e-004	1.7000e-004	2.0000e-005	1.9000e-004	0.0000	2.3053	2.3053	1.3000e-004	0.0000	2.3085
Worker	2.1100e-003	1.5000e-003	0.0157	5.0000e-005	5.2200e-003	4.0000e-005	5.2500e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.4779	4.4779	1.1000e-004	0.0000	4.4806
Total	**2.9300e-003**	**0.0293**	**0.0211**	**1.2000e-004**	**8.0500e-003**	**1.2000e-004**	**8.1600e-003**	**2.1500e-003**	**1.0000e-004**	**2.2500e-003**	**0.0000**	**11.9395**	**11.9395**	**5.0000e-004**	**0.0000**	**11.9517**

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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	tons/yr										MT/yr					
Fugitive Dust					6.3100e-003	0.0000	6.3100e-003	9.5000e-004	0.0000	9.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1393	1.3834	0.9489	1.7100e-003		0.0683	0.0683		0.0634	0.0634	0.0000	149.6033	149.6033	0.0421	0.0000	150.6560
Total	**0.1393**	**1.3834**	**0.9489**	**1.7100e-003**	**6.3100e-003**	**0.0683**	**0.0746**	**9.5000e-004**	**0.0634**	**0.0644**	**0.0000**	**149.6033**	**149.6033**	**0.0421**	**0.0000**	**150.6560**

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	5.5000e-004	0.0184	3.4100e-003	5.0000e-005	2.0800e-003	6.0000e-005	2.1300e-003	5.4000e-004	5.0000e-005	6.0000e-004	0.0000	5.1562	5.1562	2.6000e-004	0.0000	5.1626
Vendor	2.7000e-004	9.4100e-003	1.9900e-003	2.0000e-005	5.4000e-004	2.0000e-005	5.6000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.3053	2.3053	1.3000e-004	0.0000	2.3085
Worker	2.1100e-003	1.5000e-003	0.0157	5.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2900e-003	3.0000e-005	1.3200e-003	0.0000	4.4779	4.4779	1.1000e-004	0.0000	4.4806
Total	**2.9300e-003**	**0.0293**	**0.0211**	**1.2000e-004**	**7.4300e-003**	**1.2000e-004**	**7.5400e-003**	**1.9900e-003**	**1.0000e-004**	**2.1000e-003**	**0.0000**	**11.9395**	**11.9395**	**5.0000e-004**	**0.0000**	**11.9517**

3.2 Demolition - 2022

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	tons/yr										MT/yr					
Fugitive Dust					0.0188	0.0000	0.0188	2.8400e-003	0.0000	2.8400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.4403	1.1533	2.1700e-003		0.0696	0.0696		0.0647	0.0647	0.0000	190.3453	190.3453	0.0535	0.0000	191.6819
Total	**0.1478**	**1.4403**	**1.1533**	**2.1700e-003**	**0.0188**	**0.0696**	**0.0884**	**2.8400e-003**	**0.0647**	**0.0675**	**0.0000**	**190.3453**	**190.3453**	**0.0535**	**0.0000**	**191.6819**

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					

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Hauling	6.6000e-004	0.0216	4.2300e-003	7.0000e-005	2.3300e-003	6.0000e-005	2.3900e-003	6.2000e-004	6.0000e-005	6.7000e-004	0.0000	6.4758	6.4758	3.2000e-004	0.0000	6.4837
Vendor	3.2000e-004	0.0114	2.3800e-003	3.0000e-005	7.4000e-004	2.0000e-005	7.6000e-004	2.1000e-004	2.0000e-005	2.3000e-004	0.0000	2.9054	2.9054	1.5000e-004	0.0000	2.9092
Worker	2.4900e-003	1.7100e-003	0.0183	6.0000e-005	6.6400e-003	4.0000e-005	6.6900e-003	1.7700e-003	4.0000e-005	1.8100e-003	0.0000	5.4915	5.4915	1.2000e-004	0.0000	5.4945
Total	**3.4700e-003**	**0.0347**	**0.0249**	**1.6000e-004**	**9.7100e-003**	**1.2000e-004**	**9.8400e-003**	**2.6000e-003**	**1.2000e-004**	**2.7100e-003**	**0.0000**	**14.8727**	**14.8727**	**5.9000e-004**	**0.0000**	**14.8875**

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	tons/yr										MT/yr					
Fugitive Dust					8.0300e-003	0.0000	8.0300e-003	1.2200e-003	0.0000	1.2200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.4403	1.1533	2.1700e-003		0.0696	0.0696		0.0647	0.0647	0.0000	190.3451	190.3451	0.0535	0.0000	191.6817
Total	**0.1478**	**1.4403**	**1.1533**	**2.1700e-003**	**8.0300e-003**	**0.0696**	**0.0776**	**1.2200e-003**	**0.0647**	**0.0659**	**0.0000**	**190.3451**	**190.3451**	**0.0535**	**0.0000**	**191.6817**

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	6.6000e-004	0.0216	4.2300e-003	7.0000e-005	2.1600e-003	6.0000e-005	2.2200e-003	5.7000e-004	6.0000e-005	6.3000e-004	0.0000	6.4758	6.4758	3.2000e-004	0.0000	6.4837
Vendor	3.2000e-004	0.0114	2.3800e-003	3.0000e-005	6.9000e-004	2.0000e-005	7.1000e-004	2.0000e-004	2.0000e-005	2.2000e-004	0.0000	2.9054	2.9054	1.5000e-004	0.0000	2.9092
Worker	2.4900e-003	1.7100e-003	0.0183	6.0000e-005	6.1300e-003	4.0000e-005	6.1700e-003	1.6400e-003	4.0000e-005	1.6800e-003	0.0000	5.4915	5.4915	1.2000e-004	0.0000	5.4945
Total	**3.4700e-003**	**0.0347**	**0.0249**	**1.6000e-004**	**8.9800e-003**	**1.2000e-004**	**9.1000e-003**	**2.4100e-003**	**1.2000e-004**	**2.5300e-003**	**0.0000**	**14.8727**	**14.8727**	**5.9000e-004**	**0.0000**	**14.8875**

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3.3 Site Preparation - 2022

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	tons/yr										MT/yr					
Fugitive Dust					1.0857	0.0000	1.0857	0.5961	0.0000	0.5961	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1902	1.9850	1.1819	2.2800e-003		0.0968	0.0968		0.0890	0.0890	0.0000	200.6363	200.6363	0.0649	0.0000	202.2586
Total	**0.1902**	**1.9850**	**1.1819**	**2.2800e-003**	**1.0857**	**0.0968**	**1.1824**	**0.5961**	**0.0890**	**0.6851**	**0.0000**	**200.6363**	**200.6363**	**0.0649**	**0.0000**	**202.2586**

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	0.0142	0.4657	0.0915	1.4500e-003	0.0318	1.3200e-003	0.0331	8.7400e-003	1.2600e-003	0.0100	0.0000	139.8867	139.8867	6.8200e-003	0.0000	140.0571
Vendor	3.5000e-004	0.0122	2.5500e-003	3.0000e-005	7.9000e-004	2.0000e-005	8.1000e-004	2.3000e-004	2.0000e-005	2.5000e-004	0.0000	3.1129	3.1129	1.7000e-004	0.0000	3.1170
Worker	3.2000e-003	2.2000e-003	0.0236	8.0000e-005	8.5400e-003	6.0000e-005	8.6000e-003	2.2700e-003	5.0000e-005	2.3200e-003	0.0000	7.0605	7.0605	1.6000e-004	0.0000	7.0644
Total	**0.0177**	**0.4801**	**0.1176**	**1.5600e-003**	**0.0411**	**1.4000e-003**	**0.0425**	**0.0112**	**1.3300e-003**	**0.0126**	**0.0000**	**150.0600**	**150.0600**	**7.1500e-003**	**0.0000**	**150.2385**

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	tons/yr										MT/yr					
Fugitive Dust					0.4641	0.0000	0.4641	0.2548	0.0000	0.2548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1902	1.9850	1.1819	2.2800e-003		0.0968	0.0968		0.0890	0.0890	0.0000	200.6361	200.6361	0.0649	0.0000	202.2584
Total	**0.1902**	**1.9850**	**1.1819**	**2.2800e-003**	**0.4641**	**0.0968**	**0.5609**	**0.2548**	**0.0890**	**0.3438**	**0.0000**	**200.6361**	**200.6361**	**0.0649**	**0.0000**	**202.2584**

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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	tons/yr										MT/yr					
Hauling	0.0142	0.4657	0.0915	1.4500e-003	0.0296	1.3200e-003	0.0309	8.2200e-003	1.2600e-003	9.4800e-003	0.0000	139.8867	139.8867	6.8200e-003	0.0000	140.0571
Vendor	3.5000e-004	0.0122	2.5500e-003	3.0000e-005	7.4000e-004	2.0000e-005	7.6000e-004	2.2000e-004	2.0000e-005	2.4000e-004	0.0000	3.1129	3.1129	1.7000e-004	0.0000	3.1170
Worker	3.2000e-003	2.2000e-003	0.0236	8.0000e-005	7.8800e-003	6.0000e-005	7.9300e-003	2.1100e-003	5.0000e-005	2.1600e-003	0.0000	7.0605	7.0605	1.6000e-004	0.0000	7.0644
Total	**0.0177**	**0.4801**	**0.1176**	**1.5600e-003**	**0.0382**	**1.4000e-003**	**0.0396**	**0.0106**	**1.3300e-003**	**0.0119**	**0.0000**	**150.0600**	**150.0600**	**7.1500e-003**	**0.0000**	**150.2385**

3.4 Grading - 2022

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	tons/yr										MT/yr					
Fugitive Dust					0.4970	0.0000	0.4970	0.0910	0.0000	0.0910	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5438	0.4066	8.7000e-004		0.0229	0.0229		0.0211	0.0211	0.0000	76.3484	76.3484	0.0247	0.0000	76.9658
Total	**0.0508**	**0.5438**	**0.4066**	**8.7000e-004**	**0.4970**	**0.0229**	**0.5198**	**0.0910**	**0.0211**	**0.1120**	**0.0000**	**76.3484**	**76.3484**	**0.0247**	**0.0000**	**76.9658**

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	1.2800e-003	0.0421	8.2600e-003	1.3000e-004	0.0245	1.2000e-004	0.0246	6.0900e-003	1.1000e-004	6.2000e-003	0.0000	12.6349	12.6349	6.2000e-004	0.0000	12.6503
Vendor	8.0000e-005	2.8400e-003	5.9000e-004	1.0000e-005	1.8000e-004	1.0000e-005	1.9000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.7264	0.7264	4.0000e-005	0.0000	0.7273
Worker	8.3000e-004	5.7000e-004	6.1100e-003	2.0000e-005	2.2100e-003	1.0000e-005	2.2300e-003	5.9000e-004	1.0000e-005	6.0000e-004	0.0000	1.8305	1.8305	4.0000e-005	0.0000	1.8315
Total	**2.1900e-003**	**0.0455**	**0.0150**	**1.6000e-004**	**0.0268**	**1.4000e-004**	**0.0270**	**6.7300e-003**	**1.3000e-004**	**6.8600e-003**	**0.0000**	**15.1918**	**15.1918**	**7.0000e-004**	**0.0000**	**15.2091**

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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	tons/yr										MT/yr					
Fugitive Dust					0.2125	0.0000	0.2125	0.0389	0.0000	0.0389	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5438	0.4066	8.7000e-004		0.0229	0.0229		0.0211	0.0211	0.0000	76.3484	76.3484	0.0247	0.0000	76.9657
Total	**0.0508**	**0.5438**	**0.4066**	**8.7000e-004**	**0.2125**	**0.0229**	**0.2353**	**0.0389**	**0.0211**	**0.0600**	**0.0000**	**76.3484**	**76.3484**	**0.0247**	**0.0000**	**76.9657**

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	1.2800e-003	0.0421	8.2600e-003	1.3000e-004	0.0223	1.2000e-004	0.0224	5.5600e-003	1.1000e-004	5.6800e-003	0.0000	12.6349	12.6349	6.2000e-004	0.0000	12.6503
Vendor	8.0000e-005	2.8400e-003	5.9000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.7264	0.7264	4.0000e-005	0.0000	0.7273
Worker	8.3000e-004	5.7000e-004	6.1100e-003	2.0000e-005	2.0400e-003	1.0000e-005	2.0600e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.8305	1.8305	4.0000e-005	0.0000	1.8315
Total	**2.1900e-003**	**0.0455**	**0.0150**	**1.6000e-004**	**0.0245**	**1.4000e-004**	**0.0247**	**6.1600e-003**	**1.3000e-004**	**6.3000e-003**	**0.0000**	**15.1918**	**15.1918**	**7.0000e-004**	**0.0000**	**15.2091**

3.4 Grading - 2023

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	tons/yr										MT/yr					
Fugitive Dust					1.1955	0.0000	1.1955	0.4750	0.0000	0.4750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4318	4.4870	3.6467	8.0700e-003		0.1852	0.1852		0.1704	0.1704	0.0000	708.9577	708.9577	0.2293	0.0000	714.6900
Total	**0.4318**	**4.4870**	**3.6467**	**8.0700e-003**	**1.1955**	**0.1852**	**1.3807**	**0.4750**	**0.1704**	**0.6453**	**0.0000**	**708.9577**	**708.9577**	**0.2293**	**0.0000**	**714.6900**

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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	tons/yr										MT/yr					
Hauling	7.9700e-003	0.2618	0.0674	1.1700e-003	0.0305	4.5000e-004	0.0309	8.2700e-003	4.3000e-004	8.7000e-003	0.0000	112.8160	112.8160	4.8100e-003	0.0000	112.9362
Vendor	5.5000e-004	0.0205	4.8200e-003	7.0000e-005	1.7100e-003	2.0000e-005	1.7300e-003	4.9000e-004	2.0000e-005	5.1000e-004	0.0000	6.5528	6.5528	2.9000e-004	0.0000	6.5599
Worker	7.1800e-003	4.7500e-003	0.0520	1.8000e-004	0.0206	1.3000e-004	0.0207	5.4700e-003	1.2000e-004	5.5900e-003	0.0000	16.3473	16.3473	3.4000e-004	0.0000	16.3558
Total	**0.0157**	**0.2870**	**0.1241**	**1.4200e-003**	**0.0527**	**6.0000e-004**	**0.0533**	**0.0142**	**5.7000e-004**	**0.0148**	**0.0000**	**135.7160**	**135.7160**	**5.4400e-003**	**0.0000**	**135.8519**

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	tons/yr										MT/yr					
Fugitive Dust					0.5111	0.0000	0.5111	0.2030	0.0000	0.2030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4318	4.4870	3.6467	8.0700e-003		0.1852	0.1852		0.1704	0.1704	0.0000	708.9569	708.9569	0.2293	0.0000	714.6891
Total	**0.4318**	**4.4870**	**3.6467**	**8.0700e-003**	**0.5111**	**0.1852**	**0.6963**	**0.2030**	**0.1704**	**0.3734**	**0.0000**	**708.9569**	**708.9569**	**0.2293**	**0.0000**	**714.6891**

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	7.9700e-003	0.2618	0.0674	1.1700e-003	0.0283	4.5000e-004	0.0288	7.7500e-003	4.3000e-004	8.1800e-003	0.0000	112.8160	112.8160	4.8100e-003	0.0000	112.9362
Vendor	5.5000e-004	0.0205	4.8200e-003	7.0000e-005	1.6000e-003	2.0000e-005	1.6200e-003	4.7000e-004	2.0000e-005	4.9000e-004	0.0000	6.5528	6.5528	2.9000e-004	0.0000	6.5599
Worker	7.1800e-003	4.7500e-003	0.0520	1.8000e-004	0.0190	1.3000e-004	0.0191	5.0800e-003	1.2000e-004	5.2000e-003	0.0000	16.3473	16.3473	3.4000e-004	0.0000	16.3558
Total	**0.0157**	**0.2870**	**0.1241**	**1.4200e-003**	**0.0489**	**6.0000e-004**	**0.0495**	**0.0133**	**5.7000e-004**	**0.0139**	**0.0000**	**135.7160**	**135.7160**	**5.4400e-003**	**0.0000**	**135.8519**

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3.4 Grading - 2024

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	tons/yr										MT/yr					
Fugitive Dust					0.4789	0.0000	0.4789	0.0810	0.0000	0.0810	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0354	0.3562	0.3050	6.8000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	59.9715	59.9715	0.0194	0.0000	60.4564
Total	**0.0354**	**0.3562**	**0.3050**	**6.8000e-004**	**0.4789**	**0.0147**	**0.4936**	**0.0810**	**0.0135**	**0.0946**	**0.0000**	**59.9715**	**59.9715**	**0.0194**	**0.0000**	**60.4564**

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	6.7000e-004	0.0218	5.6800e-003	1.0000e-004	0.0243	4.0000e-005	0.0243	6.0300e-003	4.0000e-005	6.0700e-003	0.0000	9.4768	9.4768	4.1000e-004	0.0000	9.4869
Vendor	5.0000e-005	1.7200e-003	3.9000e-004	1.0000e-005	1.4000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.5506	0.5506	2.0000e-005	0.0000	0.5512
Worker	5.7000e-004	3.6000e-004	4.0600e-003	1.0000e-005	1.7400e-003	1.0000e-005	1.7500e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.3284	1.3284	3.0000e-005	0.0000	1.3291
Total	**1.2900e-003**	**0.0239**	**0.0101**	**1.2000e-004**	**0.0262**	**5.0000e-005**	**0.0262**	**6.5300e-003**	**5.0000e-005**	**6.5800e-003**	**0.0000**	**11.3558**	**11.3558**	**4.6000e-004**	**0.0000**	**11.3672**

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	tons/yr										MT/yr					
Fugitive Dust					0.2047	0.0000	0.2047	0.0347	0.0000	0.0347	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0354	0.3562	0.3050	6.8000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	59.9714	59.9714	0.0194	0.0000	60.4563
Total	**0.0354**	**0.3562**	**0.3050**	**6.8000e-004**	**0.2047**	**0.0147**	**0.2194**	**0.0347**	**0.0135**	**0.0482**	**0.0000**	**59.9714**	**59.9714**	**0.0194**	**0.0000**	**60.4563**

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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	tons/yr										MT/yr					
Hauling	6.7000e-004	0.0218	5.6800e-003	1.0000e-004	0.0222	4.0000e-005	0.0222	5.5100e-003	4.0000e-005	5.5400e-003	0.0000	9.4768	9.4768	4.1000e-004	0.0000	9.4869
Vendor	5.0000e-005	1.7200e-003	3.9000e-004	1.0000e-005	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.5506	0.5506	2.0000e-005	0.0000	0.5512
Worker	5.7000e-004	3.6000e-004	4.0600e-003	1.0000e-005	1.6000e-003	1.0000e-005	1.6200e-003	4.3000e-004	1.0000e-005	4.4000e-004	0.0000	1.3284	1.3284	3.0000e-005	0.0000	1.3291
Total	**1.2900e-003**	**0.0239**	**0.0101**	**1.2000e-004**	**0.0239**	**5.0000e-005**	**0.0240**	**5.9800e-003**	**5.0000e-005**	**6.0200e-003**	**0.0000**	**11.3558**	**11.3558**	**4.6000e-004**	**0.0000**	**11.3672**

3.5 Building Construction - 2024

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	tons/yr										MT/yr					
Off-Road	0.1766	1.6133	1.9400	3.2300e-003		0.0736	0.0736		0.0692	0.0692	0.0000	278.2189	278.2189	0.0658	0.0000	279.8637
Total	**0.1766**	**1.6133**	**1.9400**	**3.2300e-003**		**0.0736**	**0.0736**		**0.0692**	**0.0692**	**0.0000**	**278.2189**	**278.2189**	**0.0658**	**0.0000**	**279.8637**

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	0.2732	10.3622	2.3577	0.0346	0.8717	0.0109	0.8826	0.2522	0.0104	0.2626	0.0000	3,321.7620	3,321.7620	0.1439	0.0000	3,325.3605
Worker	1.3166	0.8396	9.4013	0.0340	4.0305	0.0252	4.0558	1.0722	0.0232	1.0954	0.0000	3,078.0486	3,078.0486	0.0595	0.0000	3,079.5360
Total	**1.5898**	**11.2018**	**11.7590**	**0.0687**	**4.9022**	**0.0362**	**4.9384**	**1.3244**	**0.0337**	**1.3580**	**0.0000**	**6,399.8106**	**6,399.8106**	**0.2034**	**0.0000**	**6,404.8964**

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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	tons/yr										MT/yr					
Off-Road	0.1766	1.6133	1.9400	3.2300e-003		0.0736	0.0736		0.0692	0.0692	0.0000	278.2186	278.2186	0.0658	0.0000	279.8634
Total	**0.1766**	**1.6133**	**1.9400**	**3.2300e-003**		**0.0736**	**0.0736**		**0.0692**	**0.0692**	**0.0000**	**278.2186**	**278.2186**	**0.0658**	**0.0000**	**279.8634**

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	0.2732	10.3622	2.3577	0.0346	0.8166	0.0109	0.8275	0.2386	0.0104	0.2491	0.0000	3,321.7620	3,321.7620	0.1439	0.0000	3,325.3605
Worker	1.3166	0.8396	9.4013	0.0340	3.7171	0.0252	3.7424	0.9953	0.0232	1.0185	0.0000	3,078.0486	3,078.0486	0.0595	0.0000	3,079.5360
Total	**1.5898**	**11.2018**	**11.7590**	**0.0687**	**4.5337**	**0.0362**	**4.5698**	**1.2339**	**0.0337**	**1.2676**	**0.0000**	**6,399.8106**	**6,399.8106**	**0.2034**	**0.0000**	**6,404.8964**

3.5 Building Construction - 2025

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	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

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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	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	0.2892	11.1781	2.4727	0.0374	0.9480	0.0117	0.9597	0.2743	0.0112	0.2854	0.0000	3,588.7095	3,588.7095	0.1543	0.0000	3,592.5673
Worker	1.3477	0.8283	9.4473	0.0355	4.3832	0.0270	4.4102	1.1660	0.0249	1.1909	0.0000	3,210.7177	3,210.7177	0.0586	0.0000	3,212.1815
Total	**1.6369**	**12.0064**	**11.9200**	**0.0729**	**5.3312**	**0.0387**	**5.3699**	**1.4403**	**0.0361**	**1.4763**	**0.0000**	**6,799.4272**	**6,799.4272**	**0.2129**	**0.0000**	**6,804.7488**

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	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

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	0.2892	11.1781	2.4727	0.0374	0.8880	0.0117	0.8997	0.2595	0.0112	0.2707	0.0000	3,588.7095	3,588.7095	0.1543	0.0000	3,592.5673
Worker	1.3477	0.8283	9.4473	0.0355	4.0424	0.0270	4.0694	1.0824	0.0249	1.1072	0.0000	3,210.7177	3,210.7177	0.0586	0.0000	3,212.1815
Total	**1.6369**	**12.0064**	**11.9200**	**0.0729**	**4.9304**	**0.0387**	**4.9691**	**1.3419**	**0.0361**	**1.3779**	**0.0000**	**6,799.4272**	**6,799.4272**	**0.2129**	**0.0000**	**6,804.7488**

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3.5 Building Construction - 2026

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	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

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	0.2828	11.0895	2.4006	0.0372	0.9480	0.0115	0.9596	0.2743	0.0110	0.2853	0.0000	3,567.5529	3,567.5529	0.1523	0.0000	3,571.3604
Worker	1.2755	0.7569	8.7888	0.0342	4.3832	0.0262	4.4094	1.1660	0.0242	1.1902	0.0000	3,091.2377	3,091.2377	0.0533	0.0000	3,092.5699
Total	**1.5583**	**11.8464**	**11.1893**	**0.0713**	**5.3312**	**0.0378**	**5.3690**	**1.4403**	**0.0352**	**1.4754**	**0.0000**	**6,658.7906**	**6,658.7906**	**0.2056**	**0.0000**	**6,663.9303**

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	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

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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					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	0.2828	11.0895	2.4006	0.0372	0.8881	0.0115	0.8996	0.2595	0.0110	0.2706	0.0000	3,567.5529	3,567.5529	0.1523	0.0000	3,571.3604
Worker	1.2755	0.7569	8.7888	0.0342	4.0424	0.0262	4.0686	1.0824	0.0242	1.1065	0.0000	3,091.2377	3,091.2377	0.0533	0.0000	3,092.5699
Total	**1.5583**	**11.8464**	**11.1893**	**0.0713**	**4.9304**	**0.0378**	**4.9682**	**1.3419**	**0.0352**	**1.3771**	**0.0000**	**6,658.7906**	**6,658.7906**	**0.2056**	**0.0000**	**6,663.9303**

3.5 Building Construction - 2027

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					tons/yr									MT/yr		
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

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	0.2770	10.9970	2.3403	0.0370	0.9481	0.0114	0.9594	0.2743	0.0109	0.2851	0.0000	3,548.3237	3,548.3237	0.1507	0.0000	3,552.0899
Worker	1.2066	0.6932	8.2048	0.0330	4.3832	0.0249	4.4081	1.1660	0.0229	1.1889	0.0000	2,985.0045	2,985.0045	0.0486	0.0000	2,986.2194
Total	**1.4837**	**11.6902**	**10.5451**	**0.0699**	**5.3313**	**0.0362**	**5.3675**	**1.4403**	**0.0337**	**1.4740**	**0.0000**	**6,533.3282**	**6,533.3282**	**0.1993**	**0.0000**	**6,538.3092**

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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	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

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	0.2770	10.9970	2.3403	0.0370	0.8881	0.0114	0.8994	0.2595	0.0109	0.2704	0.0000	3,548.3237	3,548.3237	0.1507	0.0000	3,552.0899
Worker	1.2066	0.6932	8.2048	0.0330	4.0424	0.0249	4.0672	1.0824	0.0229	1.1052	0.0000	2,985.0045	2,985.0045	0.0486	0.0000	2,986.2194
Total	**1.4837**	**11.6902**	**10.5451**	**0.0699**	**4.9304**	**0.0362**	**4.9667**	**1.3419**	**0.0337**	**1.3756**	**0.0000**	**6,533.3282**	**6,533.3282**	**0.1993**	**0.0000**	**6,538.3092**

3.5 Building Construction - 2028

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	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4953**	**301.4953**	**0.0709**	**0.0000**	**303.2671**

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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	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	0.2711	10.8862	2.2821	0.0367	0.9445	0.0112	0.9556	0.2732	0.0107	0.2839	0.0000	3,519.2069	3,519.2069	0.1483	0.0000	3,522.9150
Worker	1.1303	0.6341	7.6599	0.0318	4.3664	0.0230	4.3894	1.1615	0.0212	1.1827	0.0000	2,880.0683	2,880.0683	0.0443	0.0000	2,881.1768
Total	**1.4014**	**11.5204**	**9.9420**	**0.0685**	**5.3108**	**0.0342**	**5.3450**	**1.4348**	**0.0319**	**1.4666**	**0.0000**	**6,399.2752**	**6,399.2752**	**0.1927**	**0.0000**	**6,404.0917**

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	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4949**	**301.4949**	**0.0709**	**0.0000**	**303.2667**

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	0.2711	10.8862	2.2821	0.0367	0.8847	0.0112	0.8959	0.2586	0.0107	0.2692	0.0000	3,519.2069	3,519.2069	0.1483	0.0000	3,522.9150
Worker	1.1303	0.6341	7.6599	0.0318	4.0269	0.0230	4.0499	1.0782	0.0212	1.0994	0.0000	2,880.0683	2,880.0683	0.0443	0.0000	2,881.1768
Total	**1.4014**	**11.5204**	**9.9420**	**0.0685**	**4.9116**	**0.0342**	**4.9458**	**1.3368**	**0.0319**	**1.3686**	**0.0000**	**6,399.2752**	**6,399.2752**	**0.1927**	**0.0000**	**6,404.0917**

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3.5 Building Construction - 2029

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	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

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	0.2667	10.8244	2.2354	0.0366	0.9481	0.0110	0.9591	0.2743	0.0105	0.2848	0.0000	3,513.8939	3,513.8939	0.1480	0.0000	3,517.5929
Worker	1.0601	0.5850	7.2072	0.0310	4.3832	0.0216	4.4047	1.1660	0.0198	1.1858	0.0000	2,808.2630	2,808.2630	0.0407	0.0000	2,809.2811
Total	**1.3268**	**11.4094**	**9.4426**	**0.0676**	**5.3313**	**0.0326**	**5.3638**	**1.4403**	**0.0304**	**1.4706**	**0.0000**	**6,322.1569**	**6,322.1569**	**0.1887**	**0.0000**	**6,326.8740**

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	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

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	0.2667	10.8244	2.2354	0.0366	0.8881	0.0110	0.8991	0.2596	0.0105	0.2701	0.0000	3,513.8939	3,513.8939	0.1480	0.0000	3,517.5929
Worker	1.0601	0.5850	7.2072	0.0310	4.0424	0.0216	4.0639	1.0824	0.0198	1.1022	0.0000	2,808.2630	2,808.2630	0.0407	0.0000	2,809.2811
Total	**1.3268**	**11.4094**	**9.4426**	**0.0676**	**4.9305**	**0.0326**	**4.9630**	**1.3419**	**0.0304**	**1.3723**	**0.0000**	**6,322.1569**	**6,322.1569**	**0.1887**	**0.0000**	**6,326.8740**

3.5 Building Construction - 2030

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	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

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	0.2628	10.7547	2.1969	0.0364	0.9481	0.0108	0.9590	0.2743	0.0104	0.2846	0.0000	3,499.9476	3,499.9476	0.1469	0.0000	3,503.6192
Worker	0.9872	0.5383	6.7733	0.0302	4.3832	0.0201	4.4033	1.1660	0.0185	1.1845	0.0000	2,735.3162	2,735.3162	0.0373	0.0000	2,736.2498
Total	**1.2500**	**11.2930**	**8.9702**	**0.0666**	**5.3313**	**0.0310**	**5.3623**	**1.4403**	**0.0289**	**1.4692**	**0.0000**	**6,235.2637**	**6,235.2637**	**0.1842**	**0.0000**	**6,239.8690**

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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	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

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	0.2628	10.7547	2.1969	0.0364	0.8881	0.0108	0.8990	0.2596	0.0104	0.2699	0.0000	3,499.9476	3,499.9476	0.1469	0.0000	3,503.6192
Worker	0.9872	0.5383	6.7733	0.0302	4.0424	0.0201	4.0625	1.0824	0.0185	1.1009	0.0000	2,735.3162	2,735.3162	0.0373	0.0000	2,736.2498
Total	**1.2500**	**11.2930**	**8.9702**	**0.0666**	**4.9305**	**0.0310**	**4.9614**	**1.3419**	**0.0289**	**1.3708**	**0.0000**	**6,235.2637**	**6,235.2637**	**0.1842**	**0.0000**	**6,239.8690**

3.5 Building Construction - 2031

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	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

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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	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	0.2599	10.7030	2.1681	0.0363	0.9481	0.0107	0.9588	0.2743	0.0103	0.2845	0.0000	3,489.8026	3,489.8026	0.1460	0.0000	3,493.4535
Worker	0.9098	0.4942	6.3586	0.0295	4.3832	0.0188	4.4020	1.1660	0.0173	1.1833	0.0000	2,671.3170	2,671.3170	0.0342	0.0000	2,672.1715
Total	**1.1697**	**11.1972**	**8.5266**	**0.0658**	**5.3313**	**0.0295**	**5.3608**	**1.4403**	**0.0275**	**1.4678**	**0.0000**	**6,161.1196**	**6,161.1196**	**0.1802**	**0.0000**	**6,165.6249**

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	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

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	0.2599	10.7030	2.1681	0.0363	0.8881	0.0107	0.8989	0.2596	0.0103	0.2698	0.0000	3,489.8026	3,489.8026	0.1460	0.0000	3,493.4535
Worker	0.9098	0.4942	6.3586	0.0295	4.0424	0.0188	4.0611	1.0824	0.0173	1.0996	0.0000	2,671.3170	2,671.3170	0.0342	0.0000	2,672.1715
Total	**1.1697**	**11.1972**	**8.5266**	**0.0658**	**4.9305**	**0.0295**	**4.9600**	**1.3419**	**0.0275**	**1.3694**	**0.0000**	**6,161.1196**	**6,161.1196**	**0.1802**	**0.0000**	**6,165.6249**

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3.5 Building Construction - 2032

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	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3479	344.3479	0.0138	0.0000	344.6933
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3479**	**344.3479**	**0.0138**	**0.0000**	**344.6933**

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	0.2587	10.7018	2.1552	0.0364	0.9518	0.0107	0.9624	0.2753	0.0102	0.2855	0.0000	3,496.3063	3,496.3063	0.1460	0.0000	3,499.9554
Worker	0.8461	0.4587	6.0219	0.0290	4.4000	0.0176	4.4176	1.1705	0.0162	1.1867	0.0000	2,625.6689	2,625.6689	0.0316	0.0000	2,626.4586
Total	**1.1048**	**11.1605**	**8.1771**	**0.0654**	**5.3518**	**0.0283**	**5.3800**	**1.4458**	**0.0264**	**1.4722**	**0.0000**	**6,121.9752**	**6,121.9752**	**0.1775**	**0.0000**	**6,126.4140**

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	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3475	344.3475	0.0138	0.0000	344.6929
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3475**	**344.3475**	**0.0138**	**0.0000**	**344.6929**

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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	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	0.2587	10.7018	2.1552	0.0364	0.8916	0.0107	0.9022	0.2606	0.0102	0.2708	0.0000	3,496.3063	3,496.3063	0.1460	0.0000	3,499.9554
Worker	0.8461	0.4587	6.0219	0.0290	4.0578	0.0176	4.0755	1.0865	0.0162	1.1027	0.0000	2,625.6689	2,625.6689	0.0316	0.0000	2,626.4586
Total	**1.1048**	**11.1605**	**8.1771**	**0.0654**	**4.9494**	**0.0283**	**4.9777**	**1.3471**	**0.0264**	**1.3735**	**0.0000**	**6,121.9752**	**6,121.9752**	**0.1775**	**0.0000**	**6,126.4140**

3.5 Building Construction - 2033

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	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

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	0.2552	10.5839	2.1215	0.0361	0.9445	0.0105	0.9550	0.2732	0.0100	0.2833	0.0000	3,464.5173	3,464.5173	0.1445	0.0000	3,468.1284
Worker	0.7832	0.4241	5.6676	0.0282	4.3664	0.0164	4.3828	1.1615	0.0151	1.1766	0.0000	2,557.7152	2,557.7152	0.0290	0.0000	2,558.4412
Total	**1.0384**	**11.0080**	**7.7890**	**0.0643**	**5.3109**	**0.0269**	**5.3378**	**1.4348**	**0.0251**	**1.4599**	**0.0000**	**6,022.2325**	**6,022.2325**	**0.1735**	**0.0000**	**6,026.5696**

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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	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

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	0.2552	10.5839	2.1215	0.0361	0.8848	0.0105	0.8953	0.2586	0.0100	0.2686	0.0000	3,464.5173	3,464.5173	0.1445	0.0000	3,468.1284
Worker	0.7832	0.4241	5.6676	0.0282	4.0269	0.0164	4.0432	1.0782	0.0151	1.0933	0.0000	2,557.7152	2,557.7152	0.0290	0.0000	2,558.4412
Total	**1.0384**	**11.0080**	**7.7890**	**0.0643**	**4.9116**	**0.0269**	**4.9385**	**1.3368**	**0.0251**	**1.3619**	**0.0000**	**6,022.2325**	**6,022.2325**	**0.1735**	**0.0000**	**6,026.5696**

3.5 Building Construction - 2034

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	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

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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	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	0.2537	10.5520	2.1048	0.0360	0.9445	0.0104	0.9549	0.2732	9.9600e-003	0.2832	0.0000	3,460.9628	3,460.9628	0.1441	0.0000	3,464.5662
Worker	0.7347	0.3979	5.3780	0.0278	4.3664	0.0153	4.3817	1.1615	0.0141	1.1757	0.0000	2,516.3465	2,516.3465	0.0269	0.0000	2,517.0194
Total	**0.9884**	**10.9498**	**7.4828**	**0.0638**	**5.3109**	**0.0258**	**5.3367**	**1.4348**	**0.0241**	**1.4589**	**0.0000**	**5,977.3092**	**5,977.3092**	**0.1711**	**0.0000**	**5,981.5856**

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	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

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	0.2537	10.5520	2.1048	0.0360	0.8848	0.0104	0.8952	0.2586	9.9600e-003	0.2685	0.0000	3,460.9628	3,460.9628	0.1441	0.0000	3,464.5662
Worker	0.7347	0.3979	5.3780	0.0278	4.0269	0.0153	4.0422	1.0782	0.0141	1.0923	0.0000	2,516.3465	2,516.3465	0.0269	0.0000	2,517.0194
Total	**0.9884**	**10.9498**	**7.4828**	**0.0638**	**4.9116**	**0.0258**	**4.9374**	**1.3368**	**0.0241**	**1.3609**	**0.0000**	**5,977.3092**	**5,977.3092**	**0.1711**	**0.0000**	**5,981.5856**

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3.5 Building Construction - 2035

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	tons/yr										MT/yr					
Off-Road	0.1533	0.9023	2.0308	3.9000e-003		0.0114	0.0114		0.0114	0.0114	0.0000	331.2049	331.2049	0.0123	0.0000	331.5133
Total	**0.1533**	**0.9023**	**2.0308**	**3.9000e-003**		**0.0114**	**0.0114**		**0.0114**	**0.0114**	**0.0000**	**331.2049**	**331.2049**	**0.0123**	**0.0000**	**331.5133**

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	0.2446	10.1990	2.0261	0.0349	0.9155	0.0100	0.9255	0.2648	9.5800e-003	0.2744	0.0000	3,351.9231	3,351.9231	0.1395	0.0000	3,355.4098
Worker	0.6710	0.3656	4.9704	0.0265	4.2320	0.0140	4.2460	1.1258	0.0128	1.1386	0.0000	2,404.7741	2,404.7741	0.0243	0.0000	2,405.3824
Total	**0.9156**	**10.5646**	**6.9965**	**0.0614**	**5.1475**	**0.0240**	**5.1715**	**1.3906**	**0.0224**	**1.4131**	**0.0000**	**5,756.6971**	**5,756.6971**	**0.1638**	**0.0000**	**5,760.7922**

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	tons/yr										MT/yr					
Off-Road	0.1533	0.9023	2.0308	3.9000e-003		0.0114	0.0114		0.0114	0.0114	0.0000	331.2045	331.2045	0.0123	0.0000	331.5129
Total	**0.1533**	**0.9023**	**2.0308**	**3.9000e-003**		**0.0114**	**0.0114**		**0.0114**	**0.0114**	**0.0000**	**331.2045**	**331.2045**	**0.0123**	**0.0000**	**331.5129**

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Alameda County, Annual

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	0.2446	10.1990	2.0261	0.0349	0.8576	0.0100	0.8676	0.2506	9.5800e-003	0.2602	0.0000	3,351.9231	3,351.9231	0.1395	0.0000	3,355.4098
Worker	0.6710	0.3656	4.9704	0.0265	3.9030	0.0140	3.9169	1.0450	0.0128	1.0579	0.0000	2,404.7741	2,404.7741	0.0243	0.0000	2,405.3824
Total	**0.9156**	**10.5646**	**6.9965**	**0.0614**	**4.7605**	**0.0240**	**4.7845**	**1.2956**	**0.0224**	**1.3181**	**0.0000**	**5,756.6971**	**5,756.6971**	**0.1638**	**0.0000**	**5,760.7922**

3.6 Paving - 2024

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	tons/yr										MT/yr					
Off-Road	0.1087	1.0477	1.6088	2.5100e-003		0.0515	0.0515		0.0474	0.0474	0.0000	220.2918	220.2918	0.0713	0.0000	222.0730
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1087**	**1.0477**	**1.6088**	**2.5100e-003**		**0.0515**	**0.0515**		**0.0474**	**0.0474**	**0.0000**	**220.2918**	**220.2918**	**0.0713**	**0.0000**	**222.0730**

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	4.2600e-003	2.7200e-003	0.0304	1.1000e-004	0.0131	8.0000e-005	0.0131	3.4700e-003	8.0000e-005	3.5500e-003	0.0000	9.9631	9.9631	1.9000e-004	0.0000	9.9679
Total	**4.2600e-003**	**2.7200e-003**	**0.0304**	**1.1000e-004**	**0.0131**	**8.0000e-005**	**0.0131**	**3.4700e-003**	**8.0000e-005**	**3.5500e-003**	**0.0000**	**9.9631**	**9.9631**	**1.9000e-004**	**0.0000**	**9.9679**

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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	tons/yr										MT/yr					
Off-Road	0.1087	1.0477	1.6088	2.5100e-003		0.0515	0.0515		0.0474	0.0474	0.0000	220.2916	220.2916	0.0713	0.0000	222.0728
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1087**	**1.0477**	**1.6088**	**2.5100e-003**		**0.0515**	**0.0515**		**0.0474**	**0.0474**	**0.0000**	**220.2916**	**220.2916**	**0.0713**	**0.0000**	**222.0728**

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	4.2600e-003	2.7200e-003	0.0304	1.1000e-004	0.0120	8.0000e-005	0.0121	3.2200e-003	8.0000e-005	3.3000e-003	0.0000	9.9631	9.9631	1.9000e-004	0.0000	9.9679
Total	**4.2600e-003**	**2.7200e-003**	**0.0304**	**1.1000e-004**	**0.0120**	**8.0000e-005**	**0.0121**	**3.2200e-003**	**8.0000e-005**	**3.3000e-003**	**0.0000**	**9.9631**	**9.9631**	**1.9000e-004**	**0.0000**	**9.9679**

3.7 Architectural Coating - 2024

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	tons/yr										MT/yr					
Archit. Coating	43.8714					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0199	0.1341	0.1991	3.3000e-004		6.7000e-003	6.7000e-003		6.7000e-003	6.7000e-003	0.0000	28.0858	28.0858	1.5800e-003	0.0000	28.1253
Total	**43.8913**	**0.1341**	**0.1991**	**3.3000e-004**		**6.7000e-003**	**6.7000e-003**		**6.7000e-003**	**6.7000e-003**	**0.0000**	**28.0858**	**28.0858**	**1.5800e-003**	**0.0000**	**28.1253**

LRDPAnnualConstructionEstimate

Alameda County, Annual

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	0.2415	0.1540	1.7244	6.2400e-003	0.7393	4.6300e-003	0.7439	0.1967	4.2600e-003	0.2009	0.0000	564.5746	564.5746	0.0109	0.0000	564.8474
Total	**0.2415**	**0.1540**	**1.7244**	**6.2400e-003**	**0.7393**	**4.6300e-003**	**0.7439**	**0.1967**	**4.2600e-003**	**0.2009**	**0.0000**	**564.5746**	**564.5746**	**0.0109**	**0.0000**	**564.8474**

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	tons/yr										MT/yr					
Archit. Coating	43.8714					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0199	0.1341	0.1991	3.3000e-004		6.7000e-003	6.7000e-003		6.7000e-003	6.7000e-003	0.0000	28.0858	28.0858	1.5800e-003	0.0000	28.1253
Total	**43.8913**	**0.1341**	**0.1991**	**3.3000e-004**		**6.7000e-003**	**6.7000e-003**		**6.7000e-003**	**6.7000e-003**	**0.0000**	**28.0858**	**28.0858**	**1.5800e-003**	**0.0000**	**28.1253**

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	0.2415	0.1540	1.7244	6.2400e-003	0.6818	4.6300e-003	0.6864	0.1826	4.2600e-003	0.1868	0.0000	564.5746	564.5746	0.0109	0.0000	564.8474
Total	**0.2415**	**0.1540**	**1.7244**	**6.2400e-003**	**0.6818**	**4.6300e-003**	**0.6864**	**0.1826**	**4.2600e-003**	**0.1868**	**0.0000**	**564.5746**	**564.5746**	**0.0109**	**0.0000**	**564.8474**

UC Berkeley LRDP
Use of Carbon Offsets

USE OF CARBON OFFSETS TO ACHIEVE UNIVERSITY GHG TARGETS

Under the University of California Office of the President's (UCOP) Carbon and Climate Commitments, to achieve carbon neutrality all Scope 1 and 2 emissions must be either reduced or offset (2025), as well as those Scope 3 emissions from air travel paid for by or through the institution and regular commuting to and from campus (2050). Because it is not fully possible to completely eliminate GHG emissions from campus activities, Carbon Offsets are utilized to achieve carbon neutrality goals.

TYPES OF CARBON OFFSETS

Carbon Offsets work by providing a market to reduce GHG emissions. In this market purchase of 1 Carbon Offset reduces GHG emissions by 1 Metric Ton of carbon dioxide equivalent ($MTCO_2e$). There are several different types of Carbon Offset programs:

» Compliance Offsets. This type of offset is specific to the California Air Resources Board's (CARB) Cap-And-Trade Program. Because these type of offsets go towards achieving the State's GHG targets under AB 32 and SB 32, these type of offsets are not considered as CEQA mitigation.

» Voluntary Offsets. This is the primary offset program that is available for CEQA mitigation. The Voluntary Offset Program provides a market for the voluntary reduction, avoidable, or sequestration of CO_2e that exceeds current regulatory requirements. These type of offsets cannot be use for compliance with CARB's Cap-and-Trade Program.

» Forward Mitigation Units (FMUs). This is a new type of offset program offered by the Climate action Reserve. Unlike Voluntary offsets, this program provides funding for projects to reduce "future" emissions reductions (ex-ante).

VALIDITY OF CARBON OFFSETS

To be considered under CEQA as feasible mitigation, offsets must be "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (CEQA Guidelines Section 15364). Accredited Offset Registries maintain GHG protocols and govern the generation and retirement of offsets that provide transparency sufficient to meet the requirements of CEQA mitigation. The Registries establish high-standards for offset projects, oversee independent verifications, issue credits track transactions, and provide transparency and a platform for exchanges. The following are mandatory components of all carbon offsets programs and are also defined in 17 California Code of Regulations Section 95802 for offsets used in the California Cap and Trade System:

- Real: Estimated GHG reductions should not be an artifact of incomplete or inaccurate emissions accounting. Methods for quantifying emission reductions should be conservative to avoid overstating a project's effects. The effects of a project on GHG emissions must be comprehensively accounted for, including unintended effects (often referred to as "leakage")[1].

- **Additional:** GHG reductions must be additional to any that would have occurred in the absence of the Climate Action Reserve, or of a market for GHG reductions generally. "Business as usual" reductions (i.e., those that would occur in the absence of a GHG reduction market) should not be eligible for registration.
- **Permanent:** To function as offsets to GHG emissions, GHG reductions must effectively be "permanent." This means, in general, that any net reversal in GHG reductions used to offset emissions must be fully accounted for and compensated through the achievement of additional reductions.
- **Quantifiable:** The ability to accurately measure and calculate GHG reductions or GHG removal enhancements relative to a project baseline in a reliable and replicable manner for all GHG emission sources, GHG sinks, or GHG reservoirs included within the offset project boundary, while accounting for uncertainty and activity-shifting leakage and market-shifting leakage.
- **Verified:** GHG reductions must result from activities that have been verified. Verification requires third-party review of monitoring data for a project to ensure the data are complete and accurate.
- **Enforceable**: The emission reductions from offset must be backed by a legal instrument or contract that defines exclusive ownership and the legal instrument can be enforced within the legal system in the country in which the offset project occurs or through other compulsory means. Please note that per this mitigation measure, only credits originating within the United States are allowed.

OFFSET REGISTRIES

CEQA Guidelines Section 15097(a) allows lead agencies to delegate mitigation monitoring: "A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program." The GHG credit registry serves as the delegated entity for carbon offsets.

CARB has approved three registries to date to handle GHG offsets for the Cap-and Trade System (i.e., compliance offsets): The Climate Action Reserve (CAR), American Carbon Registry (ACR) and Verra (which uses the Verified Carbon Standard [VCS] protocol). These registries handle California Cap & Trade system offsets (i.e., compliance offsets) created through CARB protocols, along with other offsets created through non-CARB protocols. Additional carbon registries that meet the criteria outlined part 17 California Code of Regulations Section 95802 are available for the voluntary carbon offset market.

OFFSET MITIGATION HIERARCHY

Under CEQA Guidelines Section 15370(e) the impact being mitigated is global climate change. As a result, substitute resources under CEQA Guidelines Section 15370(e) are global GHG emissions. As a result, while there may be local policies to support a hierarchy of mitigation by location of offsets, location of a GHG emissions offset as CEQA mitigation does not matter. As a result, CEQA cannot require a specific location for

[1] To ensure that GHG reductions are real, CARB requires the reduction be a direct reduction within a confined project boundary.

the substitute resource offsite. CEQA only requires that offset credits be employed only after feasible local emission reduction measures have been implemented (Public resources Code Section 21168.6.5 (i)(1)).

USE OF OFFSETS AS MITIGATION UNDER CEQA

The following identifies use of offsets to mitigate a project's impacts under CEQA:

a) **CEQA Guidelines Section 15126.4(c).** Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others: (3) "Off-site measures, including offsets that are not otherwise required to mitigate a project's emissions" (4) " Measures that sequester greenhouse gases."

b) **Final Statement of Reasons (2009) – SB 97 Rulemaking process**: Offsets are consistent with the existing CEQA Guidelines Section 15370(e) definition of "mitigation," which allows compensating for the impact by replacing or providing substitute resources or environments. In the context of GHG emissions impacts, the impact is global climate change and substitute resources are global GHG emissions. The Final Statement of Reasons also cited the 2008 Scoping Plan that offsets can "describes offsets as way to provide regulated entities a source of low- cost emission reductions, and … encourage the spread of clean, efficient technology within and outside California."

c) **CARB's 2017 Scoping Plan**: "Where further project design or regional investments are infeasible or not proven to be effective, it may be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits….It may also be appropriate to utilize credits issued by a recognized and reputable voluntary carbon registry." (pp. 102) The 2017 Scoping Plan also establishes clear preference for onsite and local measures that achieve co-benefits before turning to off-site offsets.

d) **AB 900 Environmental Leadership Projects**: AB 900 provides CEQA streamlining benefits if projects that met certain conditions. (1) No net additional GHG emissions; and (2) CARB certification of GHG reduction strategy. To date, many AB 900 projects have relied heavily on purchasing carbon offsets to achieve carbon neutrality.

ENVIRONMENTAL MONITOR

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Association of Environmental Professionals | Document Prepared by PLACEWORKS

AEP

Open the Golden Door to International Carbon Credits!

Authors: AEP Climate Change Committee

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On June 12, 2020, the California Fourth District Court of Appeal in *Golden Door Properties, LLC, v. County of San Diego* filed a behemoth 137-page opinion, finding that the Supplemental EIR for the San Diego County's 2018 Climate Action Plan (CAP), in part, was not supported by substantial evidence and that it violated CEQA for several reasons. Notably, the court determined that the SEIR violated CEQA because it relied on mitigation measure M-GHG-1 to reduce greenhouse gas (GHG) emissions of general plan amendment projects to net zero (or no net increase over baseline) that the court determined contained unenforceable performance standards and improperly deferred and improperly delegated mitigation. The court seemed particularly concerned that M-GHG-1 would permit carbon offset credits created through carbon registries *not* approved by the California Air Resources Board (CARB); that the carbon credits could originate out-of-county, out-of-state and internationally and may therefore lack rigor or enforceability; that M-GHG-1 lacked objective performance standards; and that the validity and availability of the carbon offsets would be determined based on the subjective discretion of the County of San Diego's Director of Planning & Development Services.

The decision is expansive, is both legally and factually complex, and arises out of a lengthy administrative and legal process that has occurred over nearly a decade. We do not intend to address all issues in the ruling. Instead, we focus on GHG offset credits, how they can constitute valid CEQA mitigation and why the location of valid GHG offset credits does not matter scientifically and should not matter under CEQA.

What is a GHG credit?

It is common for people to use the term "offset" to refer to all forms of GHG credits, but certain protocols, guidance, and practitioners use "offset" to only refer to credits from projects completed in the past. Thus, for this article, the following definitions are used for clarity:[1,2]

- **GHG credit:** a reduction in GHG emissions of one metric ton of carbon dioxide equivalent (i.e. one $MTCO_2e$).
- **GHG offset credit:** a GHG credit resulting from an action or project that *has occurred* in the past, subject to rigorous monitoring and verification, and would not have existed without a credit market.
- **Forecasted mitigation unit (FMU):** a GHG credit resulting from an action or project that *will occur in the future*, subject to rigorous monitoring and verification, and would not have existed without a credit market.
- **Registry:** a body which oversees the registration and verification of carbon credits following approved carbon accounting protocols. Registries maintain the protocols for credit generation and govern the generation and retirement of credits to ensure integrity in the systems.
- **Protocol:** a set of standards and calculation methods which ensure emissions reductions associated with projects are real, permanent, and additional.

A credit protocol represents an accepted, technically sound method for quantifying and verifying the emission reductions associated with a particular project type and assuring that the credits result in real GHG reductions. Accredited registries develop high-standard GHG reduction project protocols to provide guidelines for project development, provide transparency, and develop a platform for exchanges. There are many credit proto-

1 Climate Action Reserve, 2019, *Reserve Offset Program Manual*, November 12. Available at https://www.climateactionreserve.org/how/program/program-manual/. Accessed July 2020.

2 Offset Quality Initiative, 2018, *Ensuring Offset Quality: Integrating High Quality Greenhouse Gas Offsets Into North American Cap-and-Trade Policy*, July. Available at: http://www.offsetqualityinitiative.org/.Accessed July 2020.

cols and more continue to be developed. Each accredited registry uses a protocol which requires credits to meet the following five criteria:

1. **Real:** GHG reductions are estimated using conservative, comprehensive, and scientifically valid accounting. Unintended effects, known as "leakage," must be accounted for.
2. **Additional:** GHG reductions must be additional to any that would have occurred in the absence of the offset market, and are not a result of existing laws or regulations.
3. **Permanent:** GHG reductions must persist for a defined length of time (often 40 to 100 years) and account for expected reversals.
4. **Verifiable:** For GHG offsets, GHG reductions must result from activities that have been verified on an "ex-post" basis – they have already occurred. FMUs are verified on an "ex ante" basis. Verification requires third-party review of monitoring data for a project to ensure the data are complete and accurate.
5. **Enforceable:** GHG reductions must be owned by a single entity and be backed by a legal instrument or contract that defines exclusive ownership.

These five criteria are also defined in 17 California Code of Regulations §95802 for offsets used in the California Cap and Trade System, which also adds the term "quantifiable" which is covered by the definition of "real" above. The Climate Action Reserve Offset Program Manual also defines these terms.

These criteria ensure that each offset credit already achieved GHG emission reductions in the past, and that it is a valid offset, or for a FMU, assures that GHG emissions will occur in the future. Therefore, a GHG credit is just as real and reliable a means of reducing GHG emissions as any other action or mitigation measure, including "onsite" measures such as EV charging stations, rooftop solar panels, and electrifying fossil fuel infrastructure. In fact, in many cases GHG offset credits are *more* reliable in reducing emissions than onsite actions since they have already occurred in the past, were created through rigorous accounting criteria, have been verified by an independent third-party, and are subject to continued monitoring and legal enforcement through a binding contract. Many onsite GHG reduction design features and mitigation measures have far less stringent quantitative requirements and monitoring / enforcement mechanisms. FMUs, although they would be in the future, can have as strong a rationale supporting real GHG reductions as any on-site measures, provided they follow a sufficiently rigorous protocol that meets the five criteria.

GHG credits are created through a six-step process as follows:

Step 1, Project Identification: Applicant identifies a project that would result in additional emissions reductions not required as part of the project or other law / regulatory action.

Step 2, Project Preparation: Applicant implements the project.

Step 3, Undertake Emissions Reductions: The project produces (or will produce for FMUs) additional emissions reductions that would not have otherwise occurred without the project to meet regulatory requirements.

Step 4, Submit Project for Verification: Applicant submits the project to registries for verification; the registry ensures that their GHG accounting protocols were used properly and comprehensively.

Step 5, Verification: An independent third party verifies that the project achieves (or will achieve for FMUs) the additional GHG emission reductions as claimed.

Step 6, Creation of Credit: The GHG credits now become "registered" and banked until they are purchased and retired through the voluntary carbon market.

For example, CARB has adopted and published Compliance Offset Protocols for six project types for use in the Cap-and-Trade Program: U.S. Forest Projects, Urban Forest Projects, Livestock Projects, Ozone Depleting Substances Projects, Mine Methane Capture Projects, and Rice Cultivation Projects.[3]

CARB has approved three registries to date to handle GHG offsets for the Cap-and Trade System: The Climate Action Reserve (CAR), American Carbon Registry (ACR) and Verra (which uses the Verified Carbon Standard [VCS] protocol). These registries handle California Cap & Trade system offsets created through CARB protocols, along with other offsets created through non-CARB protocols. But there is nothing special about CARB approved registries or CARB-approved protocols; these are just the specific protocols that CARB has adopted for use in the Cap & Trade system. There are many other protocols that are just as rigorous and enforceable as Cap & Trade protocols. For example, the Gold Standard (GS) is a fourth well-established and accredited registry.

3 California Air Resources Board, *Compliance Offset Protocols*, 2020. Available at https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program/compliance-offset-protocols.

Can we use GHG credits as CEQA mitigation?

Yes! (Emphatically). As explained above, GHG credits that are done in compliance with rigorous protocols with third-party verification are valid, real, and additional reductions in GHG emissions. They meet all the standards that CEQA demands of valid mitigation measures. In fact, the CEQA guidelines expressly permit the use of offsite actions and credits to mitigate GHG impacts:

- Section 15126.4 (c)(3) states that mitigation measures for GHG emissions may include "offsite measures, including offsets that are not otherwise required, to mitigate a project's emissions"
- Section 151370 (e) states that mitigation includes "Compensating for the impact by replacing or providing substitute resources or environments"
- Section 21168.6.5 (i)(1) states that "Offset credits shall be employed by the applicant only after feasible local emission reduction measures have been implemented."
- Section 15364 states that as feasible mitigation, offsets must be "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

The California Natural Resources Agency's Final Statement Of Reasons For Regulatory Action for the CEQA Guidelines Amendments (2009) also supports the use of GHG credits:

- "Proposed subdivision (c)(3) recognizes the availability of various offsite mitigation measures. Such measures could include, among others, the purchase of carbon offsets, community energy conservation projects, and off-site forestry projects"
- Referring to CEQA Guidelines section 15730, "As subdivision (e) implies, off-site measures may constitute mitigation under CEQA, and such measures have been upheld as adequate mitigation in CEQA case law" and "The efficacy of any proposed mitigation measure is a matter for the lead agency to determine based on the substantial evidence before it."

Further, even CARB's 2017 Scoping Plan (which many CEQA practitioners use to develop significance thresholds for GHG impacts) encourages the use of GHG credits[4] as CEQA mitigation to ensure that development projects do their fair share to contribute toward the state's 2030 GHG target:

4 It should be noted that the 2017 Scoping Plan establishes a clear preference for onsite and local measures that achieve co-benefits before turning to off-site measures and credits.

- "Local direct investments in actions to reduce GHG emissions should be supported by quantification methodologies that show the reductions are real, verifiable, quantifiable, permanent, and enforceable. Where further project design or regional investments are infeasible or not proven to be effective, it may be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits." (p. 102)
- "CAPCOA has developed the GHG Reduction Exchange (GHG Rx) for CEQA mitigation, which could provide credits to achieve additional reductions. It may also be appropriate to utilize credits issued by a recognized and reputable voluntary carbon registry." (p. 102)
- In Appendix B, which lists potential actions "that could be undertaken at a local level to support the State's climate goals," CARB suggests that projects should require "an off-site mitigation project which should generate carbon credits equivalent to the anticipated GHG emission reductions. This would be implemented via an approved protocol for carbon credits from California Air Pollution Control Officers Association (CAPCOA), the California Air Resources Board, or other similar entities determined acceptable by the local air district" and further that projects should "purchase carbon credits from the CAPCOA GHG Reduction Exchange Program, American Carbon Registry (ACR), Climate Action Reserve (CAR) or other similar carbon credit registry determined to be acceptable by the local air district." (p. 10)

To round out the case for GHG credits as valid CEQA mitigation, CARB permits such credits for "environmental leadership" projects through Assembly Bill 900 for judicial streamlining. Nineteen projects so far have submitted AB 900 applications. AB 900 requires that these projects achieve "no net additional" GHG emissions. Many AB 900 projects have relied heavily on purchasing carbon credits to achieve carbon neutrality. For example, the Oakland Athletics Oakland Sports and Mixed-Use Project at Howard Terminal will purchase nearly 40,000 credits annually for 30 years,[5] and the Downtown West Mixed Use Plan will need to purchase as many as 1.6 million credits over its 30-year life.[6]

5 AB 734 Application: Oakland Athletics Oakland Sports and Mixed-Use Project at Howard Terminal, March 2019. Available at https://opr.ca.gov/ceqa/california-jobs.html.

6 Downtown West Mixed Use Plan AB 900 Application and Supporting Documentation, August 2019. Available at https://opr.ca.gov/ceqa/california-jobs.html.

This is evidence enough that valid GHG credits, created through robust accounting protocols, subject to third-party review and verification, and contingent upon ongoing monitoring and enforcement (to prohibit emission reduction reversals), can be used as valid CEQA mitigation to reduce GHG impacts.

Does the location of the GHG credit matter?

No! (*More* emphatically). Climate change is global. Our atmosphere is global. GHG emissions are well-mixed in the atmosphere and have a lifetime of 100 years or more.[7] Reducing GHG emissions in your city has the same effect on global climate change as reducing GHG emissions on another continent.

The GHG credit protocol requirements apply regardless of the credit's location. In fact, the three CARB-approved registries (CAR, ACR, and Verra) have approved GHG credits around the world.[8]

And let's not forget, even Cap & Trade offsets occur outside of California! The Cap & Trade regulation expressly permits the use of out-of-state offsets as compliance instruments for in-state entities. **This map from CARB** shows the location of many Cap & Trade offsets.[9]

CEQA only requires that a project mitigate its direct and indirect impacts. The GHG impact created by a CEQA project is a global, cumulative impact. Therefore, the location of the mitigation measure *does not matter*, so long as it is valid under CEQA. CEQA cannot require a specific location. It is true that there may be local co-benefits of onsite project design features and local mitigation measures, such as air quality improvements, public health gains, local job creation, and can help address issues of environmental justice. But for addressing a project's specific impact on GHG emissions under CEQA, the other co-benefits related to the location of GHG credits are not relevant to the determination as to whether the mitigation effectively reduces GHG emissions.

In *Golden Door Properties, LLC, v. County of San Diego*, the court expressed skepticism about out-of-state and international GHG credits. They speculate that "'[i]n a developing country where one relies upon records that may not exist, and testing technology that may be inadequate or fraudulent, it can be difficult if not impossible' to verify GHG reductions." They worry that in the "climate [of a developing country] how does one distinguish between an emission reduction that would have happened anyway and one that is happening only or in part because of the encouragement of the offset program and the potential to sell a credit for a profit?" And further that "Corruption also presents challenges," and claim that because countries such as Ethiopia, Nicaragua, and Venezuela rank high on Transparency International's "corruption index," we cannot rely on credits created in these countries.

Does corruption in these countries exist? Yes. Does corruption in the United States exist? Yes. Does that mean that GHG credits created in the U.S. are therefore invalid? No. The U.S. is not the only country in the world that knows how to do GHG reductions projects and reliably reduce GHG emissions. It could even be argued that there are many other countries that have a strong record in reducing GHG emissions and combating climate change and in implementing GHG credit systems, including some that are reducing emissions faster than the U.S.[10]

The court's reasoning in regards to the location of GHG credits is biased and unscientific. California does a good job creating valid GHG offset credits. But so do plenty of other states and countries. Take the following analogy. California has roadway designs and traffic laws designed to make road travel safe. Germany does not use California design standards or traffic laws, they use German ones. But German roads are also safe. German roadway travel is not unsafe because they don't use California standards and laws. In fact, driving on German roads is objectively safer than driving on California roads.[11] If the goal of traffic laws is to save lives by having safe roadway travel, then clearly there is more than one way to do that. The same principal applies to GHG credits outside of California (and the U.S.).

The court also states that the "fundamental problem" in San Diego County's offset mitigation measure is that "the County has no enforcement authority in another state, much less in a foreign country." However, CEQA Guidelines section 15097(a) allows lead

7 Intergovernmental Panel on Climate Change, 2013, *Climate Change 2013: The Physical Science Basis*. Chapter 2 Observations: Atmosphere and Surface. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at https://www.ipcc.ch/report/ar5/wg1/.

8 A map of CAR offset projects is here: https://www.climateactionreserve.org/how/projects/; a list of ACR offset projects is here: https://acr2.apx.com/myModule/rpt/myrpt.asp?r=111; information for Verra offset projects is here: https://verra.org/datainsights/july-2020/.

9 See https://webmaps.arb.ca.gov/ARBOCIssuanceMap/

10 See https://www.nationalgeographic.com/environment/2019/09/climate-change-report-card-co2-emissions/#close and https://climateactiontracker.org/countries/

11 In 2018, California had 3,563 fatalities associated with 348,796 vehicle miles travelled which translates to 6.3 fatalities per billion vehicle kilometers. This is approximately 45% greater than the 2018 rate in Germany which was 4.3 fatalities per billion vehicle kilometers (Insurance Institute for Highway Safety, 2019, *Fatality Facts 2018, State by State*. December. Available at: https://www.iihs.org/topics/fatality-statistics/detail/state-by-state. Last Accessed July 26, 2020. Organization for Economic Cooperation and Development /International Transport Forum, 2019. *Road Safety Annual Report 2019 – Germany*. Available: https://www.itf-oecd.org/sites/default/files/germany-road-safety.pdf. Accessed July 26, 2020.).

agencies to delegate mitigation monitoring: "A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program." A GHG credit registry serves as the delegated entity. GHG offset credits recognized by a registry represent GHG emission reductions that *have already occurred in the past*; therefore, by purchasing an offset credit, the reduction in GHG emissions has been completed, and the impact has been mitigated. FMUs may be GHG credits created in the future, but provided that the reductions due to FMUs occur at the same time as a project's GHG emissions, then the impact will be mitigated as it occurs. Therefore, the fact that the County has no enforcement authority over the specific location where the offset was created is not relevant.

So what should I do?

As a CEQA practitioner, sustainability planner, CAP writer, or other environmental professional using GHG credits for the purpose of reducing GHG emissions, there are a number of strategies that you can use to defend their use. We recommend that you address the following four points:

1. **Accredited Registries.** Ensure that the GHG credits allowed in your document are created through accredited carbon registries. A CARB-approved registry is advised (given the legal state of things) though not required from a scientific or regulatory standpoint.
2. **Objective Criteria.** Although the carbon registries utilize robust accounting protocols for all GHG credits created for their platforms, and these protocols require the five objective criteria listed above, we advise that you identify and define each criteria. These criteria are defined in 17 CCR §95802 and also by the individual offset registries.
3. **Performance Standards.** Provide clear, well-defined, and objective performance standards for determining the number and scope of GHG credits. Make it abundantly clear how many credits are needed and when. For a CEQA project, this may be based on achieving a specific significance threshold or thresholds for different milestone years.
4. **Discuss Location.** As we've made lavishly clear above, the location of GHG credits is irrelevant from a scientific standpoint, provided that the credits are created and purchased through an accredited carbon registry which uses stringent protocols. However, if as *Golden Door Properties, LLC, v. County of San Diego* and the long line of preceding litigation against San Diego County has taught us anything, it is that there is much controversy over the location issue. We therefore advise that you prioritize all onsite project design features, onsite mitigation measures, and local GHG emission reduction programs before using GHG credits. Your strategy will necessarily be unique to your local conditions, lead agency priorities, and area policy preferences.

A valid GHG credit is one that meets the fundamental criteria of valid protocols. The success of prior GHG credit creation and use and the validation protocols is are your "substantial" evidence under CEQA that GHG credits, done correctly, are valid CEQA mitigation.

Happy carbon credit hunting!

Glossary

AB – Assembly Bill

ACR – American Climate Registry

CAP – Climate Action Plan

CAPCOA – California Air Pollution Control Officers Association

CAR – Climate Action Reserve

CARB – California Air Resources Board

CCR – California Code of Regulations

CEQA – California Environmental Quality Act

FMU – forecasted mitigation unit

GHG – greenhouse gas

GS – Gold Standard

MTCO$_2$e – metric ton of carbon dioxide equivalent

VCS – Verified Carbon Standard

UCOP and UCB Sustainability Plans & Policies

Sustainable Practices

Responsible Officer:	EVP – Chief Operating Officer
Responsible Office:	ES – Energy & Sustainability
Issuance Date:	7/24/2020
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I. POLICY SUMMARY

The Sustainable Practices Policy ("Policy") establishes goals in nine areas of sustainable practices: green building, clean energy, transportation, climate protection, sustainable operations, waste reduction and recycling, sustainable procurement, sustainable foodservice, sustainable water systems.

II. DEFINITIONS

AASHE: The Association for the Advancement of Sustainability in Higher Education is the higher education association that sets sustainability standards for universities and colleges. Its mission is to support sustainability in higher education through empowering faculty, administrators, staff, and students to be effective change agents and drivers of sustainability innovation.

Addressable Spend: Spend that can be impacted through sourcing activities. For the purposes of this policy, it relates to the spend within a specific product or service category.

Adjusted Patient Day (APD): Inpatient Days x (Gross Patient Revenue/Inpatient Revenue) where Gross Patient Revenue is Outpatient Revenue + Newborn Revenue + Inpatient Revenue.

Allowable Thermal Residual Conversion: Consistent with CalRecycle and the Southern California Conversion Technology Project, residual conversion includes: thermal, chemical, mechanical, and/or biological processes capable of converting post-recycled residual solid waste into useful products and chemicals, green fuels like ethanol and biodiesel, and clean, renewable energy. It does not include combustion.

Examples include the transformation of post-recycled residual materials into usable heat or electricity through gasification, pyrolysis, distillation, or biological conversion other than composting. To count as allowable residual conversion, the process must include an integrated materials recovery facility (MRF) or equivalent sorting system to recover recyclables and compostable material prior to conversion. Materials that are otherwise landfilled or incinerated, including biomass conversion operations that exclusively incinerate organic materials, landfill-gas-to-energy (LFGTE) facilities, and other facilities that do not employ integrated materials recovery or equivalent sorting and recovery systems may not be considered as converted residual waste.

Average Vehicle Ridership (AVR): The average vehicle ridership is calculated by dividing the number of all person trip arrivals by the number of private vehicle trips, with adjustments for telecommuting, compressed work weeks, and zero-emission vehicles (based on the South Coast Air Quality Management District method).

California Building Code (CBC): This refers to the California Building Code, Title 24 portion of the California Code of Regulations.

Climate Neutrality: Climate neutrality is a goal for the University to have net zero climate impacts from greenhouse gas (GHG) emissions attributed to scope 1 direct emission sources and scope 2 indirect emission sources as defined by The Climate Registry, and specific scope 3 emissions as defined by Second Nature's Carbon Commitment. This will be achieved by minimizing GHG emissions from these sources as much as possible and using carbon offsets or other measures to mitigate the remaining GHG emissions.

Combustion: As defined by CalRecycle, combustion is a rapid conversion of chemical energy into thermal energy. The reaction is exothermic. Organic matter is oxidized with sufficient air (or oxygen) for reactions to go to completion. The carbon and hydrogen are oxidized to carbon dioxide and water, respectively.

Construction and Demolition Waste: Waste generated by construction projects that do not occur every year or are not a result of regular operations and maintenance (e.g., building renovations or new construction).

Diversion from Landfill: Institutions divert materials from the landfill, combustion, or other non-allowable thermal conversion by recycling, composting, donating, reselling, or reusing.

Economically and Socially Responsible (EaSR) Spend: Spend on products or services supplied by a business holding one of the UC-recognized certifications listed in the UC Sustainable Procurement Guidelines.

Expanded Polystyrene (EPS): As defined by the City of San Francisco, blown polystyrene and expanded and extruded foams which are thermoplastic petrochemical materials utilizing a styrene monomer and processed by any number of techniques including but not limited to, fusion of polymer spheres (expanded bead polystyrene), injection molding, foam molding, and extrusion-blown molding (extruded foam polystyrene).

Fleet: University-owned or operated vehicles and mobility equipment (e.g., passenger vehicles, trucks, vans, shuttles, agricultural vehicles, marine equipment, etc.) including vehicles operated under contract with the University and for which the University/Campus maintains operational control.

Full Time Equivalent (FTE): A full-time equivalent employee is the hours worked by one employee on a full-time basis and can be used to convert the hours worked by several part-time employees into the hours worked by full-time employees. A full-time employee is assumed to work 40 hours in a standard week.

Green Lab Assessment Programs: A program that works with individual laboratories and researchers to inform, collect best practices, and assess areas for improvement in research efficiency, including engagement, and targeted initiatives around efficiency in natural resources and other environmental issues. This assessment program could be based on the My Green Labs (MGL) Systemwide Checklist or another similar tool. The MGL checklist was developed based on best practices from several UC campuses as well as the expertise of My Green Lab.

Green Spend: The amount spent on products meeting the UC "Preferred Level" of environmental sustainability criteria as laid out in the UC Sustainable Procurement Guidelines.

Gross Square Foot: Pursuant to the definition in the Facilities Inventory Guide (Appendix C, page C.19), gross square footage is the Outside Gross Area, or OGSF50, and equals the sum of Basic Gross Area (the sum of all areas, finished and unfinished, on all floors of an enclosed structure, for all stories or areas which have floor surfaces) + 50% Covered Unenclosed Gross Area (the sum of all covered or roofed areas of a building located outside of the enclosed structure). OGSF50 is also known as "California Gross."

Industrial Water: Water provided for specific industrial applications such as heating, cooling, or lubricating equipment.

Leadership in Energy and Environmental Design (LEED)™: Leadership in Energy and Environmental Design. LEED is a registered trademark of the U.S. Green Building Council (USGBC). This trademark applies to all occurrences of LEED in this document. LEED is a green building rating system developed and administered by the non-profit U.S. Green Building Council. The four levels of LEED certification, from lowest to highest, are Certified, Silver, Gold, and Platinum. LEED has several rating systems. This Policy refers to the following rating systems:

LEED for Interior Design and Construction (LEED-ID+C) for renovation projects;

LEED for Building Operations and Maintenance (LEED-O+M) for the ongoing operational and maintenance practices in buildings; and,

LEED for Building Design and Construction (LEED-BD+C) for new buildings and major renovations of existing buildings.

Location: As used in this Policy, means any or all campuses, health locations, and the Lawrence Berkeley National Laboratory, as referred to in the "Scope" above.

Municipal Solid Waste: Garbage, refuse, sludges, and other discarded solid materials resulting from residential activities, and industrial and commercial operations which are legally accepted in CalRecycle permitted landfills. Municipal Solid Waste does not include any regulated hazardous/universal waste, medical waste or other material used as Average Daily Cover (ADC); however, it does include construction and demolition waste, diverted recyclables and organic waste. Non-health location waste targets refer to municipal solid waste only.

Organic: As defined by CalRecycle, material containing carbon and hydrogen. Organic material in municipal solid waste includes the biomass components of the waste stream as well as hydrocarbons usually derived from fossil sources (e.g., most plastics, polymers, the majority of waste tire components, and petroleum residues).

Packaging Foam: Any open or closed cell, solidified, polymeric foam used for cushioning or packaging, including but not limited to: Ethylene-vinyl acetate (EVA) foam, Low-density polyethylene (LDPE) foam, Polychloroprene foam (Neoprene), Polypropylene (PP) foam, Polystyrene (PS) foam (including EPS, extruded polystyrene foam (XPS) and polystyrene paper (PSP)), Polyurethane (PU) foams, Polyethylene foams, Polyvinyl chloride (PVC) foam, and Microcellular foam. Not included are easily biodegradable, plant-based foams such as those derived from corn or mushrooms.

Plant-Based Foods: As defined by the Culinary Institute of America's Menus of Change program, these include fruits and vegetables (produce); whole grains; beans; other legumes (pulses), and soy foods; nuts and seeds; plant oils; herbs and spices; simple combinations of these foods and their derivatives, and vegetarian/vegan alternatives to meat and dairy.

Plant-Forward: As defined by the Culinary Institute of America's Menus of Change program, this represents a style of cooking and eating that emphasizes and celebrates, but is not limited to, plant-based foods—including fruits and vegetables (produce); whole grains; beans, other legumes (pulses), and soy foods; nuts and seeds; plant oils; and herbs and spices—and that reflects evidence-based principles of health and sustainability. Often used synonymously with "vegetable-centric," "vegetable-forward," and "plant-centric."

Policy Exception Authority: The responsible authority for granting exceptions to item III.G.5.a. in the Sustainable Procurement section of this Policy will be the Chief Procurement Officer for a non-UC Health systemwide or Office of the President contract and otherwise by the senior procurement officer of the campus.

Potable Water: Water that meets state water quality standards for human consumption**.**

Reclaimed or Recycled Water: Wastewater treated with the intention of reuse, including:

- Direct Potable Reuse: Treated wastewater reused for human consumption.
- Indirect Potable Reuse: Treated wastewater blended with groundwater or other water sources reused as potable or non-potable water.
- Non-Potable Reuse: Treated wastewater reused for purposes other than human consumption, such as irrigation, fire suppression, and industrial processes.

Renewable Energy: Energy generated from inexhaustible sources, such as the sun or wind, or from sources that can quickly be replenished, such as biomass. For the purposes of this Policy, an energy source is renewable if it has been designated as such by the California Energy Commission (Renewables Portfolio Standard Eligibility).

Required Level Green Spend criteria: The minimum certification standard required for a product or service category. For Required Level Green Spend criteria see the UC Sustainable Procurement Guidelines.

Research Group: When counting the number of laboratories assessed via a green lab assessment program, a laboratory will be counted as a research group rather by physical rooms. As defined in the Laboratory Hazard Assessment Tool, (LHAT) this group includes the workers that report to one Principal Investigator (PI) or Responsible Person. While some PI's may have multiple groups, one assessment for the purposes of this Policy will include all the people working under one PI or Responsible Person, and all of the rooms they occupy or share, and field sites, if any. Total number of PI's and Responsible People will be tracked according to LHAT or a similar tracking method at campuses not using LHAT. LHAT includes research and teaching laboratories.

Savings by Design: An energy efficiency program offered by California's four investor-owned utility companies and the Sacramento Municipal Utility District. Savings By Design provides design assistance, energy analysis, life cycle costing, and financial incentives for new construction and major renovation projects. The Savings By Design program is also known as the Non-Residential New Construction Program.

Single-Pass Cooling: Single-Pass or once-through cooling systems flow water through a piece of equipment to absorb heat and dispose the water down the drain without recirculation. Replacing and managing these types of systems is a recommended best practice by the International Institute for Sustainable Laboratories (formerly Labs 21), US Office of Energy Efficiency & Renewable Energy, and the EPA. Equipment typically using this type of cooling includes hydraulic equipment, distillation condensers, refrigeration condensers, air compressors, vacuum pumps, electron microscopes, mass spectrometers, lasers, helium recovery, and electro-magnets.

Single-Occupancy Vehicle (SOV): A vehicle driven by a single driver with no passengers. SOV percentages may separate the percentage of vehicle trips occurring in zero- or low-emission vehicles from carbon-fuel vehicles (e.g., SOV-standard fuel and SOV-alternative fuel).

Solicitation: The process of seeking information, bid proposals, and quotations from suppliers.

STARS: The Sustainability Tracking, Assessment and Rating System is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. STARS provides a framework for understanding sustainability in all sectors of higher education through using a common set of measurements that enables meaningful comparisons over time and across institutions.

Sterilized Water: Water that has been cleaned to remove, deactivate, or kill microorganisms present that may be harmful to humans; primarily used in medical facilities and research.

Stormwater: Water that originates during precipitation events.

Strategic sourcing: A process designed to maximize the purchasing power of large, decentralized organizations, such as the University of California, by consolidating and leveraging common purchases.

Sustainable Food: Food and beverage purchases that meet the AASHE STARS Technical Manual's requirements for sustainably and ethically produced food for campuses and Practice Greenhealth's sustainable food for health locations.

Sustainable Procurement: [Modified from the UK Government's Sustainable Procurement Task Force (2012)] Purchasing that takes into account the economic, environmental, and socially responsible requirements of an entity's spending. Sustainable Procurement allows organizations to procure their goods and services in a way that achieves value for money on a whole-life basis in terms of generating benefits not only to the organization but also to society and the economy, while remaining within the carrying capacity of the environment.

Sustainable Spend: The intersection of Green and EaSR Spend. UC Sustainable Spend is defined as spending that meets the criteria and requirements for Green Spend as well as EaSR Spend as laid out in the UC Sustainable Procurement Guidelines.

Sustainable Water Systems: Water systems or processes that maximize water use conservation or efficiency, optimize water resource management, protect resources in the context of the local watershed, and enhance economic, social, and environmental sustainability while meeting operational objectives.

Takeback program: A program that allows customers to return used products or materials to either the producer or distributor for responsible re-use or recycling consistent with applicable state and federal laws. These programs encourage responsible design for disassembly and recyclability, and protect the environment by keeping bulky or toxic products and packaging out of the waste stream.

TDM: Transportation Demand Management. TDM is the application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles). TDM programs may include car sharing (car share), carpools (rideshare), vanpools, bus pools, shuttles, transit, bicycle circulation systems, pedestrian circulation systems, emergency rides home, telecommuting, flexible schedules, parking management (amount, access, fees), etc.

Total Cost of Ownership (TCO): An analysis of cost that considers not only purchase price, but also any costs associated with the acquisition, use, and disposal of the product. These costs may include some or all of the following: freight, taxes and fees, installation, operation/energy use, maintenance, warranty, collection, end-of-life disposal or recycling, as well as social or environmental costs, such as the cost of purchasing pollution offsets or monitoring labor practices.

Total Solid Waste: Total solid waste includes municipal solid waste as well as all forms of regulated waste, this includes but is not limited to regulated medical waste, biohazardous waste, pharmaceutical waste, universal waste, and construction and demolition waste. Unlike campus targets, health location diversion rates and reduction targets use total solid waste rather than municipal solid waste.

Vehicle Miles Traveled (VMT): The number of miles driven by a given vehicle(s) over a given period of time.

UC Green Laboratories Action Plan: A document created with the goal of setting campus-specific targets, documenting the strengths and areas for improvement within sustainable operations of research laboratories via gap analysis, and outlining actions that can be implemented to further targets.

USGBC: U.S. Green Building Council. The USGBC is a membership-based non-profit organization dedicated to sustainable building design and construction, and is the developer of the LEED building rating system.

Wastewater: Water that is discharged from domestic, industrial, or other use.

Watershed: In the context of this Policy, a watershed is the area of land that drains to a common waterway, such as a stream, lake, estuary, wetland, aquifer, bay, or ocean.

Water systems: Natural and/or human-made systems that provide water to and support the functions of watersheds and/or human communities.

Weighted Campus User (WCU): As defined in the current AASHE STARS Technical Manual. This calculation applies only to campuses and not to health locations or LBNL.

Zero-emissions vehicle (ZEV): As defined by the current California Air Resources Board (CARB) ZEV program standards, a vehicle that emits no tailpipe pollutants from the onboard source of power and may include subcategories as defined by CARB.

Zero waste: The University zero waste goal is made up of incremental waste reduction and waste diversion targets. The University recognizes the attainment of reduction goals stated in this Policy and a 90% diversion of municipal solid waste as minimum compliance standard to be defined as a zero waste for locations other than health locations.

III. POLICY TEXT

The University of California ("University") is committed to responsible stewardship of resources and to demonstrating leadership in sustainable business practices. The University's locations should be living laboratories for sustainability, contributing to the research and educational mission of the University, consistent with available funding and safe operational practices. Policy goals are presented below in nine areas of sustainable practices.

A. Green Building Design

New Buildings

1. All new building projects, other than acute care facilities, shall be designed, constructed, and commissioned to outperform the CBC energy-efficiency standards by at least 20% or meet the whole-building energy performance targets listed in Table 1 of Section V.A.3. The University will strive to design,

construct, and commission buildings that outperform CBC energy efficiency standards by 30% or more, or meet the stretch whole-building energy performance targets listed in Table 1 of Section V.A.3, whenever possible within the constraints of program needs and standard budget parameters.

2. Acute care/hospital facilities and medical office buildings shall be designed, constructed, and commissioned to outperform ASHRAE 90.1 - 2010 by at least 30% or meet the whole-building energy performance targets listed in Table 2 in Section V.A.3.
3. No new building or major renovation that is approved after June 30, 2019, shall use onsite fossil fuel combustion (e.g., natural gas) for space and water heating (except those projects connected to an existing campus central thermal infrastructure). Projects unable to meet this requirement shall document the rationale for this decision, as described in Section V.A.4.
4. All new buildings will achieve a USGBC LEED “Silver” certification at a minimum. All new buildings will strive to achieve certification at a USGBC LEED “Gold” rating or higher, whenever possible within the constraints of program needs and standard budget parameters.
5. The University of California will design, construct, and commission new laboratory buildings to achieve a minimum of LEED “Silver” certification as well as meeting at least the prerequisites of the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria (EPC)[1]. Laboratory spaces in new buildings also shall meet at least the prerequisites of Labs21 EPC. Design, construction, and commissioning processes shall strive to optimize the energy efficiency of systems not addressed by the CBC energy efficiency standards.
6. All new building projects will achieve at least two points within the available credits in LEED-BD+C’s Water Efficiency category.

Building Renovations

7. Major Renovations of buildings are defined as projects that require 100% replacement of mechanical, electrical, and plumbing systems and replacement of over 50% of all non-shell areas (interior walls, doors, floor coverings, and ceiling systems) shall at a minimum comply with III.A.4 or III.A.5, above. Such projects shall outperform CBC Title 24, Part 6, currently in effect, by 20%. This does not apply to acute care facilities.
8. Acute care facilities and medical office buildings undertaking major renovations, as defined above, will outperform ASHRAE 90.1- 2010 by 30%.
9. Renovation projects with a project cost of $5 million or greater (CCCI 5000) that do not constitute a Major Renovation as defined in item III.A.7. shall at a

[1] Labs21 is a voluntary partnership program that offers training and resources to support the design and operation of high-performance laboratories. Labs21 is co-sponsored by the Department of Energy and the Environmental Protection Agency. The Labs21 Environmental Performance Criteria (EPC) is a rating system that consists of prerequisites and credits in several laboratory-specific areas, including laboratory equipment water use, chemical management, and ventilation. Labs21 EPC is designed as a complement to LEED.

minimum achieve a LEED-ID+C Certified rating and register with the utilities' Savings by Design program, if eligible. This does not apply to acute care facilities.

B. Clean Energy

In support of the climate neutrality goals outlined in Section C of this policy, the University of California is committed to reducing its greenhouse gas emissions by reducing energy use and switching to clean energy supplies.

1. Energy Efficiency

   Each location will implement energy efficiency actions in buildings and infrastructure systems to reduce the location's energy use intensity by an average of least 2% annually.

2. On-campus Renewable Electricity

   Campuses and health locations will install additional on-site renewable electricity supplies and energy storage systems whenever cost-effective and/or supportive of the location's Climate Action Plan or other goals.

3. Off-campus Clean Electricity

   By 2025, each campus and health location will obtain 100% clean electricity. By 2018, the University's Wholesale Power Program will provide 100% clean electricity to participating locations.

4. On-campus Combustion

   By 2025, at least 40% of the natural gas combusted on-site at each campus and health location will be biogas.

C. Climate Protection

Each campus and the UC Office of the President will develop strategies for meeting the following UC goals:

1. Climate neutrality from scope 1 and 2 sources by 2025
2. Climate neutrality from specific scope 3 sources (as defined by Second Nature's Carbon Commitment) by 2050 or sooner

In addition, at a minimum, meet the following intermediate goal in pursuit of climate neutrality:

3. Reduce greenhouse gas (GHG) emissions to 1990 levels by 2020, pursuant to the California Global Warming Solutions Act of 2006.

For purposes of this section, campuses shall include their related health location for all goals. GHG emissions reduction goals pertain to emissions of the six Kyoto greenhouse gasses[2] originating from all scope 1 and scope 2 sources as specified by the Climate Registry, and from scope 3 emissions as specified by Second

[2] The six greenhouse gasses identified in the Kyoto Protocol are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons.

Nature's Carbon Commitment, which includes air travel paid through the institution; and commuting to and from campus by students, faculty and other academic appointees, and staff. These goals will be pursued while maintaining the research, education, and public service missions of the University.

Campuses subject to the United States Environmental Protection Agency (USEPA) Greenhouse Gas Reporting Program, California Air Resources Board (CARB) Mandatory Greenhouse Gas Emissions Reporting or participation in the CARB Cap-and-Trade Program shall perform to those regulatory requirements.

D. Sustainable Transportation

The University will implement transportation programs and GHG emission reduction strategies that reduce the environmental impacts from commuting, fleet and business air travel related to achieving the Climate Protection section of this Policy (see Section III.C.).

1. Each location will reduce GHG emissions from its fleet and report annually on its progress. Locations shall implement strategies to reduce fleet emissions and improve the fuel efficiency of all university-owned or operated fleet vehicles and equipment where practical options exist through acquisition and fleet operation protocols.
    a. By 2025, zero-emission vehicles or hybrid vehicles shall account for at least 50%of all new light-duty vehicle acquisitions. Lawrence Berkeley National Laboratory will follow federal fleet requirements in the case where federal and UC fleet requirements conflict.
2. The University recognizes that single-occupant vehicle (SOV) commuting is a primary contributor to commute GHG emissions and localized transportation impacts.
    a. By 2025, each location shall strive to reduce its percentage of employees and students commuting by SOV by 10% relative to its 2015 SOV commute rates;
    b. By 2050, each location shall strive to have no more 40% of its employees and no more than 30% of all employees and students commuting to the location by SOV.
3. Consistent with the State of California goal of increasing alternative fuel – specifically electric – vehicle usage, the University shall promote purchases and support investment in alternative fuel infrastructure at each location.
    a. By 2025, each location shall strive to have at least 4.5% of commuter vehicles be ZEV.
    b. By 2050, each location shall strive to have at least 30% of commuter vehicles be ZEV.
4. Each location will develop a business-case analysis for any proposed parking structures serving University affiliates or visitors to campus to document how a

capital investment in parking aligns with each campus' Climate Action Plans and/or sustainable transportation policies.

E. Sustainable Building and Laboratory Operations for Campuses

1. Each campus will submit for certification one pilot building at a LEED-O+M "Certified" level or higher.
2. Each campus shall register a master site to certify campus-wide LEED-O+M credits and prerequisites to streamline the certification of multiple buildings through the LEED-O+M rating system by July 1, 2015. Each campus shall certify their campus-wide credits as soon as possible after the master site has been registered.
3. Each campus shall seek to certify as many buildings as possible through the LEED-O+M rating system, within budgetary constraints and eligibility limitations.
4. All campuses shall implement an ongoing Green Lab Assessment Program supported by a department on campus to assess the operational sustainability of research groups and the laboratories and other research spaces they use by Summer 2018.
   a. At least one staff or faculty member from the campus must have the role of managing the Green Lab Assessment Program.
   b. Any green lab assessment programs and related efforts will adhere to all relevant UC, state and national policies and laws. Safety will never be compromised to accommodate sustainability goals.
   c. All campuses shall submit a UC Green Laboratories Action Plan by Summer 2018.

F. Zero Waste

1. The University will achieve zero waste through prioritizing waste reduction in the following order: reduce, reuse, and then recycle and compost (or other forms of organic recycling) as described in section V.F.6. Minimum compliance for zero waste, at all locations other than health locations, is as follows:
   a. Reduce per capita total municipal solid waste generation by:
      i. 25% per capita from FY2015/16 levels by 2025
      ii. 50% per capita from FY2015/16 levels by 2030.
   b. Divert 90% of municipal solid waste from the landfill.
2. The University supports the integration of waste, climate and other sustainability goals, including the reduction of embodied carbon in the supply chain through the promotion of a circular economy and the management of organic waste to promote atmospheric carbon reduction. In support of this goal, waste reporting will include tracking estimated scope 3 greenhouse gas emissions.
3. By 2020, the University will prohibit the sale, procurement, or distribution of packaging foam, such as food containers and packaging material, other than that

utilized for laboratory supply or medical packaging and products. The University seeks to reduce, reuse, and find alternatives for packaging foam used for laboratory and medical packaging products.

a. No packaging foam or expanded polystyrene (EPS) shall be used in foodservice facilities for takeaway containers.

For implementation guidelines as they relate to the procurement of goods for University of California campuses, reference the [University of California Sustainable Procurement Guidelines.]

4. The University is committed to the reduction and elimination of single-use items in line with the University's and the State of California's Zero Waste goals and in recognition of the severe environmental impact single-use products have globally. In recognition of this commitment, locations will reduce single-use products by taking the following actions:

   a. Eliminate plastic bags in all retail and foodservice establishments in campus facilities or located on university owned land no later than January 1, 2021

   b. Replace disposable single-use plastic foodware accessory items in all foodservice facilities with reusables or locally compostable alternatives and provide only upon request no later than July 1, 2021

   c. Provide reusable foodware items for food consumed onsite at dine-in facilities and to-go facilities no later than July 1, 2022.

   d. Replace single-use plastic foodware items with reusable or locally compostable alternatives at to-go facilities no later than July 1, 2022

   e. Phase out the procurement, sale and distribution of single-use plastic beverage bottles. Non-plastic alternatives shall be locally recyclable or compostable.

      i. Foodservice facilities will provide alternatives no later than January 1, 2023.

      ii. Locations are encouraged to prioritize the installation of water refill stations to support the transition from single-use plastics to reusables.

      iii. Locations will consider eliminating single-use plastic beverage bottles when contracting with suppliers, or upon contract renewal and/or extension if current contract terms prohibit (e.g., vending machines, departmental purchases, etc.).

   f. When selecting prepackaged, sealed food that is mass produced off premises and resold at University locations (e.g., grab-and-go items, such as chips, candy, prepackaged sandwiches, etc.), preference should be given in contract award and negotiations to suppliers that utilize locally compostable or locally recyclable packaging options.

   This policy section (III.F.4.) also applies to third-party foodservice facilities that lease space or provide contracted services at UC locations. Locations will include these Policy provisions in lease language as new leases and contracts are negotiated or existing leases are renewed and work to incorporate these practices, as much as possible, within the timeframe of current leases. When procuring catering services, where possible, select providers that can provide alternatives to single-use plastics.

G. Sustainable Procurement

Recognizing the substantial impact that procurement decisions have on the environment, society, and the economy, the University of California will maximize its procurement of sustainable products and services. The goals outlined throughout these policy and procedures sections shall be applied within the constraints of research needs and budgetary requirements and in compliance with all applicable rules, regulations, and laws.

1. The University values the health and wellbeing of its students, staff, faculty and other academic appointees, visitors, and suppliers. The University seeks to provide healthy and accessible conditions for the communities it serves, and this will be considered as a fundamental factor when making procurement decisions. Where functional alternatives to harmful products or impacts exist, they are to be strongly preferred.
2. Per III.F.1. the University prioritizes waste reduction in the following order: reduce, reuse, and then recycle. Accordingly, sustainable procurement will look to reduce unnecessary purchasing first, then prioritize the purchase of surplus or multiple-use products, before looking at recyclable or compostable products.
3. The University's sustainable purchasing requirements are [3]:
    a. 100% compliance with Required Level Green Spend criteria within three fiscal years of the addition of those products and/or product categories to the Guidelines.
    b. 25% Green Spend as a total percentage of spend per product category; target to be reached within three fiscal years after a category is added to the Guidelines.
    c. 25% Economically and Socially Responsible Spend as a total percentage of addressable spend; target to be reached within five fiscal years of adoption of this section in the Guidelines.
4. The University's sustainable purchasing reporting requirements are:
    a. Reporting on percent Green Spend beginning at the close of the first full Fiscal Year after a category is added to the Guidelines.
    b. Reporting on percent Economically and Socially Responsible Spend beginning at the close of Fiscal Year 2018/19.

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[3] Detailed criteria for Green Spend, Economically and Socially Responsible (EaSR) Spend, and their combined intersection, Sustainable Spend, can be found in the UC Sustainable Procurement Guidelines.

   c. Reporting on percent Sustainable Spend will be piloted by UCOP beginning at the close of Fiscal Year 2018/19.

5. Each University's Procurement department will integrate sustainability into its processes and practices, including competitive solicitations, in order to satisfy the sustainable purchasing goals outlined above for products, as well as for the procurement of services. The University will do so by:

   a. Allocating a minimum of 15% of the points utilized in solicitation evaluations to sustainability criteria. Criteria may include, but is not limited to, sustainable product attributes, supplier diversity, supplier practices, contributions to health and wellbeing, and materials safety. This requirement will go into effect on July 1st, 2019. Exceptions to this policy may only be granted by the appropriate Policy Exception Authority. Decisions to grant an exception shall be made in the context of a location's need to support teaching, research and public service when there is a demonstrable case that the inclusion of a minimum of 15% of the points utilized in solicitation evaluation for sustainability criteria will conflict with the project teams' ability to execute a competitive solicitation.

   b. Supporting outreach, education, and providing equal access to small, diverse, and disadvantaged suppliers for all applicable University procurement opportunities in accordance with BUS-43 policy.

   c. Comparing the Total Cost of Ownership when evaluating costs for goods and services in the selection of suppliers, whenever feasible.[4]

   d. Targeting sustainable products and services for volume-discounted pricing to make less competitive or emerging sustainable products and services cost-competitive with conventional products and services.

   e. Leveraging its purchasing power and market presence to develop sustainable product and service options where not already available.

   f. Requiring packaging for all products procured by the University be designed, produced, and distributed to the end-user in a sustainable manner.

   g. Contracting with suppliers of products (e.g., electronics, furniture, lab consumables) that have established (preferably non-manufacturer specific) end-of-life reuse, recycling, and/or takeback programs at no extra cost to the University, and in compliance with applicable federal, state, and University regulations regarding waste disposal.

   h. Requiring sustainability-related purchasing claims to be supported with UC-recognized certifications and/or detailed information on proven benefits,

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[4] Public Contract Code§ 10507.8 states: "As provided for in this article, when the University of California determines that it can expect long-term savings through the use of life cycle cost methodology, the use of more sustainable goods and materials, and reduced administrative costs, the lowest responsible bidder may be selected on the basis of the best value to the university. In order to implement this method of selection, the Regents of the University of California shall adopt and publish policies and guidelines for evaluating bidders that ensure that best value selections by the university are conducted in a fair and impartial manner."

durability, recycled content, and recyclability properties, in accordance with the Federal Trade Commission's (FTC) Green Guides for the use of environmental marketing claims.

i. Working with its suppliers to achieve greater transparency and sustainable outcomes throughout the supply chain. This may include maximizing the procurement of products that optimize the use of resources from extraction through manufacturing and distribution (e.g., EPA's SmartWay Program).

6. All procurement staff will consult the UC Sustainable Procurement Guidelines document for minimum mandatory sustainability requirements to be included in solicitations for a given product or service category.

H. Sustainable Foodservices

1. Campus and Health Location Foodservice Operations

   a. Food Procurement

   Each campus foodservice operation shall strive to procure 25% sustainable food products by the year 2030 as defined by AASHE STARS and each health location foodservice operation shall strive to procure 30% sustainable food products by the year 2030 as defined by Practice Greenhealth, while maintaining accessibility and affordability for all students and health location's foodservice patrons.[5]

   b. Education

   Each campus and health location shall provide patrons and foodservice staff with access to educational and training materials that will help support their food choices.

   c. Menu Development

   Each campus and health location shall strive to reduce greenhouse gas emissions of their food purchases through globally- inspired, culturally-acceptable plant-forward menus.

   i. Campuses and health centers shall establish a baseline and goal in 2020.

   ii. Progress shall be tracked annually by reporting the percentage of plant-based foods procured beginning in 2021.

2. Foodservice Operations in Leased Locations:

   a. Foodservice operations leased in campuses and health locations owned by the University of California and contractors providing foodservices in campus and health locations will strive to meet the policies in III.H.1.a-c. above.

   b. Campuses and health locations will include Section H of this Policy in lease language as new leases and contracts are negotiated or existing leases are

[5] For the purposes of this policy, campus foodservice operations is defined as locations that are managed by entities that administer meal plans. Health location foodservice is defined as cafeterias.

renewed. However, campus and health locations will also work with tenants to advance sustainable foodservice practices as much as possible within the timeframe of current leases.

I. Sustainable Water Systems[6]

With the overall intent of achieving sustainable water systems and demonstrating leadership in the area of sustainable water systems, the University has set the following goals applicable to all locations:

1. Locations will reduce growth-adjusted potable water consumption 20% by 2020, and 36% by 2025, when compared to a three-year average baseline of FY2005/06, FY2006/07, and FY2007/08. Locations that achieve this target early are encouraged to set more stringent goals to further reduce potable water consumption. Each Campus shall strive to reduce potable water used for irrigation by converting to recycled water, implementing efficient irrigation systems, drought-tolerant planting selections, and/or by removing turf.
2. Each location will develop and maintain a Water Action Plan that identifies long term strategies for achieving sustainable water systems. The next update of the plan shall be completed in December 2016.
   a. Campuses will include in this update quantification of total square feet of used turf and under-used turf areas on campus as well as a plan for phasing out un-used turf irrigated with potable water.
3. Each location shall identify existing single-pass cooling systems and constant flow sterilizers and autoclaves in laboratories and develop a plan for replacement.
4. New equipment requiring liquid cooling shall be connected to an existing recirculated building cooling water system, new local chiller vented to building exhaust or outdoors, or to the campus chilled water system through an intervening heat exchange system if available.
   a. Once-through or single-pass cooling systems shall not be allowed for soft-plumbed systems using flexible tubing and quick connect fittings for short term research settings.
   b. If no alternative to single-pass cooling exists, water flow must be automated and controlled to avoid water waste.

J. Sustainability at UC Health

1. Health locations will achieve Practice Greenhealth's award "Greenhealth Partner for Change."
2. Locations will use the definitions in Practice Greenhealth to set medical-center-specific goals for waste diversion and reduction as well as water reduction.

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[6] Related sections: Green Building Design policy III.A. 5, Green Building Design procedure V.A.4, and Sustainable Purchasing procedures V.G.10.e, V.G.15, V.G.16, and V.G.17.

- UC San Francisco Health and UCLA Health have the following waste and water targets:
    - Waste
        - By 2020, 50% of total solid waste diverted from landfill and incineration.
        - By 2020, 40lbs of total solid waste per Adjusted Patient Day.
    - Water
        - In line with campus targets, UC San Francisco Health and UCLA Health will reduce growth-adjusted potable water consumption 20% by 2020 and 36% by 2025, when compared to a three-year average baseline of FY2005/06, FY2006/07, and FY2007/08.
- UC Irvine Health has the following waste and water targets:
    - Waste
        - By 2020, 50% of total solid waste diverted from landfill and incineration.
    - Water
        - In line with campus targets, UC Irvine Health will reduce growth-adjusted potable water consumption 20% by 2020 and 36% by 2025, when compared to a three-year average baseline of FY2005/06, FY2006/07, and FY2007/08.
- UC San Diego Health and UC Davis Health will have target commitments by December 31, 2020.

3. Acute care/hospital facilities and medical office buildings in health locations shall be designed, constructed and commissioned, or renovated as outlined in Section A of this policy.
4. Health locations will strive to procure 30% sustainable food products by the year 2030 as defined by Practice Greenhealth and outlined in Section H of this policy on Sustainable Foodservices.

K. General Sustainability Performance Assessment

1. All undergraduate campuses must maintain a certified AASHE STARS report.
2. All campuses must achieve a Silver STARS rating and strive for Gold by 2023.

IV. COMPLIANCE/RESPONSIBILITIES

A. Implementation of the Policy

The Executive Vice President-Chief Operating Officer is the Responsible Officer for this Policy. The UC Sustainability Steering Committee, which is chaired by the

Executive Vice President-Chief Operating Officer, provides oversight for all aspects of the Policy.

B. Revisions to the Policy

The President is the approver of this Policy and has the authority to approve or delegate the approval of revisions to the Policy.

The systemwide Working Group corresponding to each section of the Policy recommends Policy revisions to the UC Sustainability Steering Committee and Executive Vice President-Chief Operating Officer. Proposed previsions accepted by the UC Sustainability Steering Committee and the Executive Vice President-Chief Operating Officer shall then be recommended to the President for approval or to the appropriate delegated authority, as stated above.

The Sustainable Practices Policy will be reviewed, at a minimum, once every three years with the intent of developing and strengthening implementation provisions and assessing the influence of the Policy on existing facilities and operations, new capital projects, plant operating costs, fleet and transportation services, and accessibility, mobility, and livability. The University will provide for ongoing active participation of students, faculty and other academic appointees, administrators, and external representatives in further development and implementation of this Policy.

C. Compliance with the Policy

Chancellors and the Lawrence Berkeley National Laboratory Director are responsible for implementation of the Policy in the context of individual building projects, facilities operations, etc. An assessment of location achievements with regard to the Policy is detailed in an annual report to the Regents. The internal audit department may conduct periodic audits to assess compliance with this Policy. (Annual Report on Sustainable Practices).

D. Reporting

On an annual basis, the President will report to the Regents on the University's sustainability efforts in each area of the Policy.

V. PROCEDURES

A. Green Building Design

New Buildings and Major Renovations

1. Projects will utilize the versions of the CBC energy efficiency standards and of LEED-BD+C that are in effect at the time of the first submittal of "Preliminary Plans" (design development drawings and outline specifications) as defined in the State Administrative Manual.[7]

[7] The State Administrative Manual (SAM) is a reference source for statewide policies, procedures, regulations and information developed and issued by authoring agencies such as the Governor's Office, Department of General Services (DGS), Department of Finance (DOF), and Department of Personnel Administration.

2. If eligible, all new buildings and major renovations (as defined in III.A) will register with the Savings By Design program in order to document compliance with the requirement to outperform CBC energy efficiency standards by at least 20%.

3. Projects other than acute care facilities that opt to use energy performance targets for compliance with III.A.1 will at a minimum use the whole-building energy performance target listed below that corresponds to the year of the project's budget approval. The whole-building energy performance target is expressed as a percentage of the sum of the Annual Electricity and Annual Thermal targets (converted to kBTU/gsf-yr) published as Table 1, UC Building 1999 Energy Benchmarks by Campus, in Sahai, et al. 2014.[8]

Table 1

Calendar Years	Compliance Target	Stretch Target
2015-16	65%	50%
2017-18	60%	45%
2019-20	55%	40%
2021-22	50%	35%
2023-24	45%	30%
2025 or after	40%	25%

4. Decisions affecting energy efficiency, fossil fuel use, and connection to existing central thermal services shall be made in the context of the location's climate action plan. Where on-site fossil fuel combustion within the building is deemed necessary, the rationale for this decision shall be documented as part of the existing project approval process. The submittal should include the following:

   a. An estimate of annual electricity and gas use for the project as well as the project's target design energy use in thousand British thermal units (kBtu) per square foot.

   b. An explanation of why fossil fuel combustion is required for the project and what other alternatives were evaluated.

   c. An analysis explaining why fossil-fuel combustion is the most cost-effective energy source for the identified project-specific applications.

   d. A plan to mitigate, by 2025, the associated greenhouse gas emissions in accordance with the location's Climate Action Plan.

   This documentation is part of the broader project approval process and does not require separate UCOP approval. Draft information should be submitted prior to budget approval as part of a Project Planning Guide, Delegated Authority Project

[8] Sahai, R., Kniazewycz, C., Brown, K, 2014.Benchmark-based, Whole-Building Energy Performance Targets for UC Buildings. University of California Office of the President and California Institute of Energy and Environment.

Certification Checklist or related ancillary document. This information should be updated prior to design approval.

5. Acute care facilities and medical office buildings opting to use energy performance targets for compliance with III.A.2 will at a minimum use the whole-building energy performance target listed in table 2 below. The whole-building energy performance target is expressed as a percentage of the sum of the Annual Electricity and Annual Thermal targets (converted to kBTU/gsf-yr) based on ASHRAE (2012) Advanced Energy Design Guidelines.[9]

Table 2

	Acute Care			**Medical Office Buildings**		
	Benchmark Average	**Target**	**Stretch Target**	**Benchmark Average**	**Target**	**Stretch Target**
UC Davis Health	230	160	115	85	60	43
UC Irvine Health	230	160	115	80	56	40
UCLA Health	230	160	115	80	56	40
UC San Diego	230	160	115	80	56	40
UC San Francisco Health	230	160	115	80	56	40

Locations will demonstrate compliance based on the results of energy modeling that represents a best estimate of as-operated, whole-building energy use, before accounting for on-site energy generation. Targets are intended to be verifiable in actual operation following building occupancy.

Projects are also required to model and report on the following metrics:

- annual electricity consumption (kWh/gsf/yr)
- annual thermal consumption (therms/gsf/yr)
- peak electricity (W/gsf)
- peak chilled water (tons/kgsf) (if applicable)
- peak thermal (therms/hr/kgsf)

The following very high-intensity process loads may be subtracted out of the total building energy use intensity if they can be metered separately.

- Clean room
- Data center

[9] ASHRAE (2012) Advanced Energy Design Guidelines for Large Hospitals

- Micro-chip fabrication
- Accelerator (e.g., laser, light source)
- Bio-safety level III Laboratory
- Magnetic Resonance Imaging (MRI)
- Positron Emission Tomography (PET)
- Computer Tomography (CT)
- Pharmacies

If a building has more than 6 Operating Rooms (ORs), additional ORs (defined as any ORs beyond the baseline of 6 ORs) may be subtracted out of total building energy use intensity if they meet the following two requirements:

a. OR heating, ventilation and air conditioning (HVAC) is metered separately; and,
b. A commitment is made by an appropriate official within the hospital's administration to implement an OR HVAC setback program in the subtracted ORs.

6. Locations are encouraged to coordinate with local water districts in efforts to conserve water and to meet reduced water use goals of the local districts.

Privatized Development

1. All privatized development of New Buildings or Major Renovations on University-owned land that is constructed in whole or in substantial part for University-related purposes (i.e., in furtherance of the University's mission, both programmatic and auxiliary uses), and build-to-suit projects not on University-owned land constructed for University-related purposes, shall comply with section III.A. of this Policy. The provisions of this subsection apply regardless of the business relationship between the parties (i.e., whether a gift, acquisition, ground lease and/or lease).

Building Renovations

1. At budget approval, all renovation projects should include a listing of sustainable measures under consideration.
2. For all improvement projects in spaces leased or licensed by the Regents to be used for University-related purposes for a term of greater than 12 months, locations shall strive to comply with the Policy requirements in III.A.6 and III.A.7, as appropriate.

Waiver Conditions Applicable to all Projects

1. Waivers will only be granted in exceptional circumstances and will not be considered if the project negatively impacts the ability to comply with the goals of this policy, in particular the goal of achieving carbon neutrality by 2025.

2. Any proposed waiver from section III.A of the Policy may be requested administratively from the UCOP Executive Director of Capital Programs prior to first project approval.
3. New Building and Major Renovation projects applying for an exception from section III.A.3 of this Policy should strive to achieve a USGBC LEED "Certified" rating. New building and renovation projects that are unable to achieve a USGBC LEED "Certified" rating shall submit a request for an exception with a LEED scorecard and supporting documentation to the UCOP Executive Director of Capital Programs, showing the credits that the project would achieve.
4. Such waiver requests shall indicate the applicable section of the Policy and/or Procedures; the proposed solution; and demonstrate equivalency with policy intent.

General/Miscellaneous

1. The University will develop a program for sharing best practices.
2. The University will incorporate the requirements of sections III.A. and V.A. into existing training programs, with the aim of promoting and maintaining the goals of the Policy.
3. The University planning and design process will include explicit consideration of life cycle cost along with other factors in the project planning and design process, recognizing the importance of long-term operations and maintenance in the performance of University facilities.
4. The University will work closely with the USGBC, Labs21, the Department of Energy, the U.S. Environmental Protection Agency, state government, and other organizations to facilitate the improvement of evaluation methodologies to address University requirements.

B. Clean Energy

1. Energy Efficiency: The energy efficiency goal follows the spirit of the US Department of Energy's Better Building Challenge. Each location's percent reduction in energy use intensity (EUI) will be reported annually based on the sum of weather-adjusted energy use divided by the sum of the maintained gross square footage (OGSF50). The average annual reduction will be calculated using an established baseline as detailed in the UC EUI Tracking Methods and References. UCOP will use energy usage data from the systemwide purchased utility database for reporting campus energy use intensity, based on the campus-specified set of utility accounts and associated maintained gross square footage. Electric and gas site energy will be converted to kBTU and normalized for weather. Policy goals will be evaluated and adjusted as appropriate following the 2025 reporting year.
2. On-campus Renewable Energy
   a. Each location will determine the appropriate mix of measures to be adopted within its clean energy portfolio. The capacity to adopt these measures is

driven by technological and economic factors and each location will need to reevaluate its mix of energy measures on a regular basis.

b. Locations will periodically evaluate the feasibility of new on-site renewable electricity projects. The financial evaluation of these projects will fully account for the anticipated avoided costs associated with decreased on-site power production from combined heat and power plants and/or purchased electricity as well as the avoided cost of carbon.

3. Off-campus Clean Electricity

   a. Clean electricity is defined as having a residual greenhouse gas emission factor that is less than 150 lbs. CO_2/MWh.

   b. Clean electricity shall be procured through the following methods and reported on annually:

      i. A location may opt-in to a utility provided green power program for its purchased electricity that meets the definition of clean electricity specified in V.B.3.a.

      ii. The UC Wholesale Power Program, which will procure and supply to participating campuses 100% clean electricity by 2018.

      iii. Those locations without access to a green power program may purchase Renewable Energy Credits (REC) to offset purchased electricity. In order to be counted, such RECs will be transferred to UC or retired on behalf of UC.

4. Where feasible, the University will seek to benefit from the economies of scale and to reduce risk by developing a portfolio for systemwide clean energy procurement contracts from which locations may benefit.

5. On-campus Combustion

   a. The University will develop and procure biogas supplies under the direction of the Energy Services Unit Governing Board (The Governing Board). The Governing Board will establish acceptable pricing for biogas projects and determine how the biogas will be allocated to each location. Locations may also implement local projects to directly transport biogas to the location.

C. Climate Protection

1. Each campus will maintain individual membership with The Climate Registry (TCR)[10]. Campuses shall include their health locations in their membership.

2. Each campus will complete a Greenhouse Gas (GHG) emissions inventory annually. Campuses shall include their health locations in their inventories.

[10] The Climate Registry is a nonprofit collaboration among North American states, provinces, territories and Native Sovereign Nations that sets consistent and transparent standards to calculate, verify and publicly report greenhouse gas emissions into a single registry.

3. To comply with TCR and the Second Nature Carbon Commitment requirements,[11] inventories should contain emissions of the six Kyoto greenhouse gasses from scope 1 and 2 emission sources outlined in the TCR General Reporting Protocol; and scope 3 emissions sources outlined by the Second Nature Carbon Commitment's Implementation Guide. All UC campuses will report their updated emissions inventories through the Second Nature Carbon Commitment online reporting tool at least biennially. Campuses must verify all emissions inventories through TCR.Campuses may either pursue verification annually (for the previous year's emissions inventory) or biennially (for the emissions inventories from the previous two years).
4. Campuses subject to the United States Environmental Protection Agency (USEPA) Greenhouse Gas Reporting Program, California Air Resources Board (CARB) Mandatory Greenhouse Gas Emissions Reporting, or participation in the CARB Cap-and-Trade Program shall complete the relevant emissions inventories outlined in the USEPA and CARB reporting protocols.
5. Each campus will regularly update its climate action plan for reducing GHG emissions to 1990 levels by calendar year 2020 (annual 2020 emissions to be reported in 2021); achieving climate neutrality for scope 1 and 2 sources by calendar year 2025 (annual 2025 emissions reported in 2026), and achieving climate neutrality for the Second Nature Carbon Commitment-specified scope 3 sources (as defined by Second Nature's Carbon Commitment) for calendar year 2050 (annual 2050 emissions reported in 2051). This will include an annual review and update, if needed, of the GHG reduction strategies reported by the campus to the UC Office of the President (UCOP). Campuses shall include their health locations in the action plan.
6. Each campus will complete an assessment of Scope 1 emissions from natural gas combustion by 2035 or at the date when that location's combined heat & power plant (or any other major fossil fuel-using campus infrastructure) is planned for capital renewal or major repair, whichever occurs first. The assessment should determine the best pathway, at that point, to decarbonize 80% of scope 1 emissions through means other than offsets. A de-carbonization assessment should evaluate, but is not limited to, (1) progress toward de-carbonization of piped gas, (2) the feasibility of installing on-site carbon capture, (3) electrification of carbon-emitting plant equipment, (4) hydrogen or synthetic methane injection, (5) emergent technologies, and (6) energy efficiency directed at Scope 1 footprint reductions. The assessment should be provided to campus leadership and inform each campus's Climate Action Plan.
7. The Climate Change Working Group (CCWG), under the UC Sustainability Steering Committee and represented on the President's Global Climate Leadership Council, will monitor progress toward reaching the stated goals for

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[11] The Second Nature Carbon Commitment requirements are outlined at [Second Nature: The Presidents' Climate Leadership Commitments](#).

GHG reduction, and will evaluate suggestions for strategies and programs to reach these goals.

8. The CCWG will develop protocols for growth adjustment, data normalization, and accurate reporting procedures, as required.

D. Sustainable Transportation

1. The Sustainable Transportation Working Group, with input from the Climate Change Working Group, will develop normalized data reporting protocols to track progress on the implementation of sustainable transportation programs. Annually, each location will collect and report:
   a. Fleet efficiency metrics: fleet fuel consumption, total vehicle inventory, and total number and percent of new ZEV fleet acquisitions.
   b. Commute data: employee and campus-wide mode split, average vehicle ridership (AVR), and percent of commuter alternative fuel vehicles.
   c. Number and type of alternative fuel infrastructure (e.g., electric vehicle charging stations, natural gas, etc.).
2. Due to the unique characteristics of each campus' fleet management protocols, each location shall develop a Fleet Sustainability Implementation Plan by January 1, 2018, to document the infrastructure and financial needs to implement a low-carbon fleet program and lower campus fleet carbon emissions through 2025. Location fleets shall implement practical measures to improve fleet emissions, including, but not necessarily limited to, managing vehicle fleet size, eliminating non-essential vehicles, purchasing the cleanest and most efficient vehicles and fuels, and investing in clean shuttle operations.
3. To amplify the impact of campus programs, each location is encouraged to partner with local agencies on opportunities to improve sustainable transportation access to and around university facilities in addition to developing its own transportation programs.
4. Each location shall implement parking management and pricing strategies to support emissions reduction and sustainable transportation goals, including variable pricing and unbundling parking and housing costs.
5. The University will pursue strategic programs and data collection to offset greenhouse gas emissions related to business-related campus air travel.
6. This Policy shall be consulted for all new campus development – including acquisitions and leases – to evaluate how the development or acquisition would meet the transportation policies and goals of the campus and University.
7. Sustainable Transportation Working Group will coordinate the development of a systemwide best practices guide for campus units implementing this Policy. Mechanisms for reducing transportation emissions include, but are not limited to:
   a. Constructing additional on-campus housing (e.g., student housing and temporary housing for new faculty)

b. Expanding TDM programs: car share, carpool/rideshare, vanpool, shuttles, transit, bicycle circulation system, pedestrian circulation system, emergency rides home, parking management and pricing, employee service, and retail amenities, etc.

c. Expanding intra-campus transportation programs such as shuttles, car share, bike share, bicycle, and pedestrian infrastructure, etc.

d. Encourage opportunities for employees to participate in flexible work schedules and/or telecommuting programs to provide alternative commute flexibility and options.

e. Replacing fleet vehicles with newer, more fuel-efficient vehicles when ZEV are not available

f. Rightsizing fleets (determining the appropriate fleet size, revising business practices to reduce the need for travel)

g. Reducing fleet vehicle miles traveled

h. Increasing use of fuels with lower GHG emissions

i. Installation of telematics and GPS to measure and help reduce fuel consumption by monitoring and reducing excessive idling and speeding.

E. Sustainable Building and Laboratory Operations for Campuses

1. The University will incorporate the Sustainable Building and Laboratory Operations policy requirements into existing facilities-related training programs, with the aim of promoting and maintaining the goals of the Policy.
2. The University will work closely with the USGBC to address the needs and concerns of campuses in the further development of USGBC programs, including the LEED-O+M rating system and the USGBC's "Application Guide for Multiple Buildings and On-Campus Buildings."
3. Campuses will use the LEED-O+M certification process to advance the University's educational and research mission by using the buildings as living, learning laboratories.
4. Campuses will assess at least three new research groups through their Green Lab Assessment Program by Summer 2018.
5. Campuses shall complete a UC Green Laboratories Action Plan by summer 2018 to determine strengths and areas for improvement within the operations of research laboratories with respect to sustainability and carbon neutrality. A standard template for this with required sections will be maintained and updated by the Sustainable Operations Working Group and this plan will be updated on a four-year cycle (2018, 2022, 2026 and so on).
6. Each campus will report annually on their Green Labs program progress, including the number of researchers directly and indirectly engaged by the program each year.

F. Zero Waste

1. The University will voluntarily comply with Chapter 18.5, the "State Agency Integrated Waste Management Plan," in California Public Resources Code Section 40196.3.
2. Waste reduction and recycling shall be prioritized in seeking LEED credits for LEED-BD+C, LEED-ID+C, and LEED-O+M projects.
3. By the end of 2018, locations other than health locations will submit new waste management plans, including planned waste reduction strategies. Plans will include campus and regional waste management practices and options, evaluate progress towards policy goals, and determine the associated costs of achieving policy goals. Waste management plans will be updated and submitted to the Associate Vice President of Energy and Sustainability, Office of the President, on a five-year cycle.
   a. The 2023 updates to locations' waste management plans shall identify the next steps to take (including costs, responsible parties, etc.) towards eliminating non-essential single-use plastics by 2030 and assess other opportunities for eliminating other single-use products. The findings of these assessments will be used to recommend changes and additions to section III.F.4. of this policy, no later than July 1, 2024.
4. In line with the objective to minimize the use of single-use products (Section III.F.4), all locations will,
   a. Create a local implementation procedure, by December 2020 that includes the delineation of an exception/exemption protocol (i.e., identifying campus authority, implementation authority, etc.) for cases where reasonable alternatives to plastic do not exist. Key stakeholders could include sustainability, dining, athletics, event services, and other departments that operate foodservice facilities. Local procedures may consider allowing plastic water bottles for emergency services, emergency water storage, and at events where alternatives are not practically available.
   b. Work to identify and reduce single-use plastics that are not identified in section III.F.4.
   c. Recognize that accessibility for and inclusion of the disability community is a priority, and integrate best practices into their local implementation procedures to ensure this policy and its implementation do not create barriers to access or an unwelcoming environment. This includes providing reasonable alternatives to single-use plastic products. If reasonable alternatives are not available, a small stock of single-use plastics (including, but not limited to, plastic straws) should be maintained and made readily available for individuals who need them either at the point of service/cashier; or upon request at dine-in facilities.
5. Exceptions will be considered for entities that represent less than 1% of the overall campus solid waste tonnage.

6. Reduction, reuse, recycling and composting are the primary methods to be counted toward the municipal solid waste diversion from landfill goals. The goal is to strive for the highest form of resource recovery methods and the best use of the materials. The hierarchy for resource recovery is as follows:
   a. Source reduction: The reduction of waste is the highest form of resource recovery as it eliminates the products from being manufactured or transported in the first place.
   b. Reuse: Reuse materials in their original form (e.g., use lumber for lumber, mugs instead of single-use cups, reuse course readers in subsequent classes. These methods maintain the embodied energy in each material.)
   c. Composting and recycling: Composting is the recycling of organics such as animal waste, bedding, greenwaste, and foodwaste into compost and mulch. Recycling refers to the conversion of waste into basic materials so they can be made back into new products.
   d. The methods of reusing and recycling waste vary and will evolve over time as technologies improve. The Zero Waste Working Group – comprising waste and recycling professionals from each location – will continue to evaluate recycling methods and recommend their appropriateness for counting toward diversion goals.
7. Waste Reduction: For the purposes of measuring waste reduction, reporting will be in waste generated per capita per day. Waste generated includes municipal solid waste that goes to landfill and all waste that is diverted through recycling, organics or conversion technologies. Not included in waste reduction calculations are:
   a. Waste generated as part of major construction and demolition projects;
   b. Organic waste generated due to landscape management;
   c. Agricultural, and animal-related waste.
8. Per capita metrics will be understood in the context of business operations and activities:
   a. Campuses will use Weighted Campus User
   b. LBNL will use Full Time Equivalent

   Other locations should use the per capita metric that best supports their business operations.
9. Locations, other than health locations, will strive to achieve 90% diversion of municipal solid waste as soon as feasible through steps that include but are not limited to partnering with local waste haulers to maximize diversion opportunities available and actively engaging with their local campus users to improve source separation. These locations shall outline their strategy for maximizing diversion in their waste management plans and updates. Every year, after 2020, these locations will report to UCOP on their progress and next steps towards meeting this target and identify common barriers and opportunities.

10. The Zero Waste Working Group will coordinate the development of a systemwide best practices guide to outlining methods for quantifying waste generation and diversion at university locations. This guide will include recommendations on boundaries, calculation methodologies, contamination rates, tools, best practices for waste reduction and diversion, etc.

11. Where significant data methodology errors are found in benchmark years, an appropriate alternative methodology will be determined by agreement with UCOP and the Zero Waste Working Group.

12. Reporting of solid waste and recycling data will follow ULs Environmental Claim Validation Procedure for Zero Waste to Landfill (UL2799: 2017-03-22: 3rd Edition) and should be applied in principle to future standards/ editions. Where there are discrepancies between UC policy definitions and goals and UL2799 and subsequent editions, the policy language will apply.

13. Campuses will be able to meet up to 10% of their diversion targets through combustion until the end of FY2021/22 after which the UC will no longer accept combustion as a form of diversion. No campus will increase the percentage of combustion reported as diversion from reported FY2015/16 levels. Up to 10%of total waste generated per campus may be disposed of through allowable thermal residual conversion after FY2021/22. To count, (non-combustion) waste converted through thermal processes must include an integrated materials recovery facility (MRF) or equivalent sorting system to recover recyclables and compostable material prior to conversion. The total value of converted materials counted as diversion from landfill is not to exceed 10%.

G. Sustainable Procurement

1. This section V.G. shall be applied within the constraints of research needs and budgetary requirements and in compliance with applicable rules, regulations and laws.

2. The University will work to remove harmful chemicals from products brought onto campus by increasing the purchase of products and materials that disclose known hazards (e.g., in compliance with the requirements of LEED BD+C v4 “Building product disclosure and optimization - material ingredients” - or updated equivalent) and choosing products with reduced concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

3. The University will require suppliers to clearly identify products with UC-recognized certifications, as defined by the Guidelines, in both hosted and punch out catalog e-procurement environments.

    a. Commodity/Contract Managers will work with all contracted suppliers to ensure that contract items that meet the UC criteria for Green and EaSR Spend as outlined in the Guidelines will be prioritized in all product searches.

   b. Unless locations request otherwise, products that do not meet the University's minimum criteria requirements will be blocked in all hosted catalogs and punch out catalogs upon contract award.

4. The University will require all strategically sourced suppliers to report annually on their sustainable business operations, and quarterly on the University's sustainable purchasing activity. Quarterly sustainable spend reports will be collected by the appropriate University of California Procurement Services department. Quarterly spend reports must be filterable, include all products and services purchased, use an Excel-compatible software, include information on a single sheet, and include the following fields:
   i. Campus
   ii. Department and/or delivery location
   iii. SKU and/or manufacturer number
   iv. Item description
   v. 8-digit UNSPSC code
   vi. Product category/Title of UNSPSC code
   vii. Quantity
   viii. Unit of measure
   ix. Price
   x. Third-party sustainability attribute or certification as recognized in the Guidelines
5. UC locations, not including health locations or the Lawrence Berkeley National Lab, will report annually to the UC Office of the President (UCOP) their percent Green Spend and EaSR Spend for product and service categories defined in the Guidelines. For the first two years of reporting, reports on Green Spend will include, at minimum, a location's share of products purchased from systemwide strategically sourced suppliers, with reports to be provided by the suppliers to UCOP and locations. EaSR Spend reporting will be compiled at the campus level, with the support of UCOP. Reports will be reviewed by each location for accuracy and signed by the location's Chief Procurement Officer, with reporting due 60 days after fiscal close. Reporting procedures will be reviewed after two years of reporting under this policy.
6. The University Standards for all packaging materials will be outlined in all solicitations. Suppliers will be required to demonstrate how their standards and practices for packaging materials meet the UC Standards.
   a. Additional consideration in bid evaluations will be given to suppliers who meet more than one criteria listed in 8 (a) - (e) for packaging, and with preference given to bids meeting 8 (b).

7. In accordance with section III.F.3., the University has disallowed the use of packaging foam by 2020. For implementation procedures, reference the University of California Sustainable Procurement Guidelines.
8. The University requires that all packaging be compliant with the Toxics in Packaging Prevention Act (AB 455) as to be free of any intentionally introduced lead, cadmium, mercury or hexavalent chromium, and containing no incidental concentrations of these regulated metals greater than 100 parts per million (ppm) by weight. In addition, the University requires that all packaging meet at least one of the criteria listed below:
   a. Uses bulk packaging;
   b. Uses reusable packaging (e.g., totes reused by delivery service for next delivery);
   c. Uses innovative packaging that reduces the weight of packaging, reduces packaging waste, or utilizes packaging that is a component of the product;
   d. Maximizes recycled content and/or meets or exceeds the minimum post-consumer content level for packaging in the U.S. Environmental Protection Agency Comprehensive Procurement Guidelines;
   e. Uses locally recyclable or certified compostable material.
9. Suppliers, when interacting with the University, shall be prohibited from providing hard copies of presentations or other materials. Suppliers will be required to present all information in an electronic format that is easily transferable to University staff, who may choose to print their own copies in accordance with UC Policy if necessary. Materials may be provided if specifically required or requested by a UC representative.
10. All recyclers of the University's electronic equipment must be e-Steward certified by the Basel Action Network (BAN) (www.ban.org). In cases where the University has established take-back programs with a manufacturer, the University will encourage the manufacturer to become a BAN-certified e-Steward Enterprise (e-Stewards for Enterprises).

H. Sustainable Foodservices

1. Campus and health location foodservice operations subject to this Policy shall include self-operated and contract-operated foodservices, as well as foodservices in leased locations.
2. Sustainable food is defined as food and beverage purchases that meet AASHE STARS' "sustainably and ethically produced" food for campuses and Practice Greenhealth's "sustainable food" for health locations, as outlined below:
   a. AASHE STARS 2.2 Sustainably and Ethically Produced for campuses;
   b. Practice Greenhealth Healthier Food Purchasing Standards for health locations.

3. Plant-based foods as defined by the Culinary Institute of America's Menus of Change program includes fruits and vegetables (produce); whole grains; beans; other legumes (pulses), and soy foods; nuts and seeds; plant oils; herbs and spices; simple combinations of these foods and their derivatives, and vegetarian/ vegan alternatives to meat and dairy.
    a. AASHE STARS provides additional guidance on processed food items.
    b. Animal products (i.e., meat, poultry, fish, seafood, eggs, and dairy) and their derivatives, drinking water, and most ultra-processed foods do NOT qualify as plant-based foods. Examples of ultra-processed foods include sweet or savory packaged snacks; chocolate and candies (confectionary); mass-produced packaged breads and buns; cookies (biscuits), pastries, cakes, and cake mixes; instant sauces; many ready to heat products including pre-prepared pies and pasta and pizza dishes; powdered and packaged 'instant' soups, noodles and desserts; carbonated drinks; 'energy' drinks; 'fruit' drinks; and distilled alcoholic beverages such as whiskey, gin, rum, and vodka.
4. All foodservice operations should track and report annually the percentage of total annual food budget spent on sustainable food and plant- based products.
5. Each campus and health location procurement department will integrate sustainability into competitive solicitations. Procurement departments will allocate a minimum of 15% of the points utilized in solicitation evaluations to sustainability criteria. Additional guidelines for procurement are listed in III G and the UC Sustainable Procurement Guidelines.
6. The University prioritizes waste reduction in the following order: Reduce, reuse, and then recycle and compost. Campuses, health locations, and leased foodservice operations are encouraged to utilize compostable foodservice containers and packages that have recycled and/or sustainably harvested content wherever possible. Guidelines for compostable foodservice ware are listed in the UC Sustainable Procurement Guidelines.
7. Each campus and health location is encouraged to maintain accessibility and affordability for all students, staff, and patrons. Campuses are encouraged to explore food recovery programs that can support campus basic needs programs.

I. Sustainable Water Systems

Reporting Methods

1. Explicitly identify the geographic and operational areas comprising the scope of location water usage (e.g., the campus as defined by its Long Range Development Plan boundary, excluding third-party operated facilities).
2. Locations with health locations may choose to report health locations data and progress toward the target separately from the main campus.
3. All locations shall report water usage in a tabular format using the following methods:

a. Measure per capita water consumption by Weighted Campus User (WCU) for main campuses and Adjusted Patient Day (APD) for health locations. If necessary, WCU and APD may be combined using the following calculation: [(APD/360)* 1.5] + WCU;

b. Potable water usage for a baseline period that is three consecutive fiscal years including FY 2005/06, 2006/07, and FY 2007/08:

   i. Total location potable water usage, in gallons, for each of the three years comprising the baseline period,

   ii. WCU, or APD, for each of the three years comprising the baseline period,

   iii. Baseline Potable Water Usage: calculate the baseline metric as follows: Step 1: Divide each year's total water use in gallons by that years' WCU or APD population. Step 2: Average the three gallons/population calculations to derive the Baseline Potable Water Usage for the location,

   iv. Multiply the Baseline Potable Water Usage figure by 0.64 to derive the location's 2025 Potable Water Usage Target, and

   v. Unless impracticable, provide average gallons of potable water usage per baseline year per gross square foot of location built space for which potable water consumption is being reported, mirroring (c) above;

c. Potable water usage for the most recent fiscal year[12].

   i. If using only the most recent fiscal year, and not an average, list in the table the following:

      1. Total location potable water usage, in gallons, for the most recent fiscal year,

      2. WCU or APD for the most recent fiscal year,

      3. Divide the gallons by the WCU or APD to derive the Current Potable Water Usage, and

   ii. If feasible, provide average gallons of potable water usage per gross square feet for either the three most current fiscal years, if that is the method adopted, or for the single most current fiscal year, again using the methodology described above;

d. Total location non-potable water usage, in gallons, for the most recent fiscal year.

e. Report, or estimate if metered data is not available, water usage in the following use categories at a minimum: buildings, landscape, and central plant including cooling towers, identifying the quantities of potable and non-potable used for these purposes.

[12] An average of the three most current fiscal years is allowed but not required.

Reporting Schedule

1. Each location prepared a Water Action Plan as specified below and submitted it to the Office of the President by December 2013.
2. Beginning the following year, each location will provide an annual progress report on implementing its Water Action Plan to include progress on its water usage reduction.

Water Action Plans

1. Each Water Action Plan and the water conservation and water efficiency strategies it contains will take into account relevant regional conditions and regulatory requirements, will recognize historical progress, and will acknowledge current location best practices being implemented.
2. Each Water Action Plan will include a section on Water Usage and Reduction Strategies that:
   a. Describes the applicable types of water comprising water systems, including but not limited to potable water, non-potable water, industrial water, sterilized water, reclaimed water, stormwater, and wastewater;
   b. Reports water usage in accordance with the methods set forth in these procedures;
   c. Considers setting more stringent potable water reduction goals if the location has already achieved a 36% below baseline reduction in per capita potable water consumption;
   d. Outlines location-specific strategies for achieving the target for reduced potable water consumption;
   e. Encourages implementation of innovative water-efficient technologies as part of capital projects and renovations (e.g., installation of WaterSense certified fixtures and appliances, graywater reuse, rainwater harvesting, and watershed restoration);
   f. Addresses use of non-potable water sources, and how those sources factor into overall sustainable water systems strategy;
   g. Analyzes the identified water use reduction strategies using a full cost approach by considering:
      i. Projected costs and savings of the identified water-use strategies,
      ii. Indirect costs and savings associated with reduced energy consumption due to the energy use embodied in water use,
      iii. Savings associated with reduced or avoided infrastructure costs, and
      iv. Other avoided costs; and
   h. Sets a timeline for the strategies being implemented to reach the water usage reduction target.

3. Each Water Action Plan will include a section on Stormwater Management developed in conjunction with the location stormwater regulatory specialist that:
   a. Addresses stormwater management from a watershed perspective in a location-wide, comprehensive way that recognizes stormwater as a resource and aims to protect and restore the integrity of the local watershed(s);
   b. References the location's best management practices for preventing stormwater pollution from activities that have the potential to pollute the watershed (e.g., construction; trenching; storage of outdoor equipment, materials, and waste; landscaping maintenance; outdoor cleaning practices; vehicle parking);
   c. Encourages stormwater quality elements such as appropriate source control, site design (low impact development), and stormwater treatment measures to be considered during the planning stages of projects in order to most efficiently incorporate measures to protect stormwater quality;
   d. If feasible, cites relevant and current location stormwater-related plans and permits in an appendix or reference list accompanying the Water Action Plan; and
   e. Includes, to the extent feasible, full cost evaluation of stormwater management initiatives similar to the approach in the Water Usage and Reduction Strategies section above.
4. Each location's Water Action Plan will include a section on Education and Outreach that:
   a. Presents potential opportunities to serve as a living laboratory for sustainable water projects;
   b. Supports efforts of students, faculty and other academic appointees, and staff to implement sustainable water systems on campuses and other locations;
   c. Identifies opportunities for pilot projects that illustrate the University's commitment to sustainable water practices through teaching, research, and service; and
   d. Identifies opportunities for new practices that could create behavior change with regard to water use and watershed management.
5. Each location's Water Action Plan will include a section called Irrigation and Landscape that includes:
   a. Total square feet of turf area and breaks out used and underused turf areas, and;
   b. A description and plan to reduce irrigation with potable water.

J. Sustainability at UC Health

1. The UC Health Sustainability Working Group, with input from relevant working groups for each subject area, will develop normalized data reporting protocols to track the implementation of sustainability programs at health locations. Annually,

the UC Health Sustainability Working Group will report to the University of California Health Center Chief Operating Officer Group and the University of California Sustainability Steering Committee.

2. Health locations will participate in Practice Greenhealth's reporting program and report at a minimum metrics for energy, carbon, water, and waste. To meet the reporting requirements, reporting to Practice Greenhealth will reflect UC Health location boundaries and will use either adjusted patient encounters or adjusted patient days as appropriate to reflect non-licensed patient encounters. Reporting to Practice Greenhealth will be based on the most recently complete fiscal year. Beginning in the 2018/19 fiscal year, these reports will be used for the Annual Report on Sustainable Practices that is presented to the UC Regents.
3. Health locations may discretionarily submit additional facility-specific applications to Practice Greenhealth for award consideration in addition to a total site/campus application. The stated policy goal of achieving Practice Greenhealth Partner for Change Awards may be at the campus or facility level.
4. Health locations will set targets for their facilities for waste diversion and reduction as well as for water reduction in accordance with the schedule outlined in section III.J. If targets require a comparison to a baseline dataset, Practice Greenhealth's 2017 report will be used as a baseline. These targets will be recommended to the system wide Sustainability Steering Committee for addition to the Policy at the meeting following the due dates listed in section III.J.

K. General Sustainability Performance Assessment

1. The rating must be for a current certified STARS report, and under the current STARS point allocations.

VI. RELATED INFORMATION

- Annual Report on Sustainable Practices
- BFB-BUS-43 Purchases of Goods and Services; Supply Chain Management
- BFB-BUS-38: Disposition of Excess Property and Transfer of University-Owned Property
- California Building Code, Title 24
- California Energy Commission Renewables Portfolio Standard Eligibility
- Facilities Inventory Guide
- Federal Trade Commission's (FTC) Green Guides
- Public Contract Code: Materials, Goods, and Services, Section 10507.8
- Public Contract Code: Construction
- State Administrative Manual

- Trademark Licensing Code of Conduct
- UC Sustainability Website
- UC Sustainable Procurement Guidelines
- UC Sustainable Procurement Website
- UL 2799 Environmental Claim Validation Procedure for Zero Waste to Landfill

VII. FREQUENTLY ASKED QUESTIONS

Not applicable.

VIII. REVISION HISTORY

July 24, 2020: Policy revised to update the following sections with new goals, procedures, and clarifications: clean energy, climate protection, sustainable building and laboratory operations for campuses, sustainable foodservice, zero waste, and UC Health. Policy expanded to add a section for general sustainability performance assessment. The following provides more details on the updates:

- Added a new provision to the Climate Protection section to require that campuses formally assess options for reducing emissions from combined heat and power plants before capital renewal or major repairs.
- Updated the Zero Waste section to integrate the waste diversion and minimization targets into a new zero waste goal and adding a new policy provision to begin phasing out single-use plastic bags and foodware items.
- Replaced the 2020 goal in the Sustainable Food Services section, which has already been met, with a new 2030 goal that aligns with the Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability Tracking, Assessment and Rating System (STARS) and Practice Greenhealth's requirements.
- Added a General Sustainability Performance Assessment section that codifies participation by all undergraduate campuses in the AASHE STARS rating system and achieving a gold rating by 2023.
- Updated the UC Health Policy Section to include new waste and water targets for UCI Health and to reference existing green building and sustainable food requirements.
- Made other small formatting and wording changes to improve the clarity and readability of the policy and to clarify which policy sections apply to the Lawrence Berkeley National Laboratory.

January 2019: Policy revised to clarify the following sections: climate protection, zero waste, and sustainable procurement.

August 2018: Policy expanded to include UC Health and change the name of the Environmental Preferable Purchasing section to Sustainable Procurement. Policy revised to update the following sections with new goals and clarifying language: definitions, green building design, clean energy, zero waste, and sustainable procurement.

June 2017: Policy remediated for accessibility according to Web Content Accessibility Guidelines (WCAG) 2.0

Policy revised to reflect the University Carbon Neutrality Initiative, adding definitions of green lab assessment programs, “research group” as defined by the Laboratory Hazard Assessment Tool (LHAT), and the inclusion of the UC Green Laboratories Action Plan. Changes were also made to the sections for Sustainable Building Operations for Campuses.

June 2016: Policy revised to update the following sections with new goals and clarifying language: definitions, green building design, sustainable transportation, and sustainable water systems.

June 2015: Policy revised to update the following sections: sustainable building operations, sustainable foodservices practices, green building design, and clean energy.

July 2011: Policy revised to update the following sections: green building design, climate protection practices, sustainable operations, environmentally preferable purchasing, and sustainable foodservice practices.

September 2009: Policy expanded to include sustainable foodservice

March 2007: Policy expanded to include sustainable operations, waste reduction, and environmentally preferable purchasing; renovations guidelines added to green building section, climate protection section refined

January 2006: Policy expanded to include transportation and climate protection

June 2004: President formally issued the “Presidential Policy on Green Building Design and Clean Energy Standards.” This Policy was subsequently renamed the Policy on Sustainable Practices

July 2003: The Regents approved sustainability policy principles (UCOP Sustainability)

University of California, Berkeley

Campus Energy Plan

Additional Options Analysis

Rev2 | July 21, 2020

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Draft 1	May 7, 2020	**Description**	First draft	
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Contents

Appendix E

Future Technologies

Executive Summary

The University of California, Berkeley (UC Berkeley) receives steam and power from an aging and inefficient cogeneration plant. To assess options to improve or replace the plant, UC Berkeley commissioned a study in 2019. Building upon that analysis, this study moves up the construction phasing of the systems to 2 years and considers financial costs associated with UC requirements of carbon offsets (in addition to regulation), biogas, and clean electricity purchases. This analysis evaluates three additional options that could require lower investment than similar options, provide some carbon benefit in the near term, and allow for future decarbonization using technologies that may not be currently feasible:

- **Option 6 | central hot water** *Gas boilers and hot water distribution.* A lower first-cost alternative to Option 2 (new cogeneration) that provides efficient heating and decarbonizes the power supply by procuring electricity from renewable sources rather than natural gas. Although gas boilers are used to generate heat, they could be replaced by carbon-neutral technologies (biogas, hydrogen, heat pumps, etc.) in the future.
- **Option 10A | central steam** *Gas boilers and steam distribution.* A lower-cost alternative to Option 0 (BAU) that utilizes the existing steam system to provide heat and decarbonizes the power supply by procuring electricity from renewable sources rather than natural gas. Although gas boilers are used to generate heat, they could be replaced by carbon-neutral technologies (biogas, hydrogen, heat pumps + hot water distribution) in the future.
- **Option 12 | hybrid nodal heat recovery** *Two heat recovery plants with thermal storage serve the north half of campus only*. *South half of campus remains on existing system*. A lower cost alternative to Option 11C that moves most of the campus load to an efficient, carbon-free, all-electric system but keeps some load on the existing cogeneration plant. Although the existing cogeneration plant runs on natural gas, it could be replaced by carbon-neutral technologies (biogas, hydrogen, new nodal heat recovery plant + hot water and chilled water distribution) in the future. Maintaining the existing cogeneration plant also provides resilience in case of a power outage.

These new options were compared to the three front-runners from the previous study:

- **0 | business as usual** (BAU) *Cogeneration and steam distribution.* Lowest capital cost.
- **2 | new cogeneration** *Cogeneration and hot water distribution.* Lowest lifecycle cost.
- **11C | central heat recovery** *Electric heat pump and heat recovery chiller plant with thermal storage.* Lowest lifecycle cost of carbon neutral options.

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Capital and Life Cycle Cost Assessment

Costs were estimated per Class 5 standards and a Class 5 are accurate from -40% to +50%.

Capital cost varies by option from $75M to $280M as shown in Figure 1.

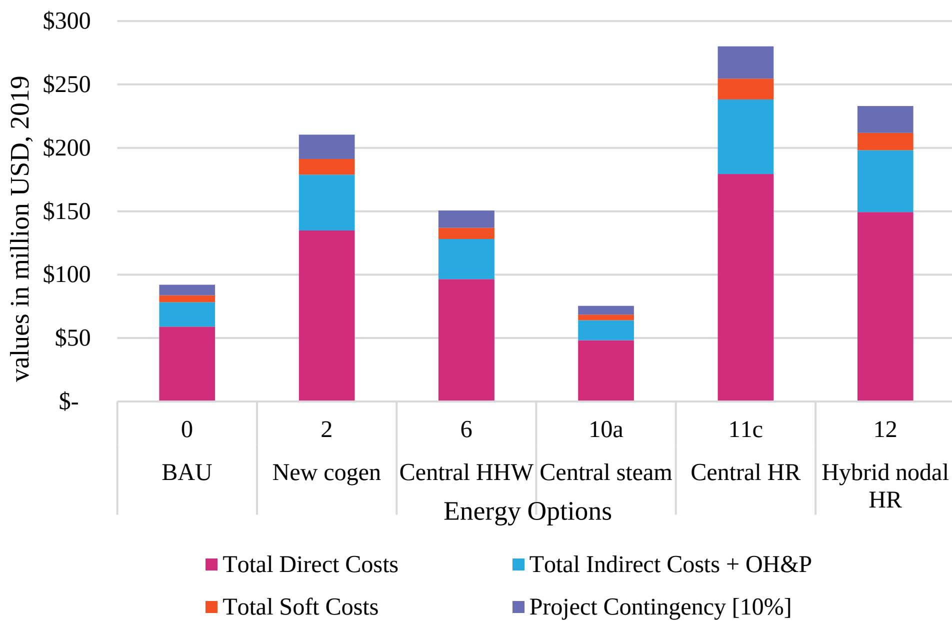

Figure 1 Capital cost in millions of USD, 2025

These capital costs were combined with commodities, operations and maintenance, and equipment replacement to develop 30-year life cycle costs. Since future commodity pricing is uncertain, life cycle costs were examined under four scenarios:

1. **Base case**- base assumes same life cycle costs as the 2019 study plus voluntary cost of carbon and new phasing
2. **Social cost of carbon**- base case plus comprehensive carbon cost
3. **Biogas premium**- base case plus biogas offsets for 40% of natural gas use
4. **Breakeven electricity rate-** base case with an adjusted electricity rate, which shows at what electricity rate the 30-year present value of Options 0 and 12 are equal ($0.1315/kWh).

Figure 2 shows the life cycle cost for the base case scenario.

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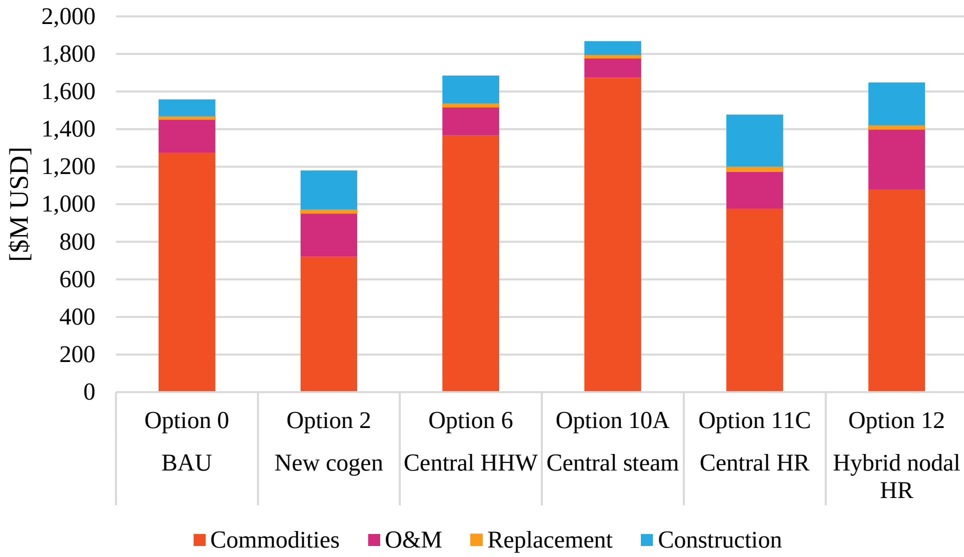

Figure 2 Base Case 30-year life cycle present value cost for each option in millions of USD.

As depicted in Figure 3, the present value lifecycle cost scenario assessment shows that:

- The carbon neutral option (Central Heat Recovery-11C) is more cost effective than BAU across all scenarios. The business case improves further when cost of carbon increases, biogas procurement is required, or the cost of electricity decreases.
- The cost effectiveness of Hybrid Nodal Heat Recovery-Option 12 is particularly sensitive to commodity rates. However, this excludes other unquantified benefits such as resilience, which may add considerable value.
- To improve the business case for the carbon neutral and low carbon options, renewable electricity procurement should target a blended rate of $0.1315/kWh in 2025 or lower. This rate is within the realm of possibility according to EIA projections. [1]

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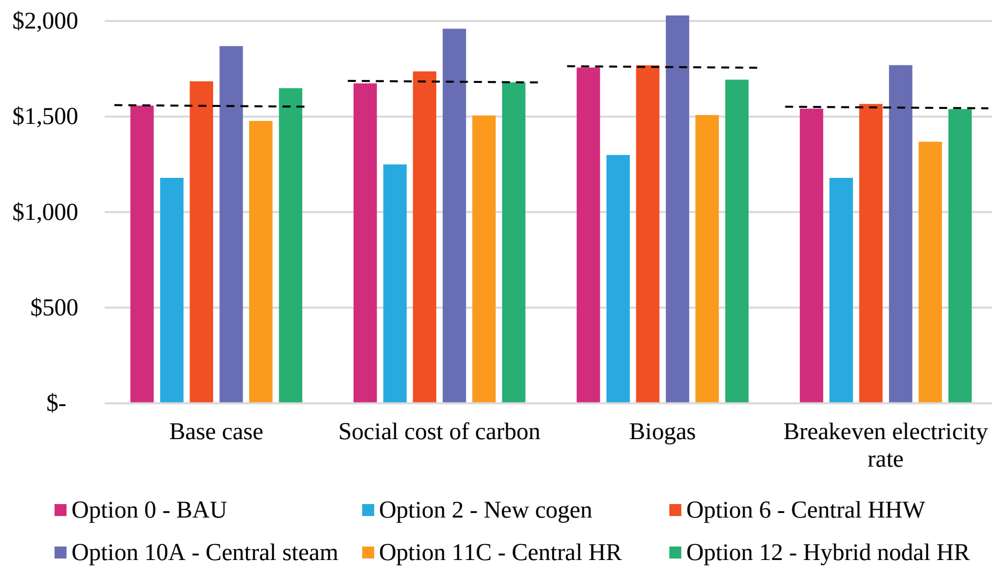

Figure 3 Present Value Life cycle cost for each option and each scenario. Options below the horizontal line have life cycle cost savings compared to Option 0 (BAU).

Similar Options Comparison

Options 6 (central hot water), 10A (central steam), and 12 (hybrid nodal heat recovery) were suggested for study as they could require lower upfront investment than similar options, move the campus toward its carbon neutrality goals, and allow flexibility for future decarbonization. The BAU option includes seismic upgrade of the existing cogeneration plant, replacement of turbines and boilers, repair of sections of the steam distribution system, and installation of new building-level cooling equipment and has an associated total cost of capital cost of about $100M. Each of these new options reduces carbon emissions vs. BAU, saves cost vs. the most similar previously studied option, and increases life cycle cost compared to the most similar previously studied options (Table 1). Each new option would require additional investment in the future to achieve carbon neutrality.

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Table 1 Comparison of first cost, carbon savings, and life cycle cost for new options vs. similar previously studied options. Negative numbers show increased costs.

Option	6	10A	12
Description	Central hot water	Central steam	Hybrid nodal heat recovery
Similar Option	2 - new cogen	0 - BAU	11C - central heat recovery
First Cost Savings	28%	18%	17%
Carbon Savings vs BAU	63%	15%	85%
Life Cycle Cost Savings	-43%	-20%	-12%
Potential Future Investment Required	Moderate	High	Moderate

Of the new options, Option 12 delivers the best value for investment. By transferring only the north half of campus (which accounts for most of the campus load) onto a new all-electric, carbon neutral system, the campus achieves 85% carbon reduction (vs BAU) while reducing upfront cost by 17% (vs Option 11C, central heat recovery). Although this system has a 12% higher life cycle cost than Option 11C, it provides an added benefit of resilience to grid power outages which are becoming increasingly common in response to wildfires. If desired, UC Berkeley could invest in a similar nodal heat recovery system for the south side of campus at a later date. Alternatively, the cogeneration plant could be converted to run on biogas or hydrogen fuel should these technologies become commercially and technically feasible in the future.

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Recommendations

The recommended system varies by scenario and by UC Berkeley priorities (Figure 4). The three leading options are:

- **Option 2 | new cogeneration**. Uses natural gas. Offers the lowest life cycle cost across scenarios and resilience to electricity outage (e.g. a planned safety power shutoff during fire conditions). Not carbon neutral and not compliant with UC mandates.
- **Option 11C | central heat recovery**. Offers lower life cycle cost than BAU across scenarios and resilience to natural gas outage (e.g. after an earthquake). Carbon neutral. Requires higher initial investment.
- **Option 12 | hybrid nodal heat recovery**. Offers comparable life cycle cost to BAU. Business case improves under biogas and breakeven electricity rate scenarios. Provides resilience to both natural gas and electricity outages. Reduces first cost by 17% over Option 11C. Reduces carbon emissions by 85% vs BAU, with potential for carbon neutrality through further future investment.

Variable	Unit	Best Overall Solution		Best Low-Carbon Solution	
		Option	*Amt*	*Option*	*Amt*
Lowest capital cost	NPV first cost	Option 10A (replace cogeneration turbine with steam boilers)*	$87M	Option 12 (hybrid nodal heat recovery)	$233M
Lowest life cycle cost	NPV 30-year life cycle cost	Option 2 (new cogeneration with HHW distribution)*	$1.2B	Option 11C (central heat recovery chillers and heat pump heating)	$1.5B
Lowest annual commodities cost	NPV annual commodities cost after completion	Option 2 (new cogeneration with HHW distribution)*	$77M	Option 11C (central heat recovery chillers and heat pump heating)	$82M
Lowest carbon emissions	Annual CO_2-eq after completion	Option 11C (central heat recovery chillers and heat pump heating)	0 tons	Option 11C (central heat recovery chillers and heat pump heating)	0 tons

* Options violates the UC carbon neutrality mandate.

Figure 4 Recommended system by UC Berkeley priority. Best solution is listed for each variable in leftmost column. The best overall solution is shown in the column titled “Best Overall Solution.” The best solution of only the low-carbon options (11C, 12) is shown in the column titled “Best Low-Carbon Solution.”

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Next Steps

Based on these findings, we recommend the following items for further study:

- Detailed analysis of preferred options that do not violate the UC mandate (11C and 12)
- Detailed solar PV and battery energy storage system (BESS) simulation, optimizing for UC Berkeley's goal of resilience in the campus power supply.
- Detailed operational cost optimization for solar PV and thermal storage.
- Evaluation of delivery methods over project life cycle, e.g. design-build-operate-maintain (DBOM), design-build-finance-maintain (DBFM), design-build-finance-operate-maintain (DBFOM), and traditional delivery to determine the best-value solution. Consider factors of value to UC Berkeley such as affordability, risk transfer over the asset life cycle, attractiveness to investors/philanthropists, and market precedents.
- Detailed O&M study for the current central cogeneration plant to further understand potential operational cost implications from implementing the proposed options.
- Evaluation of developing technologies noted in Table 12, Table 13, and Table 14 in Appendix E and the potential for their integration into future systems.

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1 Introduction

The University of California, Berkeley (UC Berkeley) receives steam and power from a cogeneration plant. Motivated by aging and inefficient equipment, leaking distribution, air quality issues, high carbon emissions from natural gas, and insufficient capacity, UC Berkeley commissioned a study in 2019 to analyze ten options to improve or replace the cogeneration plant.

Based on the results of the 2019 study, three additional analyses were recommended:

1. Evaluating three additional options that have some commodities and carbon reduction benefits and require fewer up-front infrastructure upgrades and therefore lower initial investment
2. Condensing construction and phasing schedule to reduce the amount of time that the old and new systems must be operated simultaneously
3. Assessing sensitivity of life cycle costs to changes in commodities pricing

This memo summarizes the results of the analyses described above, as well as any key changes to assumptions or methodology from the 2019 study. Results include:

- Mechanical and electrical equipment upgrades required
- Central utility plant siting and pipe routing
- Construction phasing
- Electricity, natural gas, and water usage
- Carbon emissions
- Capital and life cycle costs
- Financing options assessment

For details on methodology or the results of the previously analyzed options, please see the 2019 Campus Energy Plan Final Report.

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2 Key Changes

The assumptions and methodology for this assessment are consistent with the 2019 study except where noted below. For further details on methodology and assumptions, please see the 2019 Campus Energy Plan Final Report.

2.1 Options

Three new options were considered that could require lower investment than similar options, provide some carbon benefit in the near term, and allow for future decarbonization using technologies that may not be currently feasible:

- **Option 6 | central hot water** *Gas boilers and hot water distribution.* A lower-cost alternative to Option 2 (new cogeneration) that provides efficient heating and decarbonizes the power supply by procuring utility from carbon-free and renewable sources rather than natural gas. Although gas boilers are used to generate heat, they could be replaced by carbon-neutral technologies (biogas, hydrogen, heat pumps, etc.) in the future.
- **Option 10A | central steam** *Gas boilers and steam distribution.* A lower-cost alternative to Option 0 (BAU) that uses the existing steam system to provide heat and decarbonizes the power supply by procuring utility from carbon-free and renewable sources rather than natural gas. Although gas boilers are used to generate heat, they could be replaced by carbon-neutral technologies (biogas, hydrogen, heat pumps + hot water distribution) in the future.
- **Option 12 | hybrid nodal heat recovery** *Two heat recovery plants with thermal storage serve the north half of campus only. South half of campus remains on existing system.* A lower cost alternative to Option 11C (central heat recovery) that moves most of the campus load to an efficient, carbon-free, all-electric system but keeps some load on the existing cogeneration plant. Although the existing cogeneration plant runs on natural gas, it could be replaced by carbon-neutral technologies (biogas, hydrogen, new nodal heat recovery plant + hot water and chilled water distribution) in the future but upgrades to the plant will still be required. Maintaining the existing cogeneration plant also provides resilience in case of a power outage.

These new options were compared to the three front-runners from the previous study:

- **0 | business as usual** *Cogeneration and steam distribution.* Lowest capital cost.
- **2 | new cogeneration** *Cogeneration and hot water distribution.* Lowest lifecycle cost.
- **11C | central heat recovery** *Electric heat pump and heat recovery chiller plant with thermal storage.* Lowest lifecycle cost of carbon neutral options.

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Major characteristics of each option are shown in Figure 5. Layouts for each option are shown in Appendix C1.

#	Description	Heating Layout	Heating Distribution	Heating Generation	Cooling Layout	Electricity Source	Thermal Storage	Predicted Benefits
0	BAU – Upgrade existing central cogeneration plant, in-building cooling	■						Resilient to power outage (e.g. PSPS)
2	New central cogeneration plant, in-building cooling	■						Moderately lower carbon emissions Resilient to power outage (e.g. PSPS)
6	New central heating plant, in-building cooling	■						Moderately lower carbon emissions Lower initial investment
10A	Upgrade existing central steam plant, in-building cooling	■						Lower initial investment
11C	Central heat recovery chillers and heat pump heating	■			■		✓	Resilient to gas outage (e.g. earthquake) Carbon neutral
12	Nodal heat recovery chillers and heat pump heating	▪ ▪ ■			▪ ▪		✓	Resilient to gas outage (e.g. earthquake) Resilient to power outage (e.g. PSPS) Significantly lower carbon emissions

LEGEND

Layout
- ■ Central
- ▪ ▪ Nodal
- Building

Heat Distribution
- Steam
- Hot water

Heat Generation
- Cogeneration
- Gas boiler
- Heat pump

Electricity Source
- Cogeneration
- PG&E

Figure 5 Three additional options (6, 10A, 12) were considered to provide energy to the UC Berkeley campus with lower upfront investment and flexibility for future decarbonization. Three options from the previous study (0, 2, 11C-E) were also assessed under new phasing.

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2.2 Siting and Phasing

In the 2019 study, phasing assumed that surge space could accommodate only 10% of the campus at any given time. The resulting 15-year timeline required partial operation of both the existing cogeneration plant and the new system for the first 15 years of the 30-year study period. As a result, differences in life cycle cost, energy and water use, and carbon emissions across the options were leveled and comparison was challenging.

In contrast, a shorter phasing schedule reduces the amount of time that UC Berkeley pays to operate two plants simultaneously and therefore provides a clearer picture for comparison across options. Accordingly, for this analysis "fastest feasible" phasing was developed which assumed that adequate surge space for the campus would be available throughout construction.

For each option listed in Section 2.1, Class 5 schedules were developed using Primavera P6 software that define an approximate sequence for execution. The schedules were developed with a Work Breakdown Structure (WBS) that divides the project into major elements, including central utility plants, distribution piping, and electrical infrastructure.

More information on siting and phasing assumptions can be found in Appendix C.

2.3 Carbon

Carbon emissions were calculated from electricity and natural gas use.

In the 2019 study, carbon emissions from electricity were sourced from PG&E and projected forward according to California's Renewable Portfolio Standards. For this study, carbon emissions from electricity were assumed to be 0 as UC Berkeley is required to procure 100% carbon-free electricity by 2025 per University of California guidelines.

Carbon emissions for natural gas were assumed to remain constant at 0.006723 tons CO_2-eq per therm across the 30-year study period.

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2.4 Cost Estimation

Capital costs and 30-year life cycle costs were developed for each option listed in Section 2.1. The commodities base rates and escalation factors used for this study are specified in section 3.5.2.1.

The assumptions for the cost estimate (as described in the 2019 study) represent the UC Berkeley/Arup team's best guess for future conditions. However, there is considerable uncertainty around how the cost of electricity, natural gas, biogas, and carbon will change over the next 35 years. To test the sensitivity of the results to changes in these key inputs, life cycle costs were calculated under four scenarios as shown in

Table 2.

Table 2 Life cycle costs were evaluated under 4 scenarios to test sensitivity to changes in commodity pricing. Changes from base case are shown in blue.

Scenario	Description	Carbon Cost	Biogas Cost	Electricity Rate
Base case	Same as 2019 study plus voluntary cost of carbon. Uses "fastest feasible" phasing.	Base rate + voluntary offsets	Excluded	$0.1532/kWh in 2025
Social cost of carbon	Higher carbon cost to account for social impacts	Ceiling rate	Same as base case	Same as base case
Biogas	Procure biogas offsets for 40% of natural gas use	Same as base case	For 40% of natural gas use	Same as base case
Breakeven electricity rate	Electricity rate at which 30-year present value is equal for options 0 and 12	Same as base case	Same as base case	$0.1315/kWh in 2025

For further details on cost estimation methodology and assumptions, please see the 2019 Campus Energy Plan Final Report.

2.5 Financing

Financial analysis was performed for Option 12 (hybrid nodal heat recovery) to represent simplified "bookends" of a range of possible financing costs and their commensurate risk profile.

By financing the estimated capital costs for Option 12 either through tax exempt debt or through a project financing with taxable debt and equity, the University should expect to have an average annual nominal payment for the total cost of ownership that falls between $128.6M and $133.0M starting in 2028. Financing assumptions are listed in Appendix D1.

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3 Results

3.1 Siting and Phasing

Locations of utility plants, thermal storage tanks, and distribution piping for each option are shown in Appendix C1. These siting options are representative rather than absolute and used for assessment only. Using an alternative site that is also located along the major distribution path should not substantially impact the results presented in this report.

"Fastest feasible" schedule duration for each option is broken out by work element (Table 3).

Assuming no surge space constraints, construction duration for Options 2, 6, 10A and 12 is approximately 2 years. Construction duration for Option 11C is the longest at 3 years due to installation of campus-wide hot water and chilled water piping.

For all options except 10A, installation of new distribution piping is critical path. To compress the schedule, multiple work fronts were assumed for pipe installation. The resulting shorter duration reduces time-dependent indirect costs and escalation costs for the project. For Option 10A, building improvements (e.g. cooling system installation and heat exchanger repair) are critical path because this option reuses existing steam distribution piping.

Detailed construction schedules are shown in Appendix C2.

Description	Duration (months)				
	2	6	10A	11C	12
Existing plant refurbishment	-	-	10	-	12
New plant @ Evans hall	13	7	-	15	11
New plant @ Tolman hall	-	-	-	-	9
Building improvements	14	14	25	26	20
Existing pipe repair	-	-	12	-	5
New pipe installation	23	23	-	35	26
Electrical improvements	22	22	18	18	20
Total	**23**	**23**	**25**	**35**	**26**
Assumed Construction Start	Sep 2025	Sep 2025	Sep 2025	Sep 2025	Sep 2025
Construction Completion	**Aug 2027**	**Aug 2027**	**Oct 2027**	**Aug 2028**	**Nov 2027**

Table 3 Fastest feasible construction duration (months) by work element for each option.

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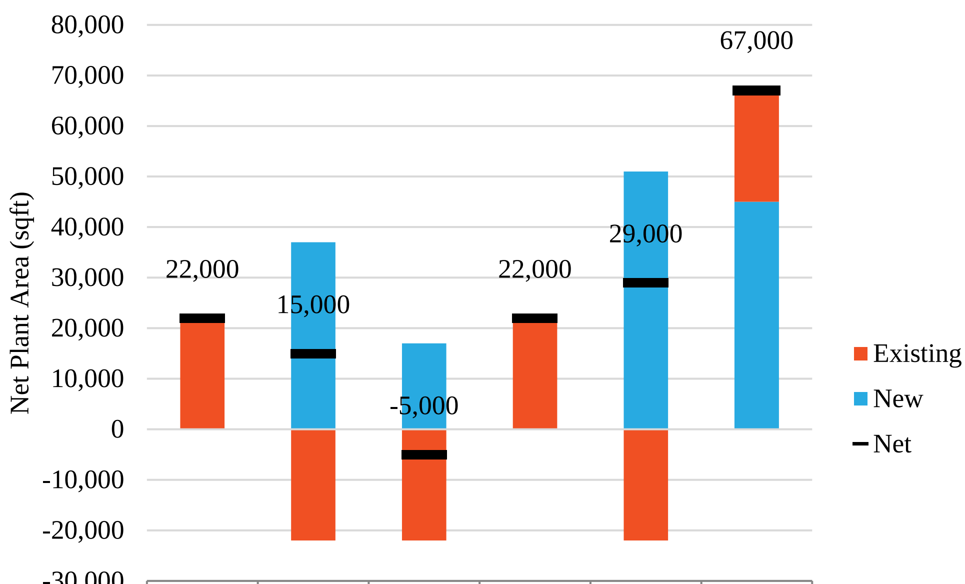
3.2 Plant and Equipment Size

Required plant size is shown in Figure 6. Certain options (0, 10A) make use of the existing cogeneration plant, while others (2, 6, 11C) require new central utility plants and free up the existing cogeneration site for reuse or redevelopment. Option 12 uses both the existing cogeneration plant and two new plants.



	2	6	10a	11c	12	
Existing	22000	-22000	-22000	22000	-22000	22000
New		37000	17000		51000	45000
Net	22000	15000	-5000	22000	29000	67000

Option

Figure 6 Central utility plant area required for each option.

Note that additional space will be required within a mechanical room or on the roof of every building for cooling equipment (chillers or packaged units) under options 0, 2, 6, and 10A. In-building cooling space will also be required for buildings on the south half of campus under option 12.

Equipment sizes for each option are summarized in Appendix A1.

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3.3 Electrical Infrastructure

The peak electrical demand for each option including estimated campus growth was compared to the capacity of the Hilltop Substation, which is the campus electrical service point-of-connection (Figure 7). All new options (6, 10A, 12) fall below the Hilltop Substation capacity of 3,000 amps and do not require on-site generation to prevent the need for a third 115-kV PG&E line or loss of redundancy. When compared to the three front-runners from the previous study (0, 2, 11C), all loads fall below the Hilltop maximum capacity but exceed the capacity of the duct bank that connects the Hilltop Substation to Switching Stations #1 and #6. Therefore, all options will require an upgrade to the main loop feeders to accommodate load growth.

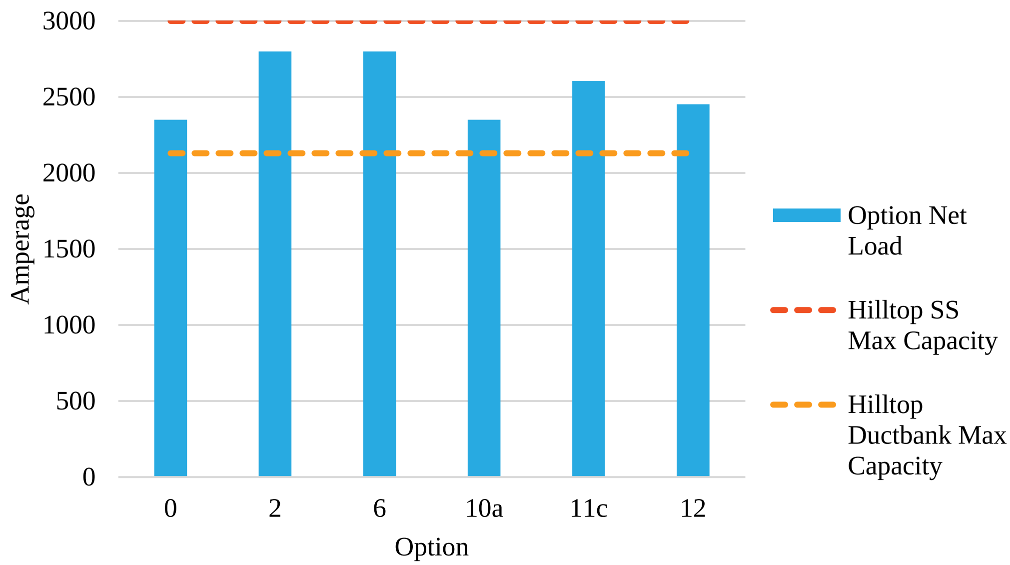

Figure 7 Peak electrical demand for each option exceeds the capacity of the ductbanks between Switching Stations and the Hilltop Substation but fall below the capacity of the Hilltop Substation.

Peak electrical demand for each option was also compared to the capacity of key components in the campus 12kV power distribution system (Figure 8). All options exceed the rated capacity of switching stations and secondary feeders, which are the main chokepoints to the system. Please see Figure 65 in Appendix C5 of the 2019 Campus Energy Plan Final Report to observe these components in context of the campus power distribution system.

Current campus peak demand is approximately 32 MW, but we anticipate a 158% - 189% increase under the studied option scenarios. These new loads must tie in to 12kV infrastructure at various locations across campus (where each new central or

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nodal utility plant is located), and the power flow through switching stations and associated duct banks connecting them increases in varying degree across the options. A detailed look into the existing conditions of the switching stations is required for each upgrade since conditions are not consistent across all locations.

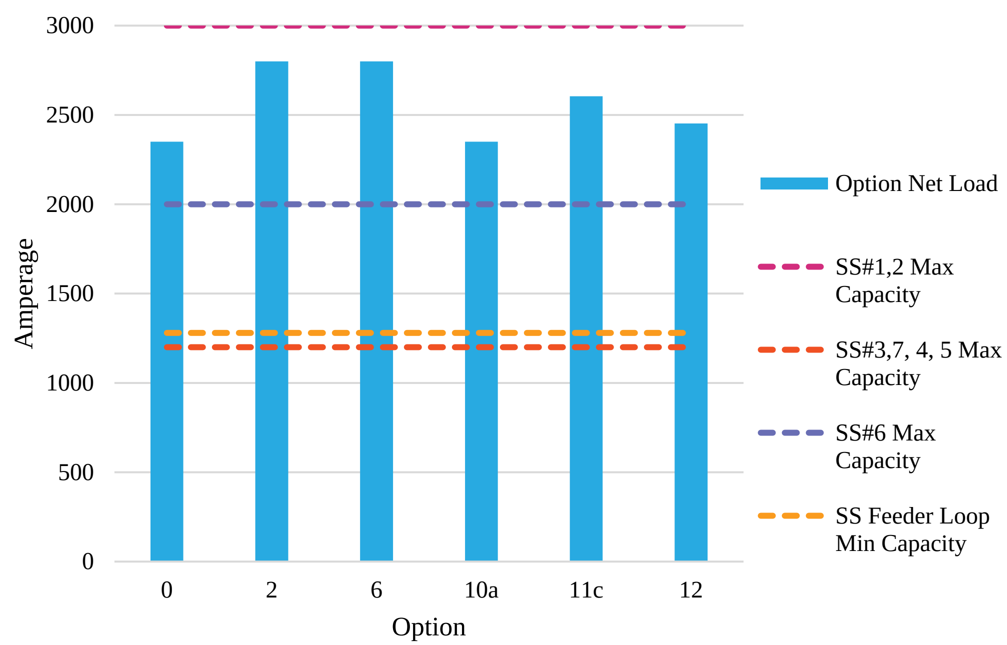

Figure 8 Peak electrical demand for each option exceeds the capacity of some switching stations and feeders.

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3.4 Commodities

Annual commodities usage upon project completion is shown in Table 4. Carbon emissions are lowest for the all-electric option (11C) and highest for Option 0 (BAU).

Table 4 Annual commodities (electricity, natural gas, water, and carbon) for each option after construction is completed on the new system.

Commodity	0	2	6	10A	11C	12
Electricity (MWh/y x1000)	55	-	263	221	269	263
Natural gas (therms/y x1000)	20,993	12,421	7,762	17,808	-	3,141
Water (CCF/y x1000)	291	235	235	292	164	203
Carbon (tons CO_2-eq/y x1000)	141	84	52	120	-	21

Carbon emissions for each option over time are shown in Figure 9. Emissions are closely correlated to natural gas consumption.

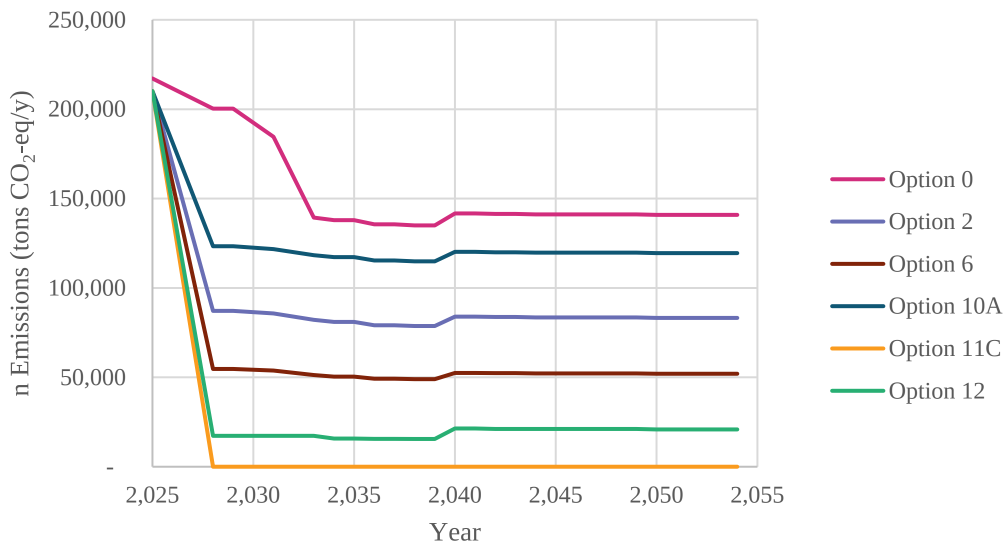

Figure 9 Carbon emissions for each option over time.

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Options 6 (central hot water), 10A (central steam), and 12 (hybrid nodal heat recovery) were suggested for study as they could move the campus toward its carbon neutrality goals while requiring lower upfront investment than similar options and allowing flexibility for future decarbonization. Each of these new options reduces carbon emissions compared to Option 0 (BAU) (Table 5).

Table 5 Comparison of carbon savings for new options vs Option 0 (BAU).

Option	6	10A	12
Description	Central hot water	Central steam	Hybrid nodal heat recovery
Similar Option	2 - new cogen	0 - BAU	11C - central heat recovery
Carbon Savings vs BAU	63%	15%	85%
Potential Future Upgrade	Replace gas boilers with biogas, hydrogen, or heat pumps	Replace gas boilers with biogas, hydrogen, or heat pumps + hot water distribution	Replace existing cogen plant with biogas, hydrogen, or new nodal heat recovery plants

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3.5 Cost Estimation

All net present value costs are presented in 2025 USD unless otherwise noted.

3.5.1 Capital Cost

Total capital cost – including direct, indirect and soft costs; project contingency; and contractor's overhead and profit – varies by option from $75M to $280M (Figure 10).

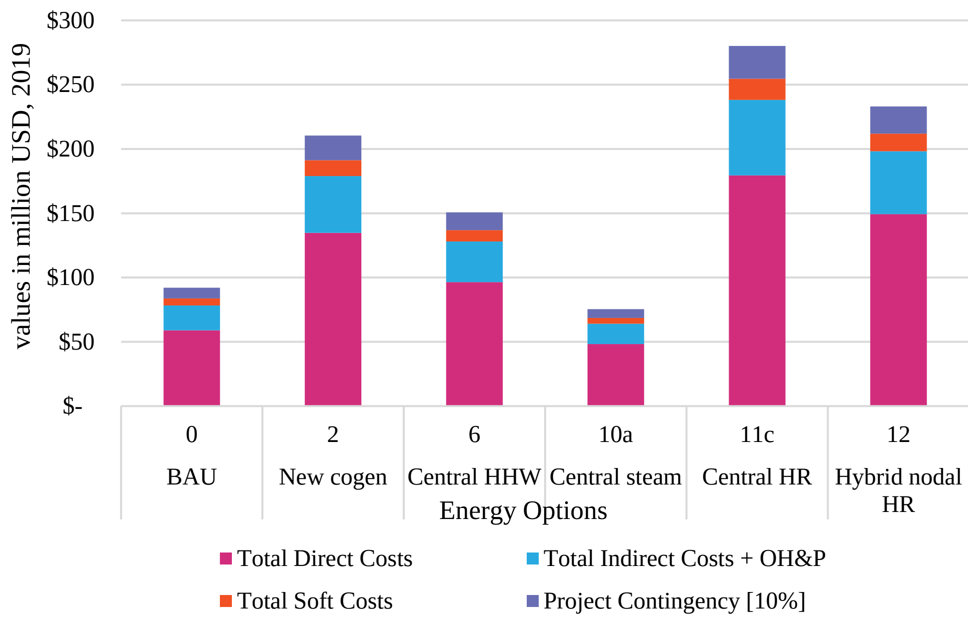

Figure 10 Capital cost in millions of USD, 2025

To provide insight into why capital costs vary across options, direct cost breakdown by major component is shown in Figure 11. Options 0 and 10A have the lowest capital cost because they utilize the existing steam distribution network and do not require new central utility plant buildings. Capital cost is higher for Options 2 and 6 because they require new hot water distribution piping and new central utility plants. Capital cost is highest for options 11C and 12 because they require new distribution piping for both hot water and chilled water and the largest new central utility plants.

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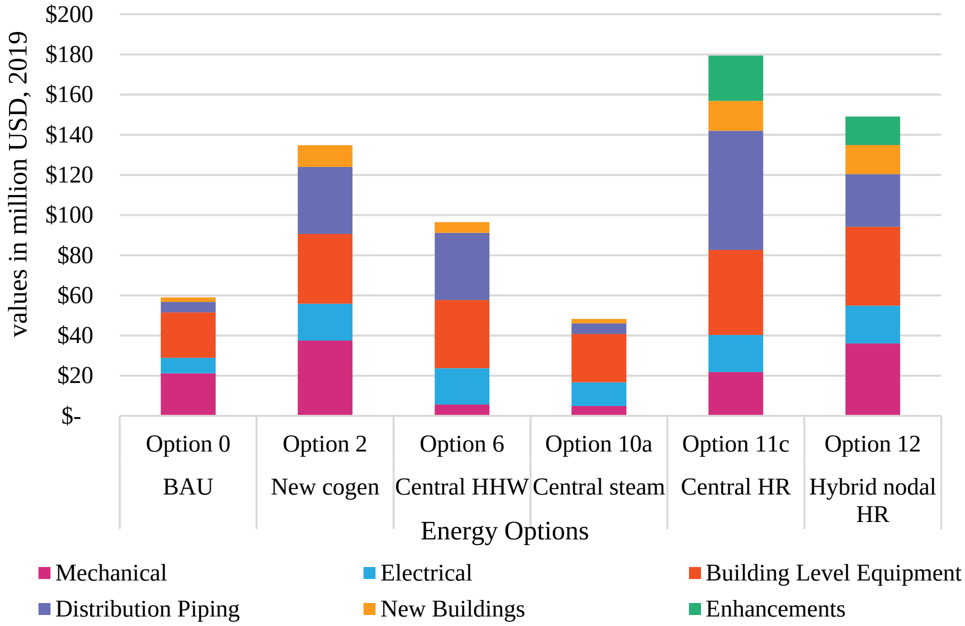

Figure 11 Direct cost breakdown in millions of USD, 2025

Options 6 (central hot water), 10A (central steam), and 12 (hybrid nodal heat recovery) were suggested for study as they could move the campus toward its carbon neutrality goals while requiring lower upfront investment than similar options and allowing flexibility for future decarbonization. Each of these new options reduces capital cost compared to similar, previously studied options (Table 6).

Option	6	10A	12
Description	Central hot water	Central steam	Hybrid nodal heat recovery
Similar Option	2 - new cogen	0 - BAU	11C - central heat recovery
Carbon Savings vs BAU	63%	15%	85%
First Cost Savings	28%	18%	17%
Potential Future Upgrade	Replace gas boilers with biogas, hydrogen, or heat pumps	Replace gas boilers with biogas, hydrogen, or heat pumps + hot water distribution	Replace existing cogen plant with biogas, hydrogen, or new nodal heat recovery plants

Table 6 Comparison of first cost and carbon savings for new options vs similar previously studied options.

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3.5.2 Life Cycle Cost

Life cycle costs for each option were calculated under four scenarios (

Table 2):

5. **Base case**- base assumes same life cycle costs as the 2019 study plus voluntary cost of carbon and new phasing
6. **Social cost of carbon**- base case plus comprehensive carbon cost
7. **Biogas premium**- base case plus biogas offsets for 40% of natural gas use
8. **Breakeven electricity rate-** base case with an adjusted electricity rate, which shows at what electricity rate the 30-year present value of Options 0 and 12 are equal ($0.1315/kWh)

Detailed thirty-year present value costs under each scenario are shown in sections 3.5.2.1 through 3.5.2.4. Section 3.5.2.5 compares options across scenarios.

3.5.2.1 Base Case

Table 7 includes the base rates and escalation factors used per commodity for the base case scenario.

Table 7 Commodities base rates and escalation factors

Commodity	Base Rate (2025)	Escalation (%)
Carbon		
Base price forecast	$27.84 / ton	Annual values
ARB ceiling price	$79.01 / ton	5.00%
Voluntary carbon offset	$10.33 / ton	3.00%
Electricity	$0.1315 / kWh	3.50%
Natural Gas	$1.2150 / Therm	4.00%
Water	$10.7496 / CCF	7.97%

Life cycle cost for each option under base assumptions is shown in Figure 12. Life cycle cost includes first cost, operations and maintenance costs, replacement costs, and commodity costs for electricity use, gas use, water use, and carbon emissions.

Option 2 (new cogeneration with HHW distribution) has the lowest life cycle cost of all options at $1.2B. Option 10A has the highest life cycle cost of all options at $1.9B. Despite having the highest first cost, the all-electric option (11C) has the second lowest 30-year present value at $1.5B.

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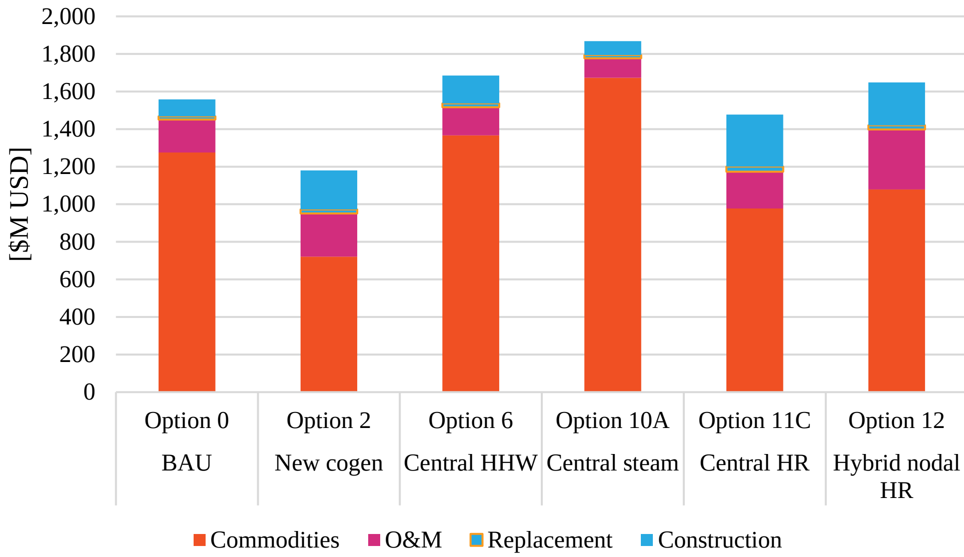

Figure 12 30-year life cycle present value cost for each option in millions of USD.

The difference in life cycle cost between Option 0 (BAU) and all other options is shown in Figure 13. Options 2 (new cogeneration) and 11C (central heat recovery) have lower 30-year costs than business as usual. All other options are more expensive.

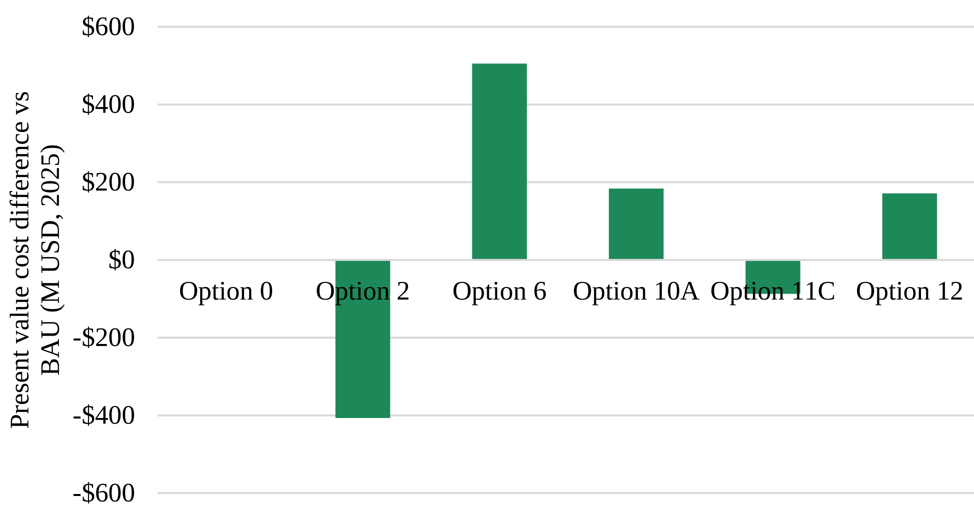

Figure 13 Difference in 30-year life cycle present value cost between each option and business-as-usual (Option 0). Negative values indicate life cycle cost savings vs. BAU.

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Life cycle cost for all options is driven by commodities usage. Thirty-year commodities cost for each option is summarized in Figure 14. Commodities cost is lowest for Option 2 because the cogeneration plant produces electricity and hot water from natural gas, which is less expensive per unit energy than purchased electricity. Options 11C and 12 are highly efficient heat recovery systems but cost more per unit energy because they rely mostly on electricity. Options 0, 6, and 10A are less efficient systems and therefore have higher commodities cost.

Electricity and natural gas dominate commodities costs. Carbon cost also contributes to the more carbon intensive options (0, 2, and 10A). Since commodities usage drives life cycle cost, the optimal path forward will depend on future trends in the price for electricity, natural gas, and carbon. The three scenarios in the sections below reflect potential changes to these prices.

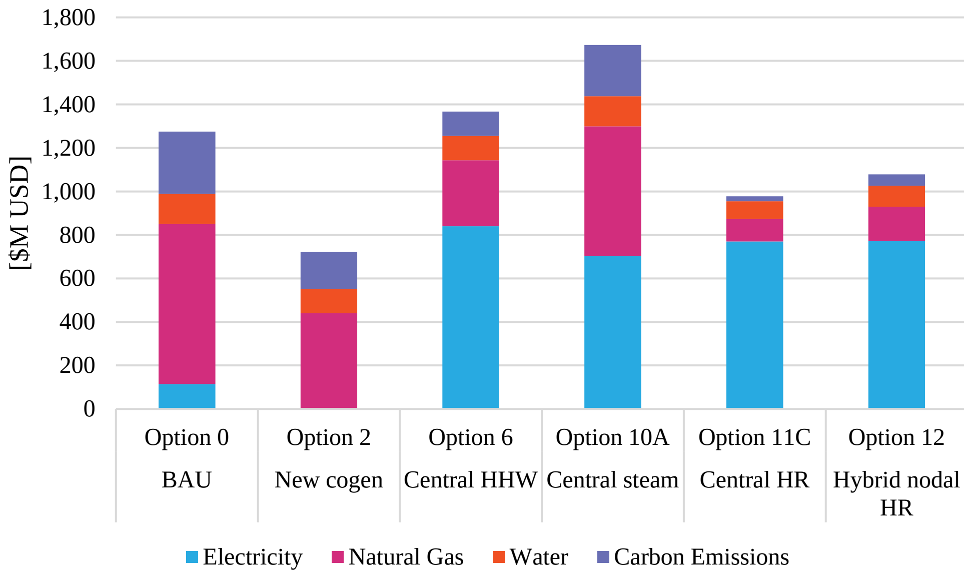

Figure 14 30-year life cycle present value commodities cost for each option.

Options 6 (central hot water), 10A (central steam), and 12 (hybrid nodal heat recovery) were suggested for study as they could move the campus toward its carbon neutrality goal while requiring lower upfront investment than similar options and allowing flexibility for future decarbonization. Each of these new options increases life cycle cost compared to similar, previously studied options (Table 8).

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Table 8 Comparison of first cost, life cycle cost, and carbon savings for new options vs similar previously studied options. Negative numbers show increased costs.

Option	6	10A	12
Description	Central hot water	Central steam	Hybrid nodal heat recovery
Similar Option	2 - new cogen	0 - BAU	11C - central heat recovery
Carbon Savings vs BAU	63%	15%	85%
First Cost Savings	28%	18%	17%
Life Cycle Cost Savings	-43%	-20%	-12%
Potential Future Upgrade	Replace gas boilers with biogas, hydrogen, or heat pumps	Replace gas boilers with biogas, hydrogen, or heat pumps + hot water distribution	Replace existing cogen plant with biogas, hydrogen, or new nodal heat recovery plants

Cumulative cashflow for all options is shown in Figure 15. Although initially more expensive than Option 0, lower annual operating costs make both options 2 and 11C lower cost in the long run. Cumulative cash flow for Option 2 is lower than business-as-usual after 4 years. The same is true for Option 11C after 15 years and for Option 12 after 25 years.

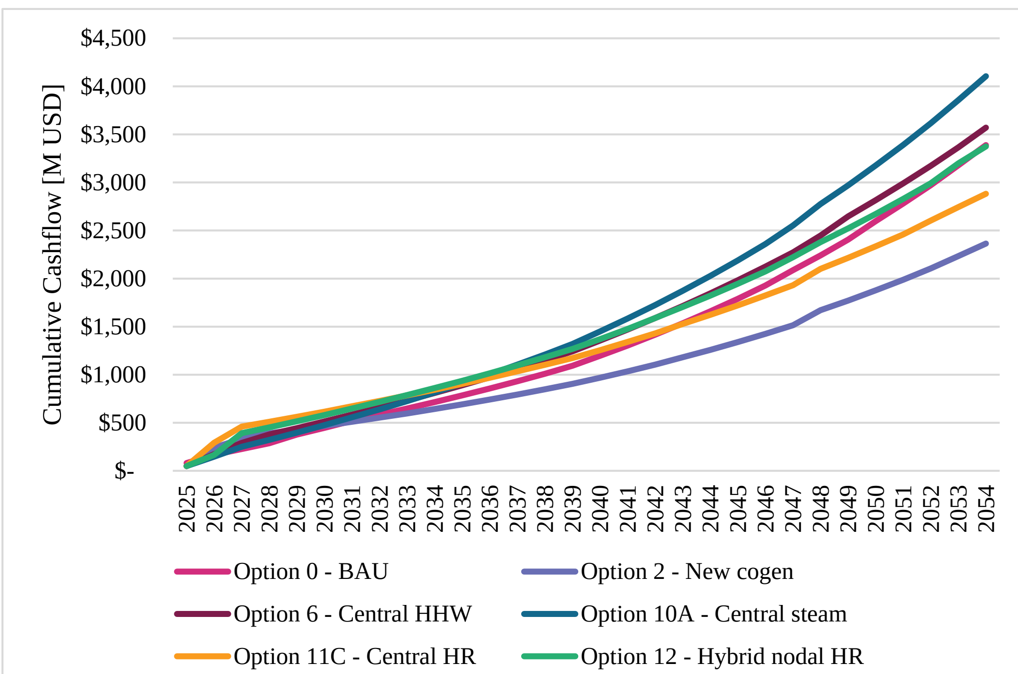

Figure 15 Cumulative nominal cashflow for each option in millions of USD.

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3.5.2.2 Social Cost of Carbon

Increasing the cost of carbon from the base rate to the ceiling rate changes the picture slightly. Life cycle costs increase for the more carbon intensive options (0, 6, and 10A), while the carbon neutral option (11C) and low carbon option (12) are less affected. As in the base case, Options 2 and 11C have lower present value cost than Option 0; in contrast, Option 12 is also cost competitive under this scenario (Figure 16).

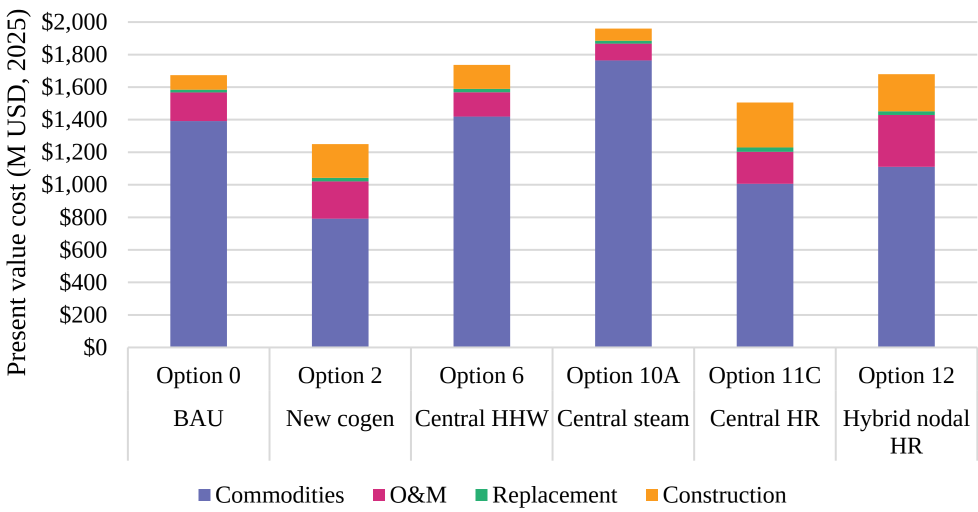

Figure 16 30-year life cycle present value cost for each option.

Cumulative cashflow for all options is shown in Figure 17. Although initially more expensive than Option 0, lower annual operating costs make options 2, 11C and 12 more cost-effective in the long run. Cumulative cash flow for Option 2 is lower than business-as-usual after 3 years. The same is true for Option 11C after 10 years and for Option 12 after 20 years.

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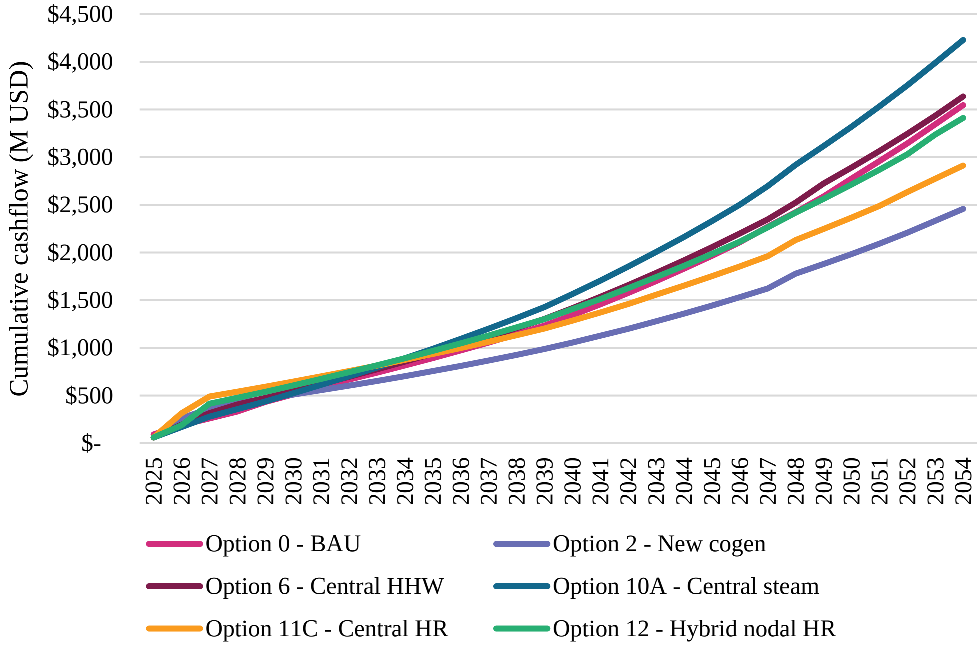

Figure 17 Cumulative nominal cashflow for each option in millions of USD.

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3.5.2.3 Biogas

University of California guidelines require that UC Berkeley procure 40% of natural gas from biogas by 2025. Since no local source of biogas is currently available, this may take the form of biogas offsets.

Purchasing biogas offsets for 40% of natural gas use, in addition to the cost of natural gas, further drives the business case for low-carbon and carbon neutral options. Under this scenario, both Options 11C and 12 are more cost effective than business as usual. Option 2 is still the most cost effective but by a smaller margin (Figure 18).

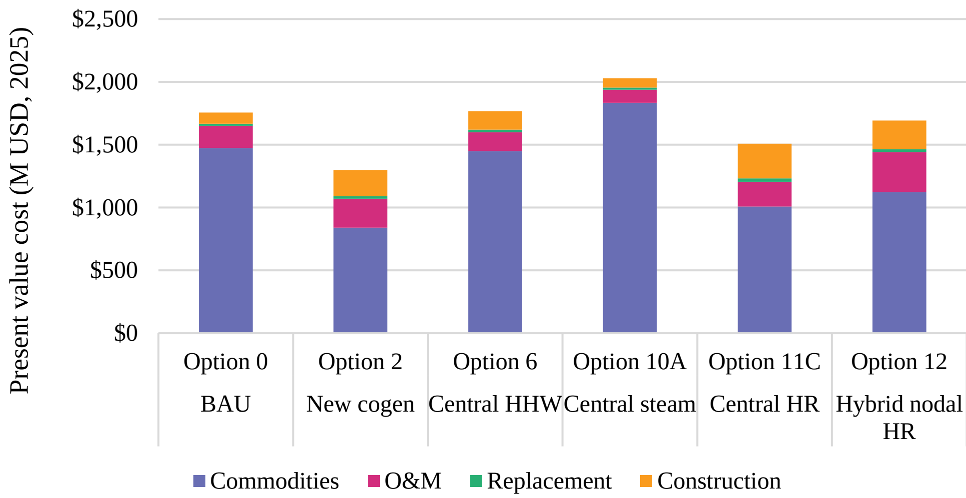

Figure 18 30-year life cycle present value cost for each option.

Cumulative cashflow for all options is shown in Figure 19. Although initially more expensive than Option 0, lower annual operating costs make options 2, 11C and 12 more cost-effective in the long run. Cumulative cash flow for Option 2 is lower than business-as-usual after 3 years. The same is true for Option 11C after 10 years and for Option 12 after 15 years.

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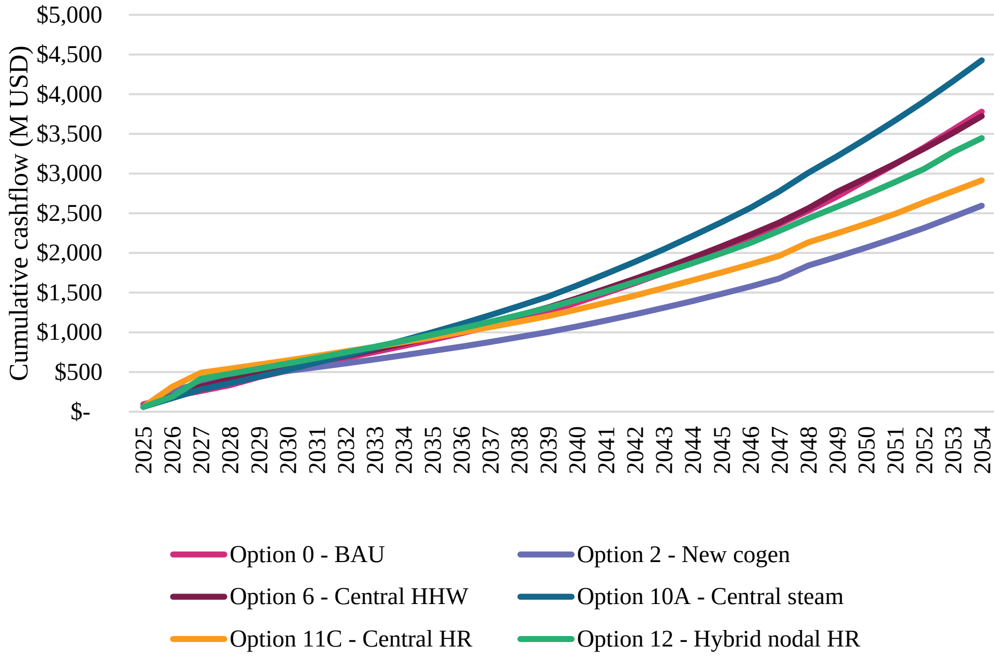
Figure 19 Cumulative nominal cashflow for each option in millions of USD.



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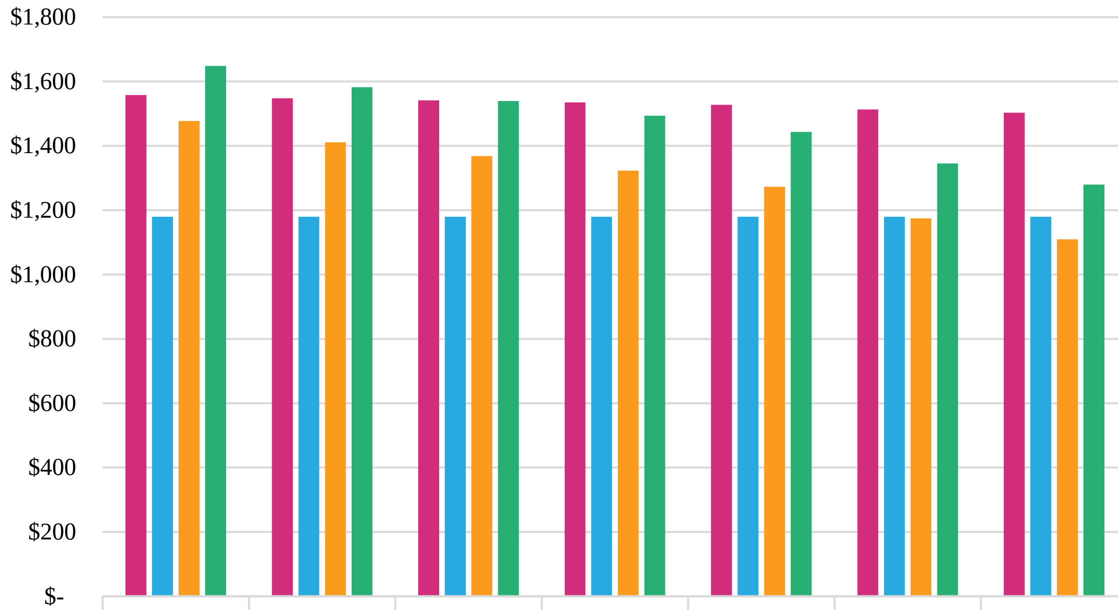
3.5.2.4 Breakeven Electricity Rate

The carbon free and low-carbon options are particularly sensitive to changes in the cost of electricity. Since future electricity costs are uncertain, Arup conducted sensitivity analysis on the cost of electricity to identify two "breakeven" rates
(



	$0.1532/kWh	$0.1400/kWh	$0.1315/kWh	$0.1225/kWh	$0.1125/kWh	$0.0930/kWh	$0.0800/kWh
Option 0	$1,558	$1,548	$1,542	$1,535	$1,528	$1,513	$1,503
Option 2	$1,180	$1,180	$1,180	$1,180	$1,180	$1,180	$1,180
Option 11C	$1,477	$1,411	$1,368	$1,323	$1,273	$1,175	$1,109
Option 12	$1,648	$1,582	$1,539	$1,494	$1,444	$1,345	$1,280

Option 0 Option 2 Option 11C Option 12

Figure 20):

- If the blended electricity rate in 2025 is $0.1315/kWh, then it is more cost effective on a present value basis to implement Option 12 than Option 0.
- If the blended electricity rate in 2025 is $0.093/kWh, then the carbon neutral option (11C) is the most cost effective.

For comparison, the base case assumes $0.1532/kWh in 2025. The US Energy Information Administration (EIA) predicts that the average electricity cost in northern California in 2025 will be $0.188/kWh for commercial customers and $0.133/kWh for industrial customers. This indicates that the breakeven rate of $0.1315/kWh for Option 12 vs Option 0 is within the realm of possibility, but the breakeven rate of $0.093/kWh for Option 11C vs Option 2 is unlikely with more traditional procurement methods but not unforeseeable with long-term contracts.

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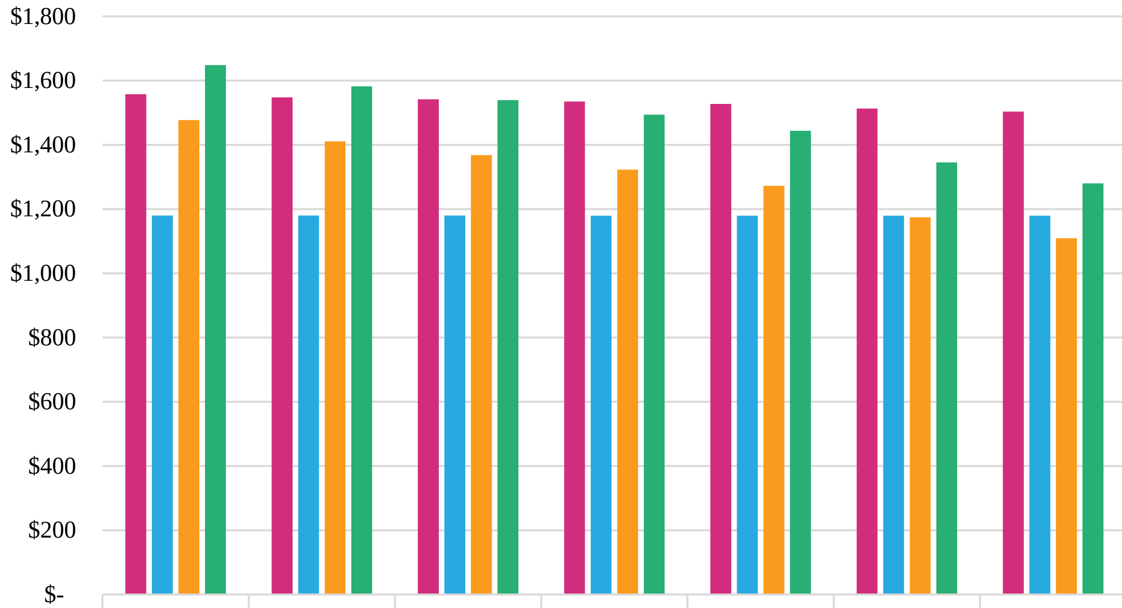

	$0.1532/kWh	$0.1400/kWh	$0.1315/kWh	$0.1225/kWh	$0.1125/kWh	$0.0930/kWh	$0.0800/kWh
Option 0	$1,558	$1,548	$1,542	$1,535	$1,528	$1,513	$1,503
Option 2	$1,180	$1,180	$1,180	$1,180	$1,180	$1,180	$1,180
Option 11C	$1,477	$1,411	$1,368	$1,323	$1,273	$1,175	$1,109
Option 12	$1,648	$1,582	$1,539	$1,494	$1,444	$1,345	$1,280

Option 0 Option 2 Option 11C Option 12

Figure 20 30-year life cycle present value cost comparison for different electricity rates.

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3.5.2.5 Scenario Analysis Comparison

As depicted in Figure 21, the scenario analysis shows that:

- Options 2 (new cogen) and 11C (central heat recovery) have a lower 30-year present value cost than BAU across all scenarios.
- Option 12 (hybrid nodal heat recovery) is comparable to Option 0 in two scenarios, more expensive in the base case, and less expensive in the biogas scenario.
- The other “lower investment” options – 6 (new gas boilers) and 10A (central steam) – are not preferred under any scenario.

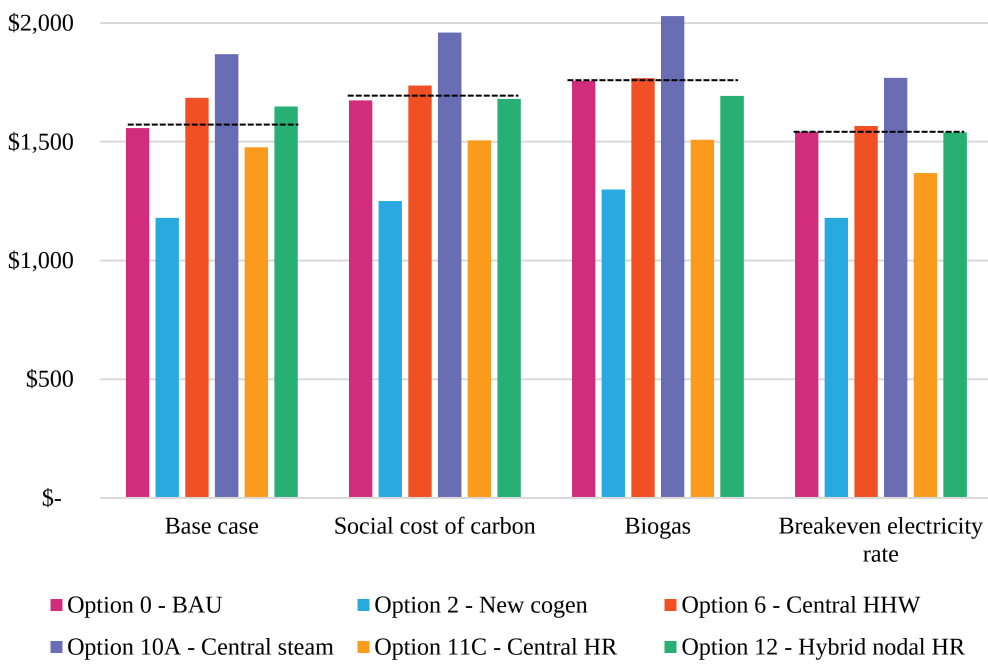

Figure 21 Present Value Life cycle cost for each option and each scenario. Horizontal dotted line shows comparison to Option 0; options below the line present life cycle cost savings compare to business as usual.

These results indicate that:

- The preferred path forward depends on commodity pricing, which is uncertain.
- The cost effectiveness of Option 12 is particularly sensitive to commodity rates. However, this excludes other unquantified benefits such as resilience.
- Option 11C, the carbon neutral option, is cost effective in the long term compared to BAU. The business case improves when cost of carbon increases, biogas procurement is required, or the cost of electricity decreases.

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- To improve the business case for the carbon neutral and low carbon options, renewable electricity procurement should target a blended rate of \$0.1315/kWh in 2025 or lower. This rate is within the realm of possibility according to industry projections.

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3.6 Financing

The range of financing costs are shown in Table 11. Capital cost indicates how much it will cost to build the project, while the tax-exempt and private financing show how much it will cost the University to fund the capital project under public and private financing scenarios, respectively. The 15-20% premium paid for Private Financing over the Tax-exempt financing is primarily attributable to the assumed difference in interest rates.

Table 9 Total capital cost compared to total financing costs on net present value basis. Values in million USD.

Capital Cost	Tax-exempt Financing	Private Financing	Financing Delta
$228	$267	$329	$62

When the total cost of ownership is viewed as a range of average annual total cost of ownership, the possible impact on UC Berkeley's budget and project affordability is more tangible. Figure 22 summarizes the potential average annual payments for the total cost of ownership in nominal dollars over the 28-year operation period, between 2028 and 2055. The University should expect and budget to have an average annual nominal payment for the total cost of ownership of the new system that falls between $267M and $329M starting in 2027.

Private Financing yields a $4-$5 million higher annual payment over the Tax-Exempt alternative. However, the Private Financing alternative should enable the transfer of engineering; procurement; financing; construction; and long-term operations, maintenance and replacement risks to a private developer. For a project this complex, the value added by transferring risk may outweigh the premium for private financing.

To examine this more closely, please see recommended next steps in Section 5.3.

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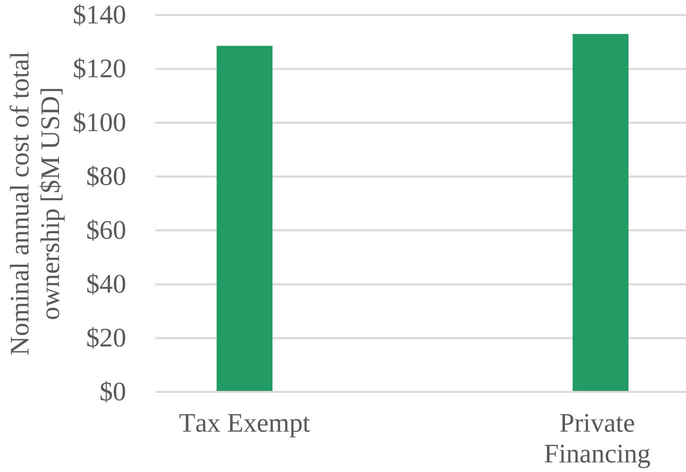

Tax-exempt	Private Financing	Delta
$129	$133	$4

Figure 22 Potential average annual payments for the total cost of ownership in nominal dollars over the 28-year operation period, between 2027 and 2055.

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4 Future Technologies

The three studies completed in 2015, 2019, and 2020 assessed a total of 33 different system configurations to upgrade or replace the cogeneration plant. Many other technologies were considered but not assessed because they were not technically or commercially feasible at the time of study. We recommend that UC Berkeley monitors these developing technologies for potential integration into future campus systems.

While it is unlikely that a single technology can be added to the existing cogeneration system to meet UC Berkeley's carbon and resilience goals, these technologies can be potentially be integrated to improve sustainability and/or cost performance. Any near-term systems, particularly the lower investment options that do not achieve carbon neutrality, should be "future-proofed" to potentially accommodate these technologies when and if they become feasible.

Table 12, Table 13, and Table 14 in Appendix E list key technologies that are currently under development and may be beneficial to the campus in the future. For each technology, we present:

- Description
- Drivers for adoption
- Barriers to adoption
- Commercial feasibility
- Technical feasibility
- System compatibility
- Potential capacity served

This information was derived from previous design experience, academic research and pilot projects.

The major barriers to adoption for each technology are identified in red, amber, and green (major, moderate, and minor, respectively). We expect that these will change as markets mature and new research is commercialized.

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5 Conclusions and Recommendations

5.1 Conclusions

Options 6 (central hot water), 10A (central steam), and 12 (hybrid nodal heat recovery) were suggested for study as they could require lower upfront investment than similar options, move the campus toward its carbon neutrality goals, and allow flexibility for future decarbonization. Each of these new options reduces carbon vs BAU, saves capital cost vs. the most comparable option, and increases life cycle cost vs. similar, previously studied options (Table 10).

Each of these three options will require further investment down the road to achieve carbon neutrality. The relative level of future investment required (high, moderate, or low) is shown qualitatively in red, amber, and green, respectively.

Table 10 Comparison of first cost, life cycle cost, and carbon savings for new options vs similar previously studied options. Negative numbers show increased costs.

Option	6	10A	12
Description	Central hot water	Central steam	Hybrid nodal heat recovery
Similar Option	2 - new cogen	0 - BAU	11C - central heat recovery
First Cost Savings	28%	18%	17%
Carbon Savings vs BAU	63%	15%	85%
Life Cycle Cost Savings	-43%	-20%	-12%
Potential Future Upgrade	Replace gas boilers with biogas, hydrogen, or heat pumps	Replace gas boilers with biogas, hydrogen, or heat pumps + hot water distribution	Replace existing cogen plant with biogas, hydrogen, or new nodal heat recovery plants

Of the new options, Option 12 appears to deliver the best value for investment. By transferring only the north half of campus (which accounts for most of the campus load) onto a new all-electric, carbon neutral system, the campus achieves 85% carbon reduction (vs. BAU) while reducing upfront cost by 17% (vs. Option 11C, central heat recovery). Although this system has a 12% higher life cycle cost than Option 11C, it provides an added benefit of resilience to grid power outages, such as the increasingly prevalent planned safety power shutoffs in response to wildfires. If desired, UC Berkeley could invest in a similar nodal heat recovery system for the south half of campus at a later date. Alternatively, the cogeneration plant could be converted to run on biogas or hydrogen fuel should these technologies become commercially and technically feasible in the future.

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The key performance aspects of each new and existing system by scenario are summarized in Figure 23. These results indicate that:

- The carbon neutral option (11C) is cost effective in the long term. The business case improves when cost of carbon increases, biogas procurement is required, or the cost of electricity decreases.
- The preferred path forward depends on commodity pricing, which is uncertain. The cost effectiveness of Option 12 is particularly sensitive to commodity rates. However, this excludes other unquantified benefits such as resilience, which may add considerable value.
- To improve the business case for the carbon neutral and low carbon options, renewable electricity procurement should target a blended rate of \$0.1315/kWh in 2025 or lower. This rate is within the realm of possibility according to EIA projections.

Variable	Scenario	0	2	6	10A	11C	12
Capital cost ($M USD)	All	92	210	151	75	290	233
Life cycle cost ($M USD)	Base case	1,558	1,180	1,685	1,868	1,477	1,648
	Social cost of carbon	1,674	1,250	1,737	1,960	1,506	1,680
	Biogas	1,756	1,299	1,768	2,029	1,508	1,693
	Breakeven electricity rate	1,542	1,180	1,566	1,769	1,368	1,539
Annual commodities cost ($M USD, 2045)	Base case	115	61	123	153	82	95
	Social cost of carbon	120	64	124	157	82	95
	Biogas	129	69	128	165	82	97
	Breakeven electricity rate	113	61	111	143	72	85
Annual O&M cost ($M USD, 2045)	All	16	20	13	9	17	29
Carbon (1,000 tons CO2-eq/y)	Base case	141	84	52	119	-	21

Figure 23 Summary of key performance aspects of each system. Red, amber, and green indicate poor, moderate, and good performance in each category, respectively.

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5.2 Recommendations

The recommended system varies by scenario and by UC Berkeley priorities (Figure 24). The three leading options are:

- **Option 2 | new cogeneration**. Offers the lowest life cycle cost across scenarios and resilience to electricity outage (e.g. a planned safety power shutoff during fire conditions). Not carbon neutral and not compliant with UC mandates.
- **Option 11C | central heat recovery**. Offers low life cycle cost across scenarios and resilience to natural gas outage (e.g. after an earthquake). Carbon neutral.
- **Option 12 | hybrid nodal heat recovery**. Offers comparable life cycle cost to BAU. Business case improves under biogas and breakeven electricity rate scenarios. Provides resilience to both natural gas and electricity outages. Reduces first cost by 17% over Option 11C. Reduces carbon emissions by 85% vs BAU, with potential for carbon neutrality through further future investment.

Variable	Unit	Best Solution		Best Low-Carbon Solution	
		Option	*Amt*	*Option*	*Amt*
Lowest capital cost	NPV first cost	Option 10A (replace cogeneration turbine with steam boilers)*	$87M	Option 12 (hybrid nodal heat recovery)	$233M
Lowest life cycle cost	NPV 30-year life cycle cost	Option 2 (new cogeneration with HHW distribution)*	$1.2B	Option 11C (central heat recovery chillers and heat pump heating)	$1.5B
Lowest annual commodities cost	NPV annual commodities cost after completion	Option 2 (new cogeneration with HHW distribution)*	$77M	Option 11C (central heat recovery chillers and heat pump heating)	$82M
Lowest carbon emissions	Annual CO_2-eq after completion	Option 11C (central heat recovery chillers and heat pump heating)	0 tons	Option 11C (central heat recovery chillers and heat pump heating)	0 tons

* Options violates the UCOP carbon neutrality mandate.

Figure 24 Recommended system by UC Berkeley priority. Best solution is listed for each variable in leftmost column. The best solution of all options studied is shown in the column titled "Best Solution." The best solution of only the low-carbon options (11C, 12) is shown in the column titled "Best Low-Carbon Solution."

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5.3 Next steps

Based on these findings, we recommend the following items for further study:

- Detailed analysis of preferred options that do not violate the UC mandate (11C and 12)
- Detailed solar PV and battery energy storage system (BESS) simulation, optimizing for UC Berkeley goal of resilience in the campus power supply.
- Detailed operational cost optimization for solar PV and thermal storage.
- Evaluation of delivery methods over the life cycle period such as design-build-operate-maintain (DBOM), design-build-finance-maintain (DBFM), design-build-finance-operate-maintain (DBFOM) as compared to a traditional approach to determine the best value solution (i.e. Value for Money). This will go beyond technical and total cost considerations to consider factors the University and/or Board of Visitors might want to see such as affordability, risk transfer over the asset life cycle, deal attractiveness to investors/philanthropists, market precedents for similar transactions.
- Detailed O&M study for the current central cogeneration plant to understand potential operational cost savings from implementing proposed options.
- Evaluation of developing technologies noted in Table 12, Table 13, and Table 14 in Appendix E and the potential for their integration into future systems.

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Appendix A

Mechanical Inputs, Assumptions, and Detailed Results

A1 Equipment Sizes

Equipment sizes were estimated for each option based on calculated peak loads and engineering rules of thumb. Equipment sizes for each option are shown in Figure 25 and Figure 26.

Equipment	Unit	0		2		6		10A		11C-E	
		#	Cap. Ea.	#	Cap. Ea	#	Cap. Ea	#	Cap. Ea	#	Cap. Ea
Cogeneration Turbines	MW	1	28	1	51						
Auxiliary Steam Boilers	MMBH	2	40	2	40			6	40		
Gas-fired Hot Water Boilers	MMBH					12	18				
Electric Hot Water Boilers	MMBH										
Heat Pumps	MMBH									4	30
Electric Chillers (Plant)	tons									6	1,200
Packaged VAV Units (Building)	0	48	100	48	100	48	100	48	100		
Electric Chillers (Building)	0	21	740	21	740	21	740	21	740		
Heat Recovery Chillers	tons									12	700
Cooling Towers	tons									6	1,200
CHW pumps	hp									33	100
HHW pumps	hp			18	75	18	75			18	75
Plant Area	sqft	1	22,000	1	37,000	1	17,000	1	22,000	1	51,000
HHW piping, main	in			13,003	20	13,003	20			13,003	20
HHW piping, branch	in			31,043	12	31,043	12			31,043	12
CHW piping, main	in									13,003	42
CHW piping, branch	in									31,043	24
HHW storage tanks	H x d									1	80 x 40
CHW storage tanks	H x d									1	100 x 80

Figure 25 Equipment quantity and capacity for each central option (0, 2, 6, 10A, 11C-E).

Equipment	Unit	Biosciences		Business & Law		Engineering, Physics, and Chemistry		Lower Sproul Offices	
		#	*Cap. Ea.*	*#*	*Cap. Ea*	*#*	*Cap. Ea*	*#*	*#*
Cogeneration Turbines	MW							1	28
Auxiliary Steam Boilers	MMBH							2	45
Gas-fired Hot Water Boilers	MMBH								
Electric Hot Water Boilers	MMBH								
Heat Pumps	MMBH	4	6			4	12		
Electric Chillers (Plant)	tons	3	400			5	1,000		
Packaged VAV Units (Building)	0							18	100
Electric Chillers (Building)	0							10	740
Heat Recovery Chillers	tons	3	700			5	700		
Cooling Towers	tons	3	400			5	1,000		
CHW pumps	hp	15	30			21	60		
HHW pumps	hp	8	40			9	60		
Plant Area	sqft	1	17,000			1	28,000	1	22,000
HHW piping, main	in	3,304	10			5,333	14		
HHW piping, branch	in	3,016	6			14,613	8		
CHW piping, main	in	3,304	20			5,333	36		
CHW piping, branch	in	3,016	12			14,613	18		
HHW storage tanks	H x d	1	63 x 30			1	90 x 40		
CHW storage tanks	H x d	1	100 x 44			1	100 x 64		

Figure 26 Equipment quantity and capacity for hybrid nodal option 12. Note that both the Lower Sproul Office and Business & Law nodes are served by the existing cogeneration plant; as such, quantities for both nodes combined are shown under the Lower Sproul Offices column.

A2 Commodities Calculation

Inputs and assumptions for electricity, natural gas, and water that were not listed in the 2019 Campus Energy Plan Final Report are listed in Figure 27.

Equipment	Unit	Existing		New	
		Value	*Source*	*Value*	*Source*
Efficiencies					
Heat recovery chiller	kW/ton	N/A		1.00	Assumption
Natural gas steam boiler	%	N/A		88%	Industry standard for new steam boiler plants
Heat recovery chiller cooling fraction	%	N/A		46%	DEF tool, scaled to match calculated consumption
Water Use					
Cogen plant loss	%	N/A	Covered by steam distribution loss	2%	Assumption, plant-level losses only
Energy Use					
Cogen steam production	lbs/y	756,124,000	2018 measured cogen output		
Cogen steam production	MMBtu/y	733,440	2018 measured cogen output		

Figure 27 Assumptions for electricity, natural gas, and water consumption calculations.

Appendix B

Cost Estimation Detailed Results

B1 Capital Cost

Item	0	2	6	10A	11C	12
Campus	$59	$134.8	$96.5	$48.3	$179.4	$22.7
Biosciences	-	-	-	-	-	$27.0
Business and Law	-	-	-	-	-	$0.6
Engineering, Physics and Chemistry	-	-	-	-	-	$67.0
Lower Sproul offices	-	-	-	-	-	$32.0
Total Direct Costs	**$59**	**$135**	**$97**	**$48**	**$179**	**$149**
Total Indirect Costs + OH&P	$19	$44	$32	$16	$59	$49
Total Construction Cost	**$78**	**$179**	**$128**	**$64**	**$238**	**$198**
Total Soft Costs	$5.4	$12.3	$ 8.8	$ 4.4	$ 16.4	$13.7
Project Contingency [10%]	$8.4	$19.1	$13.7	$6.9	$25.5	$21.2
Total Project Cost [most likely]	**$92**	**$210**	**$151**	**$75**	**$280**	**$233**
Total Project Cost [low range, -40%]	$55	$126	$90	$45	$168	$140
Total Project Cost [high range, +50%]	$138	$316	$226	$113	$420	$350

Figure 28 Capital cost in $M USD, 2019.

B2 Life Cycle Cost Assessment

B2.1 Inputs

To test the sensitivity of the 30-year net present value for each option to changes in commodity pricing, life cycle costs were calculated under four scenarios as described in Table 11.

Scenario	Description
Base case	The assumptions and methodology for the base case cost estimate are consistent with the 2019 study except for two changes: • Life cycle costs assumed "fastest feasible" phasing as described in Section 2.2 • In addition to mandatory carbon offsets, the cost of voluntary carbon offsets was also included
Social cost of carbon	The base rate for cost of carbon does not reflect the broader social impacts of climate change. To account for social impacts, this scenario uses the ceiling rate rather than the base rate to calculate carbon cost. All other parameters are identical to the base case.
Biogas	UC mandates that all UC campus procure 40% of their natural gas from biogas starting in 2025. Since local sources of biogas are not currently available, biogas will be procured as an offset. Under the biogas scenario, 100% of natural gas is procured from PG&E at the same rate as the base case. In addition, biogas offsets are procured for 40% of natural gas use. Biogas is procured 25% at the standard rate and 75% at the premium rate. All other parameters are identical to the base case.
Breakeven electricity rate	The future cost of UC Berkeley's electricity will depend on many factors, including market forces, political climate, and source (PG&E, East Bay Community Energy, direct access, etc.). To test the impact of uncertainty on the relative life cycle costs of the various options, Arup conducted sensitivity analysis on the cost of electricity. We identified the "breakeven rate" at which the 30-year present value for Option 12 (hybrid nodal heat recovery) was the same as Option 0 (business as usual). All other parameters are identical to the base case.

Table 11 Life cycle costs were compared across 4 scenarios.

Costs for carbon and biogas were provided by UC Berkeley. All other inputs and sources were consistent with the 2019 study.

B2.2 Results

Cost	Option 0	Option 2	Option 6	Option 10A	Option 11C	Option 12
Construction	$90	$208	$148	$74	$277	$228
Replacement	$17	$21	$21	$18	$27	$22
O&M	$176	$230	$150	$103	$196	$319
Commodities	$1,275	$721	$1,367	$1,674	$977	$1,078
Total	**$1,558**	**$1,180**	**$1,685**	**$1,868**	**$1,477**	**$1,648**

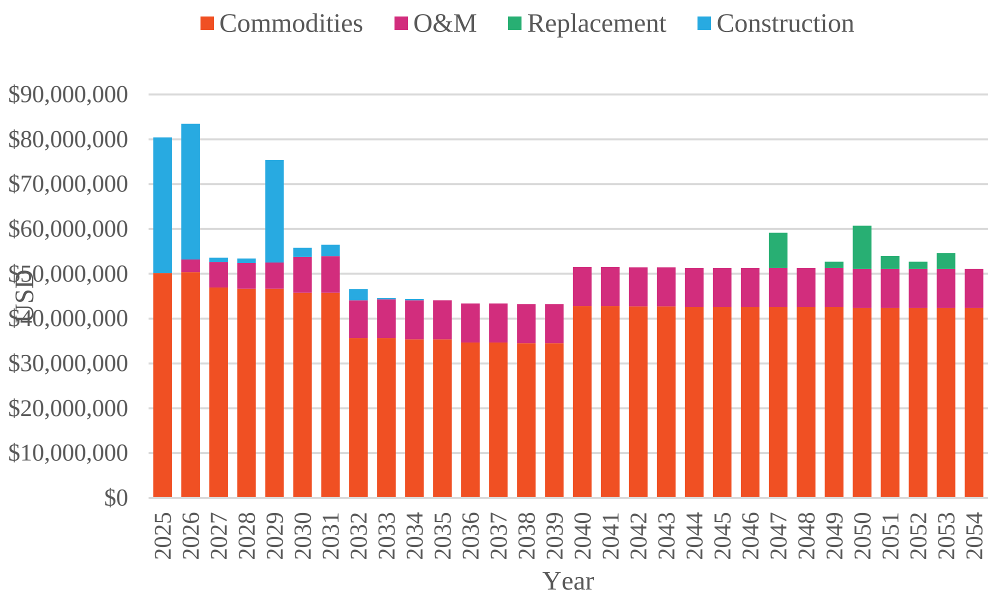
Figure 27 30-year life cycle net present value in $M USD, 2019.

Commodity	Unit	0	2	6	10A	11C	12
Electricity	$/y	$736	$440	$303	$597	$103	$158
Natural gas	$/y	$114	$0	$840	$702	$770	$772
Water	$/y	$139	$112	$112	$139	$82	$97
Carbon	$/y	$286	$169	$112	$236	$22	$52
Total	$/y	**$1,275**	**$721**	**$1,367**	**$1,674**	**$977**	**$1,078**

Figure 29 Commodities cost upon project completion in $M USD.

B2.3 Lifecycle Cash Flow

B2.3.1 Option 0



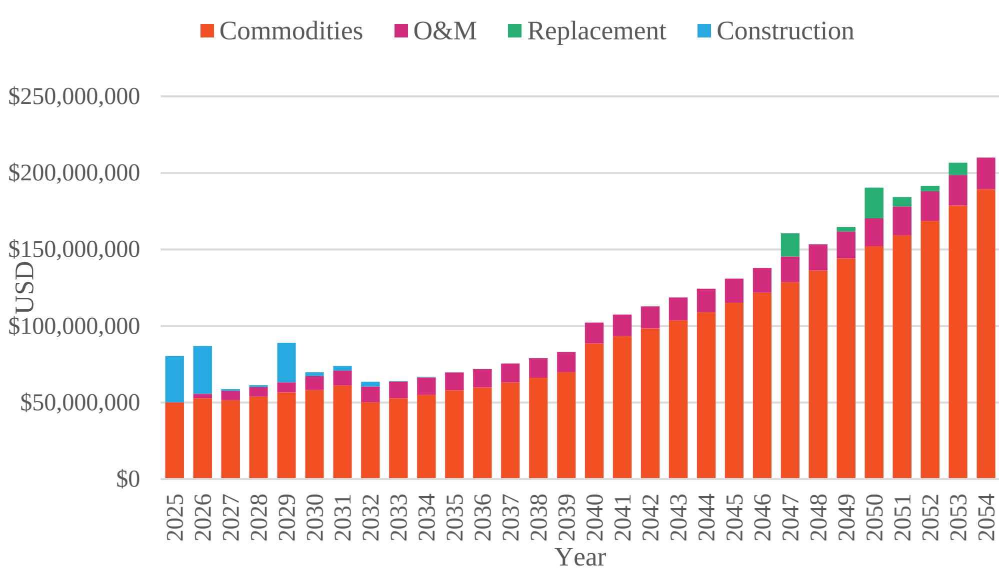
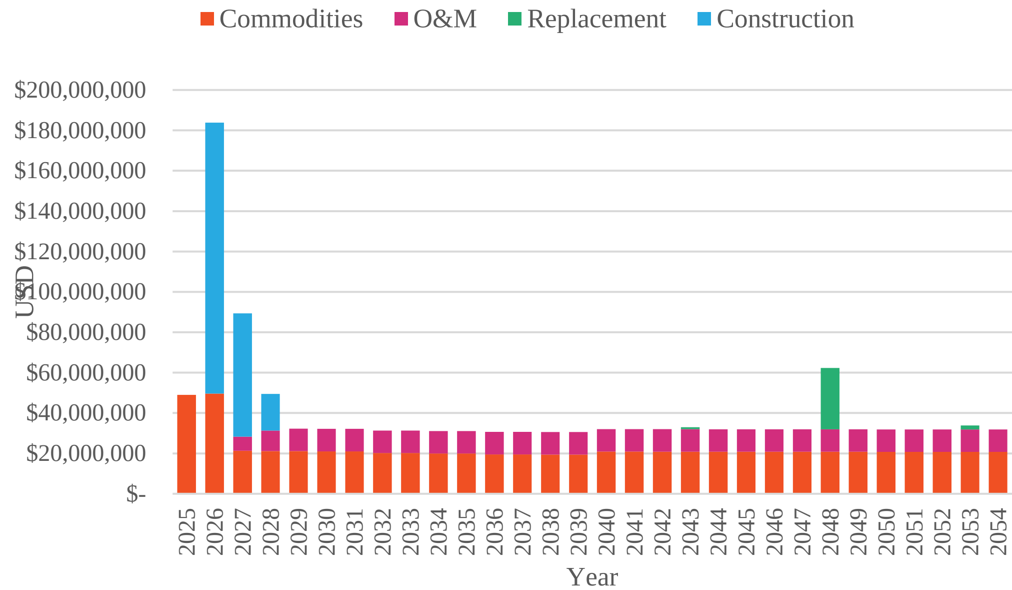


Figure 30: Cash flow for core option 0 (BAU – upgrade existing central cogeneration plant, in-building cooling) without escalation (top) and with escalation (bottom).

B2.3.2 Option 2



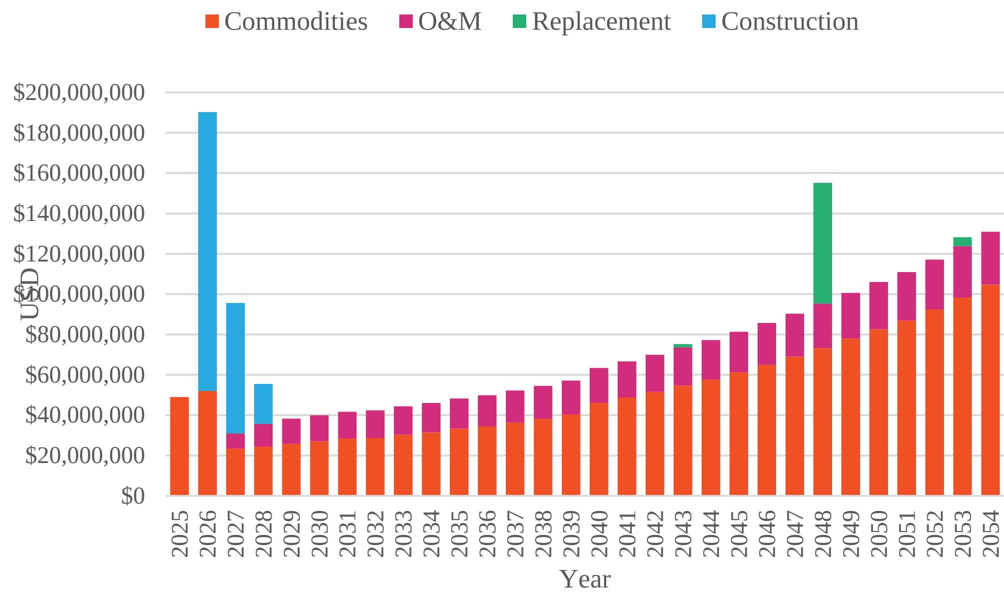
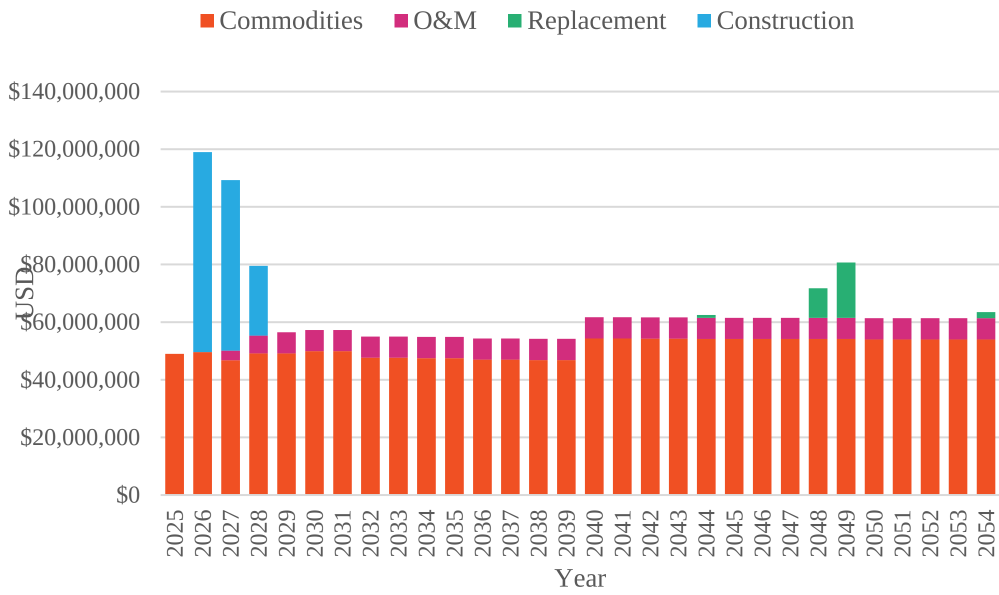


Figure 31: Cash flow for core option 2 (new central cogeneration plant, in-building cooling) without escalation (top) and with escalation (bottom).

B2.3.3 Option 6



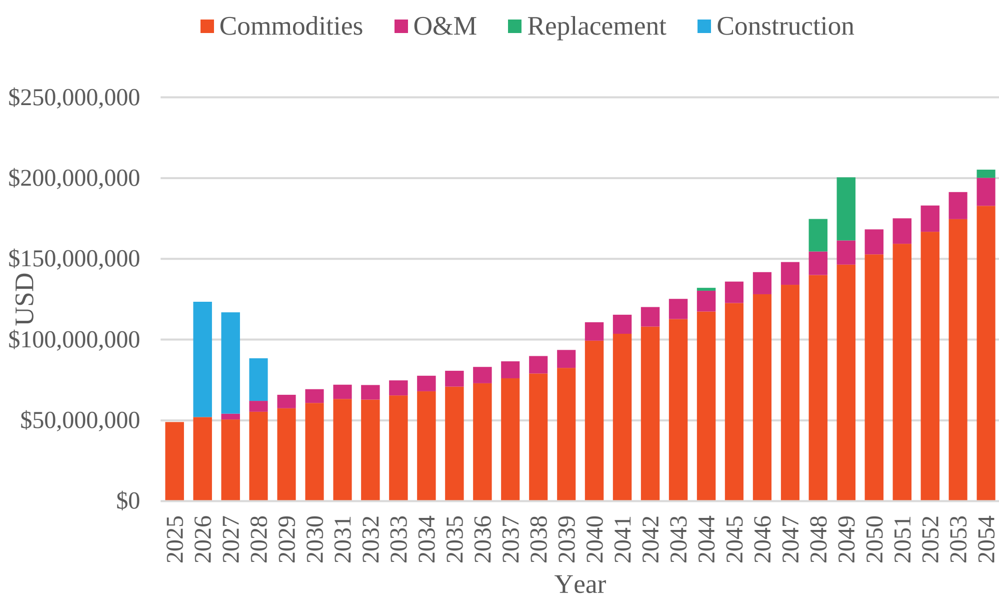
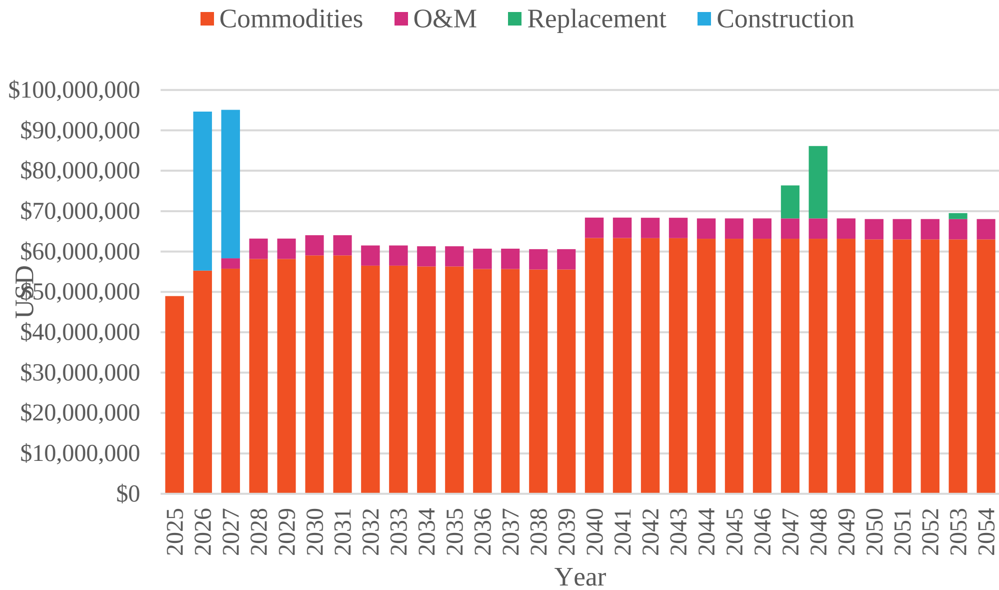


Figure 32a and 31b: Cash flow for core option 6 (central hot water, in-building cooling) without escalation (top) and with escalation (bottom).

B2.3.4 Option 10A



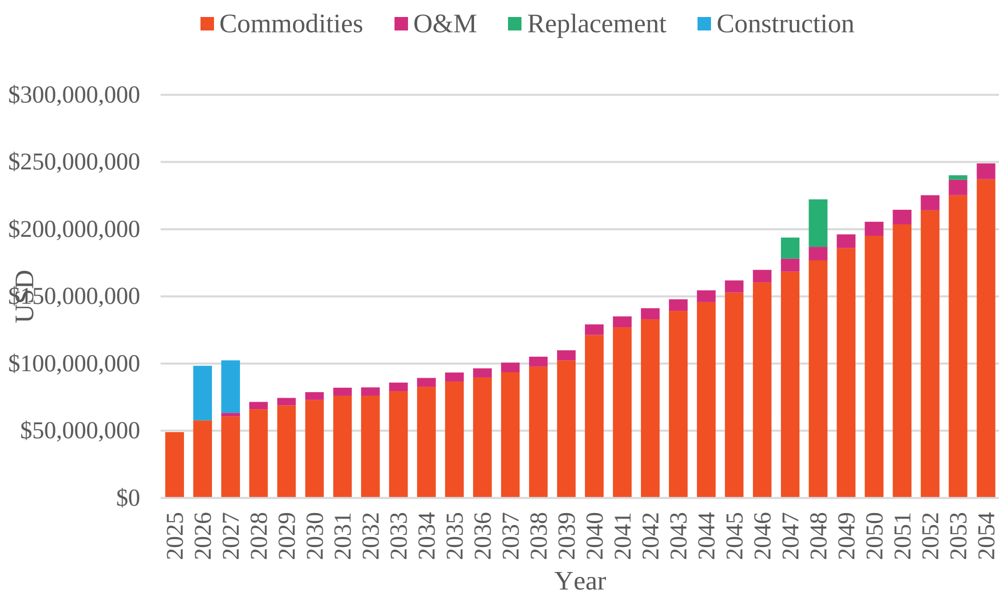
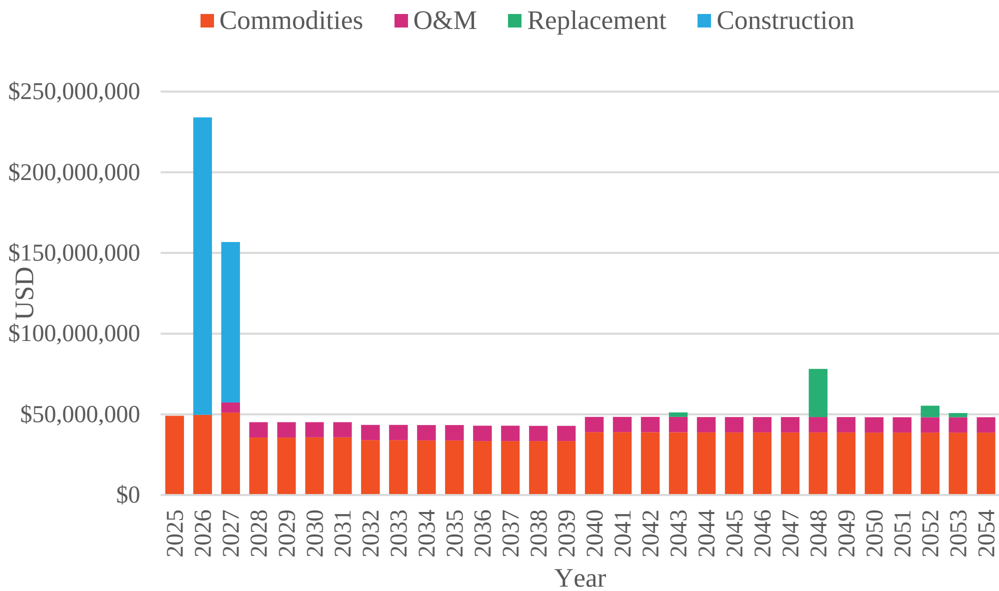


Figure 33a and 32b: Cash flow for core option 10A (central steam, in-building cooling) without escalation (top) and with escalation (bottom).

B2.3.5 Option 11C-E



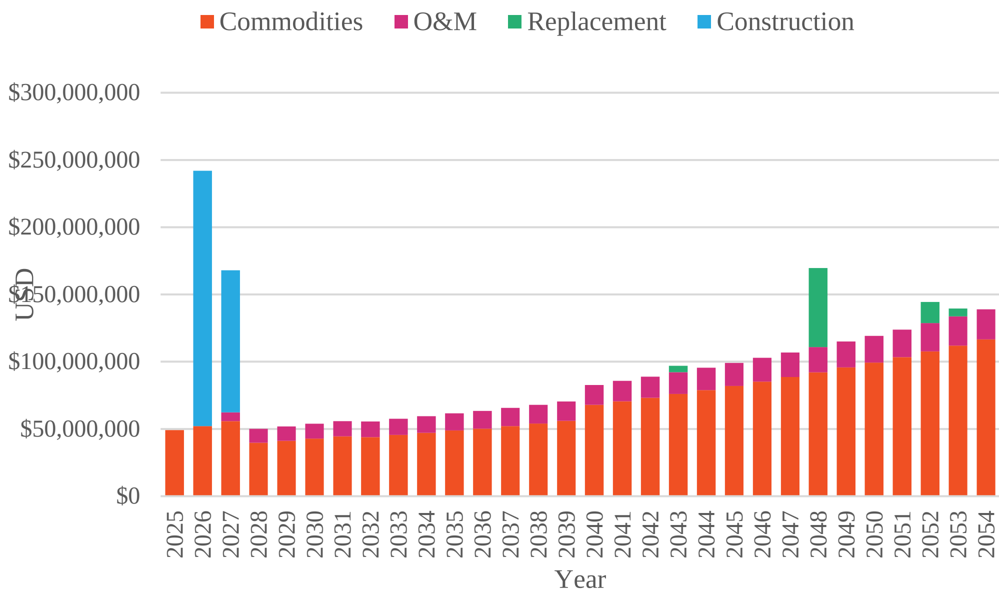
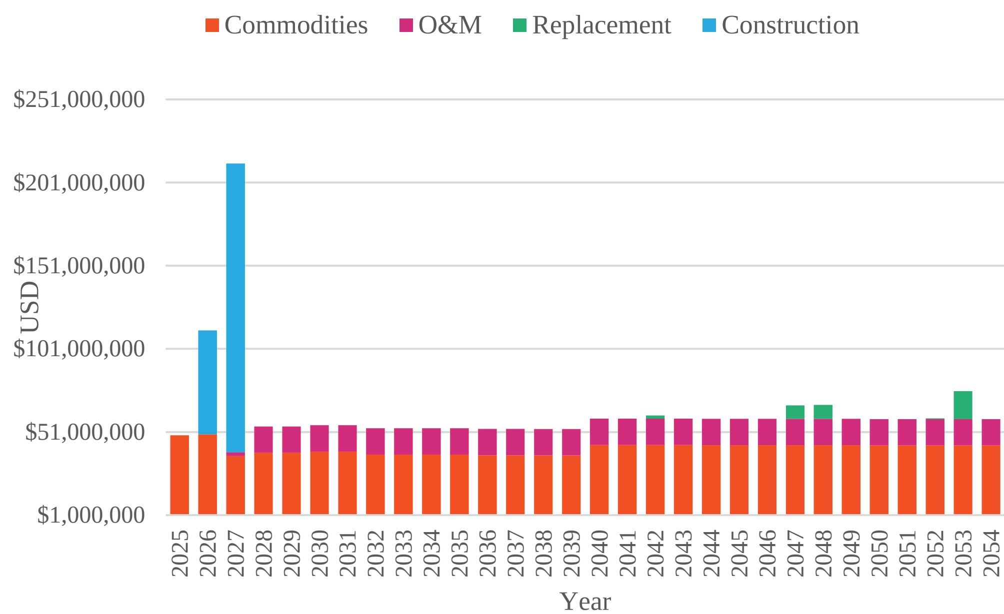


Figure 34a and 33b: Cash flow for core option 11C-E (central heat recovery chillers and heat pump heating) without escalation (top) and with escalation (bottom).

B2.3.6 Option 12



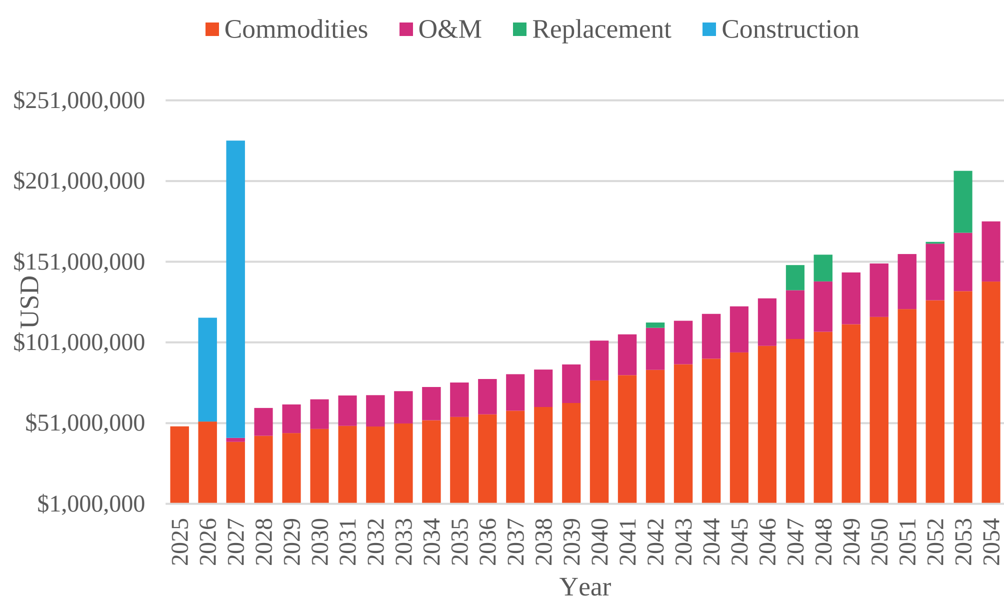


Figure 35a and 34b: Cash flow for core option 12 (hybrid nodal heat recovery chillers and heat pump heating/cogen + in-building cooling) without escalation (top) and with escalation (bottom).

Appendix C

Siting and Phasing

C1 Siting

The siting options developed below are representative rather than absolute. Using an alternative site that is also located along the major distribution path should not substantially impact cost analyses.

For new central options (2, 6, 11C), a new central utility plant is proposed to be located in the new Evans Hall site. For the hybrid nodal option (12), new plants are proposed to be located in the Tolman and Evans sites. Options 0 and 10A make use of the existing cogeneration plant with modifications including seismic upgrade.

Figure 36 Location of utility plant and distribution piping for Option 6 (central hot water).

Figure 37 Location of utility plant and distribution piping for Option 10A (central steam).

Figure 38 Location of utility plants, thermal storage tanks, and distribution piping for Option 12 (hybrid nodal heat recovery).

Figure 39 Location of utility plant and distribution piping for Option 0 (business as usual).

Figure 40 Location of utility plant and distribution piping for Option 2 (new cogeneration).

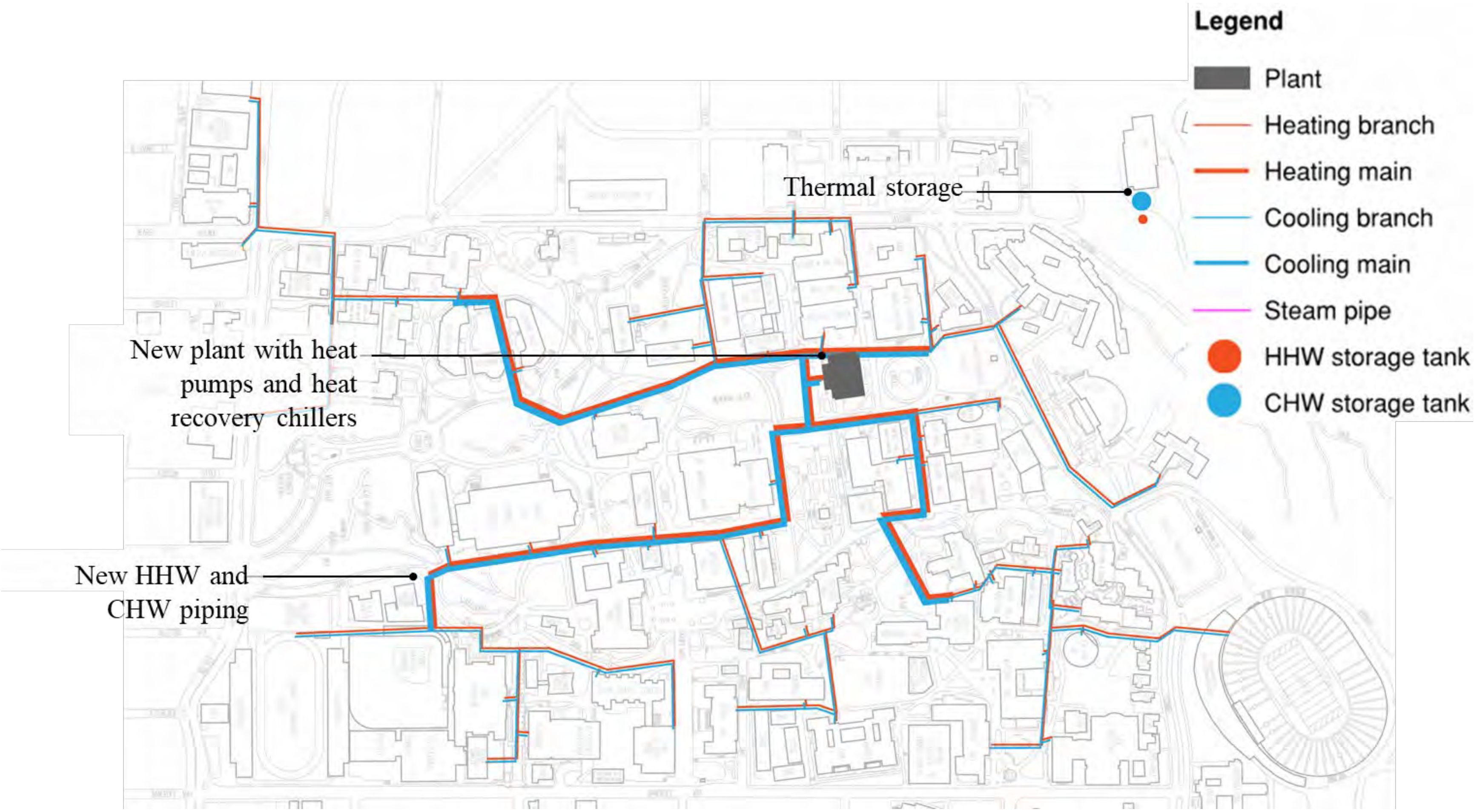


Figure 41 Location of utility plant, thermal storage tanks, and distribution piping for Option 11C-E (central heat recovery).

C2 Phasing Assumptions

For each option listed in Section 2.1, schedules were developed using Primavera P6 software.

The schedules were developed with a Work Breakdown Structure (WBS) that divided the project into major elements, including central utility plants, distribution piping, and electrical infrastructure.

The schedules are Class 5 per AACE Recommended Practices (Figure 42). Class 5 schedules are prepared based on a limited information and consequently have wide accuracy ranges. They are typically used for concept screening with a top down approach to evaluate options.

	Primary Characteristic	*Secondary Characteristic*	
SCHEDULE CLASS	DEGREE OF PROJECT DEFINITION (Expressed as % of complete definition) [1]	END USAGE	SCHEDULING METHODS USED
Class 5	0% to 2%	Concept screening	Top down planning using high level milestones and key project events.
Class 4	1% to 15%	Feasibility study	Top down planning using high level milestones and key project events. Semi-detailed.
Class 3	10% to 40%	Budget, authorization, or control	"Package" top down planning using key events. Semi-detailed.
Class 2	30% to 70%	Control or bid/tender	Bottom up planning. Detailed.
Class 1	70% to 100%	Bid/tender	Bottom up planning. Detailed.

Figure 42 AACE International Generic Schedule Classification Matrix

The schedules assume:

- Design-build project delivery
- One contractor appointed for full scope of work
- 18-month procurement duration

- Make ready work and incidental move allowance of 6 months for Options 2, 6, 11C and 12.
- Make ready work and incidental move allowance of 3 months for Option 10A
- Multiple work fronts/crews for pipe installation and building improvements
- Different advance rates for different pipe sizes
- No redundancy during replacement of cogeneration plant components (i.e. when boilers are replaced, the cogeneration turbine meets the full steam load and when the turbine is replaced, the boilers meet the full load)
- Construction of buildings housing new plants is completed by end of 2025

C3 Construction Schedules

Appendix D

Financing Inputs, Assumptions, and Detailed Results

D1 Assumptions

Financial analysis was performed for Option 12 (hybrid nodal heat recovery) that is meant to represent simplified “bookends” of possible financing costs and their commensurate risk profile.

Arup estimated the financing costs under two scenarios for the up-front capital investment:

- Tax-exempt alternative - assumes a financing strategy consistent with UC Berkeley’s traditional financing approach of using tax-exempt bonds, which represents the lowest cost of capital with minimal transfer risk.
- Private Financing alternative - assumes a financing strategy that combines private equity and long-term taxable debt, which increases the cost of capital in return for transferring capital delivery and asset preservation risks.

These financing costs replaced the capital costs within the life cycle cost estimates to determine the potential range of “total cost of ownership” for UC Berkeley, expressed in nominal and present value terms.

For the Tax-exempt scenario, Arup assumed that:

- UC Berkeley will own and operate the new energy system, which will replace the existing cogeneration plant.
- The construction of the new system will likely be under design-bid-build (DBB) delivery model with O&M contracted separately.
- The system will be financed using tax-exempt bonds using a 6.00% UCOP tax-exempt planning rate.

For the Private Financing scenario, Arup assumed that:

- A Developer will design, build, and finance the new energy system
- UC Berkeley will pay the Developer annual payments under a long-term service contract
- The Developer will finance the system through a combination of private equity and taxable debt
- Gearing of private, taxable debt to be 85%.
- Gearing of private equity to be 15%.

The assumed cost of capital is summarized in Figure 43.

Item	Tax-exempt	Private Financing
Cost of tax-exempt debt	6%	N/A
Debt to equity ratio	N/A	85/15
Cost of taxable private debt	N/A	7.5%
Cost of private equity	N/A	12%
Weighted average cost of capital	N/A	8.2%

Figure 43 Assumed cost of capital.

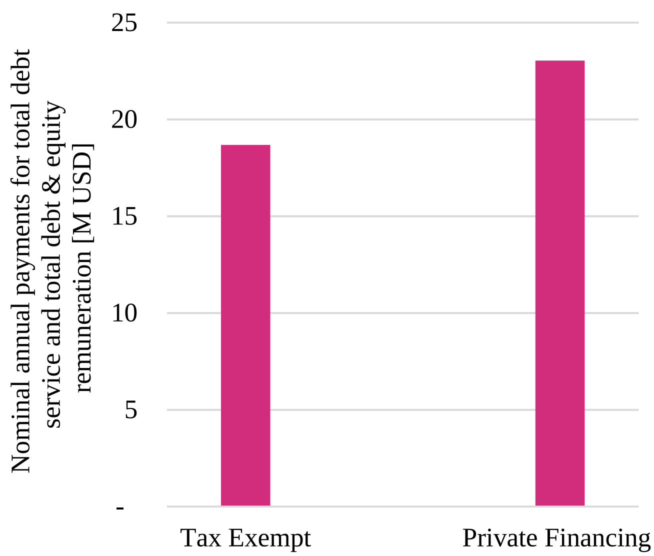
The study assumed:

- An annual escalation factor of 3%;
- An annual 5% discount rate for the calculation of present values;
- 28-year amortization term.

D2 Results

D2.1 Financing

Figure 44 summarizes the potential annual payment to remunerate the sources of capital assumed under each scenario described in Appendix D1 over the 28-year operation period, starting with new system construction in 2025.



Tax-exempt	Private Financing	Delta
$19	$23	$4

Figure 44 Potential annual payment to remunerate the sources of capital in nominal dollars over the 28-year operation period, starting in 2027. Values in million USD.

The potential annual payment for total debt & equity remuneration for the private financing alternative is approximately $23M. Private financing alternative will cost UC Berkeley $4 million more than the Tax-exempt alternative when average annual total cost of ownership over the operation period of 2027-2055 is considered. The premium cost is relatively minor in the context of the whole project cost. The delta between the two funding scenarios is 15-20% of the potential annual payment for the Private financing alternative.

Figure 45 illustrates the total cost of ownership, including financing costs for each option.

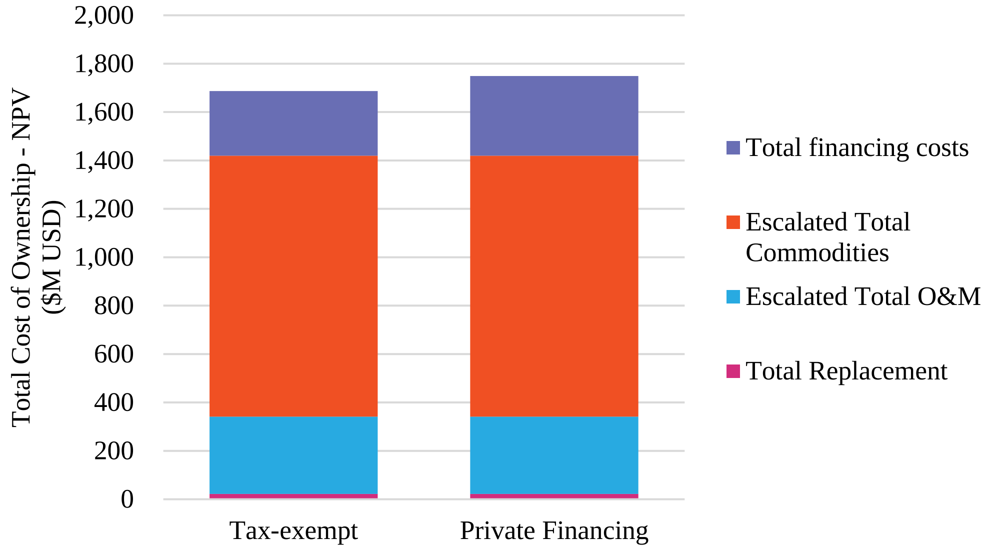


Figure 45 Present value of total cost of ownership. Values in million USD.

Appendix E

Future Technologies

E1 Developing Technologies

The three studies completed in 2015, 2019, and now in 2020 assessed a total of 33 different system configurations to upgrade or replace the cogeneration plant. Many other technologies were considered but not assessed because they were not technically or commercially feasible at the time of study. We recommend that UC Berkeley monitor these developing technologies for potential integration into future campus systems.

While it is unlikely that a single technology can be added to the existing cogeneration system to meet UC Berkeley's carbon and resilience goals, these technologies can be potentially be integrated to improve sustainability and/or cost performance. Any near-term systems should be "future-proofed" to potentially accommodate these technologies when and if they become feasible.

Table 12, Table 13, and Table 14 list key technologies that are currently under development but may be beneficial to the campus in the future. For each technology, we present:

- Description
- Drivers for adoption
- Barriers to adoption
- Commercial feasibility
- Technical feasibility
- System compatibility
- Potential capacity served
- Estimated timeline to market maturity

This information was derived from previous design experience, academic research and pilot projects.

The major barriers to adoption for each technology are identified in red, amber, and green (major, moderate, and minor, respectively). We expect that these will change as markets mature and new research is commercialized.

Table 12 Benefits, barriers and timeline for developing heat and power generation technologies.

Technology	Description	Benefits	Current Barriers to Adoption	Commercial Feasibility	Technical Feasibility	System Compatibility	Potential Capacity
Hydrogen Fuel Cells **(5-15 yrs)**	Hydrogen and oxygen fuel inputs produce both heat and electricity. There are 4 different types of fuel cell at different stages of maturity.	1. Zero carbon emissions – when sourced from renewable fuels, hydrogen has zero emissions. 2. Zero local emissions – locally, the only emissions are water vapor.	1. High upfront cost – the capital cost is 2x conventional combined heat and power (CHP) technologies. Additional cost is required for equipment to store hydrogen onsite. 2. Uncertain fuel supply and cost – In California, the hydrogen market is in its infancy and uses carbon–intensive production methods. Hydrogen costs are significantly higher than natural gas, with no evidence of price decrease in the near future.	High upfront cost. Uncertain future fuel supply and cost.	Challenging to source zero-carbon hydrogen.	Compatible with steam and hot water.	Heating and electricity for the entire campus.
Biogas Fuel Cells (transition to hydrogen possible) **(5-10 yrs)**	Biogas inputs produce both heat and electricity. Since electrochemical conversion rather than combustion, biomethane fuel cells can be modified to accept both biogas and hydrogen fuels.	1. Zero carbon emissions – if sourced appropriately biogas has zero net emissions. If biogas purification is combined with carbon capture and storage emissions can be negative. 2. Low local emissions – efficient energy conversion reduces NO_x emissions. 3. Increased efficiency – fuel cells output 7% more electricity compared to combustion.	1. High upfront cost – the capital cost is 2x conventional combined heat and power (CHP) technologies. Additional cost is required for equipment to process biogas onsite. 2. Uncertain fuel supply and cost – In California, the biogas market does not provide the 97% purity required for fuel cells. Additional and costly pretreatment is required on– site.	High upfront cost. Uncertain future fuel supply and cost.	Challenging to source zero-carbon hydrogen.	Compatible with steam and hot water. Compatible with biogas or hydrogen.	Heating and electricity for the entire campus.
Alternative Source Heat Pumps **(5-10 yrs)**	Heat pumps move thermal energy from one place to another. This study evaluated air-source heat pumps under Option 11C. Beyond air, additional heat sources such as the ground, sewer lines, and aquifers can also be used.	1. Higher efficiency – ground, sewer and aquifer maintain more constant temperatures than air, improving efficiency. 2. Zero carbon emissions – input fuel is electricity, which has zero emissions when procured from renewable sources. 3. Zero local emissions – no combustion. 4. Reduced space take – equipment does not need access to air and can be located underground or in smaller rooms.	1. High upfront cost – despite a few projects in the Bay Area, the local labor force is still upskilling on installations, resulting in a cost premium. This is expected to reduce as the technology becomes more common locally. 2. Not compatible with steam system – heat pumps produce lower temperature hot water and are unable to meet the high temperatures of the existing steam system.	High upfront cost.	Mature.	Not compatible with steam.	Heating and cooling output varies with available land area. More analysis needed.
CO_2 Heat Pumps **(5-10 yrs)**	CO_2 can be used as a refrigerant in heat pumps. Although less energy efficient for space heating, it has a lower global warming potential than conventional refrigerants.	1. Increased efficiency – 50% more efficient in top– up applications (e.g. domestic hot water). 2. Natural refrigerant – low cost and abundant. Lower global warming potential. 3. Zero carbon emissions – input fuel is electricity, which has zero emissions when procured from renewable sources. 4. Zero local emissions – no combustion.	1. Unproven technology at scale – prevalent in Japan for small residential units. Performance at scale is unknown. 2. High upfront cost – more expensive than traditional heat pumps due to the novelty in the US market.	High upfront cost, long-term savings	Currently limited to small scale.	Not compatible with steam.	Domestic hot water for the entire campus.

Table 13 Benefits, barriers and timeline for developing heat and electricity storage technologies.

Technology	Description	Benefits	Current Barriers to Adoption	Commercial Feasibility	Technical Feasibility	System Compatibility	Potential Capacity
Phase change thermal storage **(5-10 yrs)**	Thermal storage allows for heat or coolth to be produced during times of lower demand, stored, and used during times of higher demand. Traditional thermal storage uses hot or chilled water tanks. Though simple, this takes up considerable space. Phase change thermal storage leverages the large amount of energy required to change phase between solids, liquids, and gas to reduce space requirements.	1. Increased efficiency – equipment can be operated to maximize efficiency, either by staging or operating at optimal temperatures. 2. Reduced carbon – systems can be operated to maximize use of on– site renewable energy generation. 3. Reduced lifetime costs – thermal storage reduces the amount of central plant equipment required and corresponding costs. It also reduces peak electricity demand and associated utility charges. 4. Increased resilience – during a power outage, heating and cooling can be provided from storage using pumps running on backup power.	1. Unproven technology at scale – although ice storage has deployed in Paris and downtown San Francisco, the next generation of synthetic phase change materials have not been proven at scale. 2. High upfront cost – installations are bespoke and expensive for new phase change materials.	Initial investment, long-term savings.	Synthetic products unproven at scale.	Less compatible with steam.	Varies by design. 4 hours of peak heating and cooling load typical.
Flow Batteries **(5-10 yrs)**	Flow batteries are electrochemical cells that use a reversible reaction between two chemicals to store electricity. Electricity input is required for one reaction (charging), and output for the reverse (discharging). Each chemical has a storage tank to enable long duration storage.	1. Reduced lifetime costs – electricity storage reduces peak electricity demand and associated utility charges. 2. Increased resilience – during a power outage, the battery provides an alternative source of electricity.	1. Unproven technology at scale – still generally limited to pilot schemes that are large scale. 2. High upfront cost – installations are bespoke and expensive.	High upfront cost for smaller scale installations.	Mature technology.	Integrate into campus electrical loop	Varies by design. 3 days of critical campus electric load typical.
Mechanical Energy Storage **(10-20 yrs)**	Mechanical energy storage uses gravity to store electricity. One common approach is to lift mass in a concrete vault tower when excess electricity is available (charge) and drop it to turn generators when electricity is needed (discharge).	1. Reduced lifetime costs – electricity storage reduces peak electricity demand and associated utility charges. 2. Increased resilience – during a power outage, the battery provides an alternative source of electricity.	1. Unproven technology at scale – multiple projects have been proposed in the past, but only pilots delivered 2. Upfront cost – installations are bespoke and expensive.	No financials available.	Not yet proven.	Integrate into campus electrical loop	Varies by design.

Table 14 Benefits, barriers and timeline for other developing technologies.

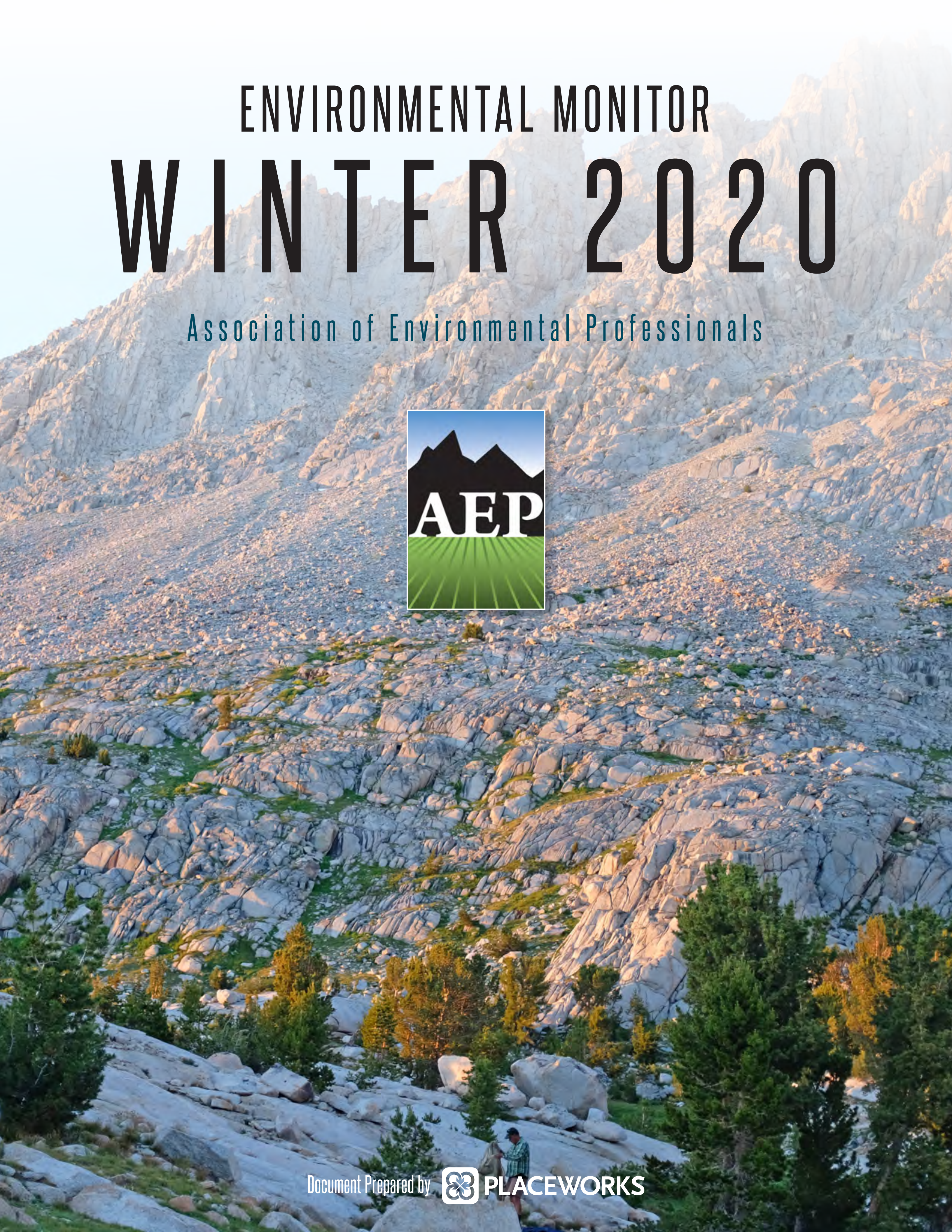
Technology	Description	Benefits	Current Barriers to Adoption	Commercial Feasibility	Technical Feasibility	System Compatibility	Potential Capacity
Remote work for non-essential workers during peak weeks **(5-10 yrs)**	Advances in technology enable remote working and learning for a large portion of the campus. During particularly hot or cold weeks when campus loads peak, non-essential classes and work could be carried out remotely, reducing campus demand and the installed capacity of plant equipment. If desired, the cost savings from smaller equipment and reduced peak demands could be used to fund other energy efficiency projects on or off campus, further reducing carbon emissions.	1. Reduced upfront cost – the resultant peak load shaving could reduce installed equipment capacity by up to 50%. 2. Reduced lifetime costs – working from home on peak days reduces peak electricity demand and associated utility charges.	1. Requires occupant buy-in – planned work/learn from home days requires a shift in thinking for employees and students. 2. Reduces future flexibility – lower installed capacity reduces the ability to meet future campus growth.	High upfront and long-term savings.	Mature technology.	Requires culture shift	Reduce installed HVAC in new buildings and renovated existing buildings by 40-80%.
Personal environmental controls **(5-10 yrs)**	Traditional space conditioning heats and cools entire room to make the occupants inside feel comfortable. A newer approach to comfort focuses on heating and cooling the occupants themselves rather than spaces. Led by UC Berkeley's Center for the Built Environment, techniques include microfans, heated mice, and operable vents that deliver warmth and coolth directly to occupants. This approach is particularly appealing in mild climates such as Berkeley.	1. Increased efficiency – conditioning occupants rather than spaces substantially reduces energy use compared to traditional systems. 2. Reduced lifetime costs – when paired with passive solar design, personal environmental controls can replace HVAC systems altogether. Even when they must be paired with an HVAC system, lower energy use is likely to offset any additional investment.	1. Requires occupant buy-in – occupants must be educated on how to use the personal environmental controls to be comfortable.	Limited data available. Upfront cost saving likely if well-designed. Long-term savings.	Mature technology. Limited case studies available.	Compatible with most air-side HVAC system types.	Theoretically could reduce heating and cooling load significantly.

UC Berkeley LRDP
Friant Ranch – Regional Scale Models &Health Incidents

ENVIRONMENTAL MONITOR

WINTER 2020

Association of Environmental Professionals



Document Prepared by PLACEWORKS

We Can Model Regional Emissions, But Are the Results Meaningful for CEQA?

Authors: AEP Climate Change Committee (Michael Hendrix, Dave Mitchell, Haseeb Qureshi, Jennifer Reed, Brian Schuster, Nicole Vermilion, and Rich Walters)

On December 24, 2018, the California Supreme Court, *Sierra Club v. County of Fresno (Friant Ranch, L.P.] (2018) 6 Cal.5th 502, Case No. S219783 (Friant Ranch)*, held that simply identifying that a project exceeds an emissions threshold is not sufficient to identify a project's significant effect on the environment relative to the health effects of project emissions. The Court found that an EIR should make a reasonable effort to substantively connect a project's criteria pollutant emissions to likely health consequences, or explain why it is not currently feasible to provide such an analysis. In 2019, there were several CEQA documents that included health effects modeling to provide additional analysis for projects with criteria air pollutant emissions that exceed a significance threshold. While it is technically possible to conduct this modeling, we argue that this additional layer of quantitative analysis may not always provide decision-makers and the public with additional meaningful information. It is the air districts that are best suited to provide frameworks for how to identify health effects of regional criteria pollutant emissions under CEQA.

Introduction

Significance thresholds for regional criteria pollutants used by California air districts and lead agencies represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable national or state ambient air quality standard (AAQS). By analyzing the project's emissions against these thresholds, the CEQA document assesses whether these emissions directly contribute to any regional or local exceedances of the applicable AAQS and exposure levels. The basis of the ruling in Friant Ranch was that the EIR did not provide a meaningful analysis of the adverse health effects that would be associated with the project's criteria pollutant emissions, which were identified as being far above the relevant thresholds. The discussion of the adverse health effects in the EIR was general in nature and did not connect the levels of the pollutants that would be emitted by the project to adverse health effects.

The process of correlating project-related criteria pollutant emissions to health-based consequences is called a health impact assessment (HIA). An HIA involves two steps: 1) running a regional photochemical grid model (PGM) to estimate the small increases in concentrations of ozone and particulate matter (PM) in the region as a result of a project's emissions of criteria and precursor pollutants; and 2) running the U.S. EPA Benefits Mapping and Analysis Program (BenMAP) to estimate the resulting health impacts from these increases in concentrations of ozone and PM.

Limitations of Regional-Scale Dispersion Models

It is technically feasible to conduct regional-scale criteria pollutant modeling for a development project. Particulate matter (PM) can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur oxides (SOx) and NOx, Ozone (O3) is a secondary pollutant formed from the oxidation of reactive organic gases (ROGs) and nitrogen oxides (NOx) in the presence of sunlight. Rates of ozone formation are a function of a variety of complex physical factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns.. Secondary formation of PM and ozone can occur far from the original emissions source from regional transport due to wind and topography (e.g. low-level jet stream). As such, modeling concentrations of secondary PM and ozone require photochemical grid models (PGMs), such as CMAQ and CAMx. These models have a much larger "grid" system and much lower resolution than localized dispersion modeling (e.g., AERMOD). For example, common grid cells in PGMs are 4x4 kilometers, while AERMOD can identify concentrations at the meter-level.

Photochemical modeling also depends on all emission sources in the entire domain. Low resolution and spatial averaging produces "noise" and model uncertainty that can exceed a project's specific emissions. Additionally, regional-scale models are highly contingent upon background concentrations. Factors such as meteorology and topography greatly affect the certainty levels of predicted concentrations at receptor points. As a result, there are statistical ranges of uncertainty through all the modeling steps. Due to these factors, it is difficult to predict ground-level secondary PM and ozone concentrations associated with relatively small emission sources with a high degree of certainty. While it is possible to use a regional-scale model to predict these regional concentrations, when a project's emissions are less than the regional model's resolution, the resultant ambient air quality concentrations will be within the margin of uncertainty. In CEQA terms, this would fit the definition of "speculative". Only when the scale of emissions would result in changes in ambient air quality beyond the model margin of uncertainty would the results not be "speculative" as defined by CEQA.

Identifying Health Effects due to Ambient Air Quality Changes

BenMap is a model developed by the USEPA to understand the health effects from changes in ozone and PM concentrations. If there is an acceptable level of confidence that the results provided by the regional dispersion modeling are valid, then these concentrations can be translated into health outcomes using BenMap. The health outcomes in BenMap are based on changes in ambient air concentrations and the population exposed to these changes. Data provided by this analysis may indicate increased number of workdays lost to illness, hospital admissions (respiratory), emergency room visits (asthma), or mortality, among other health effects. These are called "health incidences."

Translating the incremental increase in PM and ozone concentrations to specific health effects is also subject to uncertainty. For example, regional models assign the same toxicity to PM regardless of the source of PM (such as road dust as exhaust), and thus potentially overpredict adverse health effects of PM. BenMap also assumes that health effects can occur at any concentration, including small incremental concentrations, and assumes that impacts seen at large concentration differences can be linearly scaled down to small increases in concentration, with no consideration of potential thresholds below which health impacts may not occur. Additionally, BenMap is used for assessing impacts over large areas and populations and was not intended to be used for individual projects. For health incidences, the number of hospitalizations or increase in morbidity predicted by BenMap is greatly affected by the population characteristics.1 Small increases in emissions in an area with a high population have a much greater affect than large increases in emissions over an area with a small population. As a result, the same amount of emissions generated in an urban area could result in greater health consequences than if the same emissions occurred on the urban periphery, where fewer people may be affected. This will also depend on other factors including meteorology and photochemistry, as discussed above. Emissions in areas with conditions that favor high air dispersion or unfavorable ozone formation will likely have relatively lower effects on ambient air quality and health outcomes.

While BenMap provides additional statistical information about health consequences requested by the Court in the Friant Ranch decision, this information is only meaningful when presented with the full health context of the region or locality at hand. For example, if the BenMap analysis says that the project would result in two additional hospital admissions, this result alone is not useful unless one identifies how many hospital admissions are caused by poor air quality now (without the project) and how many hospital admissions occur overall (due to air quality and other causes). Because health is not solely influenced by ambient air quality, and has many factors that are highly variable across geographies and populations, there is an added level of uncertainty in using a generalized identification of health effects due to air quality conditions overlaid onto a specific diverse set of health conditions and other factors. Regardless of the uncertainty levels, if regional health effects are identified for a project, then the CEQA analysis needs to provide a full health baseline for decision-makers and the public to be able to understand the marginal change due to project criteria pollutant emissions. Given the margin of uncertainty at each step in the process

1 BenMap assigns prevalence rate for asthma and other health effects based on indicators such as gender, race, age, ethnicity, etc. The BenMap user manual specifically states that there are a wide range of variables that can be included in the health effect function. The health effect function was developed based on epidemiological studies, and specifically states that "there are a number of issues that arise when deriving and choosing between health effect functions that go well beyond this user manual. Hence, it is important to have a trained health researcher assist in developing the impact function data file."

(regional scale modeling, existing ambient air quality effects on health, population health conditions vulnerability, and marginal health effects of air pollution), the identification of marginal health effects due to individual projects using regional air quality modelling and tools such as BenMap are likely to be within the level of uncertainty and thus defined as "speculative" per CEQA.

The Role of Air Districts

Regional, community, multiscale air quality modeling conducted by the air districts for each individual air basin or locality within the air basin would be the most appropriate indictor of health effects for projects. The AQMPs provide a forecast of regional emissions based on regional dispersion modeling for all sources within the air basin. Regional-scale models attempt to account for all emissions sources within an air basin.

The regional scale model requires inputs such as existing and future regional sources of pollutants and global meteorological data, which are generally not accessible by CEQA practitioners. Modeling of future years should consider future concentrations of air pollutants based on regional growth projections and existing programs, rules, and regulations adopted by Federal, State, and local air districts. In general, air pollution in California is decreasing as a result of Federal and State laws. Based on the air quality management plans (AQMPs) required for air districts in a nonattainment area, air quality in the air basins are anticipated to improve despite an increase in population and employment growth. Air districts are charged with assessing programs, rules, and regulations so that the increase in population and employment does not conflict with the mandate to achieve the AAQS. B<u>ecause emissions forecasting and health outcomes based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should also fall on the air districts to identify the potential health outcomes associated with individual project's criteria pollutant emissions.</u>

The South Coast Air Quality Management District (South Coast AQMD) and the Sacramento Metropolitan Air Quality Management District (Sacramento Metropolitan AQMD) are exploring concepts for project-level analysis in light of Friant Ranch to assist local lead agencies.

» South Coast AQMD is looking at the largest land use development project they have had in the air basin and doing a sensitivity analysis (using CAMx for photochemical grid modeling and BenMap for health outcomes) to see how locating a very large project in different parts of the air basin (Los Angeles, Inland Empire, v. Orange County) would affect the health incidence.

» Sacramento Metropolitan AQMD is also looking at a screening process. Rather than looking at the upper end (i.e., largest project in the air basin), Sacramento Metropolitan AQMD is starting at the smallest project that exceeds the regional significance threshold and running CAMx and BenMap at different locations in the air basin to see how it affects regional health incidences.

Guidance from Air Districts would be the most effective way to incorporate meaningful information concerning regional health effects of project criteria pollutants in CEQA analyses, including guidance as to when modelling is and is not useful and meaningful, how modelling should be conducted, and how to best present additional information to inform decision-makers and the public about a project's impacts.

So…until air districts do their part, what should we do?

Projects with criteria pollutant emissions below air district thresholds

The Friant Ranch ruling was about providing disclosure of health effects of project emissions that were well over the significance thresholds. Since the air district thresholds are tied to a level the air districts find to not have a significant effect on ambient air quality, there should be no need to discuss the health effects of criteria pollutant emissions that are less than the significance thresholds.

Projects with criteria pollutant emissions above air district thresholds

Pursuant to Section 15125 of the CEQA Guidelines, the environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. For CEQA, the health effects associated with buildout of a project would occur at the project's horizon year. Because CEQA requires an analysis of the change from existing conditions, the change in effects would be associated with changes in ambient air quality and associated health outcomes between existing conditions and the project's horizon year. Therefore, in order to show how a project affects health outcomes in an air basin, the CEQA documents will need to qualitatively or quantitatively address: (1) existing ambient criteria pollutant concentrations, health incidences due to existing air quality, and health incidences overall; 2) future (without project) ambient criteria pollutant concentrations and health incidences, and 3) future (with project) ambient criteria pollutant concentrations and health incidences.

Projects with significant criteria pollutant emissions could use regional modelling and BenMap to identify health effects of project emissions, but it is likely that many (or most) projects that are not regionally substantial in scale will be shown to have minimal regional changes in PM and ozone concentrations and therefore minimal changes in associated health effects. In addition, many projects may have emissions that are less than the uncertainty level of regional air quality models and BenMap health effects modeling; in these cases, quantitative results will not be meaningful. Thus, absent better direction from air districts, CEQA lead agencies will have to determine on a case by case basis whether a qualitative discussion of health effects will suffice, or whether regional modeling, despite its limitations, should be conducted for the project.

Where a project has substantial criteria pollutant emissions when considered on a regional scale, and there is reason to believe that the modeling of ambient air quality and regional health effects would produce non-speculative results when considering modeling uncertainties, then CEQA lead agencies should use regional modelling.

Conclusion

The purpose of CEQA is to inform the public as to the potential for a project to result in one or more significant adverse effects on the environment (including health effects). A CEQA document must provide an understandable and clear environmental analysis and provide an adequate basis for decision making and public disclosure. Regional dispersion modeling of criteria pollutants and secondary pollutants like PM and ozone can provide additional information, but that information may be within the margin of modelling uncertainty and/or may not be meaningful for the public and decision-makers unless a full health context is presented in the CEQA document. Simply providing health outcomes based on use of a regional-scale model and BenMap may not satisfy the goal to provide decision-makers and the public with information that would assist in weighting the environmental consequences of a project. A CEQA document must provide an analysis that is understandable for decision making and public disclosure. Regional scale modeling may provide a technical method for this type of analysis, but it does not necessarily provide a meaningful way to connect the magnitude of a project's criteria pollutant emissions to health effects without speculation.

In order to accurately connect the dots, we urge California air districts to provide more guidance on how to identify and describe the health effects of exceeding regional criteria pollutant thresholds. The air districts are the primary agency responsible for ensuring that the air basins attain the AAQS and ensure the health and welfare of its residents relative to air quality. Because emissions forecasting and health outcomes are based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should fall on the air districts to identify the potential health outcomes associated with exceeding the CEQA thresholds for projects. The air districts should provide lead agencies with a consistent, reliable, and meaningful analytical approach to correlate specific health effects that may result from a project's criteria pollutant emissions.

Glossary

AAQS – Ambient Air Quality Standards

BenMap – Benefits Mapping and Analysis Program

CAMx – Comprehensive Air Quality Model with extensions

CMAQ – Community Multiscale Air Quality

NOx – Nitrogen Oxides

PM – Particulate Matter

SOx – Sulfur Oxides

State – California

USEPA – United States Environmental Protection Agency

SUPREME COURT COPY

CASE NO. S219783

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Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

SUPREME COURT
FILED

APR 13 2015

Frank A. McGuire Clerk

Deputy

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

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APPLICATION

Pursuant to California Rules of Court 8.520(f)(1), proposed Amicus Curiae San Joaquin Valley Unified Air Pollution Control District hereby requests permission from the Chief Justice to file an amicus brief in support of Defendant and Respondent, County of Fresno, and Defendant and Real Parties in Interest Friant Ranch, L.P. Pursuant to Rule 8.520(f)(5) of the California Rules of Court, the proposed amicus curiae brief is combined with this Application. The brief addresses the following issue certified by this Court for review:

> Is an EIR adequate when it identifies the health impacts of air pollution and quantifies a project's expected emissions, or does CEQA further require the EIR to *correlate* a project's air quality emissions to specific health impacts?

As of the date of this filing, the deadline for the final reply brief on the merits was March 5, 2015. Accordingly, under Rule 8.520(f)(2), this application and brief are timely.

1. Background and Interest of San Joaquin Valley Unified Air Pollution Control District

The San Joaquin Valley Unified Air Pollution Control District ("Air District") regulates air quality in the eight counties comprising the San Joaquin Valley ("Central Valley"): Kern, Tulare, Madera, Fresno, Merced, San Joaquin, Stanislaus, and Kings, and is primarily responsible for attaining air quality standards within its jurisdiction. After billions of dollars of investment by Central Valley businesses, pioneering air quality regulations, and consistent efforts by residents, the Central Valley air basin has made historic improvements in air quality.

The Central Valley's geographical, topographical and meteorological features create exceptionally challenging air quality conditions. For example, it receives air pollution transported from the San Francisco Bay Area and northern Central Valley communities, and the southern portion of the Central Valley includes three mountain ranges (Sierra, Tehachapi, and Coastal) that, under some meteorological conditions, effectively trap air pollution. Central Valley air pollution is only a fraction of what the Bay Area and Los Angeles produce, but these natural conditions result in air quality conditions that are only marginally better than Los Angeles, even though about ten times more pollution is emitted in the Los Angeles region. Bay Area air quality is much better than the Central Valley's, even though the Bay Area produces about six times more pollution. The Central Valley also receives air pollution transported from the Bay Area and northern counties in the Central Valley, including Sacramento, and transboundary anthropogenic ozone from as far away as China.

Notwithstanding these challenges, the Central Valley has reduced emissions at the same or better rate than other areas in California and has achieved unparalleled milestones in protecting public health and the environment:

- In the last decade, the Central Valley became the first air basin classified by the federal government under the Clean Air Act as a "serious nonattainment" area to come into attainment of health-based National Ambient Air Quality Standard ("NAAQS") for coarse particulate matter (PM10), an achievement made even more notable given the Valley's extensive agricultural sector. Unhealthy levels of particulate matter can cause and exacerbate a range of chronic and acute illnesses.
- In 2013, the Central Valley became the first air basin in the country to improve from a federal designation of "extreme" nonattainment to

actually attain (and quality for an attainment designation) of the 1-hour ozone NAAQS; ozone creates "smog" and, like PM10, causes adverse health impacts.

- The Central Valley also is in full attainment of federal standards for lead, nitrogen dioxide, sulfur dioxide, and carbon monoxide.
- The Central Valley continues to make progress toward compliance with its last two attainment standards, with the number of exceedences for the 8-hour ozone NAAQS reduced by 74% (for the 1997 standard) and 38% (for the 2008 standard) since 1991, and for the small particulate matter (PM2.5) NAAQS reduced by 85% (for the 1997 standard) and 61% (for the 2006 standard).

Sustained improvement in Central Valley air quality requires a rigorous and comprehensive regulatory framework that includes prohibitions (e.g., on wood-burning fireplaces in new residences), mandates (e.g., requiring the installation of best available pollution reduction technologies on new and modified equipment and industrial operations), innovations (e.g., fees assessed against residential development to fund pollution reduction actions to "offset" vehicular emissions associated with new residences), incentive programs (e.g., funding replacements of older, more polluting heavy duty trucks and school buses)[1], ongoing planning for continued air quality improvements, and enforcement of Air District permits and regulations.

The Air District is also an expert air quality agency for the eight counties and cities in the San Joaquin Valley. In that capacity, the Air District has developed air quality emission guidelines for use by the Central

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[1] San Joaquin's incentive program has been so successful that through 2012, it has awarded over $ 432 million in incentive funds and has achieved 93,349 tons of lifetime emissions reductions. *See* SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 2012 PM2.5 PLAN, 6-6 (2012) *available at* http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/06%20Chapter%206%20Incentives.pdf.

Valley counties and cities that implement the California Environment Quality Act (CEQA).[2] In its guidance, the Air District has distinguished between toxic air contaminants and criteria air pollutants.[3] Recognizing this distinction, the Air District's CEQA Guidance has adopted distinct thresholds of significance for *criteria* pollutants (i.e., ozone, PM2.5 and their respective precursor pollutants) based upon scientific and factual data which demonstrates the level that can be accommodated on a cumulative basis in the San Joaquin Valley without affecting the attainment of the applicable NAAQS.[4] For *toxic air* pollutants, the District has adopted different thresholds of significance which scientific and factual data demonstrates has the potential to expose sensitive receptors (i.e., children, the elderly) to levels which may result in localized health impacts.[5]

The Air District's CEQA Guidance was followed by the County of Fresno in its environment review of the Friant Ranch project, for which the Air District also served as a commenting agency. The Court of Appeal's holding, however, requiring correlation between the project's criteria

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2 *See, e.g.*, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, PLANNING DIVISION, GUIDE FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2015), *available at* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf ("CEQA Guidance").

3 Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from toxic air contaminants and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of toxic air contaminants occurs solely under section 112 of the Act. Compare 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 with 42 U.S.C. § 7411.

4 See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 64-66, 80.

5 See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 66, 99-101.

pollutants and local health impacts, departs from the Air District's Guidance and approved methodology for assessing criteria pollutants. A close reading of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants (for which a local health risk assessment is feasible and routinely performed) and criteria air pollutants (for which a local health risk assessment is not feasible and would result in speculative results).[6] The Air District has a direct interest in ensuring the lawfulness and consistent application of its CEQA Guidance, and will explain how the Court of Appeal departed from the Air District's long-standing CEQA Guidance in addressing criteria pollutants and toxic air contaminants in this amicus brief.

2. How the Proposed Amicus Curiae Brief Will Assist the Court

As counsel for the proposed amicus curiae, we have reviewed the briefs filed in this action. In addition to serving as a "commentary agency" for CEQA purposes over the Friant Ranch project, the Air District has a strong interest in assuring that CEQA is used for its intended purpose, and believes that this Court would benefit from additional briefing explaining the distinction between criteria pollutants and toxic air contaminants and the different methodologies employed by local air pollution control agencies such as the Air District to analyze these two categories of air pollutants under CEQA. The Air District will also explain how the Court of Appeal's opinion is based upon a fundamental misunderstanding of these two different approaches by requiring the County of Fresno to correlate the project's *criteria* pollution emissions with *local* health impacts. In doing

[6] CEQA does not require speculation. *See, e.g.*, *Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.*, 6 Cal. 4th 1112, 1137 (1993) (upholding EIR that failed to evaluate cumulative toxic air emission increases given absence of any acceptable means for doing so).

so, the Air District will provide helpful analysis to support its position that at least insofar as criteria pollutants are concerned, CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible.

Rule 8.520 Disclosure

Pursuant to Cal. R. 8.520(f)(4), neither the Plaintiffs nor the Defendant or Real Party In Interest or their respective counsel authored this brief in whole or in part. Neither the Plaintiffs nor the Defendant or Real Party in Interest or their respective counsel made any monetary contribution towards or in support of the preparation of this brief.

CONCLUSION

On behalf of the San Joaquin Valley Unified Air Pollution Control District, we respectfully request that this Court accept the filing of the attached brief.

Dated: April 2, 2015

Annette A. Ballatore-Williamson
District Counsel
Attorney for Proposed Amicus Curiae

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AIR POLLUTION CONTROL
DISTRICT

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I. INTRODUCTION.

The San Joaquin Valley Unified Air Pollution Control District ("Air District") respectfully submits that the Court of Appeal erred when it held that the air quality analysis contained in the Environmental Impact Report ("EIR") for the Friant Ranch development project was inadequate under the California Environmental Quality Act ("CEQA") because it did not include an analysis of the correlation between the project's criteria air pollutants and the potential adverse human health impacts. A close reading of the portion of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants and criteria air pollutants.

Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants (hereinafter referred to as "TACs") regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from TACs and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of TACs occurs solely under section 112 of the Act. *Compare* 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 *with* 42 U.S.C. § 7411.

The most relevant difference between criteria pollutants and TACs for purposes of this case is the manner in which human health impacts are accounted for. While it is common practice to analyze the correlation between an individual facility's TAC emissions and the expected localized human health impacts, such is not the case for criteria pollutants. Instead, the human health impacts associated with criteria air pollutants are analyzed and taken into consideration when EPA sets the national ambient air quality standard ("NAAQS") for each criteria pollutant. 42 U.S.C. § 7409(b)(1). The health impact of a particular criteria pollutant is analyzed on a regional and not a facility level based on how close the area is to complying with (attaining) the NAAQS. Accordingly, while the type of individual facility / health impact analysis that the Court of Appeal has required is a customary practice for TACs, it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task.

It is clear from a reading of both the administrative record and the Court of Appeal's decision that the Court did not have the expertise to fully appreciate the difference between TACs and criteria air pollutants. As a result, the Court has ordered the County of Fresno to conduct an analysis that is not practicable and not likely yield valid information. The Air District respectfully requests that this portion of the Court of Appeal's decision be reversed.

II. THE COURT OF APPEAL ERRED IN FINDING THE FRIANT RANCH EIR INADEQUATE FOR FAILING TO ANALYZE THE SPECIFIC HUMAN HEALTH IMPACTS ASSOCIATED CRITERIA AIR POLLUTANTS.

Although the Air District does not take lightly the amount of air emissions at issue in this case, it submits that the Court of Appeal got it wrong when it required Fresno County to revise the Friant Ranch EIR to include an analysis correlating the criteria air pollutant emissions associated with the project with specific, localized health-impacts. The type of analysis the Court of Appeal has required will not yield reliable information because currently available modeling tools are not well suited for this task. Further, in reviewing this issue de novo, the Court of Appeal failed to appreciate that it lacked the scientific expertise to appreciate the significant differences between a health risk assessment commonly performed for toxic air contaminants and a similar type of analysis it felt should have been conducted for criteria air pollutants.

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A. Currently Available Modeling Tools are not Equipped to Provide a Meaningful Analysis of the Correlation between an Individual Development Project's Air Emissions and Specific Human Health Impacts.

In order to appreciate the problematic nature of the Court of Appeals' decision requiring a health risk type analysis for criteria air pollutants, it is important to understand how the relevant criteria pollutants (ozone and particulate matter) are formed, dispersed and regulated.

Ground level ozone (smog) is not directly emitted into the air, but is formed when precursor pollutants such as oxides of nitrogen (NOx) and volatile organic compounds (VOCs) are emitted into the atmosphere and undergo complex chemical reactions in the process of sunlight.[1] Once formed, ozone can be transported long distances by wind.[2] Because of the complexity of ozone formation, a specific tonnage amount of NOx or VOCs emitted in a particular area does not equate to a particular concentration of ozone in that area. In fact, even rural areas that have relatively low tonnages of emissions of NOx or VOCs can have high levels of ozone concentration simply due to wind transport.[3] Conversely, the San Francisco Bay Area has six times more NOx and VOC emissions per square mile than the San Joaquin Valley, but experiences lower

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[1] *See* United States Environmental Protection Agency, *Ground-level Ozone: Basic Information*, available at: http://www.epa.gov/airquality/ozonepollution/basic.html (visited March 10, 2015).
[2] *Id.*
[3] *Id.*

concentrations of ozone (and better air quality) simply because sea breezes disperse the emissions.[4]

Particulate matter ("PM") can be divided into two categories: directly emitted PM and secondary PM.[5] While directly emitted PM can have a localized impact, the tonnage emitted does not always equate to the local PM concentration because it can be transported long distances by wind.[6] Secondary PM, like ozone, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur dioxides (SOx) and NOx.[7] Because of the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area.

The disconnect between the *tonnage* of precursor pollutants (NOx, SOx and VOCs) and the *concentration* of ozone or PM formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects, but the concentration of resulting ozone or PM. Indeed, the national ambient air quality standards ("NAAQS"), which are statutorily required to be set by the United States Environmental Protection

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[4] *San Joaquin Valley Air Pollution Control District 2007 Ozone Plan*, Executive Summary p. ES-6, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/03%20Executive%20Summary.pdf (visited March 10, 2015).

[5] United States Environmental Protection Agency, *Particulate Matter: Basic Information*, available at: http://www.epa.gov/airquality/particlepollution/basic.html (visited March 10, 2015).

[6] *Id.*

[7] *Id.*

Agency ("EPA") at levels that are "requisite to protect the public health," 42 U.S.C. § 7409(b)(1), are established as concentrations of ozone or particulate matter and not as tonnages of their precursor pollutants.[8]

Attainment of a particular NAAQS occurs when the concentration of the relevant pollutant remains below a set threshold on a consistent basis throughout a particular region. For example, the San Joaquin Valley attained the 1-hour ozone NAAQS when ozone concentrations remained at or below 0.124 parts per million Valley-wide on 3 or fewer days over a 3-year period.[9] Because the NAAQS are focused on achieving a particular concentration of pollution region-wide, the Air District's tools and plans for attaining the NAAQS are regional in nature.

For instance, the computer models used to simulate and predict an attainment date for the ozone or particulate matter NAAQS in the San Joaquin Valley are based on regional inputs, such as regional inventories of precursor pollutants (NOx, SOx and VOCs) and the atmospheric chemistry and meteorology of the Valley.[10] At a very basic level, the models simulate future ozone or PM levels based on predicted changes in precursor

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[8] See, e.g., United States Environmental Protection Agency, *Table of National Ambient Air Quality Standards*, available at: http://www.epa.gov/air/criteria.html#3 (visited March 10, 2015).
[9] *San Joaquin Valley Unified Air Pollution Control District 2013 Plan for the Revoked 1-Hour Ozone Standard*, Ch. 2 p. 2-16, available at: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/02Chapter2ScienceTrendsModeling.pdf (visited March 10, 2015).
[10] *Id.* at Ch. 2 p. 2-19 (visited March 12, 2015); *San Joaquin Valley Unified Air Pollution Control District 2008 PM2.5 Plan*, Appendix F, pp. F-2 – F-5, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Final_Adopted_PM2.5/20%20Appendix%20F.pdf
(visited March 19, 2015).

emissions Valley wide.[11] Because the NAAQS are set levels necessary to protect human health, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.

The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the date that the Valley attains the NAAQS. Rather, the Air District's modeling and planning strategy is regional in nature and based on the extent to which *all* of the emission-generating sources in the Valley (current and future) must be controlled in order to reach attainment.[12]

Accordingly, the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the Valley can accommodate without affecting the attainment date for the NAAQS.[13] The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources permitted by the Air District must "offset" their emissions.[14] This "offset"

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[11] *Id.*

[12] Although the Air District does have a dispersion modeling tool used during its air permitting process that is used to predict whether a particular project's directly emitted PM will either cause an exceedance of the PM NAAQS or contribute to an existing exceedance, this model bases the prediction on a worst case scenario of emissions and meteorology and has no provision for predicting any associated human health impacts. Further, this analysis is only performed for stationary sources (factories, oil refineries, etc.) that are required to obtain a New Source Review permit from the Air District and not for development projects such as Friant Ranch over which the Air District has no preconstruction permitting authority. *See* San Joaquin Valley Unified Air Pollution Control District Rule 2201 §§ 2.0; 3.3.9; 4.14.1, available at: http://www.valleyair.org/rules/currntrules/Rule2201041l.pdf (visited March 19, 2015).

[13] *San Joaquin Valley Unified Air Pollution Control District Guide to Assessing and Mitigating Air Quality Impacts*, (March 19, 2015) p. 22, available at: http://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf (visited March 30, 2015).

[14] *Id.* at pp. 22, 25.

level allows for growth while keeping the cumulative effects of all new sources at a level that will not impede attainment of the NAAQS.[15] In the Valley, these thresholds are 15 tons per year of PM, and 10 tons of NOx or VOC per year. *Sierra Club, supra*, 172 Cal.Rptr.3d at 303; AR 4554. Thus, the CEQA air quality analysis for criteria pollutants is not really a localized, project-level impact analysis but one of regional, "cumulative impacts."

Accordingly, the significance thresholds applied in the Friant Ranch EIR (15 tons per year of PM and 10 tons of NOx or VOCs) are not intended to be indicative of any localized human health impact that the project may have. While the health effects of air pollution are of primary concern to the Air District (indeed, the NAAQS are established to protect human health), the Air District is simply not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual CEQA project directly impact human health in a particular area. This is true even for projects with relatively high levels of emissions of criteria pollutant precursor emissions.

For instance, according to the EIR, the Friant Ranch project is estimated to emit 109.52 tons per year of ROG (VOC), 102.19 tons per year of NOx, and 117.38 tons per year of PM. Although these levels well

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[15] [15] *San Joaquin Valley Unified Air Pollution Control District Environmental Review Guidelines* (Aug. 2000) p. 4-11, available at: http://www.valleyair.org/transportation/CEQA%20Rules/ERG%20Adopted%20_August%202000_.pdf (visited March 12, 2015).

exceed the Air District's CEQA significance thresholds, this does not mean that one can easily determine the concentration of ozone or PM that will be created at or near the Friant Ranch site on a particular day or month of the year, or what specific health impacts will occur. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM. This is especially true for a project like Friant Ranch where most of the criteria pollutant emissions derive not from a single "point source," but from area wide sources (consumer products, paint, etc.) or mobile sources (cars and trucks) driving to, from and around the site.

In addition, it would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have. As discussed above, the currently available modeling tools are equipped to model the impact of *all* emission sources in the Valley on attainment. According to the most recent EPA-approved emission inventory, the NOx inventory for the Valley is for the year 2014 is 458.2 tons per day, or 167,243 tons per year and the VOC (or ROG) inventory is 361.7 tons per day, or 132,020.5 tons per year.[16] Running the photochemical grid model used for predicting ozone attainment with the

[16] *San Joaquin Valley Unified Air Pollution Control District 2007 Ozone Plan*, Appendix B pp. B-6, B-9,
available at:
http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/19%20Appendix%20B%20April%202007.pdf (visited March 12, 2015).

emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NOx and VOC in the Valley) is not likely to yield valid information given the relative scale involved.

Finally, even once a model is developed to accurately ascertain local increases in concentrations of photochemical pollutants like ozone and some particulates, it remains impossible, using today's models, to correlate that increase in concentration to a specific health impact. The reason is the same: such models are designed to determine regional, population-wide health impacts, and simply are not accurate when applied at the local level.

For these reasons, it is not the norm for CEQA practitioners, including the Air District, to conduct an analysis of the localized health impacts associated with a project's criteria air pollutant emissions as part of the EIR process. When the accepted scientific method precludes a certain type of analysis, "the court cannot impose a legal standard to the contrary." *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 717 n. 8. However, that is exactly what the Court of Appeal has done in this case. Its decision upends the way CEQA air quality analysis of criteria pollutants occurs and should be reversed.

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B. The Court of Appeal Improperly Extrapolated a Request for a Health Risk Assessment for Toxic Air Contaminants into a Requirement that the EIR contain an Analysis of Localized Health Impacts Associated with Criteria Air Pollutants.

The Court of Appeal's error in requiring the new health impact analysis for criteria air pollutants clearly stems from a misunderstanding of terms of art commonly used in the air pollution field. More specifically, the Court of Appeal (and Appellants Sierra Club et al.) appear to have confused the health risk analysis ("HRA") performed to determine the health impacts associated with a project's toxic air contaminants ("TACs"), with an analysis correlating a project's criteria air pollutants (ozone, PM and the like) with specific localized health impacts.

The first type of analysis, the HRA, is commonly performed during the Air District's stationary source permitting process for projects that emit TACs and is, thus, incorporated into the CEQA review process. An HRA is a comprehensive analysis to evaluate and predict the dispersion of TACs emitted by a project and the potential for exposure of human populations. It also assesses and quantifies both the individual and population-wide health risks associated with those levels of exposure. There is no similar analysis conducted for criteria air pollutants. Thus, the second type of analysis (required by the Court of Appeal), is not currently part of the Air District's process because, as outlined above, the health risks associated with exposure to criteria pollutants are evaluated on a regional level based on the region's attainment of the NAAQS.

The root of this confusion between the types of analyses conducted for TACs versus criteria air pollutants appears to stem from a comment that was presented to Fresno County by the City of Fresno during the administrative process.

In its comments on the draft EIR, the City of Fresno (the only party to raise this issue) stated:

> [t]he EIR must disclose the human health related effects of the Project's air pollution impacts. (CEQA Guidelines section 15126.2(a).) The EIR fails completely in this area. The EIR should be revised to disclose and determine the significance of TAC impacts, and of human health risks due to exposure to Project-related air emissions.

(AR 4602.)

In determining that the issue regarding the correlation between the Friant Ranch project's criteria air pollutants and adverse health impacts was adequately exhausted at the administrative level, the Court of Appeal improperly read the first two sentences of the City of Fresno's comment in isolation rather than in the context of the entire comment. *See Sierra Club v. County of Fresno* (2014) 172 Cal.Rptr.3d 271, 306. Although the comment first speaks generally in terms of "human health related effects" and "air pollution," it requests only that the EIR be revised to disclose "the significance of TACs" and the "human health risks due to exposure."

The language of this request in the third sentence of the comment is significant because, to an air pollution practitioner, the language would only have indicated only that a HRA for TACs was requested, and not a separate analysis of the health impacts associated with the project's criteria air pollutants. Fresno County clearly read the comment as a request to perform an HRA for TACs and limited its response accordingly. (AR 4602.)[17] The Air District submits that it would have read the City's comment in the same manner as the County because the City's use of the terms "human health risks" and "TACs" signal that an HRA for TACs is being requested. Indeed, the Air District was also concerned that an HRA be conducted, but understood that it was not possible to conduct such an analysis until the project entered the phase where detailed site specific information, such as the types of emission sources and the proximity of the sources to sensitive receptors became available. (AR 4553.)[18] The City of Fresno was apparently satisfied with the County's discussion of human health risks, as it did not raise the issue again when it commented on the final EIR. (AR 8944 – 8960.)

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[17] Appellants do not challenge the manner in which the County addressed TACs in the EIR. (Appellants' Answer Brief p. 28 fn. 7.)

[18] Appellants rely on the testimony of Air District employee, Dan Barber, as support for their position that the County should have conducted an analysis correlating the project's criteria air pollutant emissions with localized health impacts. (Appellants Answer Brief pp. 10-11; 28.) However, Mr. Barber's testimony simply reinforces the Air District's concern that a risk assessment (HRA) be conducted once the actual details of the project become available. (AR 8863.) As to criteria air pollutants, Mr. Barber's comments are aimed at the Air District's concern about the amount of emissions and the fact that the emissions will make it "more difficult for Fresno County and the Valley to reach attainment which means that the health of Valley residents maybe [sic] adversely impacted." Mr. Barber says nothing about conducting a separate analysis of the localized health impacts the project's emissions may have.

The Court of Appeal's holding, which incorrectly extrapolates a request for an HRA for TACs into a new analysis of the localized health impacts of the project's criteria air pollutants, highlights two additional errors in the Court's decision.

First, the Court of Appeal's holding illustrates why the Court should have applied the deferential substantial evidence standard of review to the issue of whether the EIR's air quality analysis was sufficient. The regulation of air pollution is a technical and complex field and the Court of Appeal lacked the expertise to fully appreciate the difference between TACs and criteria air pollutants and tools available for analyzing each type of pollutant.

Second, it illustrates that the Court likely got it wrong when it held that the issue regarding the criteria pollutant / localized health impact analysis was properly exhausted during the administrative process. In order to preserve an issue for the court, '[t]he "exact issuc" must have been presented to the administrative agency....' [Citation.] *Citizens for Responsible Equitable Environmental Development v. City of San Diego*, (2011) 196 Cal.App.4th 515, 527 129 Cal.Rptr.3d 512, 521; *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 535, 78 Cal.Rptr.3d 1, 13. "'[T]he objections must be sufficiently specific so that the agency has the opportunity to evaluate and respond to them.' [Citation.]" *Sierra Club v. City of Orange*,163 Cal.App.4th at 536.[19]

As discussed above, the City's comment, while specific enough to request a commonly performed HRA for TACs, provided the County with no notice that it should perform a new type of analysis correlating criteria pollutant tonnages to specific human health effects. Although the parties have not directly addressed the issue of failure to exhaust administrative remedies in their briefs, the Air District submits that the Court should consider how it affects the issues briefed by the parties since "[e]xhaustion of administrative remedies is a jurisdictional prerequisite to maintenance of a CEQA action." *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1199, 22 Cal.Rptr.3d 203.

III. CONCLUSION

For all of the foregoing reasons, the Air District respectfully requests that the portion of the Court of Appeal's decision requiring an analysis correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

[19] *Sierra Club v. City of Orange*, is illustrative here. In that case, the plaintiffs challenged an EIR approved for a large planned community on the basis that the EIR improperly broke up the various environmental impacts by separate project components or "piecemealed" the analysis in violation of CEQA. In evaluating the defense that the plaintiffs had failed to adequately raise the issue at the administrative level, the Court held that comments such as *"the use of a single document for both a project-level and a program-level EIR [is] 'confusing',"* and *"[t]he lead agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project,"* were too vague to fairly raise the argument of piecemealing before the agency. *Sierra Club v. City of Orange*, 163 Cal.App.4th at 537.

correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

Respectfully submitted,

Dated: April 2, 2015

Catherine T. Redmond
Attorney for Proposed Amicus
Curiae

SAN JOAQUIN VALLEY
UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.204 of the California Rules of Court, I hereby certify that this document, based on the Word County feature of the Microsoft Word software program used to compose and print this document, contains, exclusive of caption, tables, certificate of word count, signature block and certificate of service, 3806 words.

Dated: April 2, 2015

Annette A. Ballatore-Williamson
District Counsel (SBN 192176)

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

PROOF OF SERVICE

I am over the age of 18 years and not a p[arty to the above-captioned action; that my business address is San Joaquin Valley Unified Air Pollution Control District located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

On April 2, 2015, I served the document described below:

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO

On all parties to this action at the following addresses and in the following manner:

PLEASE SEE ATTACHED SERVICE LIST

(XX) **(BY MAIL)** I caused a true copy of each document(s) to be laced in a sealed envelope with first-class postage affixed and placed the envelope for collection. Mail is collected daily at my office and placed in a United State Postal Service collection box for pick-up and delivery that same day.

( ) **(BY ELECTRONIC MAIL)** I caused a true and correct scanned image (.PDF file) copy to be transmitted via electronic mail transfer system in place at the San Joaquin Valley Unified Air Pollution Control District ("District"), originating from the undersigned at 1990 E. Gettysburg Avenue, Fresno, CA, to the address(es) indicated below.

( ) **(BY OVERNIGHT MAIL)** I caused a true and correct copy to be delivered via Federal Express to the following person(s) or their representative at the address(es) listed below.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I executed this document on April 2, 2015, at Fresno, California.

Esthela Soto

SERVICE LIST

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

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S219783

IN THE SUPREME COURT OF C ALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and LEAGUE OF WOMEN VOTERS OF FRESNO,

Plaintiffs and Appellants,

v.

COUNTY OF FRESNO,

Defendant and Respondent,

and,

FRIANT RANCH, L.P.,

Real Party in Interest and Respondent.

After a Published Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726
Honorable Rosendo A. Pena, Jr.

APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND *[PROPOSED]* BRIEF OF *AMICUS CURIAE*

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TO THE HONORABLE CHIEF JUSTICE AND JUSTICES OF THE SUPREME COURT:

APPLICATION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF

Pursuant to Rule 8.520(f) of the California Rules of Court, the South Coast Air Quality Management District (SCAQMD) respectfully requests leave to file the attached *amicus curiae* brief. Because SCAQMD's position differs from that of either party, we request leave to submit this amicus brief in support of neither party.

HOW THIS BRIEF WILL ASSIST THE COURT

SCAQMD's proposed amicus brief takes a position on two of the issues in this case. In both instances, its position differs from that of either party. The issues are:

1) Does the California Environmental Quality Act (CEQA) require an environmental impact report (EIR) to correlate a project's air pollution emissions with specific levels of health impacts?

2) What is the proper standard of review for determining whether an EIR provides sufficient information on the health impacts caused by a project's emission of air pollutants?

This brief will assist the Court by discussing the practical realities of correlating identified air quality impacts with specific health outcomes. In short, CEQA requires agencies to provide detailed information about a project's air quality impacts that is sufficient for the public and decisionmakers to adequately evaluate the project and meaningfully understand its impacts. However, the level of analysis is governed by a rule of reason; CEQA only requires agencies to conduct analysis if it is reasonably feasible to do so.

With regard to health-related air quality impacts, an analysis that correlates a project's air pollution emissions with specific levels of health impacts will be feasible in some cases but not others. Whether it is feasible depends on a variety of factors, including the nature of the project and the nature of the analysis under consideration. The feasibility of analysis may also change over time as air districts and others develop new tools for measuring projects' air quality related health impacts. Because SCAQMD has among the most sophisticated air quality modeling and health impact evaluation capability of any of the air districts in the State, it is uniquely situated to express an opinion on the extent to which the Court should hold that CEQA requires lead agencies to correlate air quality impacts with specific health outcomes.

SCAQMD can also offer a unique perspective on the question of the appropriate standard of review. SCAQMD submits that the proper standard of review for determining whether an EIR is sufficient as an informational document is more nuanced than argued by either party. In our view, this is a mixed question of fact and law. It includes determining whether additional analysis is feasible, which is primarily a factual question that should be reviewed under the substantial evidence standard. However, it also involves determining whether the omission of a particular analysis renders an EIR insufficient to serve CEQA's purpose as a meaningful, informational document. If a lead agency has not determined that a requested analysis is infeasible, it is the court's role to determine whether the EIR nevertheless meets CEQA's purposes, and courts should not defer to the lead agency's conclusions regarding the legal sufficiency of an EIR's analysis. The ultimate question of whether an EIR's analysis is "sufficient" to serve CEQA's informational purposes is predominately a question of law that courts should review de novo.

This brief will explain the rationale for these arguments and may assist the Court in reaching a conclusion that accords proper respect to a lead agency's factual conclusions while maintaining judicial authority over the ultimate question of what level of analysis CEQA requires.

STATEMENT OF INTEREST OF *AMICUS CURIAE*

The SCAQMD is the regional agency primarily responsible for air pollution control in the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of the Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410; Cal. Code Regs., tit. 17, § 60104.) The SCAQMD participates in the CEQA process in several ways. Sometimes it acts as a lead agency that prepares CEQA documents for projects. Other times it acts as a responsible agency when it has permit authority over some part of a project that is undergoing CEQA review by a different lead agency. Finally, SCAQMD also acts as a commenting agency for CEQA documents that it receives because it is a public agency with jurisdiction by law over natural resources affected by the project.

In all of these capacities, SCAQMD will be affected by the decision in this case. SCAQMD sometimes submits comments requesting that a lead agency perform an additional type of air quality or health impacts analysis. On the other hand, SCAQMD sometimes determines that a particular type of health impact analysis is not feasible or would not produce reliable and informative results. Thus, SCAQMD will be affected by the Court's resolution of the extent to which CEQA requires EIRs to correlate emissions and health impacts, and its resolution of the proper standard of review.

CERTIFICATION REGARDING AUTHORSHIP AND FUNDING

No party or counsel in the pending case authored the proposed amicus curiae brief in whole or in part, or made any monetary contribution intended to fund the preparation or submission of the brief. No person or entity other than the proposed *Amicus Curiae* made any monetary contribution intended to fund the preparation or submission of the brief.

Respectfully submitted,

DATED: April 3, 2015

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BRIEF OF AMICUS CURIAE

SUMMARY OF ARGUMENT

The South Coast Air Quality Management District (SCAQMD) submits that this Court should not try to establish a hard-and-fast rule concerning whether lead agencies are required to correlate emissions of air pollutants with specific health consequences in their environmental impact reports (EIR). The level of detail required in EIRs is governed by a few, core CEQA (California Environmental Quality Act) principles. As this Court has stated, "[a]n EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project." (*Laurel Heights Improvement Assn. v. Regents of the Univ of Cal.* (1988) 47 Cal.3d 376, 405 ["*Laurel Heights I*"]) Accordingly, "an agency must use its best efforts to find out and disclose all that it reasonably can." (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 (quoting CEQA Guidelines § 15144)[1].). However, "[a]nalysis of environmental effects need not be exhaustive, but will be judged in light of what is reasonably feasible." (*Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1390; CEQA Guidelines §§ 15151, 15204(a).)

With regard to analysis of air quality related health impacts, EIRs must generally quantify a project's pollutant emissions, but in some cases it is not feasible to correlate these emissions to specific, quantifiable health impacts (e.g., premature mortality; hospital admissions). In such cases, a general description of the adverse health impacts resulting from the pollutants at issue may be sufficient. In other cases, due to the magnitude

[1] The CEQA Guidelines are found at Cal. Code Regs., tit. 14 §§ 15000, *et seq*.

or nature of the pollution emissions, as well as the specificity of the project involved, it may be feasible to quantify health impacts. Or there may be a less exacting, but still meaningful analysis of health impacts that can feasibly be performed. In these instances, agencies should disclose those impacts.

SCAQMD also submits that whether or not an EIR complies with CEQA's informational mandates by providing sufficient, feasible analysis is a mixed question of fact and law. Pertinent here, the question of whether an EIR's discussion of health impacts from air pollution is sufficient to allow the public to understand and consider meaningfully the issues involves two inquiries: (1) Is it feasible to provide the information or analysis that a commenter is requesting or a petitioner is arguing should be required?; and (2) Even if it is feasible, is the agency relying on other policy or legal considerations to justify not preparing the requested analysis? The first question of whether an analysis is feasible is primarily a question of fact that should be judged by the substantial evidence standard. The second inquiry involves evaluating CEQA's information disclosure purposes against the asserted reasons to not perform the requested analysis. For example, an agency might believe that its EIR meets CEQA's informational disclosure standards even without a particular analysis, and therefore choose not to conduct that analysis. SCAQMD submits that this is more of a legal question, which should be reviewed de novo as a question of law.

ARGUMENT

I. RELEVANT FACTUAL AND LEGAL FRAMEWORK.

A. Air Quality Regulatory Background

The South Coast Air Quality Management District (SCAQMD) is one of the local and regional air pollution control districts and air quality management districts in California. The SCAQMD is the regional air pollution agency for the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410, 17 Cal. Code Reg. § 60104.) The SCAQMD also includes the Coachella Valley in Riverside County (Palm Springs area to the Salton Sea). (SCAQMD, *Final 2012 AQMP (Feb. 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "chapter 7" hyperlink; pp 7-1, 7-3 (last visited Apr. 1, 2015).) The SCAQMD's jurisdiction includes over 16 million residents and has the worst or nearly the worst air pollution levels in the country for ozone and fine particulate matter. (SCAQMD, *Final 2012 AQMP (Feb. 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "Executive Summary" hyperlink p. ES-1 (last visited Apr. 1, 2015).)

Under California law, the local and regional districts are primarily responsible for controlling air pollution from all sources except motor vehicles. (Health & Saf. Code § 40000.) The California Air Resources Board (CARB), part of the California Environmental Protection Agency, is primarily responsible for controlling pollution from motor vehicles. (*Id.*) The air districts must adopt rules to achieve and maintain the state and federal ambient air quality standards within their jurisdictions. (Health & Saf. Code § 40001.)

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to identify pollutants that are widely distributed and pose a threat to human health, developing a so-called "criteria" document. (42 U.S.C. § 7408; CAA § 108.) These pollutants are frequently called "criteria pollutants." EPA must then establish "national ambient air quality standards" at levels "requisite to protect public health", allowing "an adequate margin of safety." (42 U.S.C. § 7409; CAA § 109.) EPA has set standards for six identified pollutants: ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter (PM), and lead. (U.S. EPA, National Ambient Air Quality Standards (NAAQS), http://www.epa.gov/air/criteria.html (last updated Oct. 21, 2014).)[2]

Under the Clean Air Act, EPA sets emission standards for motor vehicles and "nonroad engines" (mobile farm and construction equipment, marine vessels, locomotives, aircraft, etc.). (42 U.S.C. §§ 7521, 7547; CAA §§ 202, 213.) California is the only state allowed to establish emission standards for motor vehicles and most nonroad sources; however, it may only do so with EPA's approval. (42 U.S.C. §§ 7543(b), 7543(e); CAA §§ 209(b), 209(c).) Sources such as manufacturing facilities, power plants and refineries that are not mobile are often referred to as "stationary sources." The Clean Air Act charges state and local agencies with the primary responsibility to attain the national ambient air quality standards. (42 U.S.C. § 7401(a)(3); CAA § 101(a)(3).) Each state must adopt and implement a plan including enforceable measures to achieve and maintain the national ambient air quality standards. (42 U.S.C. § 7410; CAA § 110.) The SCAQMD and CARB jointly prepare portion of the plan for the South Coast Air Basin and submit it for approval by EPA. (Health & Saf. Code §§ 40460, et seq.)

The Clean Air Act also requires state and local agencies to adopt a permit program requiring, among other things, that new or modified "major" stationary sources use technology to achieve the "lowest achievable emission rate," and to control minor stationary sources as

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[2] Particulate matter (PM) is further divided into two categories: fine particulate or $PM_{2.5}$ (particles with a diameter of less than or equal to 2.5 microns) and coarse particulate (PM_{10}) (particles with a diameter of 10 microns or less). (U.S. EPA, Particulate Matter (PM), http://www.epa.gov/airquality/particlepollution/ (last visited Apr. 1, 2015).)

needed to help attain the standards. (42 U.S.C. §§ 7502(c)(5), 7503(a)(2), 7410(a)(2)(C); CAA §§ 172(c)(5), 173(a)(2), 110(a)(2)(C).) The air districts implement these permit programs in California. (Health & Saf. Code §§ 42300, et seq.)

The Clean Air Act also sets out a regulatory structure for over 100 so-called "hazardous air pollutants" calling for EPA to establish "maximum achievable control technology" (MACT) for sources of these pollutants. (42 U.S.C. § 7412(d)(2); CAA § 112(d)(2).) California refers to these pollutants as "toxic air contaminants" (TACs) which are subject to two state-required programs. The first program requires "air toxics control measures" for specific categories of sources. (Health & Saf. Code § 39666.) The other program requires larger stationary sources and sources identified by air districts to prepare "health risk assessments" for impacts of toxic air contaminants. (Health & Saf. Code §§ 44320(b), 44322, 44360.) If the health risk exceeds levels identified by the district as "significant," the facility must implement a "risk reduction plan" to bring its risk levels below "significant" levels. Air districts may adopt additional more stringent requirements than those required by state law, including requirements for toxic air contaminants. (Health & Saf. Code § 41508; *Western Oil & Gas Assn. v. Monterey Bay Unified APCD* (1989) 49 Cal.3d 408, 414.) For example, SCAQMD has adopted a rule requiring new or modified sources to keep their risks below specified levels and use best available control technology (BACT) for toxics. (SCAQMD, *Rule 1401- New Source Review of Toxic Air Contaminants*, http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiv; then follow "Rule 1401" hyperlink (last visited Apr. 1, 2015).)

B. The SCAQMD's Role Under CEQA

The California Environmental Quality Act (CEQA) requires public agencies to perform an environmental review and appropriate analysis for projects that they implement or approve. (Pub. Resources Code § 21080(a).) The agency with primary approval authority for a particular project is generally the "lead agency" that prepares the appropriate CEQA document. (CEQA Guidelines §§ 15050, 15051.) Other agencies having a subsequent approval authority over all or part of a project are called "responsible" agencies that must determine whether the CEQA document is adequate for their use. (CEQA Guidelines §§ 15096(c), 15381.) Lead agencies must also consult with and circulate their environmental impact reports to "trustee agencies" and agencies "with jurisdiction by law" including "authority over resources which may be affected by the project." (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines §§ 15086(a)(3), 15073(c).) The SCAQMD has a role in all these aspects of CEQA.

Fulfilling its responsibilities to implement its air quality plan and adopt rules to attain the national ambient air quality standards, SCAQMD adopts a dozen or more rules each year to require pollution reductions from a wide variety of sources. The SCAQMD staff evaluates each rule for any adverse environmental impact and prepares the appropriate CEQA document. Although most rules reduce air emissions, they may have secondary environmental impacts such as use of water or energy or disposal of waste—e.g., spent catalyst from control equipment.[3]

[3] The SCAQMD's CEQA program for its rules is a "Certified Regulatory Program" under which it prepares a "functionally equivalent" document in lieu of a negative declaration or EIR. (Pub. Resources Code § 21080.5, CEQA Guidelines § 15251(l).)

The SCAQMD also approves a large number of permits every year to construct new, modified, or replacement facilities that emit regulated air pollutants. The majority of these air pollutant sources have already been included in an earlier CEQA evaluation for a larger project, are currently being evaluated by a local government as lead agency, or qualify for an exemption. However, the SCAQMD sometimes acts as lead agency for major projects where the local government does not have a discretionary approval. In such cases, SCAQMD prepares and certifies a negative declaration or environmental impact report (EIR) as appropriate.[4] SCAQMD evaluates perhaps a dozen such permit projects under CEQA each year. SCAQMD is often also a "responsible agency" for many projects since it must issue a permit for part of the projects (e.g., a boiler used to provide heat in a commercial building). For permit projects evaluated by another lead agency under CEQA, SCAQMD has the right to determine that the CEQA document is inadequate for its purposes as a responsible agency, but it may not do so because its permit program already requires all permitted sources to use the best available air pollution control technology. (SCAQMD, *Rule 1303(a)(1) – Requirements*, http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiii; then follow "Rule 1303" hyperlink (last visited Apr. 1, 2015).)

Finally, SCAQMD receives as many as 60 or more CEQA documents each month (around 500 per year) in its role as commenting agency or an agency with "jurisdiction by law" over air quality—a natural resource affected by the project. (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines § 15366(a)(3).) The SCAQMD staff provides comments on as many as 25 or 30 such documents each month.

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[4] The SCAQMD's permit projects are not included in its Certified Regulatory Program, and are evaluated under the traditional local government CEQA analysis. (Pub. Resources Code §§ 21150-21154.)

(SCAQMD Governing Board Agenda, Apr. 3, 2015, Agenda Item 16, Attachment A, http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-april-3-2015; then follow "16. Lead Agency Projects and Environmental Documents Received by SCAQMD" hyperlink (last visited Apr. 1, 2015).) Of course, SCAQMD focuses its commenting efforts on the more significant projects.

Typically, SCAQMD comments on the adequacy of air quality analysis, appropriateness of assumptions and methodology, and completeness of the recommended air quality mitigation measures. Staff may comment on the need to prepare a health risk assessment detailing the projected cancer and noncancer risks from toxic air contaminants resulting from the project, particularly the impacts of diesel particulate matter, which CARB has identified as a toxic air contaminant based on its carcinogenic effects. (California Air Resources Board, Resolution 98-35, Aug. 27, 1998, http://www.arb.ca.gov/regact/diesltac/diesltac.htm; then follow Resolution 98-35 hyperlink (last visited Apr. 1, 2015).) Because SCAQMD already requires new or modified stationary sources of toxic air contaminants to use the best available control technology for toxics and to keep their risks below specified levels, (SCAQMD Rule 1401, supra, note 15), the greatest opportunity to further mitigate toxic impacts through the CEQA process is by reducing emissions—particularly diesel emissions—from vehicles.

II. THIS COURT SHOULD NOT SET A HARD-AND-FAST RULE CONCERNING THE EXTENT TO WHICH AN EIR MUST CORRELATE A PROJECT'S EMISSION OF POLLUTANTS WITH RESULTING HEALTH IMPACTS.

Numerous cases hold that courts do not review the correctness of an EIR's conclusions but rather its sufficiency as an informative document. (*Laurel Heights 1*, *supra*, 47 Cal.3d at p. 392; *Citizens of Goleta Valley v.*

Bd. of Supervisors (1990) 52 Cal.3d 553, 569; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1197.)

As stated by the Court of Appeal in this case, where an EIR has addressed a topic, but the petitioner claims that the information provided about that topic is insufficient, courts must "draw[] a line that divides *sufficient* discussions from those that are *insufficient*." (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) The Court of Appeal readily admitted that "[t]he terms themselves – sufficient and insufficient – provide little, if any, guidance as to where the line should be drawn. They are simply labels applied once the court has completed its analysis." (*Id.*)

The CEQA Guidelines, however, provide guidance regarding what constitutes a sufficient discussion of impacts. Section 15151 states that "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." Case law reflects this: "Analysis of environmental effects need not be exhaustive, but will be judged in light of what was reasonably feasible." (*Association of Irritated Residents v. County of Madera, supra,* 107 Cal.App.4th at p. 1390; see also CEQA Guidelines § 15204(a).)

Applying this test, this Court cannot realistically establish a hard-and-fast rule that an analysis correlating air pollution impacts of a project to quantified resulting health impacts is always required, or indeed that it is never required. Simply put, in some cases such an analysis will be "feasible"; in some cases it will not.

For example, air pollution control districts often require a proposed new source of toxic air contaminants to prepare a "health risk assessment" before issuing a permit to construct. District rules often limit the allowable cancer risk the new source may cause to the "maximally exposed individual" (worker and residence exposures). (*See, e.g.*, SCAQMD Rule 1401(c)(8); 1401(d)(1), *supra* note 15.) In order to perform this analysis, it is necessary to have data regarding the sources and types of air toxic contaminants, location of emission points, velocity of emissions, the meteorology and topography of the area, and the location of receptors (worker and residence). (SCAQMD, *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588), pp. 11-16*; (last visited Apr. 1, 2015) http://www.aqmd.gov/home/library/documents-support-material; "Guidelines" hyperlink; AB2588; then follow AB2588 Risk Assessment Guidelines hyperlink.)

Thus, it is feasible to determine the health risk posed by a new gas station locating at an intersection in a mixed use area, where receptor locations are known. On the other hand, it may not be feasible to perform a health risk assessment for airborne toxics that will be emitted by a generic industrial building that was built on "speculation" (i.e., without knowing the future tenant(s)). Even where a health risk assessment can be prepared, however, the resulting maximum health risk value is only a calculation of risk—it does not necessarily mean anyone will contract cancer as a result of the project.

In order to find the "cancer burden" or expected additional cases of cancer resulting from the project, it is also necessary to know the numbers and location of individuals living within the "zone of impact" of the project: i.e., those living in areas where the projected cancer risk from the project exceeds one in a million. (SCAQMD, Health Risk Assessment Summary form, http://www.aqmd.gov/home/forms ; filter by "AB2588" category; then "Health Risk Assessment" hyperlink (last visited Apr. 1, 2015).) The affected population is divided into bands of those exposed to at least 1 in a million risk, those exposed to at least 10 in a million risk, etc. up to those exposed at the highest levels. (*Id.*) This data allows agencies to calculate an approximate number of additional cancer cases expected from the project. However, it is not possible to predict which particular individuals will be affected.

For the so-called criteria pollutants[5], such as ozone, it may be more difficult to quantify health impacts. Ozone is formed in the atmosphere from the chemical reaction of the nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. (U.S. EPA, Ground Level Ozone, http://www.epa.gov/airquality/ozonepollution/ (last updated Mar. 25, 2015).) It takes time and the influence of meteorological conditions for these reactions to occur, so ozone may be formed at a distance downwind from the sources. (U.S. EPA, *Guideline on Ozone Monitoring Site Selection* (Aug. 1998) EPA-454/R-98-002 § 5.1.2, http://www.epa.gov/ttnamti1/archive/cpreldoc.html (last visited Apr. 1, 2015).) NO_x and VOC are known as "precursors" of ozone.

Scientifically, health effects from ozone are correlated with increases in the ambient level of ozone in the air a person breathes. (U.S. EPA, *Health Effects of Ozone in the General Population,* Figure 9, http://www.epa.gov/apti/ozonehealth/population.html#levels (last visited Apr. 1, 2015).) However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels over an entire region. For example, the SCAQMD's 2012 AQMP showed that reducing NO_x by 432 tons per day (157,680 tons/year) and reducing VOC by 187 tons per day (68,255 tons/year) would reduce ozone levels at the SCAQMD's monitor site with the highest levels by only 9 parts per billion. (South Coast Air Quality Management District, *Final 2012 AQMP (February 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "Appendix V: Modeling & Attainment Demonstrations" hyperlink,

[5] See discussion of types of pollutants, supra, Part I.A.

pp. v-4-2, v-7-4, v-7-24.) SCAQMD staff does not currently know of a way to accurately quantify ozone-related health impacts caused by NO_x or VOC emissions from relatively small projects.

On the other hand, this type of analysis may be feasible for projects on a regional scale with very high emissions of NO_x and VOCs, where impacts are regional. For example, in 2011 the SCAQMD performed a health impact analysis in its CEQA document for proposed Rule 1315, which authorized various newly-permitted sources to use offsets from the districts "internal bank" of emission reductions. This CEQA analysis accounted for essentially *all* the increases in emissions due to new or modified sources in the District between 2010 and 2030.[6] The SCAQMD was able to correlate this very large emissions increase (e.g., 6,620 pounds per day NO_x (1,208 tons per year), 89,180 pounds per day VOC (16,275 tons per year)) to expected health outcomes from ozone and particulate matter (e.g., 20 premature deaths per year and 89,947 school absences in the year 2030 due to ozone).[7] (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System* (see hyperlink in fn 6*)* at p. 4.1-35, Table 4.1-29.)

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[6] (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, Attachment G, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System, Vol. 1, p.4.0-6,* http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-february-4-2011; the follow "26. Adopt Proposed Rule 1315 – Federal New Source Review Tracking System" (last visited April 1, 2015).)

[7] The SCAQMD was able to establish the location of future NO_x and VOC emissions by assuming that new projects would be built in the same locations and proportions as existing stationary sources. This CEQA document was upheld by the Los Angeles County Superior Court in *Natural Res. Def. Council v SCAQMD*, Los Angeles Superior Court No. BS110792).

However, a project emitting only 10 tons per year of NO_x or VOC is small enough that its regional impact on ambient ozone levels may not be detected in the regional air quality models that are currently used to determine ozone levels. Thus, in this case it would not be feasible to directly correlate project emissions of VOC or NO_x with specific health impacts from ozone. This is in part because ozone formation is not linearly related to emissions. Ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology and seasonal impacts, and because ozone is formed some time later and downwind from the actual emission. (EPA Guideline on Ozone Monitoring Site Selection (Aug. 1998) EPA-454/R-98-002, § 5.1.2; https://www.epa.gov/ttnamti1/archive/cpreldoc.html; then search "Guideline on Ozone Monitoring Site Selection" click on pdf) (last viewed Apr. 1, 2015).)

SCAQMD has set its CEQA "significance" threshold for NO_x and VOC at 10 tons per year (expressed as 55 lb/day). (SCAQMD, *Air Quality Analysis Handbook*, http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook; then follow "SCAQMD Air Quality Significance Thresholds" hyperlink (last visited Apr. 1, 2015).) This is because the federal Clean Air Act defines a "major" stationary source for "extreme" ozone nonattainment areas such as SCAQMD as one emitting 10 tons/year. (42 U.S.C. §§ 7511a(e), 7511a(f); CAA §§ 182(e), 182(f).) Under the Clean Air Act, such sources are subject to enhanced control requirements (42 U.S.C. §§ 7502(c)(5), 7503; CAA §§ 172(c)(5), 173), so SCAQMD decided this was an appropriate threshold for making a CEQA "significance" finding and requiring feasible mitigation. Essentially, SCAQMD takes the position that a source that emits 10 tons/year of NO_x or VOC would contribute cumulatively to ozone formation. Therefore, lead agencies that use SCAQMD's thresholds of significance may determine that many projects have "significant" air quality impacts and must apply all feasible mitigation measures, yet will not be able to precisely correlate the project to quantifiable health impacts, unless the emissions are sufficiently high to use a regional modeling program.

In the case of particulate matter ($PM_{2.5}$)[8], another "criteria" pollutant, SCAQMD staff is aware of two possible methods of analysis. SCAQMD used regional modeling to predict expected health impacts from its proposed Rule 1315, as mentioned above. Also, the California Air Resources Board (CARB) has developed a methodology that can predict expected mortality (premature deaths) from large amounts of $PM_{2.5}$. (California Air Resources Board, *Health Impacts Analysis: PM Premature Death Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort_arch.htm (last reviewed Jan. 19, 2012).) SCAQMD used the CARB methodology to predict impacts from three very large power plants (e.g., 731-1837 lbs/day). (Final Environmental Assessment for Rule 1315, *supra*, pp 4.0-12, 4.1-13, 4.1-37 (e.g., 125 premature deaths in the entire SCAQMD in 2030), 4.1-39 (0.05 to 1.77 annual premature deaths from power plants.) Again, this project involved large amounts of additional $PM_{2.5}$ in the District, up to 2.82 tons/day (5,650 lbs/day of $PM_{2.5}$, or, or 1029 tons/year. (*Id.* at table 4.1-4, p. 4.1-10.)

However, the primary author of the CARB methodology has reported that this $PM_{2.5}$ health impact methodology is not suited for small projects and may yield unreliable results due to various uncertainties.[9] (SCAQMD, *Final Subsequent Mitigated Negative Declaration for: Warren*

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[8] SCAQMD has not attained the latest annual or 24-hour national ambient air quality standards for "$PM_{2.5}$" or particulate matter less than 2.5 microns in diameter.

[9] Among these uncertainties are the representativeness of the population used in the methodology, and the specific source of PM and the corresponding health impacts. (*Id.* at p. 2-24.)

E&P, Inc. WTU Central Facility, New Equipment Project (certified July 19, 2011), http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2011; then follow "Final Subsequent Mitigated Negative Declaration for Warren E&P Inc. WTU Central Facility, New Equipment Project" hyperlink, pp. 2-22, 2-23 (last visited Apr. 1, 2015).) Therefore, when SCAQMD prepared a CEQA document for the expansion of an existing oil production facility, with very small $PM_{2.5}$ increases (3.8 lb/day) and a very small affected population, staff elected not to use the CARB methodology for using estimated $PM_{2.5}$ emissions to derive a projected premature mortality number and explained why it would be inappropriate to do so. (*Id.* at pp 2-22 to 2-24.) SCAQMD staff concluded that use of this methodology for such a small source could result in unreliable findings and would not provide meaningful information. (*Id.* at pp. 2-23, 2-25.) This CEQA document was not challenged in court.

In the above case, while it may have been technically possible to plug the data into the methodology, the results would not have been reliable or meaningful. SCAQMD believes that an agency should not be required to perform analyses that do not produce reliable or meaningful results. This Court has already held that an agency may decline to use even the "normal" "existing conditions" CEQA baseline where to do so would be misleading or without informational value. (*Neighbors for Smart Rail v. Exposition Metro Line* (2013) 57 Cal.4th 439, 448, 457.) The same should be true for a decision that a particular study or analysis would not provide reliable or meaningful results.[10]

[10] Whether a particular study would result in "informational value" is a part of deciding whether it is "feasible." CEQA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and

Therefore, it is not possible to set a hard-and-fast rule on whether a correlation of air quality impacts with specific quantifiable health impacts is required in all cases. Instead, the result turns on whether such an analysis is reasonably feasible in the particular case.[11] Moreover, what is reasonably feasible may change over time as scientists and regulatory agencies continually seek to improve their ability to predict health impacts. For example, CARB staff has been directed by its Governing Board to reassess and improve the methodology for estimating premature deaths. (California Air Resources Board, *Health Impacts Analysis: PM Mortality Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm (last reviewed Dec. 29, 2010).) This factor also counsels against setting any hard-and-fast rule in this case.

III. THE QUESTION OF WHETHER AN EIR CONTAINS SUFFICIENT ANALYSIS TO MEET CEQA'S REQUIREMENTS IS A MIXED QUESTION OF FACT AND LAW GOVERNED BY TWO DIFFERENT STANDARDS OF REVIEW.

A. Standard of Review for Feasibility Determination and Sufficiency as an Informative Document

A second issue in this case is whether courts should review an EIR's informational sufficiency under the "substantial evidence" test as argued by Friant Ranch or the "independent judgment" test as argued by Sierra Club.

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technological factors." (Pub. Resources Code § 21061.1.) A study cannot be "accomplished in a *successful* manner" if it produces unreliable or misleading results.

[11] In this case, the lead agency did not have an opportunity to determine whether the requested analysis was feasible because the comment was non-specific. Therefore, SCAQMD suggests that this Court, after resolving the legal issues in the case, direct the Court of Appeal to remand the case to the lead agency for a determination of whether the requested analysis is feasible. Because Fresno County, the lead agency, did not seek review in this Court, it seems likely that the County has concluded that at least some level of correlation of air pollution with health impacts is feasible.

As this Court has explained, "a reviewing court must adjust its scrutiny to the nature of the alleged defect, depending on whether the claim is predominantly one of improper procedure or a dispute over the facts." (*Vineyard Area Citizens v. City of Rancho Cordova, supra,* 40 Cal.4th at 435.) For questions regarding compliance with proper procedure or other legal questions, courts review an agency's action de novo under the "independent judgment" test. (*Id.*) On the other hand, courts review factual disputes only for substantial evidence, thereby "accord[ing] greater deference to the agency's substantive factual conclusions." (*Id.*)

Here, Friant Ranch and Sierra Club agree that the case involves the question of whether an EIR includes sufficient information regarding a project's impacts. However, they disagree on the proper standard of review for answering this question: Sierra Club contends that courts use the independent judgment standard to determine whether an EIR's analysis is sufficient to meet CEQA's informational purposes,[12] while Friant Ranch contends that the substantial evidence standard applies to this question.

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[12] Sierra Club acknowledges that courts use the substantial evidence standard when reviewing predicate factual issues, but argues that courts ultimately decide as a matter of law what CEQA requires. (Answering Brief, pp. 14, 23.)

SCAQMD submits that the issue is more nuanced than either party contends. We submit that, whether a CEQA document includes sufficient analysis to satisfy CEQA's informational mandates is a mixed question of fact and law,[13] containing two levels of inquiry that should be judged by different standards.[14]

The state CEQA Guidelines set forth standards for the adequacy of environmental analysis. Guidelines Section 15151 states:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection, but for adequacy, completeness, and a good-faith effort at full disclosure.

In this case, the basic question is whether the underlying analysis of air quality impacts made the EIR "sufficient" as an informative document. However, whether the EIR's analysis was sufficient is judged in light of what was reasonably feasible. This represents a mixed question of fact and law that is governed by two different standards of review.

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[13] Friant Ranch actually states that the claim that an EIR lacks sufficient relevant information is, "most properly thought of as raising mixed questions of fact and law." (Opening Brief, p. 27.) However, the remainder of its argument claims that the court should apply the substantial evidence standard of review to all aspects of the issue.

[14] Mixed questions of fact and law issues may implicate predominantly factual subordinate questions that are reviewed under the substantial evidence test even though the ultimate question may be reviewed by the independent judgment test. *Crocker National Bank v. City and County of San Francisco* (1989) 49 Cal.3d 881, 888-889.

SCAQMD submits that an EIR's sufficiency as an informational document is ultimately a legal question that courts should determine using their independent judgment. This Court's language in *Laurel Heights I* supports this position. As this Court explained: "The court does not pass upon the correctness of the EIR's environmental conclusions, but only upon its *sufficiency as an informative document*." (*Laurel Heights I, supra*, 47 Cal.3d at 392-393) (emphasis added.) As described above, the Court in *Vineyard Area Citizens v. City of Rancho Cordova, supra,* 40 Cal.4th at 431, also used its independent judgment to determine what level of analysis CEQA requires for water supply impacts. The Court did not defer to the lead agency's opinion regarding the law's requirements; rather, it determined for itself what level of analysis was necessary to meet "[t]he law's informational demands." (*Id.* at p. 432.) Further, existing case law also holds that where an agency fails to comply with CEQA's information disclosure requirements, the agency has "failed to proceed in the manner required by law." (*Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 118.)

However, whether an EIR satisfies CEQA's requirements depends in part on whether it was reasonably feasible for an agency to conduct additional or more thorough analysis. EIRs must contain "a detailed statement" of a project's impacts (Pub. Res. Code § 21061), and an agency must "use its best efforts to find out and disclose all that it reasonably can." (CEQA Guidelines § 15144.) Nevertheless, "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." (CEQA Guidelines § 15151.)

SCAQMD submits that the question of whether additional analysis or a particular study suggested by a commenter is "feasible" is generally a question of fact. Courts have already held that whether a particular alternative is "feasible" is reviewed by the substantial evidence test.

(*Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 598-99; *Center for Biological Diversity v. County of San Bernardino* (2010) 185 Cal.App.4th 866, 883.) Thus, if a lead agency determines that a particular study or analysis is infeasible, that decision should generally be judged by the substantial evidence standard. However, SCAQMD urges this Court to hold that lead agencies must explain the basis of any determination that a particular analysis is infeasible in the EIR itself. An EIR must discuss information, including issues related to the feasibility of particular analyses "in sufficient detail to enable meaningful participation and criticism by the public. '[W]hatever is required to be considered in an EIR must be in that formal report; what any official might have known from other writings or oral presentations cannot supply what is lacking in the report.'" (*Laurel Heights I*, *supra*, 47 Cal.3d at p. 405 (quoting *Santiago County Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 831) (discussing analysis of alternatives).) The evidence on which the determination is based should also be summarized in the EIR itself, with appropriate citations to reference materials if necessary. Otherwise commenting agencies such as SCAQMD would be forced to guess where the lead agency's evidence might be located, thus thwarting effective public participation.

Moreover, if a lead agency determines that a particular study or analysis would not result in reliable or useful information and for that reason is not feasible, that determination should be judged by the substantial evidence test. (See *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*, *supra*, 57 Cal.4th 439, 448, 457:

whether "existing conditions" baseline would be misleading or uninformative judged by substantial evidence standard.[15])

If the lead agency's determination that a particular analysis or study is not feasible is supported by substantial evidence, then the agency has not violated CEQA's information disclosure provisions, since it would be infeasible to provide additional information. This Court's decisions provide precedent for such a result. For example, this Court determined that the issue of whether the EIR should have included a more detailed discussion of future herbicide use was resolved because substantial evidence supported the agency's finding that "the precise parameters of future herbicide use could not be predicted." *Ebbetts Pass Forest Watch v. California Dept. of Forestry & Fire Protection* (2008) 43 Cal.4th 936, 955.

Of course, SCAQMD expects that courts will continue to hold lead agencies to their obligations to consult with, and not to ignore or misrepresent, the views of sister agencies having special expertise in the area of air quality. (*Berkeley Keep Jets Over the Bay v. Board of Port Commissioners* (2007) 91 Cal.App.4th 1344, 1364 n.11.) In some cases, information provided by such expert agencies may establish that the purported evidence relied on by the lead agency is not in fact "substantial". (*Id.* at pp. 1369-1371.)

In sum, courts retain ultimate responsibility to determine what CEQA requires. However, the law does not require exhaustive analysis, but only what is reasonably feasible. Agencies deserve deference for their factual determinations regarding what type of analysis is reasonably feasible. On the other hand, if a commenter requests more information, and the lead agency declines to provide it but does *not* determine that the

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[15] The substantial evidence standard recognizes that the courts "have neither the resources nor the scientific expertise" to weigh conflicting evidence on technical issues. (*Laurel Heights I, supra,* 47 Cal.3d 376, 393.)

requested study or analysis would be infeasible, misleading or uninformative, the question becomes whether the omission of that analysis renders the EIR inadequate to satisfy CEQA's informational purposes. (*Id.* at pp. 1370-71.) Again, this is predominantly a question of law and should be judged by the de novo or independent judgment standard of review. Of course, this Court has recognized that a "project opponent or reviewing court can always imagine some additional study or analysis that might provide helpful information. It is not for them to design the EIR. That further study...might be helpful does not make it necessary." (*Laurel Heights I, supra,* 47 Cal.3d 376, 415 – see also CEQA Guidelines § 15204(a) [CEQA "does not require a lead agency to conduct every test. . . recommended or demanded by commenters."].) Courts, then, must adjudicate whether an omission of particular information renders an EIR inadequate to serve CEQA's informational purposes.[16]

[16] We recognize that there is case law stating that the substantial evidence standard applies to "challenges to the scope of an EIR's analysis of a topic" as well as the methodology used and the accuracy of the data relied on in the document "because these types of challenges involve factual questions." (*Bakersfield Citizens for Local Control v. City of Bakersfield, supra,* 124 Cal.App.4th 1184, 1198, and cases relied on therein.) However, we interpret this language to refer to situations where the question of the scope of the analysis really is factual—that is, where it involves whether further analysis is feasible, as discussed above. This interpretation is supported by the fact that the *Bakersfield* court expressly rejected an argument that a claimed "omission of information from the EIR should be treated as inquiries whether there is substantial evidence supporting the decision approving the project. " *Bakersfield, supra,* 124 Cal.App.4th at p. 1208. And the *Bakersfield* court ultimately decided that the lead agency must analyze the connection between the identified air pollution impacts and resulting health impacts, even though the EIR already included some discussion of air-pollution-related respiratory illnesses. *Bakersfield, supra,* 124 Cal.App.4th at p. 1220. Therefore, the court must not have interpreted this question as one of the "scope of the analysis" to be judged by the substantial evidence standard.

B. Friant Ranch's Rationale for Rejecting the Independent Judgment Standard of Review is Unsupported by Case Law.

In its brief, Friant Ranch makes a distinction between cases where a required CEQA topic is not discussed at all (to be reviewed by independent judgment as a failure to proceed in the manner required by law) and cases where a topic is discussed, but the commenter claims the information provided is insufficient (to be judged by the substantial evidence test). (Opening Brief, pp. 13-17.) The Court of Appeal recognized these two types of cases, but concluded that both raised questions of law. (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) We believe the distinction drawn by Friant Ranch is unduly narrow, and inconsistent with cases which have concluded that CEQA documents are insufficient. In many instances, CEQA's requirements are stated broadly, and the courts must interpret the law to determine what level of analysis satisfies CEQA's mandate for providing meaningful information, even though the EIR discusses the issue to some extent.

For example, the CEQA Guidelines require discussion of the existing environmental baseline. In *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 954-955, the lead agency had discussed the environmental baseline by describing historic month-end water levels in the affected lakes. However, the court held that this was not an adequate baseline discussion because it failed to discuss the timing and amounts of past actual water releases, to allow comparison with the proposed project. The court evidently applied the independent judgment test to its decision, even though the agency discussed the issue to some extent.

Likewise, in *Vineyard Area Citizens* (2007) 40 Cal.4th 412, this Court addressed the question of whether an EIR's analysis of water supply impacts complied with CEQA. The parties agreed that the EIR was required to analyze the effects of providing water to the development project, "and that in order to do so the EIR had, in some manner, to identify the planned sources of that water." (*Vineyard Area Citizens, supra,* at p. 428.) However, the parties disagreed as to the level of detail required for this analysis and "what level of uncertainty regarding the availability of water supplies can be tolerated in an EIR . . . ." (*Id.*) In other words, the EIR had analyzed water supply impacts for the project, but the petitioner claimed that the analysis was insufficient.

This Court noted that neither CEQA's statutory language or the CEQA Guidelines specifically addressed the question of how precisely an EIR must discuss water supply impacts. (*Id.*) However, it explained that CEQA "states that '[w]hile foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can.'" (*Id.*, [Guidelines § 15144].) The Court used this general principle, along with prior precedent, to elucidate four "principles for analytical adequacy" that are necessary in order to satisfy "CEQA's informational purposes." (*Vineyard Area Citizens, supra,* at p. 430.) The Court did not defer to the agency's determination that the EIR's analysis of water supply impacts was sufficient. Rather, this Court used its independent judgment to determine for itself the level of analysis required to satisfy CEQA's fundamental purposes. (*Vineyard Area Citizens, supra*, at p. 441: an EIR does not serve its purposes where it neglects to explain likely sources of water and "... leaves long term water supply considerations to later stages of the project.")

Similarly, the CEQA Guidelines require an analysis of noise impacts of the project. (Appendix G, "Environmental Checklist Form."[17]) In *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, 1123, the court held that the lead agency's noise impact analysis was inadequate even though it had addressed the issue and concluded that the increase would not be noticeable. If the court had been using the substantial evidence standard, it likely would have upheld this discussion.

Therefore, we do not agree that the issue can be resolved on the basis suggested by Friant Ranch, which would apply the substantial evidence standard to *every* challenge to an analysis that addresses a required CEQA topic. This interpretation would subvert the courts' proper role in interpreting CEQA and determining what the law requires.

Nor do we agree that the Court of Appeal in this case violated CEQA's prohibition on courts interpreting its provisions "in a manner which imposes procedural or substantive requirements beyond those explicitly stated in this division or in the state guidelines." (Pub. Resources Code § 21083.1.) CEQA requires an EIR to describe *all* significant impacts of the project on the environment. (Pub. Resources Code § 21100(b)(2); *Vineyard Area Citizens, supra,* at p. 428.) Human beings are part of the environment, so CEQA requires EIRs to discuss a project's significant impacts on human health. However, except in certain particular circumstances,[18] neither the CEQA statute nor Guidelines specify the precise level of analysis that agencies must undertake to satisfy the law's requirements. (see, e.g., CEQA Guidelines § 15126.2(a) [EIRs must describe "health and safety problems caused by {a project's} physical changes"].) Accordingly, courts must interpret CEQA as a whole to

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[17] Association of Environmental Professionals, 2015 CEQA Statute and Guidelines (2015) p.287.
[18] E.g., Pub. Resources Code § 21151.8(C)(3)(B)(iii) (requiring specific type of health risk analysis for siting schools).

determine whether a particular EIR is sufficient as an informational document. A court determining whether an EIR's discussion of human health impacts is legally sufficient does not constitute imposing a new substantive requirement.[19] Under Friant Ranch's theory, the above-referenced cases holding a CEQA analysis inadequate would have violated the law. This is not a reasonable interpretation.

IV. COURTS MUST SCRUPULOUSLY ENFORCE THE REQUIREMENTS THAT LEAD AGENCIES CONSULT WITH AND OBTAIN COMMENTS FROM AIR DISTRICTS

Courts must "scrupulously enforce" CEQA's legislatively mandated requirements. (*Vineyard Area Citizens, supra*, 40 Cal.4th 412, 435.) Case law has firmly established that lead agencies must consult with the relevant air pollution control district before conducting an initial study, and must provide the districts with notice of the intention to adopt a negative declaration (or EIR). (*Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 958.) As *Schenck* held, neither publishing the notice nor providing it to the State Clearinghouse was a sufficient substitute for sending notice directly to the air district. (*Id.*) Rather, courts "must be satisfied that [administrative] agencies have fully complied with the procedural requirements of CEQA, since only in this way can the important public purposes of CEQA be protected from subversion." *Schenck,* 198 Cal.App.4th at p. 959 (citations omitted).[20]

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[19] We submit that Public Resources Code Section 21083.1 was intended to prevent courts from, for example, holding that an agency must analyze economic impacts of a project where there are no resulting environmental impacts (see CEQA Guidelines § 15131) , or imposing new procedural requirements, such as imposing additional public notice requirements not set forth in CEQA or the Guidelines.

[20] Lead agencies must consult air districts, as public agencies with jurisdiction by law over resources affected by the project, *before* releasing an EIR. (Pub. Resources Code §§ 21104(a); 21153.) Moreover, air

Lead agencies should be aware, therefore, that failure to properly seek and consider input from the relevant air district constitutes legal error which may jeopardize their project approvals. For example, the court in *Fall River Wild Trout Foundation v. County of Shasta,* (1999) 70 Cal.App.4th 482, 492 held that the failure to give notice to a trustee agency (Department of Fish and Game) was prejudicial error requiring reversal. The court explained that the lack of notice prevented the Department from providing any response to the CEQA document. (*Id.* at p. 492.) It therefore prevented relevant information from being presented to the lead agency, which was prejudicial error because it precluded informed decision-making. (*Id.*)[21]

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districts should be considered "state agencies" for purposes of the requirement to consult with "trustee agencies" as set forth in Public Resources Code § 20180.3(a). This Court has long ago held that the districts are not mere "local agencies" whose regulations are superseded by those of a state agency regarding matters of statewide concern, but rather have concurrent jurisdiction over such issues. (*Orange County Air Pollution Control District v. Public Util. Com.* (1971) 4 Cal.3d 945, 951, 954.) Since air pollution is a matter of statewide concern, *Id* at 952, air districts should be entitled to trustee agency status in order to ensure that this vital concern is adequately protected during the CEQA process.

[21] In *Schenck,* the court concluded that failure to give notice to the air district was not prejudicial, but this was partly because the trial court had already corrected the error before the case arrived at the Court of Appeal. The trial court issued a writ of mandate requiring the lead agency to give notice to the air district. The air district responded by concurring with the lead agency that air impacts were not significant. (*Schenck,* 198 Cal.App.4th 949, 960.) We disagree with the *Schenck* court that the failure to give notice to the air district would not have been prejudicial (even in the absence of the trial court writ) merely because the lead agency purported to follow the air district's published CEQA guidelines for significance. (*Id.*, 198 Cal.App.4th at p. 960.) In the first place, absent notice to the air district, it is uncertain whether the lead agency properly followed those guidelines. Moreover, it is not realistic to expect that an air district's published guidelines would necessarily fully address all possible air-quality related issues that can arise with a CEQA project, or that those

Similarly, lead agencies must obtain additional information requested by expert agencies, including those with jurisdiction by law, if that information is necessary to determine a project's impacts. (*Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236-37.) Approving a project without obtaining that information constitutes a failure to proceed in the manner prescribed by CEQA. (*Id.* at p. 1236.)

Moreover, a lead agency can save significant time and money by consulting with the air district early in the process. For example, the lead agency can learn what the air district recommends as an appropriate analysis on the facts of its case, including what kinds of health impacts analysis may be available, and what models are appropriate for use. This saves the lead agency from the need to do its analysis all over again and possibly needing to recirculate the document after errors are corrected, if new significant impacts are identified. (CEQA Guidelines § 15088.5(a).) At the same time, the air district's expert input can help the lead agency properly determine whether another commenter's request for additional analysis or studies is reasonable or feasible. Finally, the air district can provide input on what mitigation measures would be feasible and effective.

Therefore, we suggest that this Court provide guidance to lead agencies reminding them of the importance of consulting with the relevant air districts regarding these issues. Otherwise, their feasibility decisions may be vulnerable to air district evidence that establishes that there is no substantial evidence to support the lead agency decision not to provide specific analysis. (*See Berkeley Keep Jets Over the Bay*, *supra*, 91 Cal.App.4th 1344, 1369-1371.)

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guidelines would necessarily be continually modified to reflect new developments. Therefore we believe that, had the trial court not already ordered the lead agency to obtain the air district's views, the failure to give notice would have been prejudicial, as in *Fall River, supra,* 70 Cal.App.4th 482, 492.

CONCLUSION

The SCAQMD respectfully requests this Court *not* to establish a hard-and-fast rule concerning whether CEQA requires a lead agency to correlate identified air quality impacts of a project with resulting health outcomes. Moreover, the question of whether an EIR is "sufficient as an informational document" is a mixed question of fact and law containing two levels of inquiry. Whether a particular proposed analysis is feasible is predominantly a question of fact to be judged by the substantial evidence standard of review. Where the requested analysis is feasible, but the lead agency relies on legal or policy reasons not to provide it, the question of whether the EIR is nevertheless sufficient as an informational document is predominantly a question of law to be judged by the independent judgment standard of review.

Respectfully submitted,

DATED: April 3, 2015

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
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CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.520(c)(1) of the California Rules of Court, I hereby certify that this brief contains 8,476 words, including footnotes, but excluding the Application, Table of Contents, Table of Authorities, Certificate of Service, this Certificate of Word Count, and signature blocks. I have relied on the word count of the Microsoft Word Vista program used to prepare this Certificate.

DATED: April 3, 2015 Respectfully submitted,

Barbara Baird

Barbara Baird

PROOF OF SERVICE

I am employed in the County of Los Angeles, California. I am over the age of 18 years and not a party to the within action. My business address is 21865 Copley Drive, Diamond Bar, California 91765.

On April 3, 2015 I served true copies of the following document(s) described as **APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND *[PROPOSED]* BRIEF OF *AMICUS CURIAE*** by placing a true copy of the foregoing document(s) in a sealed envelope addressed as set forth on the attached service list as follows:

BY MAIL: I enclosed the document(s) in a sealed envelope or package addressed to the persons at the addresses listed in the Service List and placed the envelope for collection and mailing following our ordinary business practices. I am readily familiar with this District's practice for collection and processing of correspondence for mailing. Under that practice, the correspondence would be deposited with the United States Postal Service, with postage thereon fully prepaid at Diamond Bar, California, in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on April 3, 2015 at Diamond Bar, California.

Patricia Anderson

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Appendix C2
Housing Project #1 (Anchor House) Air Quality and Greenhouse Gas Modeling

Emissions Worksheet

Criteria Air Pollutant Emissions Summary - Construction

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Unmitigated	4.36	6.72	7.77	0.03	1.74	0.15	1.89	0.47	0.14	0.61

UNMITIGATED

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Onsite	3.68	2.60	2.80	0.00	0.01	0.13	0.14	0.00	0.12	0.12
Total Offsite	0.68	4.13	4.97	0.03	1.73	0.02	1.75	0.47	0.02	0.49
check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FOR CONSTRUCTION RISK ASSESSMENT - Unmitigated Run

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2021 Onsite	0.04	0.35	0.33	0.00	0.01	0.02	0.03	0.00	0.02	0.02
2021 Offsite	0.06	1.02	0.41	0.00	0.13	0.00	0.13	0.03	0.00	0.04
2022 Onsite	0.09	0.91	0.93	0.00	0.00	0.05	0.05	0.00	0.04	0.04
2022 Offsite	0.26	1.42	1.93	0.01	0.63	0.01	0.64	0.17	0.01	0.18
2023 Onsite	0.08	0.83	0.92	0.00	0.00	0.04	0.04	0.00	0.04	0.04
2023 Offsite	0.24	1.12	1.76	0.01	0.63	0.00	0.64	0.17	0.00	0.18
2024 Onsite	3.47	0.50	0.62	0.00	0.00	0.02	0.02	0.00	0.02	0.02
2024 Offsite	0.12	0.56	0.87	0.00	0.34	0.00	0.34	0.09	0.00	0.09

FOR CONSTRUCTION REGIONAL EMISSIONS - Unmitigated Run

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total 2021	0.09	1.37	0.74	0.00	0.14	0.02	0.16	0.04	0.02	0.06
Total 2022	0.35	2.34	2.86	0.01	0.63	0.05	0.69	0.17	0.05	0.22
Total 2023	0.32	1.96	2.68	0.01	0.63	0.05	0.68	0.17	0.04	0.21
Total 2024	3.59	1.06	1.48	0.01	0.34	0.03	0.36	0.09	0.02	0.12
Construction Total	4.36	6.72	7.77	0.03	1.74	0.15	1.89	0.47	0.14	0.61
Check	-3.91	-3.02	-4.16	-0.02	-0.97	-0.07	-1.04	-0.26	-0.07	-0.33

3.2 Demolition - 2021

Unmitigated Construction On-Site

Category tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road	0.02	0.16	0.17	0.00		0.01	0.01		0.01	0.01
Total	0.02	0.16	0.17	0.00		0.01	0.01		0.01	0.01

Unmitigated Construction Off-Site

Category tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.3 Demolition Haul - 2021

Unmitigated Construction On-Site

Category tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00
Off-Road	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00
Total	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.4 Site Preparation - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00	0.00	0.00	0.00	0.00	0.00
Off-Road		0.00	0.02	0.01	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.5 Grading - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00	0.00	0.00	0.00	0.00	0.00
Off-Road		0.00	0.03	0.03	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.6 Grading Soil Haul - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00	0.00	0.00	0.00	0.00	0.00
Off-Road		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.02	0.81	0.15	0.00	0.05	0.00	0.05	0.01	0.00	0.02
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.81	0.15	0.00	0.05	0.00	0.05	0.01	0.00	0.02

3.7 Building Construction and Pile Driving - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00	0.05	0.04	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.05	0.04	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.01	0.01	0.06	0.00	0.02	0.00	0.02	0.01	0.00	0.01
Total		0.01	0.05	0.07	0.00	0.02	0.00	0.02	0.01	0.00	0.01

3.8 Building Construction - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.01	0.08	0.08	0.00		0.00	0.00		0.00	0.00
Total		0.01	0.08	0.08	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.11	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Worker		0.02	0.01	0.15	0.00	0.05	0.00	0.05	0.01	0.00	0.01
Total		0.02	0.12	0.17	0.00	0.05	0.00	0.05	0.01	0.00	0.01

3.8 Building Construction - 2022

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.09	0.91	0.93	0.00		0.05	0.05		0.04	0.04
Total		0.09	0.91	0.93	0.00		0.05	0.05		0.04	0.04

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.04	1.27	0.26	0.00	0.08	0.00	0.08	0.02	0.00	0.02
Worker		0.23	0.16	1.67	0.01	0.56	0.00	0.56	0.15	0.00	0.15
Total		0.26	1.42	1.93	0.01	0.63	0.01	0.64	0.17	0.01	0.18

3.8 Building Construction - 2023

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.08	0.83	0.92	0.00		0.04	0.04		0.04	0.04
Total		0.08	0.83	0.92	0.00		0.04	0.04		0.04	0.04

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.03	0.98	0.23	0.00	0.08	0.00	0.08	0.02	0.00	0.02
Worker		0.21	0.14	1.53	0.01	0.56	0.00	0.56	0.15	0.00	0.15
Total		0.24	1.12	1.76	0.01	0.63	0.00	0.64	0.17	0.00	0.18

3.7 Building Construction - 2024

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.04	0.39	0.46	0.00		0.02	0.02		0.02	0.02
Total		0.04	0.39	0.46	0.00		0.02	0.02		0.02	0.02

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.01	0.49	0.11	0.00	0.04	0.00	0.04	0.01	0.00	0.01
Worker		0.10	0.06	0.71	0.00	0.28	0.00	0.28	0.08	0.00	0.08
Total		0.11	0.55	0.82	0.00	0.32	0.00	0.32	0.09	0.00	0.09

3.8 Paving - 2024

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.01	0.09	0.12	0.00		0.00	0.00		0.00	0.00
Paving		0.00					0.00	0.00		0.00	0.00
Total		0.01	0.09	0.12	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.9 Architectural Coating - 2024

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Architectural Coating		3.42					0.00	0.00		0.00	0.00
Off Road		0.00	0.02	0.03	0.00		0.00	0.00		0.00	0.00
Total		3.42	0.02	0.03	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.01	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.00	0.00
Total		0.01	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.00	0.00

Criteria Air Pollutant Emissions Summary - Construction Unmitigated

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Total Construction Days	2021	2022	2023	2024	Calendar Days
739	88	260	260	131	1035

Unmigated Run - with Best Control Measures for Fugitive Dust

	average lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total		12	18	21	0	5	0	5	1	0	2
BAAQMD Threshold		54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold		No	No	NA	NA	NA	No	No	NA	No	NA

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
TOTAL 2021		2	31	17	0	3	1	4	1	0	1
TOTAL 2022		3	18	22	0	5	0	5	1	0	2
TOTAL 2023		2	15	21	0	5	0	5	1	0	2
TOTAL 2024		55	16	23	0	5	0	6	1	0	2
		43									

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Onsite		9.95	7.03	7.58	0.01	0.03	0.36	0.39	0.01	0.33	0.34
Total Offsite		1.84	11.16	13.45	0.07	4.69	0.05	4.73	1.27	0.04	1.31
		0	0			0	0		0	0	

FOR CONSTRUCTION RISK ASSESSMENT

Onsite Details

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2021 Onsite		0.81	7.84	7.48	0.01	0.27	0.42	0.69	0.05	0.40	0.45
2022 Onsite		0.69	7.03	7.15	0.01	0.00	0.37	0.37	0.00	0.34	0.34
2023 Onsite		0.63	6.42	7.10	0.01	0.00	0.32	0.32	0.00	0.29	0.29
2024 Onsite		52.99	7.70	9.43	0.02	0.00	0.36	0.36	0.00	0.34	0.34
		45	22	24	0	0	1	1	0	1	1

Offsite Details

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2021 Offsite		1.35	23.23	9.37	0.08	2.87	0.08	2.95	0.79	0.07	0.86
2022 Offsite		2.02	10.95	14.87	0.07	4.88	0.05	4.93	1.32	0.05	1.37
2023 Offsite		1.83	8.62	13.53	0.07	4.88	0.04	4.92	1.32	0.04	1.36
2024 Offsite		1.81	8.52	13.22	0.07	5.14	0.04	5.18	1.39	0.04	1.43
		5	40	38	0	13	0	13	4	0	4

Criteria Air Pollutant Emissions Summary - Construction

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Mitigated	4.19	5.90	8.10	0.03	1.74	0.03	1.77	0.47	0.02	0.50

MITIGATED

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Onsite	3.51	1.77	3.13	0.00	0.01	0.01	0.02	0.00	0.01	0.01
Total Offsite	0.68	4.13	4.97	0.03	1.73	0.02	1.75	0.47	0.02	0.49
check	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FOR CONSTRUCTION RISK ASSESSMENT - Mitigated Run

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2021 Onsite	0.01	0.21	0.37	0.00	0.01	0.00	0.01	0.00	0.00	0.00
2021 Offsite	0.06	1.02	0.41	0.00	0.13	0.00	0.13	0.03	0.00	0.04
2022 Onsite	0.03	0.58	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022 Offsite	0.26	1.42	1.93	0.01	0.63	0.01	0.64	0.17	0.01	0.18
2023 Onsite	0.03	0.58	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023 Offsite	0.24	1.12	1.76	0.01	0.63	0.00	0.64	0.17	0.00	0.18
2024 Onsite	3.44	0.40	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2024 Offsite	0.12	0.56	0.87	0.00	0.34	0.00	0.34	0.09	0.00	0.09

FOR CONSTRUCTION REGIONAL EMISSIONS - Mitigated Run

tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total 2021	0.07	1.23	0.78	0.00	0.14	0.00	0.14	0.04	0.00	0.04
Total 2022	0.29	2.01	2.97	0.01	0.63	0.01	0.64	0.17	0.01	0.18
Total 2023	0.27	1.70	2.79	0.01	0.63	0.01	0.64	0.17	0.01	0.18
Total 2024	3.56	0.96	1.56	0.01	0.34	0.00	0.34	0.09	0.00	0.10
Construction Total	0.36	3.23	3.75	0.01	0.77	0.01	0.79	0.21	0.01	0.22
Check	-3.83	-2.66	-4.35	-0.02	-0.97	-0.01	-0.98	-0.26	-0.01	-0.27

3.2 Demolition - 2021

Unmitigated Construction On-Site

Category (tons/yr)	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road	0.01	0.10	0.17	0.00		0.00	0.00		0.00	0.00
Total	0.01	0.10	0.17	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category (tons/yr)	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.3 Demolition Haul - 2021

Unmitigated Construction On-Site

Category (tons/yr)	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust					0.01	0.00	0.01	0.00	0.00	0.00
Off-Road	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00
Total	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category (tons/yr)	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.4 Site Preparation - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00	0.00	0.00	0.00	0.00	0.00
Off-Road		0.00	0.01	0.01	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.5 Grading - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00	0.00	0.00	0.00	0.00	0.00
Off-Road		0.00	0.02	0.04	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.6 Grading Soil Haul - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00	0.00	0.00	0.00	0.00	0.00
Off-Road		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.02	0.81	0.15	0.00	0.05	0.00	0.05	0.01	0.00	0.02
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.81	0.15	0.00	0.05	0.00	0.05	0.01	0.00	0.02

3.7 Building Construction and Pile Driving - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00	0.03	0.06	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.03	0.06	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.01	0.01	0.06	0.00	0.02	0.00	0.02	0.01	0.00	0.01
Total		0.01	0.05	0.07	0.00	0.02	0.00	0.02	0.01	0.00	0.01

3.8 Building Construction - 2021

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00	0.05	0.08	0.00		0.00	0.00		0.00	0.00
Total		0.00	0.05	0.08	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.11	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Worker		0.02	0.01	0.15	0.00	0.05	0.00	0.05	0.01	0.00	0.01
Total		0.02	0.12	0.17	0.00	0.05	0.00	0.05	0.01	0.00	0.01

3.8 Building Construction - 2022

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.03	0.58	1.04	0.00		0.00	0.00		0.00	0.00
Total		0.03	0.58	1.04	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.04	1.27	0.26	0.00	0.08	0.00	0.08	0.02	0.00	0.02
Worker		0.23	0.16	1.67	0.01	0.56	0.00	0.56	0.15	0.00	0.15
Total		0.26	1.42	1.93	0.01	0.63	0.01	0.64	0.17	0.01	0.18

3.8 Building Construction - 2023

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.03	0.58	1.04	0.00		0.00	0.00		0.00	0.00
Total		0.03	0.58	1.04	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.03	0.98	0.23	0.00	0.08	0.00	0.08	0.02	0.00	0.02
Worker		0.21	0.14	1.53	0.01	0.56	0.00	0.56	0.15	0.00	0.15
Total		0.24	1.12	1.76	0.01	0.63	0.00	0.64	0.17	0.00	0.18

3.7 Building Construction - 2024

Unmitigated Construction On-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.02	0.29	0.52	0.00		0.00	0.00		0.00	0.00
Total		0.02	0.29	0.52	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.01	0.49	0.11	0.00	0.04	0.00	0.04	0.01	0.00	0.01
Worker		0.10	0.06	0.71	0.00	0.28	0.00	0.28	0.08	0.00	0.08
Total		0.11	0.55	0.82	0.00	0.32	0.00	0.32	0.09	0.00	0.09

3.8 Paving - 2024

Unmitigated Construction On-Site

Category		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr										
Off-Road		0.01	0.09	0.14	0.00		0.00	0.00		0.00	0.00
Paving		0.00					0.00	0.00		0.00	0.00
Total		0.01	0.09	0.14	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr										
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.9 Architectural Coating - 2024

Unmitigated Construction On-Site

Category		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr										
Architectural Coating		3.42					0.00	0.00		0.00	0.00
Off Road		0.00	0.02	0.03	0.00		0.00	0.00		0.00	0.00
Total		3.42	0.02	0.03	0.00		0.00	0.00		0.00	0.00

Unmitigated Construction Off-Site

Category		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr										
Hauling		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker		0.01	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.00	0.00
Total		0.01	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.00	0.00

Criteria Air Pollutant Emissions Summary - Construction Mitigated

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Total Construction Days	2021	2022	2023	2024	Calendar Days
739	88	260	260	131	1035

Mitigated Run - with Tier 4 Interim Engines for eq. > 50 HP

	average lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total		11	16	22	0	5	0	5	1	0	1
BAAQMD Threshold		54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold		No	No	NA	NA	NA	No	No	NA	No	NA

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
TOTAL 2021		2	28	18	0	3	0	3	1	0	1
TOTAL 2022		2	15	23	0	5	0	5	1	0	1
TOTAL 2023		2	13	21	0	5	0	5	1	0	1
TOTAL 2024		54	15	24	0	5	0	5	1	0	1
		43									

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Onsite		10	5	8	0	0	0	0	0	0	0
Total Offsite		2	11	13	0	5	0	5	1	0	1
		0	0			0	0		0	0	

FOR CONSTRUCTION RISK ASSESSMENT

Onsite Details

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2021 Onsite		0.25	4.70	8.34	0.01	0.27	0.02	0.29	0.05	0.02	0.07
2022 Onsite		0.24	4.48	7.96	0.01	0.00	0.02	0.02	0.00	0.02	0.02
2023 Onsite		0.24	4.48	7.96	0.01	0.00	0.02	0.02	0.00	0.02	0.02
2024 Onsite		52.54	6.13	10.54	0.02	0.00	0.04	0.04	0.00	0.04	0.04
		44	15	26	0	0	0	0	0	0	0

Offsite Details

	avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2021 Offsite		1.35	23.23	9.37	0.08	2.87	0.08	2.95	0.79	0.07	0.86
2022 Offsite		2.02	10.95	14.87	0.07	4.88	0.05	4.93	1.32	0.05	1.37
2023 Offsite		1.83	8.62	13.53	0.07	4.88	0.04	4.92	1.32	0.04	1.36
2024 Offsite		1.81	8.52	13.22	0.07	5.14	0.04	5.18	1.39	0.04	1.43
		5	40	38	0	13	0	13	4	0	4

Criteria Air Pollutant Emissions Summary - Operations

Proposed Project

Mitigated Operational

		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr										
Area		2	0	2	0		0	0		0	0
Energy		0	0	0	0		0	0		0	0
Mobile		0	0	1	0	0	0	0	0	0	0
Waste							0	0		0	0
Water							0	0		0	0
Total		2	0	2	0	0	0	0	0	0	0
BAAQMD Threshold (T/YR)		10	10	NA	NA	NA	NA	15	NA	NA	10
Exceeds thresholds		No	No					No			No

Criteria Air Pollutant Emissions Summary - Operations

Annual emissions divided by 365 days/year to obtain average daily emissions.

Proposed Project

lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area	13	0	10	0	0	0	0	0	0	0
Energy	0	0	0	0	0	0	0	0	0	0
Mobile	1	0	3	0	1	0	1	0	0	0
Waste	0	0	0	0	0	0	0	0	0	0
Water	0	0	0	0	0	0	0	0	0	0
Total	13	0	13	0	1	0	1	0	0	0
BAAQMD Threshold (Daily)	54	54					82			54
Exceeds Threshold	No	No					No			No

GHG Emissions Inventory

Construction*

	$MTCO_2e$ Total Project**	
2021	387	
2022	955	
2023	927	
2024	492	
Total Construction	**2,761**	
30-Yr Amortized Construction Emissions***	**92**	
UCOP Carbon Neutrality Threshold	0	$MTCO_2e$/Year
Exceed Threshold?	**Yes**	

*CalEEMod, Version 2016.3.2.

Operation*

Project Operations		
Area	3	$MTCO_2e$/Year**
Energy	0	$MTCO_2e$/Year
Mobile	105	$MTCO_2e$/Year
Solid Waste	29	$MTCO_2e$/Year
Water	10	$MTCO_2e$/Year
Total Emissions	**147**	
UCOP Carbon Neutrality Threshold	0	$MTCO_2e$/Year
Exceed Threshold?	**Yes**	

*CalEEMod, Version 2016.3.2.25.

** $MTCO_2e$=metric tons of carbon dioxide equivalent.

*** Total construction emissions are amortized over 30 years per BAAQMD methodology; International Energy Agency, 2008, Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, March.

Criteria Air Pollutant Emissions Summary - Construction Unmitigated

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Total Construction Days	2021	2022	2023	2024	Calendar Days
787	88	260	260	179	1098

Unmigated Run - with Best Control Measures for Fugitive Dust

	average lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total		19.85	23	27	0	5	1	6	1	1	2
BAAQMD Threshold		54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold		No	No	NA	NA	NA	No	No	NA	No	NA

Criteria Air Pollutant Emissions Summary - Construction Mitigated

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Total Construction Days	2021	2022	2023	2024	Calendar Days
787	88	260	260	179	1098

Mitigated Run - with Tier 4 Interim Engines for eq. > 50 HP

	average lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total		19	20	28	0	5	0	5	1	0	2
BAAQMD Threshold		54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold		No	No	NA	NA	NA	No	No	NA	No	NA

Criteria Air Pollutant Emissions Summary - Operations

Housing Projects #1 and #2

Mitigated Operational

		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr										
Area		5	0	9	0	0	0	0	0	0	0
Energy		0	0	0	0	0	0	0	0	0	0
Mobile		0	0	2	0	0	0	0	0	0	0
Waste		0	0	0	0	0	0	0	0	0	0
Water		0	0	0	0	0	0	0	0	0	0
Combined Total		5.61	0.29	10.64	0.01	0.36	0.17	0.54	0.10	0.17	0.27
BAAQMD Threshold (T/YR)		10	10	NA	NA	NA	NA	15	NA	NA	10
Exceeds thresholds		No	No					No			No

Criteria Air Pollutant Emissions Summary - Operations

Annual emissions divided by 365 days/year to obtain average daily emissions.

Proposed Project

lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area	29	1	47	0	0	1	1	0	1	1
Energy	0	0	0	0	0	0	0	0	0	0
Mobile	2	1	11	0	2	0	2	1	0	1
Waste	0	0	0	0	0	0	0	0	0	0
Water	0	0	0	0	0	0	0	0	0	0
Combined Total	31	2	58	0	2	1	3	1	1	1
BAAQMD Threshold (Daily)	54	54					82			54
Exceeds Threshold	No	No					No			No

GHG Emissions Inventory

Construction*

	Housing Project #1	Housing Project #2	Total
		$MTCO_2e$ Total Project**	
2021	387	0	387
2022	955	0	955
2023	927	484	1,411
2024	492	138	630
Total Construction	**2,761**	**622**	**3,384**
30-Yr Amortized Construction Emissions***	**92**	**21**	**113**
*CalEEMod, Version 2016.3.2.			

Operation*

Project Operations				
	Housing Project #1	**Housing Project #2**	**Total**	
Area	3	22	25	$MTCO_2e$/Year**
Energy	0	0	0	$MTCO_2e$/Year
Mobile	105	183	288	$MTCO_2e$/Year
Solid Waste	29	48	77	$MTCO_2e$/Year
Water	10	16	27	$MTCO_2e$/Year
30-Yr Amortized Construction	92	21	113	$MTCO_2e$/Year
Total Emissions	**239**	**291**	**530**	**$MTCO_2e$/Year**
UCOP Carbon Neutrality Threshold	0	0	0	$MTCO_2e$/Year
Exceed Threshold?	**Yes**	**Yes**	**Yes**	

*CalEEMod, Version 2016.3.2.25.

** $MTCO_2e$=metric tons of carbon dioxide equivalent.

*** Total construction emissions are amortized over 30 years per BAAQMD methodology; International Energy Agency, 2008, Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, March.

Assumptions Worksheet

CalEEMod Inputs - UC Berkeley Anchor House Development, Construction

Name:	University of California, Berkeley Anchor House
Project Number:	UCB-01
Project Location:	southwest corner of Berkeley Way and Oxford St
County:	Alameda County
Source Receptor Area (SRA):	11- South San Gabriel Valley
Climate Zone:	5
Land Use Setting:	Urban
Operational Year:	2024
Utility Company:	EBCE - Renewable 100
Air Basin:	SFBAAB
Air District:	Bay Area Air Quality Management District (BAAQMD)

Project Site Acreage	0.92
Disturbed Site Acreage	0.92

Existing	SQFT	Acres	
Existing Structures	41,000		
Anchor House			
Residential	**SQFT**	**Acres**	**Students or Employees**
Residential	235,000		770
Amenities	91,000		
Rooftop Garden	22,000		
Offices	2,000		8
Utilities	101,000		
Total Residential	**451,000**	**0.69**	**778**
Campus Life	**SQFT**	**Acres**	**Students or Employees**
Fitness	6,000		
Commuter Lounge	1,500		
Mezzanine	6,000		
Events Center	6,500		
Restrooms	2,600		
Total Campus Life	**22,600**	**0**	**0**
Public and Non-University	**SQFT**	**Acres**	**Students or Employees**
Total Retail	15,000		26
Office	8,000		26
Total Public and University	**23,000**	**0**	**52**
Total Nonresidential	**45,600**	**0**	**52**
Parking	**SQFT**	**Acres**	**Parking**
Parking	26,800	0	40
Long Term Bicycle Parking	2,600	0	250
Total Parking	**29,400**	**0**	
Pervious/Impervious Surfaces			
Total Hardscape	9,100	0.21	
Total Landscape	1,050	0.02	
Total Surfaces	**10,150**	**0.23**	

Notes:

In accordance with UC Berkeley carbon neutrality initiative, energy from EBEC would be from the Renewable 100 (zero carbon intensity electricty)

The proposed Housing Project #1 would be a LEED-Certified Gold project, with a potential for Platinum Certification.

24 solar PV panels located on the roof occupying 30 percent of the roof area and provide up to 25 kilowatts of electricity. It is anticipated that the power generated by the solar panels would provide approximately 30 percent of the building's cooling requirement

CalEEMod Land Use Inputs

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Residential	Apartments (High Rise)	770	DU	0.69	451,000
Retail	Convenience Market (24 Hr)	15.000	1000 sqft	0	15,000
Recreational	Health Club	22.600	1000 sqft	0	22,600
Commercial	General Office Building	8.000	1000 sqft	0	8,000
Parking	Enclosed Parking w/Elevator	29.400	1000 sqft	0	29,400
Parking	Other Non-asphalt Surfaces	10.150	1000 sqft	0.23	10,150
				0.92	

Demolition

Component	Tons Demolished	Haul Truck Capacity (tons)	Haul Distance (miles)	Total Trip Ends	Duration (days)	Trip Ends/ day
Existing Structures	1886	20	20	189	44	4

Soil Haul

Construction Activities	Haul Volume (cy)	Haul Truck Capacity (CY)	Haul Distance (miles)	Total Trip Ends	Duration (days)	Trip Ends/ day
Grading (Export -2 subterranean)	48000	16	20	6,000	9	667

**additional 12,000 cy of export for second story of underground parking*

Architectural Coating

	% Painted
Interior	100%
Exterior	100%

	VOC Content (grams per liter)
Interior	100
Exterior	150

Source: BAAQMD Regulation 8, Rule 3

Non-Residential Structures	Land Use Square Feet	CalEEMod Factor[(a)]	Total Paintable Surface Area	Paintable Interior Area[(b)]	Paintable Exterior Area[(b)]
Total Residential	451,000	2.7	1,217,700	913,275	304,425
Retail	15,000	2.0	30,000	22,500	7,500
Recreational	22,600	2.0	45,200	33,900	11,300
Commercial	8,000	2.0	16,000	12,000	4,000
Total Non-Residential	45,600	2.0	91,200	68,400	22,800
Parking Lot[(c)]	29,400	6%	1,764	-	1,764
			1,764		1,764

[(a)] The program assumes the total surface for painting equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage defined by the user. Architectural coatings for the parking lot is based on CalEEMod methodology applied to a surface parking lot (i.e., striping), in which 6% of surface area is painted.
[(b)] CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively.
[(c)] assumes only parking area (both car and bike) would be striped

BAAQMD Construction BMPs

Replace Ground Cover	PM10:	5	% Reduction
Replace Ground Cover	PM2.5:	5	% Reduction
	PM25:	5	% Reduction
Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	15	mph
	Clean Paved Road	9	% PM Reduction

Construction Activities and Schedule Assumptions: UC Berkeley Anchor House Development

** Construction schedule provided by applicant (9/2021 - 7/2024)*

		Construction Schedule		
Construction Activities	**Phase Type**	**Start Date**	**End Date**	**CalEEMod Duration**
Demolition	Demolition	9/1/2021	9/14/2021	10
Demolition Debris Haul	Demolition	9/1/2021	9/14/2021	10
Site Preparation	Site Preparation	9/15/2021	9/15/2021	1
Grading	Grading	9/16/2021	9/17/2021	2
Grading Soil Haul (if applicable)	Grading	9/16/2021	9/17/2021	2
Building Construction	Building Construction	9/18/2021	2/4/2022	100
Architectural Coating	Architectural Coating	1/30/2022	2/4/2022	5
Paving	Paving	1/30/2022	2/4/2022	5

Normalization Calculations *

CalEEMod Defaults Demolition, Site Preparation, and Grading Durations	
16	days of construction
0.04	years of construction
0.53	months of construction

Assumed Construction Duration	
9/1/2021	11/10/2021
70	days
2.30	months
Norm Factor: 4.38	

*data request mentions 10 week duration for Demo, Site Prep, and Grading activities

CalEEMod Defaults Construction Duration	
139	days of construction
0.38	years of construction
4.57	months of construction

Assumed Construction Duration	
11/11/2021	7/1/2024
963	days
31.66	months
Norm Factor: 6.93	

CalEEMod Construction Schedule Inputs

Construction Activities	**Phase Type**	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Demolition	Demolition	9/1/2021	11/1/2021	44
Demolition Debris Haul	Demolition	9/1/2021	11/1/2021	44
Site Preparation	Site Preparation	11/2/2021	11/8/2021	5
Grading	Grading	11/9/2021	11/21/2021	9
Grading Soil Haul	Grading	11/9/2021	11/21/2021	9
Building Construction and Pile Driving *	Building Construction	11/22/2021	12/2/2021	9
Building Construction	Building Construction	12/3/2021	7/1/2024	672
Architectural Coating	Architectural Coating	5/14/2024	7/1/2024	35
Paving	Paving	5/14/2024	7/1/2024	35

**assuming that building construction/pile driving phase will have the same duration as grading (9 days*

CalEEMod Construction Off-Road Equipment Inputs

**Based on CalEEMod defaults, assumed equipment would not be shared for most conservative result:*

General Construction Hours: 8 hours btwn 7:00 AM to 4:00 PM (with 1 hr break), Mon-Fri

	Construction Equipment Details						
	Equipment	**model**	**# of Equipment**	**hr/day**	**hp**	**load factor***	**total trips**
Demolition							
	Concrete/Industrial Saws		1	8	81	0.73	
	Rubber Tired Dozers		1	1	247	0.4	
	Tractors/Loaders/Backhoes		2	6	97	0.37	
	Worker Trips						20
	Vendor Trips						0
	Hauling Trips						0
	Water Trucks						4
Demolition Haul							
	no additional equipment required for demolition haul						
	Worker Trips						0
	Vendor Trips						0
	Hauling Trips						189
Site Preparation							
	Graders		1	8	187	0.41	
	Tractors/Loaders/Backhoes		1	8	97	0.37	
	Worker Trips						5
	Vendor Trips						0
	Hauling Trips						0
	Water Trucks						4
Grading							
	Concrete/Industrial Saws		1	8	81	0.73	
	Rubber Tired Dozers		1	1	247	0.4	
	Tractors/Loaders/Backhoes		2	6	97	0.37	
	Worker Trips						10
	Vendor Trips						0
	Hauling Trips						0
	Water Trucks						4
Grading Soil Haul							
	no additional equipment required for grading soil haul						
	Worker Trips						0
	Vendor Trips						0
	Hauling Trips						6000
Building Construction and Pile Driving							
	Cranes		1	4	231	0.29	
	Forklifts		2	6	89	0.2	
	Tractors/Loaders/Backhoes		2	8	97	0.37	
	Bore/Drill Rigs		1	8	221	0.5025	
	Worker Trips						588
	Vendor Trips						96
	Hauling Trips						0
Building Construction							
	Cranes		1	4	231	0.29	
	Forklifts		2	6	89	0.2	
	Tractors/Loaders/Backhoes		2	8	97	0.37	
	Worker Trips						588
	Vendor Trips						96
	Hauling Trips						0
Paving							
	Cement and Mortar Mixers		4	6	9	0.56	
	Pavers		1	7	130	0.42	
	Rollers		1	7	80	0.38	
	Tractors/Loaders/Backhoes		1	7	97	0.37	
	Worker Trips						18
	Vendor Trips						0
	Hauling Trips						0
Architectural Coating							
	Air Compressors		1	6	78	0.48	
	Worker Trips						118
	Vendor Trips						0
	Hauling Trips						0

Construction Trips Worksheet

Phase Name	Worker Trip Ends Per Day	Vendor Trip Ends Per Day	Haul Truck Trip Ends Per Day	Total Haul Truck Trip Ends	Start Date	End Date	Workdays
Demolition and Debris Haul	20	4	5	189	9/1/2021	11/1/2021	44
Site Preparation	5	4	0	0	11/2/2021	11/8/2021	5
Grading and Soil Haul	10	4	667	6000	11/9/2021	11/21/2021	9
Building Construction and Pile Driving	588	96	0	0	11/22/2021	7/1/2024	681
Building Construction	588	96	0	0	11/22/2021	7/1/2024	681
Building Construction, Architectural Coating, and Paving	724	96	0	0	5/14/2024	7/1/2024	35
Maximum Daily Trips	**724**	**96**	**667**	**6000**			

Demo Haul Trip Calculation

*Conversion factors**

0.046	ton/SF
1.2641662	tons/cy
20	tons
15.82070459	CY
0.791035229	CY/ton

Building	BSF Demo	Tons/SF	Tons	Haul Truck (CY)	Haul Truck (Ton)	Round Trips	Total Trip Ends
Combined Building Demo	41,000	0.046	1886	16	20.00	94	189

*CalEEMod User's Guide Version 2016.3.2, Appendix A

CalEEMod Inputs - UC Berkeley Anchor House Development, Operations

Name:	University of California, Berkeley Anchor House
Project Number:	UCB-01
Project Location:	southwest corner of Berkeley Way and Oxford St
County:	Alameda County
Climate Zone:	5
Land Use Setting:	Urban
Operational Year:	2024
Utility Company:	EBCE - Renewable 100
Air Basin:	SFBAAB
Air District:	Bay Area Air Quality Management District (BAAQMD)

Project Site Area: 0.92 acres

Land Use	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Residential	Residential	Apartments (High Rise)	244.00	DU	0.69	451,000
Market	Retail	Convenience Market (24 Hr)	15.00	1000 sqft	0.00	15,000
Campus Life	Recreational	Health Club	22.60	1000 sqft	0.00	22,600
Office	Commercial	General Office Building	8.00	1000 sqft	0.00	8,000
Parking Garage	Parking	Enclosed Parking w/Elevator	29.40	1000 sqft	0.00	29,400
Pervious/Impervious Surfaces	Parking	Other Non-asphalt Surfaces	10.15	1000 sqft	0.23	10,150
					0.92	

Trip Generation

Housing Project #1: Anchor House

Use	Amount	Units	Trip Rate	Daily Trips	Annual VMT	Daily VMT	
Beds	770	beds	0.30	231.0	174,547	480	48.72%
Staff	8	staff	1.04	8.3	162,279	446	45.29%
Retail	15.00	KSF	7.47	112.1	103,441	284	28.87%
Office	8.00	KSF	2.92	23.4	43,603	120	12.17%
Misc (Deliveries, etc.)				18.7	1,950	5	0.54%
Existing Apartments	16.00	Units	(1.7)	-27.0	-127,546	-350	-35.60%
Total				**367**	**358,274.69**	**984.27**	**100%**

Daily Trips

	Housing	Public Market	Total
Passenger	236	112	348
Heavy Vehicle	19		19
Total	254	112	367

Daily VMT

	Housing	Public Market	Total	Fleet Mix
Passenger	695	284	979	99.46%
Heavy Vehicle	5	0	5	0.54%
Total	700	284	984	100%

Total Daily Trips

	Weekday	Saturday	Sunday	Fleet Mix
Light Duty	348	348	348	94.89%
Delivery Vans/Trucks	19	19	19	5.11%
Total	367	367	367	100%

Trip Rate per DU

Weekday	Saturday	Sunday
1.5023	1.5023	1.5023

Trips[2]	Average VMT/Trip[3]	Miles/day	Annual VMT
367	2.6851	984	358,275

Land Use Trip Breakdown:	Lighty Duty/Main	
Weekday Trip Rate	1.5023	trips/DU
Saturday Trip Rate	1.5023	trips/DU
Sunday Trip Rate	1.5023	trips/DU
Non-Res C-C Trip Length	2.6851	miles/trip
Non-Res C-W Trip Length	0	miles/trip
Non-Res C-NW Trip Length	0	miles/trip
Primary Trip %	100%	
Divert Trip %	0%	
Passby Trip %	0%	
Non-Res C-C Trip %	0%	passenger
Non-Res C-W Trip %	100%	MDT
Non-Res C-NW Trip %	0%	HDT

Water Use

Septic Tank	0%
Aerobic	100%
Facultative Lagoons	0%

Total Water Demand:	17,798,130	gallons/year
Total Indoor Water Use:[1]	16,727,950	gallons/year
Total Outdoor Water Use:[1]	1,070,180	gallons/year

[1] *See Table 5.17-5 in Chapter 5-17, Utilities and Service Systems, in the DEIR.*

Solid Waste CalEEMod Defaults*

Solid Waste Generation:* 58.1 tons/year**

**See Table 5.17-12 in Chapter 5-17, Utilities and Service Systems, in the DEIR.*
***For purposes of modeling, solid waste for the entirety of Housing Project #1 is assigned to the student housing land use.*

**CalEEMod default*

Architectural Coating

	% Painted
Interior	100%
Exterior	100%

	VOC Content (grams per liter)
Interior	100
Exterior	150

Source: BAAQMD Regulation 8, Rule 3

Non-Residential Structures	Land Use Square Feet	CalEEMod Factor[(a)]	Total Paintable Surface Area	Paintable Interior Area[(b)]	Paintable Exterior Area[(b)]
Total Residential	451,000	2.7	1,217,700	913,275	304,425
Retail	15,000	2.0	30,000	22,500	7,500
Recreational	22,600	2.0	45,200	33,900	11,300
Commercial	8,000	2.0	16,000	12,000	4,000
Total Non-Residential	45,600	2.0	91,200	68,400	22,800
Parking Lot(c)	29,400	6%	1,764	-	1,764
			1,764		1,764

[(a)] The program assumes the total surface for painting equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage defined by the user. Architectural coatings for the parking lot is based on CalEEMod methodology applied to a surface parking lot (i.e., striping), in which 6% of surface area is painted.
[(b)] CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively.
[(c)] assumes only parking area (both car and bike) would be striped

Electricity (Buildings)

Buildings constructed after January 1, 2020 are required to meet the 2019 Building Energy Efficiency Standards, which are result in 10.7 percent and 1 percent more energy efficiency for electricity and natural gas, respectively, for non-residential uses compared to the 2016 Building Energy Efficiency Standards. For purposes of this analysis, the increases in energy efficiencies for non-residential buildings are used because the proposed residential buildings are taller than three stories in height.

	Electricty	Natural Gas
Efficiency Increase Over 2016 Title 24:[1]	10.7%	1.0%

[1] *NORESCO. 2018, June 29. Impact Analysis: 2019 Update to California Energy Efficiency Standards for Residential and Non-Residential Buildings.*

CalEEMod Default Energy Rates

Land Use	Title 24 Electricity	Non-Title 24 Electricity	Lighting Electricity	Title 24 Natural Gas	Non-Title 24 Natural Gas
Apartments High Rise	426.45	3054.10	741.44	6115.43	2615.00
Convenience Market (24 Hour)	2.24	3.36	4.88	3.90	0.70
Enclosed Parking with Elevator	3.92	0.19	1.75	0.00	0.00
General Office Building	4.10	4.80	3.58	18.32	1.01
Health Club	1.21	3.36	2.99	17.85	6.90
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00

Adjusted Energy Rates

Land Use	Title 24 Electricity	Non-Title 24 Electricity	Lighting Electricity	Title 24 Natural Gas	Non-Title 24 Natural Gas
Apartments High Rise	380.82	3054.10	741.44	6054.28	2615.00
Convenience Market (24 Hour)	2.00	3.36	4.88	3.86	0.70
Enclosed Parking with Elevator	3.50	0.19	1.75	0.00	0.00
General Office Building	3.66	4.80	3.58	18.14	1.01
Health Club	1.08	3.36	2.99	17.67	6.90
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00

Fuel Switching - Adjustment Factor[1]

	Annual Energy Consumption[2]	
PGE Cimate Zone 3	**Electricity (kwh/yr)**	**Natural Gas (therms/yr)**
Mixed Fuel Baseline (Small Hotel CZ03)	183,772	12,341
Package 2 Fuel Switching Net Change (Small Hotel CZ03)[3]	110,595	(12,322)
Total	294,367	19
Percent Net Change	**60.18%**	**-99.85%**

Adjusted Energy Rates with Fuel Switching

Land Use	Title 24 Electricity	Non-Title 24 Electricity	Lighting Electricity	Title 24 Natural Gas[4]	Non-Title 24 Natural Gas[4]
Apartments High Rise	610.00	4892.07	1187.64	0.00	0.00
Convenience Market (24 Hour)	3.20	5.38	7.82	0.00	0.00
Enclosed Parking with Elevator	5.61	0.30	2.80	0.00	0.00
General Office Building	5.86	7.69	5.73	0.00	0.00
Health Club	1.73	5.38	4.79	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00

[1] 2019, July 25. 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study. https://efiling.energy.ca.gov/GetDocument.aspx?tn=233820-6&DocumentContentId=66490
[2] Based on the Small Hotel results.
[3] Package 2: All-Electric Federal Code-Minimum Reference is defined as all-electric design with federal code minimum appliance efficiency with no solar photovoltaic or battery included.
[4]assuming all energy from electricity

Carbon Intensity Factors

East Bay Community Carbon Intensity Factors

EBC CO_2 Intensity Factor[1]	0	pounds per megawatt hour

CO2:	0	pounds per megawatt hour
CH4:[2]	0	pound per megawatt hour
N2O:[2]	0	pound per megawatt hour

[1] *The Climate Registry CRIS Public Reports: 2018 Emission Rates. https://www.theclimateregistry.org/our-members/cris-public-reports/*
[2] *CalEEMod default values.*
[3] *Pacific Gas & Electric. 2019 Corporate Responsibility and Sustainability Report. http://www.pgecorp.com/corp_responsibility/reports/2019/assets/PGE_CRSR_2019.pdf*
[4] *For purposes of the analysis, it is anticipated that SCE would meet the 2024 RPS target of 44 percent renewables as established under Senate Bill 100.*
[5] *For purposes of the analysis, it is anticipated that SCE would meet the 2026 RPS target of 50 percent renewables as established under Senate Bill 100.*

Changes to the CalEEMod Defaults - Year 2024

Total VMT 367

Commercial Default	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	
FleetMix (Model Default)	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690	100%
Trips	1,573	106	532	297	41	14	70	131	6	7	15	1	2	2,796
Percent	80%			16%				5%						100%
Proportion	0.706367	0.047788	0.238989	0.677998	0.094499	0.032897	0.158807	1.000000	0.014168	0.015042	0.006856	0.002188	0.004402	
Assumed Mix	99.46%			0.00%				0.54%						100.00%
adjusted with Assumed	0.702522	0.047528	0.237688	0	0	0	0	0.005443	0	0	0.006819	0	0	100%
Trips	258	17	87	0	0	0	0	2	0	0	2	0	0	367
	70%	5%	24%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	100%
Modified	0.702522	0.047528	0.237688	0	0	0	0	0.005443	0	0	0.006819	0	0	100.0%
Final Check Trips	258	17	87	0	0	0	0	2	0	0	2	0	0	367
	99.46%					0%		0.54%						

EMFAC2017 Derived CalEEMod Annual Emission Rates: Year 2024[1,2]

Season	Pollutant	LDA	LDT1	LDT2	MDV	LHDT1	LHDT2	MHDT	HHDT	OBUS	UBUS	MCY	SBUS	MH
Annual	CH4_IDLEX	0	0	0	0	0.0052024	0.003539797	0.002679436	0.023864592	0.0084044	0	0	0.074002	0
Annual	CH4_RUNEX	0.0018586	0.0036823	0.0028977	0.0033472	0.0082266	0.006748854	0.001319266	0.029753049	0.0064163	1.1232746	0.3412793	0.0042524	0.0045419
Annual	CH4_STREX	0.046752	0.0631037	0.0641982	0.0745267	0.0144223	0.009171146	0.006748834	2.0183E-07	0.0221928	0.0010808	0.2586594	0.0062913	0
Annual	CO_IDLEX	0	0	0	0	0.1866333	0.146833831	0.353967642	6.632111868	0.5848555	0	0	2.9937139	0
Annual	CO_RUNEX	0.5279103	0.8365583	0.7043593	0.7478604	0.7461539	0.595517522	0.195122064	0.345655331	0.7191185	8.2676302	19.808124	0.3374097	0.3358228
Annual	CO_STREX	2.1697894	2.3617605	2.7790584	3.0747203	1.0795062	0.684678345	0.776787429	0.003927356	2.4622978	0.0728277	9.1293495	0.9127548	0
Annual	CO2_NBIO_IDLEX	0	0	0	0	8.8656298	13.52648266	72.83829025	1083.40419	84.593	0	0	343.38214	0
Annual	CO2_NBIO_RUNEX	244.53061	292.81916	312.24655	375.195	791.33996	781.1945998	1042.25181	1374.344725	1439.193	1618.2486	215.2568	980.92522	985.92311
Annual	CO2_NBIO_STREX	51.825034	62.693346	67.402805	80.527562	11.924876	8.80436705	6.730201263	0.043806745	19.375362	0.838955	61.484056	5.2770533	0
Annual	NOX_IDLEX	0	0	0	0	0.0552692	0.086279785	0.414794519	5.466029319	0.3264103	0	0	2.7793796	0
Annual	NOX_RUNEX	0.0314132	0.0685836	0.0578256	0.0685989	0.6732422	0.765807707	1.438750416	2.59288958	1.2562723	0.7073719	1.164813	3.3393773	3.7083193
Annual	NOX_STREX[3]	0.1757979	0.2330414	0.2602784	0.3097256	0.3246601	0.210616331	1.826898786	2.280435267	0.8237325	0.0091231	0.2737062	1.1383826	0
Annual	PM10_IDLEX	0	0	0	0	0.0008091	0.001317454	0.000309083	0.002342724	0.0001098	0	0	0.0027621	0
Annual	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.061241369	0.13034	0.0741758	0.01176	0.7448002	0.13034
Annual	PM10_PMTW	0.008	0.008	0.008	0.008	0.0097145	0.010605473	0.012000003	0.035701984	0.012	0.0316072	0.004	0.0105098	0.016
Annual	PM10_RUNEX	0.0013776	0.0017052	0.001397	0.0014899	0.009814	0.014557754	0.006892343	0.02539138	0.007232	0.005175	0.0020936	0.020444	0.0728988
Annual	PM10_STREX	0.0017011	0.002199	0.0017239	0.0018535	0.0002508	0.000136446	7.67148E-05	2.74318E-07	0.0001927	6.368E-06	0.0030603	7.658E-05	0
Annual	PM25_IDLEX	0	0	0	0	0.0007741	0.001260462	0.000295712	0.002241379	0.000105	0	0	0.0026427	0
Annual	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.026246301	0.05586	0.0317896	0.00504	0.3192001	0.05586
Annual	PM25_PMTW	0.002	0.002	0.002	0.002	0.0024286	0.002651368	0.003000001	0.008925496	0.003	0.0079018	0.001	0.0026274	0.004
Annual	PM25_RUNEX	0.0012694	0.0015692	0.0012859	0.001374	0.0093411	0.01390107	0.006590133	0.024292947	0.0069006	0.0049507	0.0019568	0.0195396	0.0697453
Annual	PM25_STREX	0.0015641	0.0020219	0.001585	0.0017043	0.0002306	0.000125457	7.05364E-05	2.52225E-07	0.0001772	5.855E-06	0.0028788	7.041E-05	0
Annual	ROG_DIURN	0.0350534	0.0754367	0.0551855	0.0632978	0.0017642	0.001014008	0.000254078	1.40578E-06	0.0014529	0.0001439	0.7995634	0.0003758	0
Annual	ROG_HTSK	0.0941196	0.1649076	0.1206476	0.1355647	0.0738147	0.044356723	0.013808457	7.19747E-05	0.0232747	0.0008457	0.7104472	0.0036841	0
Annual	ROG_IDLEX	0	0	0	0	0.0212458	0.016868074	0.014901842	0.447764183	0.0506226	0	0	0.3327902	0
Annual	ROG_RESTL	0.034966	0.0688998	0.0587641	0.0680298	0.0010184	0.000600492	0.00015175	9.44782E-07	0.0006903	3.797E-05	0.4923244	0.00018	0
Annual	ROG_RUNEX	0.0070558	0.0156208	0.011477	0.0138263	0.0898295	0.1045695	0.013980948	0.024182556	0.0364796	0.0161716	2.3164427	0.0562439	0.0977834
Annual	ROG_RUNLS	0.2089027	0.6094387	0.4278856	0.4499682	0.5326266	0.288241935	0.077794486	0.000369116	0.2700917	0.0051721	2.0880542	0.0245621	0
Annual	ROG_STREX	0.2074947	0.3067316	0.2956063	0.3656767	0.0722245	0.045430135	0.035471193	1.05561E-06	0.1152615	0.0047203	1.980415	0.0348935	0
Annual	SO2_IDLEX	0	0	0	0	8.607E-05	0.000129564	0.000690245	0.01014259	0.0008054	0	0	0.003276	0
Annual	SO2_RUNEX	0.0023702	0.0028389	0.0030268	0.0036352	0.0077306	0.007559592	0.009909888	0.012732084	0.0139484	0.012021	0.0021301	0.0094021	0.0093205
Annual	SO2_STREX	0.0005025	0.0006078	0.0006535	0.0007807	0.000118	8.71263E-05	6.66008E-05	4.33503E-07	0.0001917	8.302E-06	0.0006084	5.222E-05	0
Annual	TOG_DIURN	0.0350884	0.0755121	0.0552407	0.0633611	0.0017642	0.001014008	0.000254078	1.40578E-06	0.0014529	0.0001439	0.7995634	0.0003758	0
Annual	TOG_HTSK	0.0942136	0.1650724	0.1207681	0.1357002	0.0738147	0.044356723	0.013808457	7.19747E-05	0.0232747	0.0008457	0.7104472	0.0036841	0
Annual	TOG_IDLEX	0	0	0	0	0.0299825	0.022971759	0.019874584	0.512829248	0.0664233	0	0	0.478985	0
Annual	TOG_RESTL	0.0350009	0.0689687	0.0588229	0.0680978	0.0010184	0.000600492	0.00015175	9.44782E-07	0.0006903	3.797E-05	0.4923244	0.00018	0
Annual	TOG_RUNEX	0.0102586	0.0228036	0.0167268	0.0200988	0.1103155	0.122392702	0.017230806	0.056347308	0.0508907	1.1465249	2.8692488	0.0671638	0.1113199
Annual	TOG_RUNLS	0.2091116	0.6100482	0.4283135	0.4504181	0.5326266	0.288241935	0.077794486	0.000369116	0.2700917	0.0051721	2.0880542	0.0245621	0
Annual	TOG_STREX	0.2274305	0.3362017	0.3240077	0.400809	0.0790767	0.04974028	0.038836491	1.15576E-06	0.1261969	0.0051681	2.1552766	0.0382039	0
Summer	CH4_IDLEX	0	0	0	0	0.0052188	0.003550739	0.002535281	0.02524291	0.0084979	0	0	0.0741132	0
Summer	CH4_RUNEX	0.0021097	0.0041386	0.0032761	0.0037832	0.0084482	0.006839244	0.001354541	0.029754326	0.0066615	1.1232761	0.3305148	0.0043309	0.0045419
Summer	CH4_STREX	0.0388011	0.0519919	0.0531775	0.0616886	0.0135329	0.008606929	0.006312881	1.86854E-07	0.0206695	0.0009514	0.2129377	0.0052	0
Summer	CO_IDLEX	0	0	0	0	0.1866333	0.146833831	0.307383508	6.542282649	0.5800043	0	0	2.9638361	0

Summer	CO_RUNEX	0.6257075	0.9791317	0.8301339	0.8797118	0.7650061	0.60258079	0.198621628	0.346206925	0.7440606	8.2677043	18.774086	0.3446734	0.3358228
Summer	CO_STREX	1.6607454	1.8028189	2.1223574	2.3423512	0.9939917	0.630826001	0.706744848	0.003573294	2.2230923	0.0583365	7.8025367	0.6514733	0
Summer	CO2_NBIO_IDLEX	0	0	0	0	8.8656298	13.52648266	72.62691298	1070.116544	83.638521	0	0	348.61767	0
Summer	CO2_NBIO_RUNEX	263.95726	312.85378	331.6339	394.66653	791.37487	781.2075261	1042.258045	1374.345629	1439.2377	1618.2487	213.27359	980.93831	985.92311
Summer	CO2_NBIO_STREX	50.873915	61.593694	66.156895	79.114147	11.773453	8.709035722	6.610897002	0.043245282	18.968543	0.8139812	58.150508	4.8424647	0
Summer	NOX_IDLEX	0	0	0	0	0.0552692	0.086279785	0.404296595	5.208857239	0.3101813	0	0	2.8182677	0
Summer	NOX_RUNEX	0.0279249	0.0604106	0.0511586	0.0607216	0.6407732	0.733255319	1.38048075	2.496430709	1.1916293	0.7071803	1.0171776	3.1995416	3.5641858
Summer	NOX_STREX[3]	0.1538761	0.2040356	0.2278429	0.2711256	0.3001265	0.194700664	1.821960883	2.280425943	0.8053793	0.0084232	0.2488619	1.1335286	0
Summer	PM10_IDLEX	0	0	0	0	0.0008091	0.001317454	0.000263955	0.002062059	9.755E-05	0	0	0.0023374	0
Summer	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.061241369	0.13034	0.0741758	0.01176	0.7448002	0.13034
Summer	PM10_PMTW	0.008	0.008	0.008	0.008	0.0097145	0.010605473	0.012000003	0.035701984	0.012	0.0316072	0.004	0.0105098	0.016
Summer	PM10_RUNEX	0.0013776	0.0017052	0.001397	0.0014899	0.009814	0.014557754	0.006892343	0.02539138	0.007232	0.005175	0.0020936	0.020444	0.0728988
Summer	PM10_STREX	0.0017011	0.002199	0.0017239	0.0018535	0.0002508	0.000136446	7.67148E-05	2.74318E-07	0.0001927	6.368E-06	0.0030603	7.658E-05	0
Summer	PM25_IDLEX	0	0	0	0	0.0007741	0.001260462	0.000252537	0.001972855	9.333E-05	0	0	0.0022363	0
Summer	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.026246301	0.05586	0.0317896	0.00504	0.3192001	0.05586
Summer	PM25_PMTW	0.002	0.002	0.002	0.002	0.0024286	0.002651368	0.003000001	0.008925496	0.003	0.0079018	0.001	0.0026274	0.004
Summer	PM25_RUNEX	0.0012694	0.0015692	0.0012859	0.001374	0.0093411	0.01390107	0.006590133	0.024292947	0.0069006	0.0049507	0.0019568	0.0195396	0.0697453
Summer	PM25_STREX	0.0015641	0.0020219	0.001585	0.0017043	0.0002306	0.000125457	7.05364E-05	2.52225E-07	0.0001772	5.855E-06	0.0028788	7.041E-05	0
Summer	ROG_DIURN	0.0870596	0.1904757	0.1344924	0.1540702	0.0043311	0.002481391	0.000633839	3.56187E-06	0.003456	0.0003436	2.326181	0.0009268	0
Summer	ROG_HTSK	0.1031335	0.1867835	0.1325043	0.1486416	0.0819275	0.049759461	0.015386941	7.7743E-05	0.0247217	0.0009311	0.9553531	0.0038711	0
Summer	ROG_IDLEX	0	0	0	0	0.0212458	0.016868074	0.014529566	0.474096851	0.0520148	0	0	0.3330056	0
Summer	ROG_RESTL	0.0741517	0.1475925	0.1223342	0.1421739	0.0021675	0.001278299	0.000334365	2.13343E-06	0.0014622	7.909E-05	1.4175846	0.0004101	0
Summer	ROG_RUNEX	0.0078646	0.0173136	0.0127685	0.0153443	0.0909938	0.10497079	0.014140371	0.024189525	0.0376886	0.0161758	2.2204431	0.0566111	0.0977834
Summer	ROG_RUNLS	0.1951246	0.559625	0.3943643	0.4159454	0.514293	0.277809189	0.07465415	0.000359084	0.2622244	0.0046587	1.9446594	0.0207495	0
Summer	ROG_STREX	0.1692141	0.2485566	0.2407042	0.2974584	0.0674947	0.042459454	0.033003962	9.82187E-07	0.107021	0.0041232	1.6101926	0.0288047	0
Summer	SO2_IDLEX	0	0	0	0	8.607E-05	0.000129564	0.000688354	0.010017894	0.0007963	0	0	0.0033254	0
Summer	SO2_RUNEX	0.0025586	0.0030331	0.0032147	0.003824	0.0077309	0.00755972	0.00990995	0.012732093	0.0139489	0.012021	0.0021105	0.0094022	0.0093205
Summer	SO2_STREX	0.0004932	0.0005972	0.0006414	0.000767	0.0001165	8.6183E-05	6.54202E-05	4.27947E-07	0.0001877	8.055E-06	0.0005754	4.792E-05	0
Summer	TOG_DIURN	0.0871463	0.190666	0.1346267	0.1542241	0.0043311	0.002481391	0.000633839	3.56187E-06	0.003456	0.0003436	2.326181	0.0009268	0
Summer	TOG_HTSK	0.1032365	0.1869703	0.1326367	0.1487902	0.0819275	0.049759461	0.015386941	7.7743E-05	0.0247217	0.0009311	0.9553531	0.0038711	0
Summer	TOG_IDLEX	0	0	0	0	0.0299825	0.022971759	0.019243755	0.542962904	0.0680082	0	0	0.4792303	0
Summer	TOG_RESTL	0.0742257	0.14774	0.1224565	0.142316	0.0021675	0.001278299	0.000334365	2.13343E-06	0.0014622	7.909E-05	1.4175846	0.0004101	0
Summer	TOG_RUNEX	0.01144	0.0252765	0.0186135	0.0223159	0.1120145	0.122978263	0.017463436	0.056357477	0.0526549	1.146531	2.7534987	0.0676996	0.1113199
Summer	TOG_RUNLS	0.1953197	0.5601847	0.3947587	0.4163614	0.514293	0.277809189	0.07465415	0.000359084	0.2622244	0.0046587	1.9446594	0.0207495	0
Summer	TOG_STREX	0.1854719	0.2724373	0.2638307	0.3260368	0.0738983	0.046487758	0.036135184	1.07537E-06	0.1171745	0.0045144	1.7524771	0.0315375	0

Winter	CH4_IDLEX	0	0	0	0	0.0051895	0.003531284	0.002819677	0.019105041	0.0082952	0	0	0.0739105	0
Winter	CH4_RUNEX	0.0017935	0.0035666	0.0027989	0.0032383	0.0080698	0.00668363	0.001294816	0.001111362	0.0062494	1.1232736	0.3524532	0.0041971	0.0045419
Winter	CH4_STREX	0.0520634	0.0705517	0.0715701	0.0831266	0.0151133	0.009609401	0.00707325	2.13193E-07	0.0232709	0.0011779	0.2981113	0.0071213	0
Winter	CO_IDLEX	0	0	0	0	0.1866333	0.146833831	0.4023011	6.698746588	0.5915547	0	0	3.0349738	0
Winter	CO_RUNEX	0.5228884	0.8303913	0.6981734	0.7420765	0.7330625	0.590585428	0.192779383	0.248601087	0.7024798	8.2675805	21.438543	0.3323906	0.3358228
Winter	CO_STREX	2.5391773	2.7674167	3.2553302	3.6059864	1.155648	0.732485425	0.835657082	0.00422478	2.6495636	0.0849283	10.472928	1.1368644	0
Winter	CO2_NBIO_IDLEX	0	0	0	0	8.8656298	13.52648266	73.22081604	1091.800451	85.911088	0	0	336.15212	0
Winter	CO2_NBIO_RUNEX	242.59501	290.82782	310.3173	373.25901	791.31572	781.1855443	1042.247628	1347.621692	1439.1631	1618.2485	218.19306	980.91615	985.92311
Winter	CO2_NBIO_STREX	52.510816	63.485504	68.300354	81.545699	12.057976	8.887939323	6.829786317	0.044278371	19.691861	0.8596567	64.699659	5.6478631	0
Winter	NOX_IDLEX	0	0	0	0	0.0552692	0.086279785	0.429304527	5.769319332	0.3488218	0	0	2.725677	0
Winter	NOX_RUNEX	0.0344569	0.0754032	0.0635351	0.0753381	0.6889685	0.780664648	1.463417292	2.626282756	1.2871758	0.7074797	1.2500678	3.3997133	3.7679317
Winter	NOX_STREX[3]	0.1910806	0.2532178	0.2828741	0.3366126	0.344241	0.223321023	1.830740151	2.280442521	0.8381245	0.0096432	0.2920822	1.1419446	0
Winter	PM10_IDLEX	0	0	0	0	0.0008091	0.001317454	0.000371402	0.002676026	0.0001267	0	0	0.0033486	0
Winter	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.089180026	0.130340037	0.060698516	0.13034	0.0741758	0.01176	0.7448002	0.13034
Winter	PM10_PMTW	0.008	0.008	0.008	0.008	0.0097145	0.010605473	0.012000003	0.035385451	0.012	0.0316072	0.004	0.0105098	0.016
Winter	PM10_RUNEX	0.0013776	0.0017052	0.001397	0.0014899	0.009814	0.014557754	0.006892343	0.025356266	0.007232	0.005175	0.0020936	0.020444	0.0728988
Winter	PM10_STREX	0.0017011	0.002199	0.0017239	0.0018535	0.0002508	0.000136446	7.67148E-05	2.74318E-07	0.0001927	6.368E-06	0.0030603	7.658E-05	0
Winter	PM25_IDLEX	0	0	0	0	0.0007741	0.001260462	0.000355335	0.002560262	0.0001212	0	0	0.0032038	0
Winter	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.038220011	0.055860016	0.02601365	0.05586	0.0317896	0.00504	0.3192001	0.05586
Winter	PM25_PMTW	0.002	0.002	0.002	0.002	0.0024286	0.002651368	0.003000001	0.008846363	0.003	0.0079018	0.001	0.0026274	0.004
Winter	PM25_RUNEX	0.0012694	0.0015692	0.0012859	0.001374	0.0093411	0.01390107	0.006590133	0.024259352	0.0069006	0.0049507	0.0019568	0.0195396	0.0697453
Winter	PM25_STREX	0.0015641	0.0020219	0.001585	0.0017043	0.0002306	0.000125457	7.05364E-05	2.52225E-07	0.0001772	5.855E-06	0.0028788	7.041E-05	0
Winter	ROG_DIURN	0.0147185	0.0299202	0.024325	0.027963	0.0007323	0.000437006	0.000107286	6.28733E-07	0.0006871	7.262E-05	0.2127535	0.0001718	0
Winter	ROG_HTSK	0.0976404	0.1751629	0.1251184	0.1403901	0.081655	0.047694508	0.014438922	7.61488E-05	0.0239698	0.0008728	0.8436143	0.0037653	0
Winter	ROG_IDLEX	0	0	0	0	0.0212458	0.016868074	0.015170078	0.411326287	0.0487002	0	0	0.3324927	0
Winter	ROG_RESTL	0.0169383	0.0331675	0.0287823	0.0331425	0.0004951	0.000299426	7.34102E-05	4.47005E-07	0.0003599	2.039E-05	0.1744413	9.051E-05	0
Winter	ROG_RUNEX	0.0068926	0.0152995	0.0112154	0.0135555	0.0890183	0.104282459	0.013872162	0.02333466	0.0356617	0.0161688	2.4141832	0.0559859	0.0977834
Winter	ROG_RUNLS	0.2461114	0.7483201	0.5201894	0.5442663	0.5907749	0.322346275	0.088067553	0.000410538	0.2950071	0.0064737	2.479435	0.0318685	0
Winter	ROG_STREX	0.2339898	0.3472238	0.3336595	0.4130714	0.0759216	0.047752278	0.037339816	1.11122E-06	0.1211213	0.0051735	2.30719	0.0395348	0
Winter	SO2_IDLEX	0	0	0	0	8.607E-05	0.000129564	0.000693752	0.010314789	0.0008178	0	0	0.0032077	0
Winter	SO2_RUNEX	0.0023514	0.0028196	0.003008	0.0036164	0.0077303	0.007559502	0.009909847	0.012732078	0.0139481	0.012021	0.0021592	0.009402	0.0093205
Winter	SO2_STREX	0.0005091	0.0006155	0.0006622	0.0007906	0.0001193	8.79534E-05	6.75863E-05	4.3817E-07	0.0001949	8.507E-06	0.0006403	5.589E-05	0
Winter	TOG_DIURN	0.0147332	0.0299502	0.0243493	0.0279909	0.0007323	0.000437006	0.000107286	6.28733E-07	0.0006871	7.262E-05	0.2127535	0.0001718	0
Winter	TOG_HTSK	0.0977378	0.175338	0.1252434	0.1405304	0.081655	0.047694508	0.014438922	7.61488E-05	0.0239698	0.0008728	0.8436143	0.0037653	0
Winter	TOG_IDLEX	0	0	0	0	0.0299825	0.022971759	0.020386972	0.468263667	0.0642348	0	0	0.4786464	0
Winter	TOG_RESTL	0.0169552	0.0332007	0.0288111	0.0331757	0.0004951	0.000299426	7.34102E-05	4.47005E-07	0.0003599	2.039E-05	0.1744413	9.051E-05	0
Winter	TOG_RUNEX	0.0100202	0.0223341	0.0163446	0.0197023	0.1091318	0.121973852	0.017072065	0.026615943	0.0496972	1.1465208	2.9876168	0.0667873	0.1113199
Winter	TOG_RUNLS	0.2463575	0.7490684	0.5207096	0.5448106	0.5907749	0.322346275	0.088067553	0.000410538	0.2950071	0.0064737	2.479435	0.0318685	0
Winter	TOG_STREX	0.2564712	0.3805842	0.3657169	0.4527569	0.0831246	0.052282733	0.040882398	1.21665E-06	0.1326126	0.0056644	2.5107803	0.0432856	0

1 Source: California Air Resources Board. EMFAC2017 Web Database. https://www.arb.ca.gov/emfac/2017/; California Air Pollution Control Officers Association (CAPCOA). 2017, November. California Emissions Estimator Model User's Guide, Version 2016.3.2, Appendix A.

2 Unless otherwise noted, per CalEEMod methodology, the calculated CalEEMod emission rates are derived from the emission rates obtained using the EMFAC2017 Web Database for the Los Angeles (SC) region .

3 Because EMFAC2017 provides vehicle trips data for MHDT and HHDT diesel trucks, the formula provided in Appendix A of the CalEEMod User's Guide in calculating the NO_X STREX emission rates are utilized.

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: Sub-Area
Region: Alameda (SF)
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Gasolin	8.292061214	929.7915234	165.9075608	3.176724225	0	0.126250999	0.00071217	0	0.000261825
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Diesel	15671.122	2027557.272	170334.5692	2.60731653	59.53024202	2.305582422	0.024485443	0.02415439	0
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Natural	441.4400497	17993.80599	1721.616194	0.937080342	19.17661087	0	0.003820823	0.016964064	0
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Gasolin	678972.2166	24107384.54	3179933.599	0.032172885	0	0.183841076	0.001253032	0	0.00162927
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Diesel	7970.485713	285207.3503	37180.15258	0.065143877	0	0	0.006200819	0	0
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Electric	23066.89351	918852.9627	112300.4002	0	0	0	0	0	0
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Gasolin	69607.74812	2421121.057	320177.1151	0.069193187	0	0.235523687	0.001549391	0	0.002035519
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Diesel	35.88370999	591.2260853	115.8236906	0.956082857	0	0	0.135497851	0	0
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Electric	735.3580321	32102.99329	3682.856041	0	0	0	0	0	0
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Gasolin	219659.0043	7734914.424	1020303.459	0.058615211	0	0.26576042	0.001268887	0	0.001612128
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Diesel	1568.62235	62823.71487	7610.193034	0.038650204	0	0	0.004513251	0	0
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Electric	3021.074423	94192.51812	15129.6274	0	0	0	0	0	0
Alameda (SF)	2024	LHDT1	Aggregate	Aggregate	Gasolin	15544.65947	540429.5884	231592.2645	0.197395477	0.036948863	0.510628143	0.002090462	0	0.000362745
Alameda (SF)	2024	LHDT1	Aggregate	Aggregate	Diesel	10546.20745	405424.3807	132658.0226	1.307544496	1.854456042	0	0.019006074	0.026736362	0
Alameda (SF)	2024	LHDT2	Aggregate	Aggregate	Gasolin	2401.66657	82238.48447	35781.25341	0.196050108	0.036932099	0.509581248	0.001904745	0	0.000303541
Alameda (SF)	2024	LHDT2	Aggregate	Aggregate	Diesel	4037.815994	153650.1878	50790.64564	1.070760158	1.827895633	0	0.020321886	0.027024648	0
Alameda (SF)	2024	MCY	Aggregate	Aggregate	Gasolin	30564.54034	229590.4215	61129.08067	1.164813008	0	0.273706213	0.001956837	0	0.00287883
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Gasolin	134655.8839	4595894.408	620683.5591	0.070395452	0	0.32187397	0.001315854	0	0.001764275
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Diesel	3426.213977	134874.3863	16540.1457	0.032382189	0	0	0.003685386	0	0
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Electric	1691.781671	54818.70034	8579.063495	0	0	0	0	0	0
Alameda (SF)	2024	MH	Aggregate	Aggregate	Gasolin	2249.832395	22289.58897	225.0732328	0.308100098	0	0.337035936	0.001482878	0	0.000329894
Alameda (SF)	2024	MH	Aggregate	Aggregate	Diesel	803.2896618	8099.858765	80.32896618	3.708319296	0	0	0.069745257	0	0
Alameda (SF)	2024	MHDT	Aggregate	Aggregate	Gasolin	1666.220591	89835.09068	33337.74159	0.338290755	0.088834942	0.361208291	0.001200152	0	0.000395578
Alameda (SF)	2024	MHDT	Aggregate	Aggregate	Diesel	15286.28648	989523.3293	153624.732	1.538656998	5.063557512	2.144964831	0.007079469	0.003616776	0
Alameda (SF)	2024	OBUS	Aggregate	Aggregate	Gasolin	564.5682568	26756.66734	11295.88168	0.457184483	0.065042585	0.323734824	0.001012775	0	0.000241025
Alameda (SF)	2024	OBUS	Aggregate	Aggregate	Diesel	421.4576547	32559.28875	4067.912136	1.912949042	11.81181382	2.21213859	0.01173917	0.003828948	0
Alameda (SF)	2024	SBUS	Aggregate	Aggregate	Gasolin	116.4733116	5749.837425	465.8932462	0.215877033	0.9265304	0.497811826	0.001325778	0	0.000600083
Alameda (SF)	2024	SBUS	Aggregate	Aggregate	Diesel	303.7154773	9683.40124	3504.834499	5.194058097	35.98184665	1.223532873	0.030354669	0.03454965	0
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Gasolin	8.861843848	523.6878471	35.44737539	0.259682026	0	0.730912625	0.001592864	0	0.000469078
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Diesel	551.8040066	64959.37179	2207.216027	0.782263572	0	0	0.005523211	0	0
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Electric	12.02059328	1081.8767	48.08237312	0	0	0	0	0	0
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Natural	137.2924637	15063.68768	549.1698549	0.450782749	0	0	0.002954035	0	0

Vehicle Category	Fuel	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX
HHDT	Gasolin	0.005000001	0.026460008	0.000774549	0	0.000284759	0.020000006	0.061740018	2044.204338	0	45.47405336	0.078779949	0	0.000209512	0.134763119
HHDT	Diesel	0.008926635	0.026244306	0.025592566	0.025246544	0	0.035706539	0.061236715	1359.262493	11798.33063	0	0.001086466	0.228521775	0	0.213657135
HHDT	Natural	0.009000003	0.026460008	0.003993583	0.017731103	0	0.03600001	0.061740018	3039.209802	3835.307669	0	3.25739448	1.19793684	0	0.6195628
LDA	Gasolin	0.002000001	0.015750005	0.001362786	0	0.00177198	0.008000002	0.036750011	249.2124688	0	53.16076821	0.001944112	0	0.048949659	0.003970047
LDA	Diesel	0.002000001	0.015750005	0.006481193	0	0	0.008000002	0.036750011	200.5537816	0	0	0.000621246	0	0	0.031524262
LDA	Electric	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0
LDT1	Gasolin	0.002000001	0.015750005	0.00168509	0	0.002213782	0.008000002	0.036750011	290.6577887	0	62.15064095	0.00373008	0	0.063852411	0.005995188
LDT1	Diesel	0.002000001	0.015750005	0.141624463	0	0	0.008000002	0.036750011	405.0605749	0	0	0.007972357	0	0	0.063669882
LDT1	Electric	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0
LDT2	Gasolin	0.002000001	0.015750005	0.001380027	0	0.001753329	0.008000002	0.036750011	309.9941826	0	67.50762413	0.002950877	0	0.065629043	0.005387341
LDT2	Diesel	0.002000001	0.015750005	0.00471732	0	0	0.008000002	0.036750011	267.6635147	0	0	0.000692198	0	0	0.042072977
LDT2	Electric	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0
LHDT1	Gasolin	0.002000001	0.032760009	0.002273568	0	0.000394519	0.008000002	0.076440022	987.7277288	119.489847	18.75554674	0.009135944	0.118445355	0.022683539	0.012189833
LHDT1	Diesel	0.003000001	0.032760009	0.019865445	0.027945262	0	0.012000003	0.076440022	529.5556132	130.0827091	0	0.007014484	0.005098128	0	0.083238768
LHDT2	Gasolin	0.002000001	0.038220011	0.002071584	0	0.000330129	0.008000002	0.089180026	1131.822036	137.7630986	21.3019585	0.006816636	0.119026358	0.022189371	0.012848351
LHDT2	Diesel	0.003000001	0.038220011	0.021240751	0.028246583	0	0.012000003	0.089180026	593.5276052	208.0709632	0	0.006712575	0.005098128	0	0.093294274
MCY	Gasolin	0.001	0.005040001	0.00209359	0	0.003060323	0.004000001	0.011760003	215.2568021	0	61.48405648	0.341279334	0	0.258659423	0.066844113
MDV	Gasolin	0.002000001	0.015750005	0.001431083	0	0.001918738	0.008000002	0.036750011	372.7805105	0	82.08732403	0.003472022	0	0.077542857	0.006140844
MDV	Diesel	0.002000001	0.015750005	0.003852022	0	0	0.008000002	0.036750011	347.0203898	0	0	0.000455065	0	0	0.054546773
MDV	Electric	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0
MH	Gasolin	0.003000001	0.055860016	0.001612765	0	0.00035879	0.012000003	0.130340037	1693.851342	0	25.03119375	0.011019374	0	0.031031701	0.020928
MH	Diesel	0.004000001	0.055860016	0.072898828	0	0	0.016000005	0.130340037	985.9231064	0	0	0.00454185	0	0	0.154973383
MHDT	Gasolin	0.003000001	0.055860016	0.001305275	0	0.000430227	0.012000003	0.130340037	1694.062576	526.8116954	37.74386073	0.010335604	0.270267778	0.037848354	0.01825423
MHDT	Diesel	0.003000001	0.055860016	0.007399571	0.003780311	0	0.012000003	0.130340037	983.0763691	833.4426048	0	0.000500707	0.003312006	0	0.154525915
OBUS	Gasolin	0.003000001	0.055860016	0.001101485	0	0.000262137	0.012000003	0.130340037	1738.821784	374.7806255	26.35288436	0.013472893	0.19937593	0.030184914	0.02294545
OBUS	Diesel	0.003000001	0.055860016	0.012269963	0.004002076	0	0.012000003	0.130340037	1192.963184	2581.706956	0	0.000617326	0.039298638	0	0.187517199
SBUS	Gasolin	0.002000001	0.319200087	0.001441904	0	0.000652645	0.008000002	0.744800204	807.1966681	2423.919472	44.97541437	0.005620216	2.490137523	0.053620035	0.015590934
SBUS	Diesel	0.003000001	0.319200091	0.031727172	0.036111832	0	0.012000003	0.744800213	1084.082245	3559.76285	0	0.003440234	0.012535175	0	0.170402632
UBUS	Gasolin	0.002651155	0.04970638	0.001732384	0	0.000510165	0.010604621	0.115981553	1827.442424	0	67.21404374	0.005349878	0	0.086593711	0.02156833
UBUS	Diesel	0.008048248	0.031122655	0.005772946	0	0	0.032192991	0.072619529	1582.463678	0	0	0.074711673	0	0	0.248741253
UBUS	Electric	0.00899756	0.026471996	0	0	0	0.035990242	0.061767991	0	0	0	0	0	0	0
UBUS	Natural	0.007374173	0.034424899	0.003087604	0	0	0.029496692	0.080324765	1881.514777	0	0	5.764547188	0	0	0.383559096

Vehicle Category	Fuel	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX
HHDT	Gasolin	0	0.004315713	0.361504394	0	0.001095789	0.074714103	0.383164385	0.019622672	0.029197329	0.527506364	0
HHDT	Diesel	1.854533274	0	0.023391315	4.920011154	0	0	0	0	0	0.026629231	5.601058181
HHDT	Natural	0.781852558	0	0.095909916	0.028972816	0	0	0	0	0	3.380659132	1.236091662
LDA	Gasolin	0	0.025443809	0.007250005	0	0.217248506	0.098371348	0.21872272	0.171322803	0.1713988	0.01057919	0
LDA	Diesel	0	0	0.013375059	0	0	0	0	0	0	0.015226616	0
LDA	Electric	0	0	0	0	0	0.004888026	0	0.004020953	0.014405	0	0
LDT1	Gasolin	0	0.02784747	0.015789786	0	0.310370778	0.166807854	0.616669306	0.320638218	0.350953146	0.023038455	0
LDT1	Diesel	0	0	0.171640146	0	0	0	0	0	0	0.195400895	0
LDT1	Electric	0	0	0	0	0	0.004888026	0	0.004020953	0.014405	0	0
LDT2	Gasolin	0	0.031089608	0.01158889	0	0.302194617	0.123264	0.437422044	0.278984097	0.261848516	0.01690992	0
LDT2	Diesel	0	0	0.014902616	0	0	0	0	0	0	0.016965637	0
LDT2	Electric	0	0	0	0	0	0.004888026	0	0.004020953	0.014405	0	0
LHDT1	Gasolin	0.003094615	0.040483004	0.043926746	0.423377397	0.1135953	0.116096383	0.837719612	0.0238646	0.041340111	0.064097804	0.617791303
LHDT1	Diesel	0.02044719	0	0.151017714	0.109759705	0	0	0	0	0	0.171923627	0.124954127
LHDT2	Gasolin	0.003040256	0.039853108	0.029932157	0.423502465	0.109917141	0.107320045	0.697394567	0.021645674	0.036551547	0.043676933	0.617973802
LHDT2	Diesel	0.032705858	0	0.144517789	0.109759705	0	0	0	0	0	0.164523894	0.124954127
MCY	Gasolin	0	0.015455594	2.31644267	0	1.980414998	0.710447195	2.088054225	0.984648863	1.599126779	2.869248774	0
MDV	Gasolin	0	0.033411582	0.014109479	0	0.380475757	0.14098344	0.468178479	0.326217069	0.303392153	0.020578394	0
MDV	Diesel	0	0	0.009797273	0	0	0	0	0	0	0.011153544	0
MDV	Electric	0	0	0	0	0	0.004888026	0	0.004020953	0.014405	0	0
MH	Gasolin	0	0.036638935	0.045941972	0	0.126852243	0.070708471	1.712962891	0.029210061	0.074006783	0.067038417	0
MH	Diesel	0	0	0.097783364	0	0	0	0	0	0	0.111319858	0
MHDT	Gasolin	0.007900572	0.029725252	0.049238135	1.017915832	0.19892715	0.077439655	0.436281788	0.017027519	0.028509436	0.07184817	1.485340393
MHDT	Diesel	0.131005571	0	0.010780081	0.071306585	0	0	0	0	0	0.012272302	0.081177119
OBUS	Gasolin	0.005583023	0.025916759	0.064697104	0.745995178	0.156769918	0.031656428	0.367358083	0.018786453	0.039538097	0.094405862	1.088554412
OBUS	Diesel	0.405808381	0	0.013290861	0.846088899	0	0	0	0	0	0.015130634	0.963207807
SBUS	Gasolin	0.095662759	0.050600689	0.026227301	10.64151815	0.297390924	0.031399305	0.209338329	0.006136656	0.012811436	0.038270816	15.5280783
SBUS	Diesel	0.559545147	0	0.074067287	0.269878883	0	0	0	0	0	0.084319968	0.307236565
UBUS	Gasolin	0	0.063669873	0.01773591	0	0.378174226	0.067751974	0.414371846	0.012168083	0.018222172	0.025880198	0
UBUS	Diesel	0	0	0.001075499	0	0	0	0	0	0	0.076257495	0
UBUS	Electric	0	0	0	0	0	0	0	0	0	0	0
UBUS	Natural	0	0	0.082377973	0	0	0	0	0	0	5.88315847	0

Vehicle Category	Fuel	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
HHDT	Gasolin	0.001199751	0.074714103	0.383164385	0.019622672	0.029197329	31.39207406	0	4.076833348	0.020229059	0	0.000450003
HHDT	Diesel	0	0	0	0	0	0.236893457	72.27170421	0	0.012841638	0.111464778	0
HHDT	Natural	0	0	0	0	0	10.9967778	21.78663364	0	0	0	0
LDA	Gasolin	0.237859769	0.098371348	0.21872272	0.171322803	0.1713988	0.549299219	0	2.26183362	0.002466159	0	0.000526069
LDA	Diesel	0	0	0	0	0	0.216469939	0	0	0.001895954	0	0
LDA	Electric	0	0.004888026	0	0.004020953	0.014405	0	0	0	0	0	0
LDT1	Gasolin	0.339816689	0.166807854	0.616669306	0.320638218	0.350953146	0.843895767	0	2.379312168	0.002876294	0	0.000615031
LDT1	Diesel	0	0	0	0	0	1.007731034	0	0	0.003829279	0	0
LDT1	Electric	0	0.004888026	0	0.004020953	0.014405	0	0	0	0	0	0
LDT2	Gasolin	0.330864997	0.123264	0.437422044	0.278984097	0.261848516	0.714393363	0	2.828550529	0.003067644	0	0.000668043
LDT2	Diesel	0	0	0	0	0	0.1379991	0	0	0.002530383	0	0
LDT2	Electric	0	0.004888026	0	0.004020953	0.014405	0	0	0	0	0	0
LHDT1	Gasolin	0.124372555	0.116096383	0.837719612	0.0238646	0.041340111	0.821720872	3.756073401	1.697856525	0.009774367	0.001182449	0.000185601
LHDT1	Diesel	0	0	0	0	0	0.64542328	0.909745076	0	0.005006205	0.001229749	0
LHDT2	Gasolin	0.120345434	0.107320045	0.697394567	0.021645674	0.036551547	0.554829716	3.763345203	1.656563113	0.011200297	0.001363278	0.0002108
LHDT2	Diesel	0	0	0	0	0	0.617294934	0.909745076	0	0.00561097	0.001967019	0
MCY	Gasolin	2.155276639	0.710447195	2.088054225	0.984648863	1.599126779	19.80812362	0	9.129349519	0.002130141	0	0.000608435
MDV	Gasolin	0.416571623	0.14098344	0.468178479	0.326217069	0.303392153	0.769746656	0	3.185140308	0.003688965	0	0.000812321
MDV	Diesel	0	0	0	0	0	0.190631403	0	0	0.003280591	0	0
MDV	Electric	0	0.004888026	0	0.004020953	0.014405	0	0	0	0	0	0
MH	Gasolin	0.138887239	0.070708471	1.712962891	0.029210061	0.074006783	1.109531068	0	2.80628346	0.016762032	0	0.000247704
MH	Diesel	0	0	0	0	0	0.335822771	0	0	0.009320519	0	0
MHDT	Gasolin	0.21780019	0.077439655	0.436281788	0.017027519	0.028509436	1.115827949	15.17682776	4.356326862	0.016764122	0.005213229	0.000373506
MHDT	Diesel	0	0	0	0	0	0.111534649	2.67499389	0	0.009287618	0.007873952	0
OBUS	Gasolin	0.171643327	0.031656428	0.367358083	0.018786453	0.039538097	1.415940214	5.772964511	3.349028988	0.017207051	0.003708758	0.000260783
OBUS	Diesel	0	0	0	0	0	0.146482349	13.58705047	0	0.011270525	0.024390687	0
SBUS	Gasolin	0.325605628	0.031399305	0.209338329	0.006136656	0.012811436	0.529620916	82.24087757	7.77925172	0.007987865	0.023986648	0.000445068
SBUS	Diesel	0	0	0	0	0	0.223277916	7.600388373	0	0.010241872	0.033630874	0
UBUS	Gasolin	0.414053176	0.067751974	0.414371846	0.012168083	0.018222172	0.322714174	0	5.834688483	0.018084024	0	0.000665137
UBUS	Diesel	0	0	0	0	0	0.126420734	0	0	0.014959973	0	0
UBUS	Electric	0	0	0	0	0	0	0	0	0	0	0
UBUS	Natural	0	0	0	0	0	44.24507967	0	0	0	0	0

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: Sub-Area
Region: Alameda (SF)
Calendar Year: 2024
Season: Summer
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Gasolin	8.292061214	929.7915234	165.9075608
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Diesel	15671.122	2027557.272	170334.5692
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Natural	441.4400497	17993.80599	1721.616194
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Gasolin	678972.2166	24107384.54	3179933.599
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Diesel	7970.485713	285207.3503	37180.15258
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Electric	23066.89351	918852.9627	112300.4002
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Gasolin	69607.74812	2421121.057	320177.1151
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Diesel	35.88370999	591.2260853	115.8236906
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Electric	735.3580321	32102.99329	3682.856041
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Gasolin	219659.0043	7734914.424	1020303.459
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Diesel	1568.62235	62823.71487	7610.193034
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Electric	3021.074423	94192.51812	15129.6274
Alameda (SF)	2024	LHDT1	Aggregate	Aggregate	Gasolin	15544.65947	540429.5884	231592.2645
Alameda (SF)	2024	LHDT1	Aggregate	Aggregate	Diesel	10546.20745	405424.3807	132658.0226
Alameda (SF)	2024	LHDT2	Aggregate	Aggregate	Gasolin	2401.66657	82238.48447	35781.25341
Alameda (SF)	2024	LHDT2	Aggregate	Aggregate	Diesel	4037.815994	153650.1878	50790.64564
Alameda (SF)	2024	MCY	Aggregate	Aggregate	Gasolin	30564.54034	229590.4215	61129.08067
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Gasolin	134655.8839	4595894.408	620683.5591
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Diesel	3426.213977	134874.3863	16540.1457
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Electric	1691.781671	54818.70034	8579.063495
Alameda (SF)	2024	MH	Aggregate	Aggregate	Gasolin	2249.832395	22289.58897	225.0732328
Alameda (SF)	2024	MH	Aggregate	Aggregate	Diesel	803.2896618	8099.858765	80.32896618
Alameda (SF)	2024	MHDT	Aggregate	Aggregate	Gasolin	1666.220591	89835.09068	33337.74159
Alameda (SF)	2024	MHDT	Aggregate	Aggregate	Diesel	15286.28648	989523.3293	153624.732
Alameda (SF)	2024	OBUS	Aggregate	Aggregate	Gasolin	564.5682568	26756.66734	11295.88168
Alameda (SF)	2024	OBUS	Aggregate	Aggregate	Diesel	421.4576547	32559.28875	4067.912136
Alameda (SF)	2024	SBUS	Aggregate	Aggregate	Gasolin	116.4733116	5749.837425	465.8932462
Alameda (SF)	2024	SBUS	Aggregate	Aggregate	Diesel	303.7154773	9683.40124	3504.834499
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Gasolin	8.861843848	523.6878471	35.44737539
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Diesel	551.8040066	64959.37179	2207.216027
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Electric	12.02059328	1081.8767	48.08237312
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Natural	137.2924637	15063.68768	549.1698549

Vehicle Category	Fuel	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW
HHDT	Gasolin	2.796901366	0	0.116572016	0.00071217	0	0.000261825	0.005000001	0.026460008
HHDT	Diesel	2.51044957	56.72545668	2.305582422	0.024485443	0.021270645	0	0.00892635	0.026244306
HHDT	Natural	0.901247349	18.41415011	0	0.003820823	0.014575978	0	0.009000003	0.026460008
LDA	Gasolin	0.028545332	0	0.160916286	0.001253032	0	0.00162927	0.002000001	0.015750005
LDA	Diesel	0.062554553	0	0	0.006200819	0	0	0.002000001	0.015750005
LDA	Electric	0	0	0	0	0	0	0.002000001	0.015750005
LDT1	Gasolin	0.060929005	0	0.206208911	0.001549391	0	0.002035519	0.002000001	0.015750005
LDT1	Diesel	0.918128324	0	0	0.135497851	0	0	0.002000001	0.015750005
LDT1	Electric	0	0	0	0	0	0	0.002000001	0.015750005
LDT2	Gasolin	0.051833436	0	0.232641693	0.001268887	0	0.001612128	0.002000001	0.015750005
LDT2	Diesel	0.037111213	0	0	0.004513251	0	0	0.002000001	0.015750005
LDT2	Electric	0	0	0	0	0	0	0.002000001	0.015750005
LHDT1	Gasolin	0.175597995	0.036948863	0.472041539	0.002090462	0	0.000362745	0.002000001	0.032760009
LHDT1	Diesel	1.260850496	1.854456042	0	0.019006074	0.026736362	0	0.003000001	0.032760009
LHDT2	Gasolin	0.173755246	0.036932099	0.471073666	0.001904745	0	0.000303541	0.002000001	0.038220011
LHDT2	Diesel	1.032717615	1.827895633	0	0.020321886	0.027024648	0	0.003000001	0.038220011
MCY	Gasolin	1.017177575	0	0.248861906	0.001956837	0	0.00287883	0.001	0.005040001
MDV	Gasolin	0.062240674	0	0.281760028	0.001315854	0	0.001764275	0.002000001	0.015750005
MDV	Diesel	0.031093441	0	0	0.003685386	0	0	0.002000001	0.015750005
MDV	Electric	0	0	0	0	0	0	0.002000001	0.015750005
MH	Gasolin	0.27087162	0	0.311046946	0.001482878	0	0.000329894	0.003000001	0.055860016
MH	Diesel	3.564185828	0	0	0.069745257	0	0	0.004000001	0.055860016
MHDT	Gasolin	0.29813466	0.092626875	0.333515878	0.001200152	0	0.000395578	0.003000001	0.055860016
MHDT	Diesel	1.478742869	4.934746888	2.144964831	0.007079469	0.003088708	0	0.003000001	0.055860016
OBUS	Gasolin	0.402741727	0.065042585	0.298772301	0.001012775	0	0.000241025	0.003000001	0.055860016
OBUS	Diesel	1.83992361	11.22020293	2.21213859	0.01173917	0.003402278	0	0.003000001	0.055860016
SBUS	Gasolin	0.190478935	0.9265304	0.456442266	0.001325778	0	0.000600083	0.002000001	0.319200087
SBUS	Diesel	4.9862713	36.49026331	1.223532873	0.030354669	0.029237449	0	0.003000001	0.319200091
UBUS	Gasolin	0.229846362	0	0.674837103	0.001592864	0	0.000469078	0.002651155	0.04970638
UBUS	Diesel	0.782263455	0	0	0.005523211	0	0	0.008048248	0.031122655
UBUS	Electric	0	0	0	0	0	0	0.00899756	0.026471996
UBUS	Natural	0.450782545	0	0	0.002954035	0	0	0.007374173	0.034424899

Vehicle Category	Fuel	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX
HHDT	Gasolin	0.000774549	0	0.000284759	0.020000006	0.061740018	2046.194871	0	44.89122131
HHDT	Diesel	0.025592566	0.022232409	0	0.035706539	0.061236715	1359.262493	11653.27868	0
HHDT	Natural	0.003993583	0.015235039	0	0.03600001	0.061740018	3039.209802	3800.649735	0
LDA	Gasolin	0.001362786	0	0.00177198	0.008000002	0.036750011	269.1957442	0	52.18513561
LDA	Diesel	0.006481193	0	0	0.008000002	0.036750011	200.5537816	0	0
LDA	Electric	0	0	0	0.008000002	0.036750011	0	0	0
LDT1	Gasolin	0.00168509	0	0.002213782	0.008000002	0.036750011	310.5511585	0	61.06050832
LDT1	Diesel	0.141624463	0	0	0.008000002	0.036750011	405.0605749	0	0
LDT1	Electric	0	0	0	0.008000002	0.036750011	0	0	0
LDT2	Gasolin	0.001380027	0	0.001753329	0.008000002	0.036750011	329.3739305	0	66.25977651
LDT2	Diesel	0.00471732	0	0	0.008000002	0.036750011	267.6635147	0	0
LDT2	Electric	0	0	0	0.008000002	0.036750011	0	0	0
LHDT1	Gasolin	0.002273568	0	0.000394519	0.008000002	0.076440022	987.7888157	119.489847	18.51738798
LHDT1	Diesel	0.019865445	0.027945262	0	0.012000003	0.076440022	529.5556132	130.0827091	0
LHDT2	Gasolin	0.002071584	0	0.000330129	0.008000002	0.089180026	1131.859113	137.7630986	21.07130661
LHDT2	Diesel	0.021240751	0.028246583	0	0.012000003	0.089180026	593.5276052	208.0709632	0
MCY	Gasolin	0.00209359	0	0.003060323	0.004000001	0.011760003	213.2735884	0	58.15050845
MDV	Gasolin	0.001431083	0	0.001918738	0.008000002	0.036750011	392.644536	0	80.64653145
MDV	Diesel	0.003852022	0	0	0.008000002	0.036750011	347.0203898	0	0
MDV	Electric	0	0	0	0.008000002	0.036750011	0	0	0
MH	Gasolin	0.001612765	0	0.00035879	0.012000003	0.130340037	1693.9406	0	24.56682607
MH	Diesel	0.072898828	0	0	0.016000005	0.130340037	985.9231064	0	0
MHDT	Gasolin	0.001305275	0	0.000430227	0.012000003	0.130340037	1694.137484	553.5044733	37.07478663
MHDT	Diesel	0.007399571	0.003228366	0	0.012000003	0.130340037	983.0763691	827.9477665	0
OBUS	Gasolin	0.001101485	0	0.000262137	0.012000003	0.130340037	1738.920986	374.7806255	25.79956046
OBUS	Diesel	0.012269963	0.003556114	0	0.012000003	0.130340037	1192.963184	2546.912463	0
SBUS	Gasolin	0.001441904	0	0.000652645	0.008000002	0.744800204	807.2318219	2423.919472	41.27149109
SBUS	Diesel	0.031727172	0.030559436	0	0.012000003	0.744800213	1084.082245	3628.211363	0
UBUS	Gasolin	0.001732384	0	0.000510165	0.010604621	0.115981553	1827.463527	0	65.21323113
UBUS	Diesel	0.005772946	0	0	0.032192991	0.072619529	1582.463678	0	0
UBUS	Electric	0	0	0	0.035990242	0.061767991	0	0	0
UBUS	Natural	0.003087604	0	0	0.029496692	0.080324765	1881.514777	0	0

Vehicle Category	Fuel	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
HHDT	Gasolin	0.081589924	0	0.000193966	0.123338741	0	0.004085199
HHDT	Diesel	0.001086466	0.241963	0	0.213657135	1.831733127	0
HHDT	Natural	3.25739448	1.258506304	0	0.6195628	0.774787311	0
LDA	Gasolin	0.002207722	0	0.040624991	0.003662719	0	0.023131433
LDA	Diesel	0.000621246	0	0	0.031524262	0	0
LDA	Electric	0	0	0	0	0	0
LDT1	Gasolin	0.004192576	0	0.052608794	0.005506243	0	0.025328802
LDT1	Diesel	0.007972357	0	0	0.063669882	0	0
LDT1	Electric	0	0	0	0	0	0
LDT2	Gasolin	0.003337003	0	0.054362675	0.004958492	0	0.0282737
LDT2	Diesel	0.000692198	0	0	0.042072977	0	0
LDT2	Electric	0	0	0	0	0	0
LHDT1	Gasolin	0.009523841	0.118831461	0.021284587	0.011227508	0.003176931	0.03842791
LHDT1	Diesel	0.007014484	0.005098128	0	0.083238768	0.02044719	0
LHDT2	Gasolin	0.007075907	0.119420784	0.020824263	0.01173622	0.003127757	0.037899106
LHDT2	Diesel	0.006712575	0.005098128	0	0.093294274	0.032705858	0
MCY	Gasolin	0.33051478	0	0.212937718	0.060774935	0	0.014638461
MDV	Gasolin	0.003925951	0	0.064185119	0.005651166	0	0.030384095
MDV	Diesel	0.000455065	0	0	0.054546773	0	0
MDV	Electric	0	0	0	0	0	0
MH	Gasolin	0.011464104	0	0.028690742	0.019141416	0	0.035114035
MH	Diesel	0.00454185	0	0	0.154973383	0	0
MHDT	Gasolin	0.010759433	0.25266917	0.035403475	0.016638293	0.008495006	0.028310715
MHDT	Diesel	0.000500707	0.003467153	0	0.154525915	0.130141859	0
OBUS	Gasolin	0.014016477	0.200158569	0.028113071	0.020929068	0.005760725	0.024684462
OBUS	Diesel	0.000617326	0.041655791	0	0.187517199	0.400339171	0
SBUS	Gasolin	0.00583083	2.493587985	0.04431831	0.014212371	0.098647018	0.047850367
SBUS	Diesel	0.003440234	0.01266599	0	0.170402632	0.5703043	0
UBUS	Gasolin	0.005578976	0	0.076223911	0.019768407	0	0.060825991
UBUS	Diesel	0.074711673	0	0	0.248741253	0	0
UBUS	Electric	0	0	0	0	0	0
UBUS	Natural	5.764547188	0	0	0.383559096	0	0

Vehicle Category	Fuel	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN
HHDT	Gasolin	0.376843599	0	0.00101957	0.080701901	0.372750844	0.044310369	0.073978214
HHDT	Diesel	0.023391315	5.209397033	0	0	0	0	0
HHDT	Natural	0.095909916	0.029121532	0	0	0	0	0
LDA	Gasolin	0.008099121	0	0.177168418	0.107808915	0.204296931	0.362899347	0.425196909
LDA	Diesel	0.013375059	0	0	0	0	0	0
LDA	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
LDT1	Gasolin	0.01750553	0	0.251505523	0.18894336	0.566264611	0.68671927	0.886000602
LDT1	Diesel	0.171640146	0	0	0	0	0	0
LDT1	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
LDT2	Gasolin	0.012906663	0	0.246068851	0.135384986	0.403153617	0.580611812	0.637940443
LDT2	Diesel	0.014902616	0	0	0	0	0	0
LDT2	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
LHDT1	Gasolin	0.045964486	0.423377397	0.106156317	0.128856289	0.808884479	0.050790237	0.101489138
LHDT1	Diesel	0.151017714	0.109759705	0	0	0	0	0
LHDT2	Gasolin	0.031083196	0.423502465	0.102729648	0.120391843	0.672152784	0.046078312	0.089445687
LHDT2	Diesel	0.144517789	0.109759705	0	0	0	0	0
MCY	Gasolin	2.220443097	0	1.610192625	0.955353143	1.944659367	2.835169261	4.652362022
MDV	Gasolin	0.015690101	0	0.309496572	0.154589627	0.432778846	0.681595474	0.738280536
MDV	Diesel	0.009797273	0	0	0	0	0	0
MDV	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
MH	Gasolin	0.048206903	0	0.117758998	0.077638692	1.666953608	0.063041841	0.181676537
MH	Diesel	0.097783364	0	0	0	0	0	0
MHDT	Gasolin	0.051153586	0.945499346	0.185090591	0.086292002	0.418670366	0.03751821	0.071121475
MHDT	Diesel	0.010780081	0.074646845	0	0	0	0	0
OBUS	Gasolin	0.067377403	0.745995178	0.145561726	0.033624564	0.356657596	0.039791843	0.094050261
OBUS	Diesel	0.013290861	0.896837756	0	0	0	0	0
SBUS	Gasolin	0.027212863	10.64151815	0.245497486	0.032992728	0.176844524	0.013980653	0.031595218
SBUS	Diesel	0.074067287	0.272695302	0	0	0	0	0
UBUS	Gasolin	0.018383565	0	0.330337096	0.074596537	0.373236673	0.02534453	0.043494222
UBUS	Diesel	0.001075499	0	0	0	0	0	0
UBUS	Electric	0	0	0	0	0	0	0
UBUS	Natural	0.082377973	0	0	0	0	0	0

Vehicle Category	Fuel	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN
HHDT	Gasolin	0.549889296	0	0.001116301	0.080701901	0.372750844	0.044310369	0.073978214
HHDT	Diesel	0.026629231	5.930501976	0	0	0	0	0
HHDT	Natural	3.380659132	1.297090646	0	0	0	0	0
LDA	Gasolin	0.011818218	0	0.193977117	0.107808915	0.204296931	0.362899347	0.425196909
LDA	Diesel	0.015226616	0	0	0	0	0	0
LDA	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
LDT1	Gasolin	0.025541994	0	0.275366723	0.18894336	0.566264611	0.68671927	0.886000602
LDT1	Diesel	0.195400895	0	0	0	0	0	0
LDT1	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
LDT2	Gasolin	0.018832792	0	0.269414371	0.135384986	0.403153617	0.580611812	0.637940443
LDT2	Diesel	0.016965637	0	0	0	0	0	0
LDT2	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
LHDT1	Gasolin	0.06707127	0.617791303	0.116227805	0.128856289	0.808884479	0.050790237	0.101489138
LHDT1	Diesel	0.171923627	0.124954127	0	0	0	0	0
LHDT2	Gasolin	0.045356526	0.617973802	0.112476034	0.120391843	0.672152784	0.046078312	0.089445687
LHDT2	Diesel	0.164523894	0.124954127	0	0	0	0	0
MCY	Gasolin	2.753498698	0	1.75247707	0.955353143	1.944659367	2.835169261	4.652362022
MDV	Gasolin	0.022884531	0	0.338858817	0.154589627	0.432778846	0.681595474	0.738280536
MDV	Diesel	0.011153544	0	0	0	0	0	0
MDV	Electric	0	0	0	0.004888026	0	0.020951366	0.050309097
MH	Gasolin	0.0703434	0	0.12893128	0.077638692	1.666953608	0.063041841	0.181676537
MH	Diesel	0.111319858	0	0	0	0	0	0
MHDT	Gasolin	0.074643193	1.379670427	0.202650899	0.086292002	0.418670366	0.03751821	0.071121475
MHDT	Diesel	0.012272302	0.084979751	0	0	0	0	0
OBUS	Gasolin	0.098316948	1.088554412	0.159371767	0.033624564	0.356657596	0.039791843	0.094050261
OBUS	Diesel	0.015130634	1.020981517	0	0	0	0	0
SBUS	Gasolin	0.039708946	15.5280783	0.268788846	0.032992728	0.176844524	0.013980653	0.031595218
SBUS	Diesel	0.084319968	0.310442843	0	0	0	0	0
UBUS	Gasolin	0.026825254	0	0.36167754	0.074596537	0.373236673	0.02534453	0.043494222
UBUS	Diesel	0.076257495	0	0	0	0	0	0
UBUS	Electric	0	0	0	0	0	0	0
UBUS	Natural	5.88315847	0	0	0	0	0	0

Vehicle Category	Fuel	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
HHDT	Gasolin	32.60613874	0	3.709295331	0.020248757	0	0.000444235
HHDT	Diesel	0.236893457	71.29700839	0	0.012841638	0.110094399	0
HHDT	Natural	10.9967778	21.3426345	0	0	0	0
LDA	Gasolin	0.651531132	0	1.731195555	0.00266391	0	0.000516414
LDA	Diesel	0.216469939	0	0	0.001895954	0	0
LDA	Electric	0	0	0	0	0	0
LDT1	Gasolin	0.987761449	0	1.816216789	0.003073155	0	0.000604243
LDT1	Diesel	1.007731034	0	0	0.003829279	0	0
LDT1	Electric	0	0	0	0	0	0
LDT2	Gasolin	0.842159043	0	2.160154351	0.003259422	0	0.000655694
LDT2	Diesel	0.1379991	0	0	0.002530383	0	0
LDT2	Electric	0	0	0	0	0	0
LHDT1	Gasolin	0.854715883	3.756073401	1.563358646	0.009774971	0.001182449	0.000183245
LHDT1	Diesel	0.64542328	0.909745076	0	0.005006205	0.001229749	0
LHDT2	Gasolin	0.575089635	3.763345203	1.526268637	0.011200663	0.001363278	0.000208518
LHDT2	Diesel	0.617294934	0.909745076	0	0.00561097	0.001967019	0
MCY	Gasolin	18.77408623	0	7.80253669	0.002110515	0	0.000575446
MDV	Gasolin	0.906438687	0	2.426470254	0.003885536	0	0.000798063
MDV	Diesel	0.190631403	0	0	0.003280591	0	0
MDV	Electric	0	0	0	0	0	0
MH	Gasolin	1.159680451	0	2.532577025	0.016762915	0	0.000243109
MH	Diesel	0.335822771	0	0	0.009320519	0	0
MHDT	Gasolin	1.157874811	10.4649923	3.963518781	0.016764864	0.005477375	0.000366885
MHDT	Diesel	0.111534649	2.618830641	0	0.009287618	0.00782204	0
OBUS	Gasolin	1.471233406	5.772964511	3.023680073	0.017208033	0.003708758	0.000255308
OBUS	Diesel	0.146482349	13.41020699	0	0.011270525	0.024061966	0
SBUS	Gasolin	0.549117648	82.24087757	5.552394464	0.007988213	0.023986648	0.000408415
SBUS	Diesel	0.223277916	7.209770357	0	0.010241872	0.034277542	0
UBUS	Gasolin	0.334265427	0	4.673706932	0.018084233	0	0.000645338
UBUS	Diesel	0.126420734	0	0	0.014959973	0	0
UBUS	Electric	0	0	0	0	0	0
UBUS	Natural	44.24507967	0	0	0	0	0

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: Sub-Area
Region: Alameda (SF)
Calendar Year: 2024
Season: Winter
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Gasolin	8.292061214	929.7915234	165.9075608	3.395323503	0	0.133780627
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Diesel	15671.122	2027557.272	170334.5692	2.64923736	63.403517	2.305582422
Alameda (SF)	2024	HHDT	Aggregate	Aggregate	Natural	441.4400497	17993.80599	1721.616194	0.954569985	20.22953288	0
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Gasolin	678972.2166	24107384.54	3179933.599	0.035352886	0	0.199823051
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Diesel	7970.485713	285207.3503	37180.15258	0.066149511	0	0
Alameda (SF)	2024	LDA	Aggregate	Aggregate	Electric	23066.89351	918852.9627	112300.4002	0	0	0
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Gasolin	69607.74812	2421121.057	320177.1151	0.076093087	0	0.25591492
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Diesel	35.88370999	591.2260853	115.8236906	0.970780856	0	0
Alameda (SF)	2024	LDT1	Aggregate	Aggregate	Electric	735.3580321	32102.99329	3682.856041	0	0	0
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Gasolin	219659.0043	7734914.424	1020303.459	0.064428733	0	0.288832023
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Diesel	1568.62235	62823.71487	7610.193034	0.039250361	0	0
Alameda (SF)	2024	LDT2	Aggregate	Aggregate	Electric	3021.074423	94192.51812	15129.6274	0	0	0
Alameda (SF)	2024	LHDT1	Aggregate	Aggregate	Gasolin	15544.65947	540429.5884	231592.2645	0.210347829	0.036948863	0.541425145
Alameda (SF)	2024	LHDT1	Aggregate	Aggregate	Diesel	10546.20745	405424.3807	132658.0226	1.326968644	1.854456042	0
Alameda (SF)	2024	LHDT2	Aggregate	Aggregate	Gasolin	2401.66657	82238.48447	35781.25341	0.209111696	0.036932099	0.54031995
Alameda (SF)	2024	LHDT2	Aggregate	Aggregate	Diesel	4037.815994	153650.1878	50790.64564	1.08657803	1.827895633	0
Alameda (SF)	2024	MCY	Aggregate	Aggregate	Gasolin	30564.54034	229590.4215	61129.08067	1.250067835	0	0.292082177
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Gasolin	134655.8839	4595894.408	620683.5591	0.077389722	0	0.349815604
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Diesel	3426.213977	134874.3863	16540.1457	0.032884169	0	0
Alameda (SF)	2024	MDV	Aggregate	Aggregate	Electric	1691.781671	54818.70034	8579.063495	0	0	0
Alameda (SF)	2024	MH	Aggregate	Aggregate	Gasolin	2249.832395	22289.58897	225.0732328	0.32965182	0	0.357415801
Alameda (SF)	2024	MH	Aggregate	Aggregate	Diesel	803.2896618	8099.858765	80.32896618	3.767931667	0	0
Alameda (SF)	2024	MHDT	Aggregate	Aggregate	Gasolin	1666.220591	89835.09068	33337.74159	0.361392008	0.085043009	0.382751176
Alameda (SF)	2024	MHDT	Aggregate	Aggregate	Diesel	15286.28648	989523.3293	153624.732	1.56346601	5.241438849	2.144964831
Alameda (SF)	2024	OBUS	Aggregate	Aggregate	Gasolin	564.5682568	26756.66734	11295.88168	0.488540926	0.065042585	0.343309832
Alameda (SF)	2024	OBUS	Aggregate	Aggregate	Diesel	421.4576547	32559.28875	4067.912136	1.943480346	12.6288003	2.21213859
Alameda (SF)	2024	SBUS	Aggregate	Aggregate	Gasolin	116.4733116	5749.837425	465.8932462	0.230951515	0.9265304	0.528170214
Alameda (SF)	2024	SBUS	Aggregate	Aggregate	Diesel	303.7154773	9683.40124	3504.834499	5.281269658	35.27974745	1.223532873
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Gasolin	8.861843848	523.6878471	35.44737539	0.276478917	0	0.772574792
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Diesel	551.8040066	64959.37179	2207.216027	0.782263618	0	0
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Electric	12.02059328	1081.8767	48.08237312	0	0	0
Alameda (SF)	2024	UBUS	Aggregate	Aggregate	Natural	137.2924637	15063.68768	549.1698549	0.450782829	0	0

Vehicle Category	Fuel	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW
HHDT	Gasolin	0.00071217	0	0.000261825	0.005000001	0.026460008	0.000774549	0	0.000284759	0.020000006	0.061740018
HHDT	Diesel	0.024485443	0.028136705	0	0.008926635	0.026244306	0.025592566	0.029408922	0	0.035706539	0.061236715
HHDT	Natural	0.003820823	0.020261897	0	0.009000003	0.026460008	0.003993583	0.02117805	0	0.03600001	0.061740018
LDA	Gasolin	0.001253032	0	0.00162927	0.002000001	0.015750005	0.001362786	0	0.00177198	0.008000002	0.036750011
LDA	Diesel	0.006200819	0	0	0.002000001	0.015750005	0.006481193	0	0	0.008000002	0.036750011
LDA	Electric	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011
LDT1	Gasolin	0.001549391	0	0.002035519	0.002000001	0.015750005	0.00168509	0	0.002213782	0.008000002	0.036750011
LDT1	Diesel	0.135497851	0	0	0.002000001	0.015750005	0.141624463	0	0	0.008000002	0.036750011
LDT1	Electric	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011
LDT2	Gasolin	0.001268887	0	0.001612128	0.002000001	0.015750005	0.001380027	0	0.001753329	0.008000002	0.036750011
LDT2	Diesel	0.004513251	0	0	0.002000001	0.015750005	0.00471732	0	0	0.008000002	0.036750011
LDT2	Electric	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011
LHDT1	Gasolin	0.002090462	0	0.000362745	0.002000001	0.032760009	0.002273568	0	0.000394519	0.008000002	0.076440022
LHDT1	Diesel	0.019006074	0.026736362	0	0.003000001	0.032760009	0.019865445	0.027945262	0	0.012000003	0.076440022
LHDT2	Gasolin	0.001904745	0	0.000303541	0.002000001	0.038220011	0.002071584	0	0.000330129	0.008000002	0.089180026
LHDT2	Diesel	0.020321886	0.027024648	0	0.003000001	0.038220011	0.021240751	0.028246583	0	0.012000003	0.089180026
MCY	Gasolin	0.001956837	0	0.00287883	0.001	0.005040001	0.00209359	0	0.003060323	0.004000001	0.011760003
MDV	Gasolin	0.001315854	0	0.001764275	0.002000001	0.015750005	0.001431083	0	0.001918738	0.008000002	0.036750011
MDV	Diesel	0.003685386	0	0	0.002000001	0.015750005	0.003852022	0	0	0.008000002	0.036750011
MDV	Electric	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011
MH	Gasolin	0.001482878	0	0.000329894	0.003000001	0.055860016	0.001612765	0	0.00035879	0.012000003	0.130340037
MH	Diesel	0.069745257	0	0	0.004000001	0.055860016	0.072898828	0	0	0.016000005	0.130340037
MHDT	Gasolin	0.001200152	0	0.000395578	0.003000001	0.055860016	0.001305275	0	0.000430227	0.012000003	0.130340037
MHDT	Diesel	0.007079469	0.004346013	0	0.003000001	0.055860016	0.007399571	0.00454252	0	0.012000003	0.130340037
OBUS	Gasolin	0.001012775	0	0.000241025	0.003000001	0.055860016	0.001101485	0	0.000262137	0.012000003	0.130340037
OBUS	Diesel	0.01173917	0.004418158	0	0.003000001	0.055860016	0.012269963	0.004617928	0	0.012000003	0.130340037
SBUS	Gasolin	0.001325778	0	0.000600083	0.002000001	0.319200087	0.001441904	0	0.000652645	0.008000002	0.744800204
SBUS	Diesel	0.030354669	0.041885547	0	0.003000001	0.319200091	0.031727172	0.043779426	0	0.012000003	0.744800213
UBUS	Gasolin	0.001592864	0	0.000469078	0.002651155	0.04970638	0.001732384	0	0.000510165	0.010604621	0.115981553
UBUS	Diesel	0.005523211	0	0	0.008048248	0.031122655	0.005772946	0	0	0.032192991	0.072619529
UBUS	Electric	0	0	0	0.00899756	0.026471996	0	0	0	0.035990242	0.061767991
UBUS	Natural	0.002954035	0	0	0.007374173	0.034424899	0.003087604	0	0	0.029496692	0.080324765

Vehicle Category	Fuel	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
HHDT	Gasolin	2042.889287	0	45.9636301	0.07690926	0	0.000221308	0.141143909	0	0.004493048
HHDT	Diesel	1359.262493	11998.64047	0	0.001086466	0.209960084	0	0.213657135	1.886019191	0
HHDT	Natural	3039.209802	3883.168624	0	3.25739448	1.114293293	0	0.6195628	0.791609327	0
LDA	Gasolin	247.2214142	0	53.86422627	0.00187575	0	0.054510808	0.004245436	0	0.026921323
LDA	Diesel	200.5537816	0	0	0.000621246	0	0	0.031524262	0	0
LDA	Electric	0	0	0	0	0	0	0	0	0
LDT1	Gasolin	288.6804911	0	62.93594148	0.00361286	0	0.071388714	0.006411922	0	0.029454766
LDT1	Diesel	405.0605749	0	0	0.007972357	0	0	0.063669882	0	0
LDT1	Electric	0	0	0	0	0	0	0	0	0
LDT2	Gasolin	308.0656865	0	68.40656962	0.002850117	0	0.073165225	0.005761665	0	0.032891019
LDT2	Diesel	267.6635147	0	0	0.000692198	0	0	0.042072977	0	0
LDT2	Electric	0	0	0	0	0	0	0	0	0
LHDT1	Gasolin	987.6852884	119.489847	18.96488811	0.008861555	0.118144753	0.023770286	0.012725972	0.003040419	0.042171771
LHDT1	Diesel	529.5556132	130.0827091	0	0.007014484	0.005098128	0	0.083238768	0.02044719	0
LHDT2	Gasolin	1131.796061	137.7630986	21.50415965	0.006629552	0.118719493	0.023249718	0.013450956	0.002985003	0.041491507
LHDT2	Diesel	593.5276052	208.0709632	0	0.006712575	0.005098128	0	0.093294274	0.032705858	0
MCY	Gasolin	218.1930572	0	64.69965855	0.352453164	0	0.298111322	0.070224574	0	0.016138656
MDV	Gasolin	370.8054974	0	83.12518152	0.003358582	0	0.086490723	0.006567831	0	0.035345352
MDV	Diesel	347.0203898	0	0	0.000455065	0	0	0.054546773	0	0
MDV	Electric	0	0	0	0	0	0	0	0	0
MH	Gasolin	1693.792676	0	25.39473719	0.010721139	0	0.032709943	0.021927699	0	0.038088837
MH	Diesel	985.9231064	0	0	0.00454185	0	0	0.154973383	0	0
MHDT	Gasolin	1694.012325	500.1189175	38.30234692	0.010041833	0.28796942	0.039667721	0.019131024	0.007424429	0.030917927
MHDT	Diesel	983.0763691	841.0307149	0	0.000500707	0.003097756	0	0.154525915	0.132198316	0
OBUS	Gasolin	1738.755499	374.7806255	26.78336266	0.013102888	0.198832385	0.031651347	0.024044492	0.005478854	0.026970273
OBUS	Diesel	1192.963184	2629.756495	0	0.000617326	0.036043522	0	0.187517199	0.4133611	0
SBUS	Gasolin	807.1723279	2423.919472	48.13576302	0.005471696	2.487489793	0.06069397	0.016376027	0.0939917	0.052744504
SBUS	Diesel	1084.082245	3465.238715	0	0.003440234	0.012354525	0	0.170402632	0.54468727	0
UBUS	Gasolin	1827.428257	0	68.87258933	0.005192571	0	0.094370607	0.022539882	0	0.066068764
UBUS	Diesel	1582.463678	0	0	0.074711673	0	0	0.248741253	0	0
UBUS	Electric	0	0	0	0	0	0	0	0	0
UBUS	Natural	1881.514777	0	0	5.764547188	0	0	0.383559096	0	0

Vehicle Category	Fuel	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN
HHDT	Gasolin	0.351373091	0	0.001153515	0.079047071	0.426163412	0.00928407	0.013058486
HHDT	Diesel	0.023391315	4.520383034	0	0	0	0	0
HHDT	Natural	0.095909916	0.028767448	0	0	0	0	0
LDA	Gasolin	0.007078628	0	0.244989029	0.102057572	0.257680453	0.083052662	0.072130848
LDA	Diesel	0.013375059	0	0	0	0	0	0
LDA	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
LDT1	Gasolin	0.01546416	0	0.351343369	0.177184854	0.75719838	0.154369843	0.139244599
LDT1	Diesel	0.171640146	0	0	0	0	0	0
LDT1	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
LDT2	Gasolin	0.011321981	0	0.341095905	0.127834435	0.531783013	0.136669453	0.115488967
LDT2	Diesel	0.014902616	0	0	0	0	0	0
LDT2	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
LHDT1	Gasolin	0.04250697	0.423377397	0.119410209	0.128427611	0.929175777	0.011601397	0.017159183
LHDT1	Diesel	0.151017714	0.109759705	0	0	0	0	0
LHDT2	Gasolin	0.029108821	0.423502465	0.11553551	0.115395737	0.779909214	0.010793286	0.01575256
LHDT2	Diesel	0.144517789	0.109759705	0	0	0	0	0
MCY	Gasolin	2.414183168	0	2.307190025	0.843614302	2.479435025	0.348882653	0.42550707
MDV	Gasolin	0.013827482	0	0.429788445	0.146004119	0.566292869	0.158947557	0.134093173
MDV	Diesel	0.009797273	0	0	0	0	0	0
MDV	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
MH	Gasolin	0.044444204	0	0.133344851	0.081769721	1.841564828	0.014582205	0.029538625
MH	Diesel	0.097783364	0	0	0	0	0	0
MHDT	Gasolin	0.047931078	1.090332318	0.209406636	0.080975387	0.493894511	0.008237176	0.012038305
MHDT	Diesel	0.010780081	0.066693845	0	0	0	0	0
OBUS	Gasolin	0.062883969	0.745995178	0.16473997	0.032601844	0.401246089	0.009794697	0.018697271
OBUS	Diesel	0.013290861	0.776007145	0	0	0	0	0
SBUS	Gasolin	0.025534787	10.64151815	0.336948162	0.032091352	0.271610031	0.003085446	0.005855197
SBUS	Diesel	0.074067287	0.265989543	0	0	0	0	0
UBUS	Gasolin	0.017293611	0	0.414485238	0.069923629	0.518651715	0.006532899	0.009193086
UBUS	Diesel	0.001075499	0	0	0	0	0	0
UBUS	Electric	0	0	0	0	0	0	0
UBUS	Natural	0.082377973	0	0	0	0	0	0

Vehicle Category	Fuel	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN
HHDT	Gasolin	0.51272279	0	0.001262953	0.079047071	0.426163412	0.00928407	0.013058486
HHDT	Diesel	0.026629231	5.146111987	0	0	0	0	0
HHDT	Natural	3.380659132	1.15185497	0	0	0	0	0
LDA	Gasolin	0.010329117	0	0.268232149	0.102057572	0.257680453	0.083052662	0.072130848
LDA	Diesel	0.015226616	0	0	0	0	0	0
LDA	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
LDT1	Gasolin	0.022563129	0	0.384676453	0.177184854	0.75719838	0.154369843	0.139244599
LDT1	Diesel	0.195400895	0	0	0	0	0	0
LDT1	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
LDT2	Gasolin	0.016520398	0	0.373456992	0.127834435	0.531783013	0.136669453	0.115488967
LDT2	Diesel	0.016965637	0	0	0	0	0	0
LDT2	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
LHDT1	Gasolin	0.062026071	0.617791303	0.130739148	0.128427611	0.929175777	0.011601397	0.017159183
LHDT1	Diesel	0.171923627	0.124954127	0	0	0	0	0
LHDT2	Gasolin	0.042475524	0.617973802	0.126496841	0.115395737	0.779909214	0.010793286	0.01575256
LHDT2	Diesel	0.164523894	0.124954127	0	0	0	0	0
MCY	Gasolin	2.987616803	0	2.510780276	0.843614302	2.479435025	0.348882653	0.42550707
MDV	Gasolin	0.020165951	0	0.470562422	0.146004119	0.566292869	0.158947557	0.134093173
MDV	Diesel	0.011153544	0	0	0	0	0	0
MDV	Electric	0	0	0	0.004888026	0	0.00017784	0.001262572
MH	Gasolin	0.064852879	0	0.145995827	0.081769721	1.841564828	0.014582205	0.029538625
MH	Diesel	0.111319858	0	0	0	0	0	0
MHDT	Gasolin	0.069940916	1.591010359	0.229273908	0.080975387	0.493894511	0.008237176	0.012038305
MHDT	Diesel	0.012272302	0.075925865	0	0	0	0	0
OBUS	Gasolin	0.09176014	1.088554412	0.180369531	0.032601844	0.401246089	0.009794697	0.018697271
OBUS	Diesel	0.015130634	0.883425064	0	0	0	0	0
SBUS	Gasolin	0.037260302	15.5280783	0.368915825	0.032091352	0.271610031	0.003085446	0.005855197
SBUS	Diesel	0.084319968	0.302808847	0	0	0	0	0
UBUS	Gasolin	0.025234797	0	0.453809164	0.069923629	0.518651715	0.006532899	0.009193086
UBUS	Diesel	0.076257495	0	0	0	0	0	0
UBUS	Electric	0	0	0	0	0	0	0
UBUS	Natural	5.88315847	0	0	0	0	0	0

Vehicle Category	Fuel	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
HHDT	Gasolin	30.58999273	0	4.385577242	0.020216046	0	0.000454847
HHDT	Diesel	0.236893457	73.61771272	0	0.012841638	0.113357206	0
HHDT	Natural	10.9967778	22.39977531	0	0	0	0
LDA	Gasolin	0.544049602	0	2.646891189	0.002446456	0	0.00053303
LDA	Diesel	0.216469939	0	0	0.001895954	0	0
LDA	Electric	0	0	0	0	0	0
LDT1	Gasolin	0.837672812	0	2.787983028	0.002856727	0	0.000622802
LDT1	Diesel	1.007731034	0	0	0.003829279	0	0
LDT1	Electric	0	0	0	0	0	0
LDT2	Gasolin	0.708109551	0	3.313304187	0.00304856	0	0.000676938
LDT2	Diesel	0.1379991	0	0	0.002530383	0	0
LDT2	Electric	0	0	0	0	0	0
LHDT1	Gasolin	0.798808491	3.756073401	1.817613093	0.009773947	0.001182449	0.000187673
LHDT1	Diesel	0.64542328	0.909745076	0	0.005006205	0.001229749	0
LHDT2	Gasolin	0.54068275	3.763345203	1.772231216	0.01120004	0.001363278	0.000212801
LHDT2	Diesel	0.617294934	0.909745076	0	0.00561097	0.001967019	0
MCY	Gasolin	21.4385428	0	10.47292816	0.002159197	0	0.000640256
MDV	Gasolin	0.763750407	0	3.735485429	0.003669421	0	0.000822591
MDV	Diesel	0.190631403	0	0	0.003280591	0	0
MDV	Electric	0	0	0	0	0	0
MH	Gasolin	1.07659434	0	3.021888563	0.016761452	0	0.000251302
MH	Diesel	0.335822771	0	0	0.009320519	0	0
MHDT	Gasolin	1.087680903	19.88866322	4.686475675	0.016763625	0.004949082	0.000379033
MHDT	Diesel	0.111534649	2.752552662	0	0.009287618	0.007945641	0
OBUS	Gasolin	1.379054487	5.772964511	3.603733611	0.017206395	0.003708758	0.000265043
OBUS	Diesel	0.146482349	13.83126289	0	0.011270525	0.024844635	0
SBUS	Gasolin	0.516149075	82.24087757	9.689299377	0.007987625	0.023986648	0.000476342
SBUS	Diesel	0.223277916	8.139813253	0	0.010241872	0.032737857	0
UBUS	Gasolin	0.314979456	0	6.804146762	0.018083884	0	0.00068155
UBUS	Diesel	0.126420734	0	0	0.014959973	0	0
UBUS	Electric	0	0	0	0	0	0
UBUS	Natural	44.24507967	0	0	0	0	0

CalEEMod Construction Model

UCB Anchor House Construction Run

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	29.40	1000sqft	0.00	29,400.00	0
Other Non-Asphalt Surfaces	10.15	1000sqft	0.23	10,150.00	0
Health Club	22.60	1000sqft	0.00	22,600.00	0
Apartments High Rise	770.00	Dwelling Unit	0.69	451,000.00	770
Convenience Market (24 Hour)	15.00	1000sqft	0.00	15,000.00	0
General Office Building	8.00	1000sqft	0.00	8,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on data provided by UCB

Construction Phase - based on normalized construction schedule fit to duration provided by UCB, assuming pile driving duration will happen during BC for the same duration as normalized grading

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - no additional equipment for hauling

Off-road Equipment -

Off-road Equipment - no additional equipment for hauling

Off-road Equipment -

Off-road Equipment -

Trips and VMT - 10 worker trips each for building and asphalt demo to be included in demo phase. 4 vt/water truck/day, see hauling calc in assump file

Demolition -

Grading -

Architectural Coating - based on CalEEMod calculationsfor non-residential coating. only assumes parking area will be painted

Construction Off-road Equipment Mitigation - BAAQMD BMPs

Off-road Equipment - bore drill rig added for pile driving

Woodstoves -

Area Coating -

Fleet Mix -

Water And Wastewater -

Solid Waste -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	2,373.00	1,764.00
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	1.00	5.00
tblConstructionPhase	NumDays	2.00	9.00
tblConstructionPhase	NumDays	2.00	9.00
tblConstructionPhase	NumDays	100.00	672.00
tblConstructionPhase	NumDays	5.00	35.00
tblConstructionPhase	NumDays	5.00	35.00
tblConstructionPhase	NumDays	100.00	9.00
tblConstructionPhase	PhaseEndDate	11/9/2020	11/1/2021

tblConstructionPhase	PhaseEndDate	11/23/2020	11/1/2021
tblConstructionPhase	PhaseEndDate	11/24/2020	11/8/2021
tblConstructionPhase	PhaseEndDate	11/26/2020	11/21/2021
tblConstructionPhase	PhaseEndDate	11/30/2020	11/21/2021
tblConstructionPhase	PhaseEndDate	4/19/2021	7/1/2024
tblConstructionPhase	PhaseEndDate	9/13/2021	7/1/2024
tblConstructionPhase	PhaseEndDate	9/20/2021	7/1/2024
tblConstructionPhase	PhaseEndDate	9/6/2021	12/2/2021
tblConstructionPhase	PhaseStartDate	10/27/2020	9/1/2021
tblConstructionPhase	PhaseStartDate	11/10/2020	9/1/2021
tblConstructionPhase	PhaseStartDate	11/24/2020	11/2/2021
tblConstructionPhase	PhaseStartDate	11/25/2020	11/9/2021
tblConstructionPhase	PhaseStartDate	11/27/2020	11/9/2021
tblConstructionPhase	PhaseStartDate	12/1/2020	12/3/2021
tblConstructionPhase	PhaseStartDate	9/7/2021	5/14/2024
tblConstructionPhase	PhaseStartDate	9/14/2021	5/14/2024
tblConstructionPhase	PhaseStartDate	4/20/2021	11/22/2021
tblGrading	MaterialExported	0.00	48,000.00
tblLandUse	LandUseSquareFeet	770,000.00	451,000.00
tblLandUse	LotAcreage	0.18	0.00
tblLandUse	LotAcreage	0.67	0.00
tblLandUse	LotAcreage	0.52	0.00
tblLandUse	LotAcreage	12.42	0.69
tblLandUse	LotAcreage	0.34	0.00
tblLandUse	Population	2,202.00	770.00
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripNumber	186.00	189.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00

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					
2021	0.0949	1.3672	0.7411	4.1100e-003	0.1639	0.0221	0.1860	0.0425	0.0208	0.0632	0.0000	386.3945	386.3945	0.0272	0.0000	387.0754
2022	0.3520	2.3370	2.8626	0.0104	0.6864	0.0547	0.7411	0.1845	0.0504	0.2349	0.0000	953.6584	953.6584	0.0704	0.0000	955.4174
2023	0.3197	1.9556	2.6813	0.0101	0.6864	0.0465	0.7329	0.1845	0.0429	0.2274	0.0000	925.4148	925.4148	0.0658	0.0000	927.0588
2024	3.5897	1.0624	1.4836	5.3700e-003	0.3646	0.0264	0.3910	0.0980	0.0244	0.1224	0.0000	490.8837	490.8837	0.0379	0.0000	491.8305
Maximum	**3.5897**	**2.3370**	**2.8626**	**0.0104**	**0.6864**	**0.0547**	**0.7411**	**0.1845**	**0.0504**	**0.2349**	**0.0000**	**953.6584**	**953.6584**	**0.0704**	**0.0000**	**955.4174**

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					
2021	0.0949	1.3672	0.7411	4.1100e-003	0.1382	0.0221	0.1603	0.0369	0.0208	0.0577	0.0000	386.3944	386.3944	0.0272	0.0000	387.0754
2022	0.3520	2.3370	2.8626	0.0104	0.6342	0.0547	0.6889	0.1717	0.0504	0.2221	0.0000	953.6582	953.6582	0.0704	0.0000	955.4173
2023	0.3197	1.9556	2.6813	0.0101	0.6342	0.0465	0.6807	0.1717	0.0429	0.2145	0.0000	925.4147	925.4147	0.0658	0.0000	927.0587
2024	3.5897	1.0624	1.4835	5.3700e-003	0.3369	0.0264	0.3632	0.0912	0.0244	0.1156	0.0000	490.8836	490.8836	0.0379	0.0000	491.8304
Maximum	**3.5897**	**2.3370**	**2.8626**	**0.0104**	**0.6342**	**0.0547**	**0.6889**	**0.1717**	**0.0504**	**0.2221**	**0.0000**	**953.6582**	**953.6582**	**0.0704**	**0.0000**	**955.4173**

	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	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	8.30	0.00	7.70	7.46	0.00	5.86	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	7-27-2021	10-26-2021	0.2193	0.2193
5	10-27-2021	1-26-2022	2.6150	2.6150
6	1-27-2022	4-26-2022	0.6700	0.6700
7	4-27-2022	7-26-2022	0.6678	0.6678
8	7-27-2022	10-26-2022	0.6790	0.6790
9	10-27-2022	1-26-2023	0.6591	0.6591
10	1-27-2023	4-26-2023	0.5677	0.5677
11	4-27-2023	7-26-2023	0.5658	0.5658
12	7-27-2023	10-26-2023	0.5753	0.5753
13	10-27-2023	1-26-2024	0.5765	0.5765
14	1-27-2024	4-26-2024	0.5492	0.5492
15	4-27-2024	7-26-2024	3.9477	3.9477
		Highest	3.9477	3.9477

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/1/2021	11/1/2021	5	44	a
2	Demolition Haul	Demolition	9/1/2021	11/1/2021	5	44	b
3	Site Preparation	Site Preparation	11/2/2021	11/8/2021	5	5	c
4	Grading	Grading	11/9/2021	11/21/2021	5	9	d
5	Grading Soil Haul	Grading	11/9/2021	11/21/2021	5	9	e
6	Building Construction and Pile Driving	Building Construction	11/22/2021	12/2/2021	5	9	f
7	Building Construction	Building Construction	12/3/2021	7/1/2024	5	672	g
8	Paving	Paving	5/14/2024	7/1/2024	5	35	h
9	Architectural Coating	Architectural Coating	5/14/2024	7/1/2024	5	35	i

Acres of Grading (Site Preparation Phase): 2.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.23

Residential Indoor: 913,275; Residential Outdoor: 304,425; Non-Residential Indoor: 68,400; Non-Residential Outdoor: 22,800; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Demolition Haul	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition Haul	Rubber Tired Dozers	0	1.00	247	0.40
Demolition Haul	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading Soil Haul	Concrete/Industrial Saws	0	8.00	81	0.73
Grading Soil Haul	Rubber Tired Dozers	0	1.00	247	0.40
Grading Soil Haul	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48
Building Construction and Pile Driving	Cranes	1	4.00	231	0.29

Building Construction and Pile Driving	Forklifts	2	6.00	89	0.20
Building Construction and Pile Driving	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction and Pile Driving	Bore/Drill Rigs	1	8.00	221	0.50

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
Demolition	4	20.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition Haul	0	0.00	0.00	189.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading Soil Haul	0	0.00	0.00	6,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	588.00	96.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	118.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction and Pile Driving	6	588.00	96.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2021

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	tons/yr										MT/yr					
Off-Road	0.0175	0.1596	0.1665	2.6000e-004		8.9600e-003	8.9600e-003		8.5500e-003	8.5500e-003	0.0000	22.9006	22.9006	4.2700e-003	0.0000	23.0073
Total	**0.0175**	**0.1596**	**0.1665**	**2.6000e-004**		**8.9600e-003**	**8.9600e-003**		**8.5500e-003**	**8.5500e-003**	**0.0000**	**22.9006**	**22.9006**	**4.2700e-003**	**0.0000**	**23.0073**

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	2.7000e-004	9.4100e-003	1.9900e-003	2.0000e-005	5.8000e-004	2.0000e-005	6.0000e-004	1.7000e-004	2.0000e-005	1.9000e-004	0.0000	2.3053	2.3053	1.3000e-004	0.0000	2.3085
Worker	1.4100e-003	1.0000e-003	0.0105	3.0000e-005	3.4800e-003	2.0000e-005	3.5000e-003	9.3000e-004	2.0000e-005	9.5000e-004	0.0000	2.9853	2.9853	7.0000e-005	0.0000	2.9871
Total	**1.6800e-003**	**0.0104**	**0.0125**	**5.0000e-005**	**4.0600e-003**	**4.0000e-005**	**4.1000e-003**	**1.1000e-003**	**4.0000e-005**	**1.1400e-003**	**0.0000**	**5.2906**	**5.2906**	**2.0000e-004**	**0.0000**	**5.2956**

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	tons/yr										MT/yr					
Off-Road	0.0175	0.1596	0.1665	2.6000e-004		8.9600e-003	8.9600e-003		8.5500e-003	8.5500e-003	0.0000	22.9005	22.9005	4.2700e-003	0.0000	23.0072
Total	**0.0175**	**0.1596**	**0.1665**	**2.6000e-004**		**8.9600e-003**	**8.9600e-003**		**8.5500e-003**	**8.5500e-003**	**0.0000**	**22.9005**	**22.9005**	**4.2700e-003**	**0.0000**	**23.0072**

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	2.7000e-004	9.4100e-003	1.9900e-003	2.0000e-005	5.4000e-004	2.0000e-005	5.6000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.3053	2.3053	1.3000e-004	0.0000	2.3085
Worker	1.4100e-003	1.0000e-003	0.0105	3.0000e-005	3.2100e-003	2.0000e-005	3.2300e-003	8.6000e-004	2.0000e-005	8.8000e-004	0.0000	2.9853	2.9853	7.0000e-005	0.0000	2.9871
Total	**1.6800e-003**	**0.0104**	**0.0125**	**5.0000e-005**	**3.7500e-003**	**4.0000e-005**	**3.7900e-003**	**1.0200e-003**	**4.0000e-005**	**1.0600e-003**	**0.0000**	**5.2906**	**5.2906**	**2.0000e-004**	**0.0000**	**5.2956**

3.3 Demolition Haul - 2021

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	tons/yr										MT/yr					
Fugitive Dust					0.0202	0.0000	0.0202	3.0600e-003	0.0000	3.0600e-003	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0202**	**0.0000**	**0.0202**	**3.0600e-003**	**0.0000**	**3.0600e-003**	**0.0000**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	7.6000e-004	0.0255	4.7300e-003	7.0000e-005	1.6000e-003	8.0000e-005	1.6800e-003	4.4000e-004	7.0000e-005	5.1000e-004	0.0000	7.1446	7.1446	3.5000e-004	0.0000	7.1534
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	0.0000	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
Total	**7.6000e-004**	**0.0255**	**4.7300e-003**	**7.0000e-005**	**1.6000e-003**	**8.0000e-005**	**1.6800e-003**	**4.4000e-004**	**7.0000e-005**	**5.1000e-004**	**0.0000**	**7.1446**	**7.1446**	**3.5000e-004**	**0.0000**	**7.1534**

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	tons/yr										MT/yr					
Fugitive Dust					8.6300e-003	0.0000	8.6300e-003	1.3100e-003	0.0000	1.3100e-003	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.6300e-003**	**0.0000**	**8.6300e-003**	**1.3100e-003**	**0.0000**	**1.3100e-003**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	7.6000e-004	0.0255	4.7300e-003	7.0000e-005	1.4900e-003	8.0000e-005	1.5700e-003	4.1000e-004	7.0000e-005	4.9000e-004	0.0000	7.1446	7.1446	3.5000e-004	0.0000	7.1534
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	0.0000	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
Total	**7.6000e-004**	**0.0255**	**4.7300e-003**	**7.0000e-005**	**1.4900e-003**	**8.0000e-005**	**1.5700e-003**	**4.1000e-004**	**7.0000e-005**	**4.9000e-004**	**0.0000**	**7.1446**	**7.1446**	**3.5000e-004**	**0.0000**	**7.1534**

3.4 Site Preparation - 2021

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	tons/yr										MT/yr					
Fugitive Dust					1.3300e-003	0.0000	1.3300e-003	1.4000e-004	0.0000	1.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	0.0196	0.0101	2.0000e-005		7.5000e-004	7.5000e-004		6.9000e-004	6.9000e-004	0.0000	2.1377	2.1377	6.9000e-004	0.0000	2.1550
Total	**1.6000e-003**	**0.0196**	**0.0101**	**2.0000e-005**	**1.3300e-003**	**7.5000e-004**	**2.0800e-003**	**1.4000e-004**	**6.9000e-004**	**8.3000e-004**	**0.0000**	**2.1377**	**2.1377**	**6.9000e-004**	**0.0000**	**2.1550**

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	3.0000e-005	1.0700e-003	2.3000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2620	0.2620	1.0000e-005	0.0000	0.2623
Worker	4.0000e-005	3.0000e-005	3.0000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0848	0.0848	0.0000	0.0000	0.0849
Total	**7.0000e-005**	**1.1000e-003**	**5.3000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.3468**	**0.3468**	**1.0000e-005**	**0.0000**	**0.3472**

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	tons/yr										MT/yr					
Fugitive Dust					5.7000e-004	0.0000	5.7000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	0.0196	0.0101	2.0000e-005		7.5000e-004	7.5000e-004		6.9000e-004	6.9000e-004	0.0000	2.1377	2.1377	6.9000e-004	0.0000	2.1550
Total	**1.6000e-003**	**0.0196**	**0.0101**	**2.0000e-005**	**5.7000e-004**	**7.5000e-004**	**1.3200e-003**	**6.0000e-005**	**6.9000e-004**	**7.5000e-004**	**0.0000**	**2.1377**	**2.1377**	**6.9000e-004**	**0.0000**	**2.1550**

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	3.0000e-005	1.0700e-003	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2620	0.2620	1.0000e-005	0.0000	0.2623
Worker	4.0000e-005	3.0000e-005	3.0000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.0848	0.0848	0.0000	0.0000	0.0849
Total	**7.0000e-005**	**1.1000e-003**	**5.3000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.3468**	**0.3468**	**1.0000e-005**	**0.0000**	**0.3472**

3.5 Grading - 2021

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	tons/yr										MT/yr					
Fugitive Dust					3.3900e-003	0.0000	3.3900e-003	1.8600e-003	0.0000	1.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5800e-003	0.0326	0.0341	5.0000e-005		1.8300e-003	1.8300e-003		1.7500e-003	1.7500e-003	0.0000	4.6842	4.6842	8.7000e-004	0.0000	4.7060
Total	**3.5800e-003**	**0.0326**	**0.0341**	**5.0000e-005**	**3.3900e-003**	**1.8300e-003**	**5.2200e-003**	**1.8600e-003**	**1.7500e-003**	**3.6100e-003**	**0.0000**	**4.6842**	**4.6842**	**8.7000e-004**	**0.0000**	**4.7060**

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	6.0000e-005	1.9300e-003	4.1000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.4716	0.4716	3.0000e-005	0.0000	0.4722
Worker	1.4000e-004	1.0000e-004	1.0700e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3053	0.3053	1.0000e-005	0.0000	0.3055

Total	**2.0000e-004**	**2.0300e-003**	**1.4800e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.2000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.7769**	**0.7769**	**4.0000e-005**	**0.0000**	**0.7777**

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	tons/yr										MT/yr					
Fugitive Dust					1.4500e-003	0.0000	1.4500e-003	8.0000e-004	0.0000	8.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5800e-003	0.0326	0.0341	5.0000e-005		1.8300e-003	1.8300e-003		1.7500e-003	1.7500e-003	0.0000	4.6842	4.6842	8.7000e-004	0.0000	4.7060
Total	**3.5800e-003**	**0.0326**	**0.0341**	**5.0000e-005**	**1.4500e-003**	**1.8300e-003**	**3.2800e-003**	**8.0000e-004**	**1.7500e-003**	**2.5500e-003**	**0.0000**	**4.6842**	**4.6842**	**8.7000e-004**	**0.0000**	**4.7060**

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	6.0000e-005	1.9300e-003	4.1000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.4716	0.4716	3.0000e-005	0.0000	0.4722
Worker	1.4000e-004	1.0000e-004	1.0700e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3053	0.3053	1.0000e-005	0.0000	0.3055
Total	**2.0000e-004**	**2.0300e-003**	**1.4800e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.7769**	**0.7769**	**4.0000e-005**	**0.0000**	**0.7777**

3.6 Grading Soil Haul - 2021

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	tons/yr										MT/yr					
Fugitive Dust					2.7100e-003	0.0000	2.7100e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.7100e-003**	**0.0000**	**2.7100e-003**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**0.0000**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	0.0240	0.8090	0.1501	2.3500e-003	0.0508	2.4700e-003	0.0533	0.0140	2.3700e-003	0.0164	0.0000	226.8124	226.8124	0.0112	0.0000	227.0935
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	0.0000	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
Total	**0.0240**	**0.8090**	**0.1501**	**2.3500e-003**	**0.0508**	**2.4700e-003**	**0.0533**	**0.0140**	**2.3700e-003**	**0.0164**	**0.0000**	**226.8124**	**226.8124**	**0.0112**	**0.0000**	**227.0935**

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	tons/yr										MT/yr					
Fugitive Dust					1.1600e-003	0.0000	1.1600e-003	1.8000e-004	0.0000	1.8000e-004	0.0000	0.0000	0.0000	0.0000	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	0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.1600e-003**	**0.0000**	**1.1600e-003**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	0.0240	0.8090	0.1501	2.3500e-003	0.0474	2.4700e-003	0.0499	0.0131	2.3700e-003	0.0155	0.0000	226.8124	226.8124	0.0112	0.0000	227.0935
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	0.0000	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
Total	**0.0240**	**0.8090**	**0.1501**	**2.3500e-003**	**0.0474**	**2.4700e-003**	**0.0499**	**0.0131**	**2.3700e-003**	**0.0155**	**0.0000**	**226.8124**	**226.8124**	**0.0112**	**0.0000**	**227.0935**

3.7 Building Construction and Pile Driving - 2021

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	tons/yr										MT/yr					
Off-Road	4.6500e-003	0.0495	0.0420	9.0000e-005		2.4300e-003	2.4300e-003		2.2300e-003	2.2300e-003	0.0000	8.2270	8.2270	2.6600e-003	0.0000	8.2936
Total	**4.6500e-003**	**0.0495**	**0.0420**	**9.0000e-005**		**2.4300e-003**	**2.4300e-003**		**2.2300e-003**	**2.2300e-003**	**0.0000**	**8.2270**	**8.2270**	**2.6600e-003**	**0.0000**	**8.2936**

Unmitigated Construction Off-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
	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	1.3400e-003	0.0462	9.7900e-003	1.2000e-004	2.8400e-003	1.0000e-004	2.9300e-003	8.2000e-004	9.0000e-005	9.1000e-004	0.0000	11.3171	11.3171	6.2000e-004	0.0000	11.3327
Worker	8.4500e-003	6.0200e-003	0.0631	2.0000e-004	0.0209	1.4000e-004	0.0211	5.5700e-003	1.3000e-004	5.6900e-003	0.0000	17.9524	17.9524	4.3000e-004	0.0000	17.9631
Total	**9.7900e-003**	**0.0522**	**0.0729**	**3.2000e-004**	**0.0238**	**2.4000e-004**	**0.0240**	**6.3900e-003**	**2.2000e-004**	**6.6000e-003**	**0.0000**	**29.2695**	**29.2695**	**1.0500e-003**	**0.0000**	**29.2958**

Mitigated 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
	tons/yr										MT/yr					
Off-Road	4.6500e-003	0.0495	0.0420	9.0000e-005		2.4300e-003	2.4300e-003		2.2300e-003	2.2300e-003	0.0000	8.2270	8.2270	2.6600e-003	0.0000	8.2935
Total	**4.6500e-003**	**0.0495**	**0.0420**	**9.0000e-005**		**2.4300e-003**	**2.4300e-003**		**2.2300e-003**	**2.2300e-003**	**0.0000**	**8.2270**	**8.2270**	**2.6600e-003**	**0.0000**	**8.2935**

Mitigated Construction Off-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
	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	1.3400e-003	0.0462	9.7900e-003	1.2000e-004	2.6600e-003	1.0000e-004	2.7500e-003	7.8000e-004	9.0000e-005	8.7000e-004	0.0000	11.3171	11.3171	6.2000e-004	0.0000	11.3327

	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
Worker	8.4500e-003	6.0200e-003	0.0631	2.0000e-004	0.0193	1.4000e-004	0.0194	5.1700e-003	1.3000e-004	5.3000e-003	0.0000	17.9524	17.9524	4.3000e-004	0.0000	17.9631
Total	**9.7900e-003**	**0.0522**	**0.0729**	**3.2000e-004**	**0.0220**	**2.4000e-004**	**0.0222**	**5.9500e-003**	**2.2000e-004**	**6.1700e-003**	**0.0000**	**29.2695**	**29.2695**	**1.0500e-003**	**0.0000**	**29.2958**

3.8 Building Construction - 2021

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	tons/yr										MT/yr					
Off-Road	8.1400e-003	0.0838	0.0763	1.2000e-004		4.7000e-003	4.7000e-003		4.3200e-003	4.3200e-003	0.0000	10.5086	10.5086	3.4000e-003	0.0000	10.5936
Total	**8.1400e-003**	**0.0838**	**0.0763**	**1.2000e-004**		**4.7000e-003**	**4.7000e-003**		**4.3200e-003**	**4.3200e-003**	**0.0000**	**10.5086**	**10.5086**	**3.4000e-003**	**0.0000**	**10.5936**

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	3.1200e-003	0.1078	0.0228	2.8000e-004	6.6200e-003	2.2000e-004	6.8400e-003	1.9200e-003	2.2000e-004	2.1300e-003	0.0000	26.4066	26.4066	1.4500e-003	0.0000	26.4429
Worker	0.0197	0.0141	0.1472	4.6000e-004	0.0488	3.3000e-004	0.0491	0.0130	3.0000e-004	0.0133	0.0000	41.8889	41.8889	1.0000e-003	0.0000	41.9139
Total	**0.0228**	**0.1219**	**0.1700**	**7.4000e-004**	**0.0554**	**5.5000e-004**	**0.0560**	**0.0149**	**5.2000e-004**	**0.0154**	**0.0000**	**68.2956**	**68.2956**	**2.4500e-003**	**0.0000**	**68.3568**

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	tons/yr										MT/yr					
Off-Road	8.1400e-003	0.0838	0.0763	1.2000e-004		4.7000e-003	4.7000e-003		4.3200e-003	4.3200e-003	0.0000	10.5086	10.5086	3.4000e-003	0.0000	10.5936
Total	**8.1400e-003**	**0.0838**	**0.0763**	**1.2000e-004**		**4.7000e-003**	**4.7000e-003**		**4.3200e-003**	**4.3200e-003**	**0.0000**	**10.5086**	**10.5086**	**3.4000e-003**	**0.0000**	**10.5936**

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	3.1200e-003	0.1078	0.0228	2.8000e-004	6.2000e-003	2.2000e-004	6.4300e-003	1.8100e-003	2.2000e-004	2.0300e-003	0.0000	26.4066	26.4066	1.4500e-003	0.0000	26.4429
Worker	0.0197	0.0141	0.1472	4.6000e-004	0.0450	3.3000e-004	0.0454	0.0121	3.0000e-004	0.0124	0.0000	41.8889	41.8889	1.0000e-003	0.0000	41.9139
Total	**0.0228**	**0.1219**	**0.1700**	**7.4000e-004**	**0.0512**	**5.5000e-004**	**0.0518**	**0.0139**	**5.2000e-004**	**0.0144**	**0.0000**	**68.2956**	**68.2956**	**2.4500e-003**	**0.0000**	**68.3568**

3.8 Building Construction - 2022

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	tons/yr										MT/yr					
Off-Road	0.0892	0.9134	0.9299	1.4800e-003		0.0484	0.0484		0.0445	0.0445	0.0000	130.1920	130.1920	0.0421	0.0000	131.2447

Total	**0.0892**	**0.9134**	**0.9299**	**1.4800e-003**		**0.0484**	**0.0484**		**0.0445**	**0.0445**	**0.0000**	**130.1920**	**130.1920**	**0.0421**	**0.0000**	**131.2447**

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	0.0361	1.2679	0.2649	3.3800e-003	0.0820	2.4100e-003	0.0844	0.0237	2.3000e-003	0.0260	0.0000	323.7424	323.7424	0.0172	0.0000	324.1715
Worker	0.2267	0.1557	1.6679	5.5300e-003	0.6044	3.9600e-003	0.6083	0.1608	3.6500e-003	0.1644	0.0000	499.7239	499.7239	0.0111	0.0000	500.0013
Total	**0.2628**	**1.4236**	**1.9328**	**8.9100e-003**	**0.6864**	**6.3700e-003**	**0.6927**	**0.1845**	**5.9500e-003**	**0.1904**	**0.0000**	**823.4664**	**823.4664**	**0.0283**	**0.0000**	**824.1728**

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	tons/yr										MT/yr					
Off-Road	0.0892	0.9134	0.9299	1.4800e-003		0.0484	0.0484		0.0445	0.0445	0.0000	130.1918	130.1918	0.0421	0.0000	131.2445
Total	**0.0892**	**0.9134**	**0.9299**	**1.4800e-003**		**0.0484**	**0.0484**		**0.0445**	**0.0445**	**0.0000**	**130.1918**	**130.1918**	**0.0421**	**0.0000**	**131.2445**

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	0.0361	1.2679	0.2649	3.3800e-003	0.0768	2.4100e-003	0.0792	0.0224	2.3000e-003	0.0247	0.0000	323.7424	323.7424	0.0172	0.0000	324.1715
Worker	0.2267	0.1557	1.6679	5.5300e-003	0.5574	3.9600e-003	0.5614	0.1492	3.6500e-003	0.1529	0.0000	499.7239	499.7239	0.0111	0.0000	500.0013
Total	**0.2628**	**1.4236**	**1.9328**	**8.9100e-003**	**0.6342**	**6.3700e-003**	**0.6405**	**0.1717**	**5.9500e-003**	**0.1776**	**0.0000**	**823.4664**	**823.4664**	**0.0283**	**0.0000**	**824.1728**

3.8 Building Construction - 2023

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	tons/yr										MT/yr					
Off-Road	0.0822	0.8344	0.9226	1.4800e-003		0.0416	0.0416		0.0383	0.0383	0.0000	130.2710	130.2710	0.0421	0.0000	131.3243
Total	**0.0822**	**0.8344**	**0.9226**	**1.4800e-003**		**0.0416**	**0.0416**		**0.0383**	**0.0383**	**0.0000**	**130.2710**	**130.2710**	**0.0421**	**0.0000**	**131.3243**

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

	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
Vendor	0.0265	0.9815	0.2315	3.2800e-003	0.0820	1.0400e-003	0.0830	0.0237	9.9000e-004	0.0247	0.0000	314.5321	314.5321	0.0137	0.0000	314.8747
Worker	0.2110	0.1397	1.5272	5.3100e-003	0.6044	3.8700e-003	0.6083	0.1608	3.5600e-003	0.1643	0.0000	480.6118	480.6118	9.9200e-003	0.0000	480.8599
Total	**0.2375**	**1.1212**	**1.7587**	**8.5900e-003**	**0.6864**	**4.9100e-003**	**0.6913**	**0.1845**	**4.5500e-003**	**0.1891**	**0.0000**	**795.1439**	**795.1439**	**0.0236**	**0.0000**	**795.7346**

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	tons/yr										MT/yr					
Off-Road	0.0822	0.8344	0.9226	1.4800e-003		0.0416	0.0416		0.0383	0.0383	0.0000	130.2708	130.2708	0.0421	0.0000	131.3241
Total	**0.0822**	**0.8344**	**0.9226**	**1.4800e-003**		**0.0416**	**0.0416**		**0.0383**	**0.0383**	**0.0000**	**130.2708**	**130.2708**	**0.0421**	**0.0000**	**131.3241**

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	0.0265	0.9815	0.2315	3.2800e-003	0.0768	1.0400e-003	0.0778	0.0224	9.9000e-004	0.0234	0.0000	314.5321	314.5321	0.0137	0.0000	314.8747
Worker	0.2110	0.1397	1.5272	5.3100e-003	0.5574	3.8700e-003	0.5613	0.1492	3.5600e-003	0.1528	0.0000	480.6118	480.6118	9.9200e-003	0.0000	480.8599
Total	**0.2375**	**1.1212**	**1.7587**	**8.5900e-003**	**0.6342**	**4.9100e-003**	**0.6391**	**0.1717**	**4.5500e-003**	**0.1762**	**0.0000**	**795.1439**	**795.1439**	**0.0236**	**0.0000**	**795.7346**

3.8 Building Construction - 2024

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	tons/yr										MT/yr					
Off-Road	0.0390	0.3913	0.4629	7.5000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.6588	65.6588	0.0212	0.0000	66.1897
Total	**0.0390**	**0.3913**	**0.4629**	**7.5000e-004**		**0.0185**	**0.0185**		**0.0170**	**0.0170**	**0.0000**	**65.6588**	**65.6588**	**0.0212**	**0.0000**	**66.1897**

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	0.0129	0.4909	0.1117	1.6400e-003	0.0413	5.2000e-004	0.0418	0.0120	4.9000e-004	0.0124	0.0000	157.3782	157.3782	6.8200e-003	0.0000	157.5487
Worker	0.0995	0.0634	0.7103	2.5700e-003	0.3045	1.9100e-003	0.3064	0.0810	1.7600e-003	0.0828	0.0000	232.5564	232.5564	4.4900e-003	0.0000	232.6688
Total	**0.1124**	**0.5544**	**0.8220**	**4.2100e-003**	**0.3458**	**2.4300e-003**	**0.3483**	**0.0930**	**2.2500e-003**	**0.0952**	**0.0000**	**389.9347**	**389.9347**	**0.0113**	**0.0000**	**390.2175**

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	tons/yr										MT/yr					

	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
Off-Road	0.0390	0.3913	0.4629	7.5000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.6587	65.6587	0.0212	0.0000	66.1896
Total	**0.0390**	**0.3913**	**0.4629**	**7.5000e-004**		**0.0185**	**0.0185**		**0.0170**	**0.0170**	**0.0000**	**65.6587**	**65.6587**	**0.0212**	**0.0000**	**66.1896**

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	0.0129	0.4909	0.1117	1.6400e-003	0.0387	5.2000e-004	0.0392	0.0113	4.9000e-004	0.0118	0.0000	157.3782	157.3782	6.8200e-003	0.0000	157.5487
Worker	0.0995	0.0634	0.7103	2.5700e-003	0.2808	1.9100e-003	0.2828	0.0752	1.7600e-003	0.0770	0.0000	232.5564	232.5564	4.4900e-003	0.0000	232.6688
Total	**0.1124**	**0.5544**	**0.8220**	**4.2100e-003**	**0.3195**	**2.4300e-003**	**0.3220**	**0.0865**	**2.2500e-003**	**0.0888**	**0.0000**	**389.9347**	**389.9347**	**0.0113**	**0.0000**	**390.2175**

3.9 Paving - 2024

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	tons/yr										MT/yr					
Off-Road	0.0103	0.0915	0.1231	2.0000e-004		4.2500e-003	4.2500e-003		3.9700e-003	3.9700e-003	0.0000	16.4511	16.4511	4.7900e-003	0.0000	16.5709
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0103**	**0.0915**	**0.1231**	**2.0000e-004**		**4.2500e-003**	**4.2500e-003**		**3.9700e-003**	**3.9700e-003**	**0.0000**	**16.4511**	**16.4511**	**4.7900e-003**	**0.0000**	**16.5709**

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	8.1000e-004	5.2000e-004	5.8100e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.9020	1.9020	4.0000e-005	0.0000	1.9030
Total	**8.1000e-004**	**5.2000e-004**	**5.8100e-003**	**2.0000e-005**	**2.4900e-003**	**2.0000e-005**	**2.5100e-003**	**6.6000e-004**	**1.0000e-005**	**6.8000e-004**	**0.0000**	**1.9020**	**1.9020**	**4.0000e-005**	**0.0000**	**1.9030**

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	tons/yr										MT/yr					
Off-Road	0.0103	0.0915	0.1231	2.0000e-004		4.2500e-003	4.2500e-003		3.9700e-003	3.9700e-003	0.0000	16.4510	16.4510	4.7900e-003	0.0000	16.5708
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0103**	**0.0915**	**0.1231**	**2.0000e-004**		**4.2500e-003**	**4.2500e-003**		**3.9700e-003**	**3.9700e-003**	**0.0000**	**16.4510**	**16.4510**	**4.7900e-003**	**0.0000**	**16.5708**

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	8.1000e-004	5.2000e-004	5.8100e-003	2.0000e-005	2.3000e-003	2.0000e-005	2.3100e-003	6.2000e-004	1.0000e-005	6.3000e-004	0.0000	1.9020	1.9020	4.0000e-005	0.0000	1.9030
Total	**8.1000e-004**	**5.2000e-004**	**5.8100e-003**	**2.0000e-005**	**2.3000e-003**	**2.0000e-005**	**2.3100e-003**	**6.2000e-004**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**1.9020**	**1.9020**	**4.0000e-005**	**0.0000**	**1.9030**

3.10 Architectural Coating - 2024

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	tons/yr										MT/yr					
Archit. Coating	3.4187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1600e-003	0.0213	0.0317	5.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	4.4682	4.4682	2.5000e-004	0.0000	4.4745
Total	**3.4218**	**0.0213**	**0.0317**	**5.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**4.4682**	**4.4682**	**2.5000e-004**	**0.0000**	**4.4745**

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	5.3300e-003	3.4000e-003	0.0381	1.4000e-004	0.0163	1.0000e-004	0.0164	4.3400e-003	9.0000e-005	4.4400e-003	0.0000	12.4690	12.4690	2.4000e-004	0.0000	12.4750
Total	**5.3300e-003**	**3.4000e-003**	**0.0381**	**1.4000e-004**	**0.0163**	**1.0000e-004**	**0.0164**	**4.3400e-003**	**9.0000e-005**	**4.4400e-003**	**0.0000**	**12.4690**	**12.4690**	**2.4000e-004**	**0.0000**	**12.4750**

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	tons/yr										MT/yr					
Archit. Coating	3.4187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1600e-003	0.0213	0.0317	5.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	4.4682	4.4682	2.5000e-004	0.0000	4.4745
Total	**3.4218**	**0.0213**	**0.0317**	**5.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**4.4682**	**4.4682**	**2.5000e-004**	**0.0000**	**4.4745**

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	5.3300e-003	3.4000e-003	0.0381	1.4000e-004	0.0151	1.0000e-004	0.0152	4.0300e-003	9.0000e-005	4.1300e-003	0.0000	12.4690	12.4690	2.4000e-004	0.0000	12.4750
Total	**5.3300e-003**	**3.4000e-003**	**0.0381**	**1.4000e-004**	**0.0151**	**1.0000e-004**	**0.0152**	**4.0300e-003**	**9.0000e-005**	**4.1300e-003**	**0.0000**	**12.4690**	**12.4690**	**2.4000e-004**	**0.0000**	**12.4750**

CalEEMod Mitigated Construction Model

UCB Anchor House Mitigated Construction Run

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	8.00	1000sqft	0.00	8,000.00	0
Enclosed Parking with Elevator	29.40	1000sqft	0.00	29,400.00	0
Other Non-Asphalt Surfaces	10.15	1000sqft	0.23	10,150.00	0
Health Club	22.60	1000sqft	0.00	22,600.00	0
Apartments High Rise	770.00	Dwelling Unit	0.69	451,000.00	770
Convenience Market (24 Hour)	15.00	1000sqft	0.00	15,000.00	0

1.2 Other Project Characteristics

Urbanization Urban | **Wind Speed (m/s)** 2.2 | **Precipitation Freq (Days)** 63

Climate Zone 5 | **Operational Year** 2024

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 | **CH4 Intensity (lb/MWhr)** 0.029 | **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - based on data provided by UCB

Construction Phase - based on normalized construction schedule fit to duration provided by UCB, assuming pile driving duration will happen during BC for the same duration as normalized grading

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - bore drill rig added for pile driving

Off-road Equipment -

Off-road Equipment - no additional equipment for hauling

Off-road Equipment -

Off-road Equipment - no additional equipment for hauling

Off-road Equipment -

Off-road Equipment -

Trips and VMT - 10 worker trips each for building and asphalt demo to be included in demo phase. 4 vt/water truck/day, see hauling calc in assump file

Demolition -

Grading -

Architectural Coating - based on CalEEMod calculationsfor non-residential coating. only assumes parking area will be painted

Woodstoves -

Area Coating -

Water And Wastewater -

Solid Waste -

Construction Off-road Equipment Mitigation - BAAQMD BMPs, MM: Tier 4 Interim for equipment >25HP

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	2,373.00	1,764.00
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00

tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	10.00	44.00
tblConstructionPhase	NumDays	1.00	5.00
tblConstructionPhase	NumDays	2.00	9.00
tblConstructionPhase	NumDays	2.00	9.00
tblConstructionPhase	NumDays	100.00	9.00
tblConstructionPhase	NumDays	100.00	672.00
tblConstructionPhase	NumDays	5.00	35.00
tblConstructionPhase	NumDays	5.00	35.00
tblGrading	MaterialExported	0.00	48,000.00
tblLandUse	LandUseSquareFeet	770,000.00	451,000.00
tblLandUse	LotAcreage	0.18	0.00
tblLandUse	LotAcreage	0.67	0.00
tblLandUse	LotAcreage	0.52	0.00
tblLandUse	LotAcreage	12.42	0.69
tblLandUse	LotAcreage	0.34	0.00
tblLandUse	Population	2,202.00	770.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripNumber	186.00	189.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00

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					
2021	0.0949	1.3672	0.7411	4.1100e-003	0.1639	0.0221	0.1860	0.0425	0.0208	0.0632	0.0000	386.3945	386.3945	0.0272	0.0000	387.0754
2022	0.3520	2.3370	2.8626	0.0104	0.6864	0.0547	0.7411	0.1845	0.0504	0.2349	0.0000	953.6584	953.6584	0.0704	0.0000	955.4174
2023	0.3197	1.9556	2.6813	0.0101	0.6864	0.0465	0.7329	0.1845	0.0429	0.2274	0.0000	925.4148	925.4148	0.0658	0.0000	927.0588
2024	3.5897	1.0624	1.4836	5.3700e-003	0.3646	0.0264	0.3910	0.0980	0.0244	0.1224	0.0000	490.8837	490.8837	0.0379	0.0000	491.8305
Maximum	**3.5897**	**2.3370**	**2.8626**	**0.0104**	**0.6864**	**0.0547**	**0.7411**	**0.1845**	**0.0504**	**0.2349**	**0.0000**	**953.6584**	**953.6584**	**0.0704**	**0.0000**	**955.4174**

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					
2021	0.0704	1.2288	0.7794	4.1100e-003	0.1382	4.2500e-003	0.1425	0.0369	4.0900e-003	0.0410	0.0000	386.3944	386.3944	0.0272	0.0000	387.0754
2022	0.2937	2.0059	2.9679	0.0104	0.6342	8.7900e-003	0.6430	0.1717	8.3700e-003	0.1801	0.0000	953.6582	953.6582	0.0704	0.0000	955.4173
2023	0.2685	1.7035	2.7939	0.0101	0.6342	7.3300e-003	0.6415	0.1717	6.9700e-003	0.1787	0.0000	925.4147	925.4147	0.0658	0.0000	927.0587
2024	3.5597	0.9596	1.5565	5.3700e-003	0.3369	4.8400e-003	0.3417	0.0912	4.6600e-003	0.0958	0.0000	490.8836	490.8836	0.0379	0.0000	491.8304
Maximum	**3.5597**	**2.0059**	**2.9679**	**0.0104**	**0.6342**	**8.7900e-003**	**0.6430**	**0.1717**	**8.3700e-003**	**0.1801**	**0.0000**	**953.6582**	**953.6582**	**0.0704**	**0.0000**	**955.4173**

	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	N20	CO2e
Percent Reduction	3.76	12.27	-4.24	0.00	8.30	83.16	13.76	7.46	82.60	23.52	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	7-27-2021	10-26-2021	0.2193	0.1540
5	10-27-2021	1-26-2022	2.6150	2.4437
6	1-27-2022	4-26-2022	0.6700	0.5738
7	4-27-2022	7-26-2022	0.6678	0.5705
8	7-27-2022	10-26-2022	0.6790	0.5806
9	10-27-2022	1-26-2023	0.6591	0.5669
10	1-27-2023	4-26-2023	0.5677	0.4927
11	4-27-2023	7-26-2023	0.5658	0.4900
12	7-27-2023	10-26-2023	0.5753	0.4987
13	10-27-2023	1-26-2024	0.5765	0.5043
14	1-27-2024	4-26-2024	0.5492	0.4890
15	4-27-2024	7-26-2024	3.9477	3.8925
		Highest	3.9477	3.8925

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/1/2021	11/1/2021	5	44	a
2	Demolition Haul	Demolition	9/1/2021	11/1/2021	5	44	b
3	Site Preparation	Site Preparation	11/2/2021	11/8/2021	5	5	c
4	Grading	Grading	11/9/2021	11/21/2021	5	9	d
5	Grading Soil Haul	Grading	11/9/2021	11/21/2021	5	9	e
6	Building Construction and Pile Driving	Building Construction	11/22/2021	12/2/2021	5	9	f
7	Building Construction	Building Construction	12/3/2021	7/1/2024	5	672	g
8	Paving	Paving	5/14/2024	7/1/2024	5	35	h

9	Architectural Coating	Architectural Coating	5/14/2024	7/1/2024	5	35	i

Acres of Grading (Site Preparation Phase): 2.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.23

Residential Indoor: 913,275; Residential Outdoor: 304,425; Non-Residential Indoor: 68,400; Non-Residential Outdoor: 22,800; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Demolition Haul	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition Haul	Rubber Tired Dozers	0	1.00	247	0.40
Demolition Haul	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading Soil Haul	Concrete/Industrial Saws	0	8.00	81	0.73
Grading Soil Haul	Rubber Tired Dozers	0	1.00	247	0.40
Grading Soil Haul	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Building Construction and Pile Driving	Bore/Drill Rigs	1	8.00	221	0.50
Building Construction and Pile Driving	Cranes	1	4.00	231	0.29
Building Construction and Pile Driving	Forklifts	2	6.00	89	0.20
Building Construction and Pile Driving	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56

Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	4	20.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition Haul	0	0.00	0.00	189.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading Soil Haul	0	0.00	0.00	6,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction and Pile Driving	6	588.00	96.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	588.00	96.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	118.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2021

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	tons/yr										MT/yr					
Off-Road	0.0175	0.1596	0.1665	2.6000e-004		8.9600e-003	8.9600e-003		8.5500e-003	8.5500e-003	0.0000	22.9006	22.9006	4.2700e-003	0.0000	23.0073
Total	**0.0175**	**0.1596**	**0.1665**	**2.6000e-004**		**8.9600e-003**	**8.9600e-003**		**8.5500e-003**	**8.5500e-003**	**0.0000**	**22.9006**	**22.9006**	**4.2700e-003**	**0.0000**	**23.0073**

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	2.7000e-004	9.4100e-003	1.9900e-003	2.0000e-005	5.8000e-004	2.0000e-005	6.0000e-004	1.7000e-004	2.0000e-005	1.9000e-004	0.0000	2.3053	2.3053	1.3000e-004	0.0000	2.3085
Worker	1.4100e-003	1.0000e-003	0.0105	3.0000e-005	3.4800e-003	2.0000e-005	3.5000e-003	9.3000e-004	2.0000e-005	9.5000e-004	0.0000	2.9853	2.9853	7.0000e-005	0.0000	2.9871
Total	**1.6800e-003**	**0.0104**	**0.0125**	**5.0000e-005**	**4.0600e-003**	**4.0000e-005**	**4.1000e-003**	**1.1000e-003**	**4.0000e-005**	**1.1400e-003**	**0.0000**	**5.2906**	**5.2906**	**2.0000e-004**	**0.0000**	**5.2956**

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	tons/yr										MT/yr					
Off-Road	5.2000e-003	0.1000	0.1746	2.6000e-004		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	22.9005	22.9005	4.2700e-003	0.0000	23.0072
Total	**5.2000e-003**	**0.1000**	**0.1746**	**2.6000e-004**		**3.9000e-004**	**3.9000e-004**		**3.9000e-004**	**3.9000e-004**	**0.0000**	**22.9005**	**22.9005**	**4.2700e-003**	**0.0000**	**23.0072**

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	2.7000e-004	9.4100e-003	1.9900e-003	2.0000e-005	5.4000e-004	2.0000e-005	5.6000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.3053	2.3053	1.3000e-004	0.0000	2.3085
Worker	1.4100e-003	1.0000e-003	0.0105	3.0000e-005	3.2100e-003	2.0000e-005	3.2300e-003	8.6000e-004	2.0000e-005	8.8000e-004	0.0000	2.9853	2.9853	7.0000e-005	0.0000	2.9871
Total	**1.6800e-003**	**0.0104**	**0.0125**	**5.0000e-005**	**3.7500e-003**	**4.0000e-005**	**3.7900e-003**	**1.0200e-003**	**4.0000e-005**	**1.0600e-003**	**0.0000**	**5.2906**	**5.2906**	**2.0000e-004**	**0.0000**	**5.2956**

3.3 Demolition Haul - 2021

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	tons/yr										MT/yr					
Fugitive Dust					0.0202	0.0000	0.0202	3.0600e-003	0.0000	3.0600e-003	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0202**	**0.0000**	**0.0202**	**3.0600e-003**	**0.0000**	**3.0600e-003**	**0.0000**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	7.6000e-004	0.0255	4.7300e-003	7.0000e-005	1.6000e-003	8.0000e-005	1.6800e-003	4.4000e-004	7.0000e-005	5.1000e-004	0.0000	7.1446	7.1446	3.5000e-004	0.0000	7.1534
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	0.0000	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
Total	**7.6000e-004**	**0.0255**	**4.7300e-003**	**7.0000e-005**	**1.6000e-003**	**8.0000e-005**	**1.6800e-003**	**4.4000e-004**	**7.0000e-005**	**5.1000e-004**	**0.0000**	**7.1446**	**7.1446**	**3.5000e-004**	**0.0000**	**7.1534**

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	tons/yr										MT/yr					
Fugitive Dust					8.6300e-003	0.0000	8.6300e-003	1.3100e-003	0.0000	1.3100e-003	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.6300e-003**	**0.0000**	**8.6300e-003**	**1.3100e-003**	**0.0000**	**1.3100e-003**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	7.6000e-004	0.0255	4.7300e-003	7.0000e-005	1.4900e-003	8.0000e-005	1.5700e-003	4.1000e-004	7.0000e-005	4.9000e-004	0.0000	7.1446	7.1446	3.5000e-004	0.0000	7.1534
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	0.0000	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

Total	**7.6000e-004**	**0.0255**	**4.7300e-003**	**7.0000e-005**	**1.4900e-003**	**8.0000e-005**	**1.5700e-003**	**4.1000e-004**	**7.0000e-005**	**4.9000e-004**	**0.0000**	**7.1446**	**7.1446**	**3.5000e-004**	**0.0000**	**7.1534**

3.4 Site Preparation - 2021

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	tons/yr										MT/yr					
Fugitive Dust					1.3300e-003	0.0000	1.3300e-003	1.4000e-004	0.0000	1.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-003	0.0196	0.0101	2.0000e-005		7.5000e-004	7.5000e-004		6.9000e-004	6.9000e-004	0.0000	2.1377	2.1377	6.9000e-004	0.0000	2.1550
Total	**1.6000e-003**	**0.0196**	**0.0101**	**2.0000e-005**	**1.3300e-003**	**7.5000e-004**	**2.0800e-003**	**1.4000e-004**	**6.9000e-004**	**8.3000e-004**	**0.0000**	**2.1377**	**2.1377**	**6.9000e-004**	**0.0000**	**2.1550**

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	3.0000e-005	1.0700e-003	2.3000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2620	0.2620	1.0000e-005	0.0000	0.2623
Worker	4.0000e-005	3.0000e-005	3.0000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0848	0.0848	0.0000	0.0000	0.0849
Total	**7.0000e-005**	**1.1000e-003**	**5.3000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.3468**	**0.3468**	**1.0000e-005**	**0.0000**	**0.3472**

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	tons/yr										MT/yr					
Fugitive Dust					5.7000e-004	0.0000	5.7000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4000e-004	7.7500e-003	0.0146	2.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.1377	2.1377	6.9000e-004	0.0000	2.1550
Total	**4.4000e-004**	**7.7500e-003**	**0.0146**	**2.0000e-005**	**5.7000e-004**	**4.0000e-005**	**6.1000e-004**	**6.0000e-005**	**4.0000e-005**	**1.0000e-004**	**0.0000**	**2.1377**	**2.1377**	**6.9000e-004**	**0.0000**	**2.1550**

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	3.0000e-005	1.0700e-003	2.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2620	0.2620	1.0000e-005	0.0000	0.2623
Worker	4.0000e-005	3.0000e-005	3.0000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.0848	0.0848	0.0000	0.0000	0.0849
Total	**7.0000e-005**	**1.1000e-003**	**5.3000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.3468**	**0.3468**	**1.0000e-005**	**0.0000**	**0.3472**

3.5 Grading - 2021

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	tons/yr										MT/yr					
Fugitive Dust					3.3900e-003	0.0000	3.3900e-003	1.8600e-003	0.0000	1.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5800e-003	0.0326	0.0341	5.0000e-005		1.8300e-003	1.8300e-003		1.7500e-003	1.7500e-003	0.0000	4.6842	4.6842	8.7000e-004	0.0000	4.7060

Total	**3.5800e-003**	**0.0326**	**0.0341**	**5.0000e-005**	**3.3900e-003**	**1.8300e-003**	**5.2200e-003**	**1.8600e-003**	**1.7500e-003**	**3.6100e-003**	**0.0000**	**4.6842**	**4.6842**	**8.7000e-004**	**0.0000**	**4.7060**

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	6.0000e-005	1.9300e-003	4.1000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.4716	0.4716	3.0000e-005	0.0000	0.4722
Worker	1.4000e-004	1.0000e-004	1.0700e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3053	0.3053	1.0000e-005	0.0000	0.3055
Total	**2.0000e-004**	**2.0300e-003**	**1.4800e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.2000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.7769**	**0.7769**	**4.0000e-005**	**0.0000**	**0.7777**

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	tons/yr										MT/yr					
Fugitive Dust					1.4500e-003	0.0000	1.4500e-003	8.0000e-004	0.0000	8.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0600e-003	0.0205	0.0357	5.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	4.6842	4.6842	8.7000e-004	0.0000	4.7060
Total	**1.0600e-003**	**0.0205**	**0.0357**	**5.0000e-005**	**1.4500e-003**	**8.0000e-005**	**1.5300e-003**	**8.0000e-004**	**8.0000e-005**	**8.8000e-004**	**0.0000**	**4.6842**	**4.6842**	**8.7000e-004**	**0.0000**	**4.7060**

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	6.0000e-005	1.9300e-003	4.1000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.4716	0.4716	3.0000e-005	0.0000	0.4722
Worker	1.4000e-004	1.0000e-004	1.0700e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3053	0.3053	1.0000e-005	0.0000	0.3055
Total	**2.0000e-004**	**2.0300e-003**	**1.4800e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.7769**	**0.7769**	**4.0000e-005**	**0.0000**	**0.7777**

3.6 Grading Soil Haul - 2021

<u>Unmitigated Construction On-Site</u>

	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					2.7100e-003	0.0000	2.7100e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.7100e-003**	**0.0000**	**2.7100e-003**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

<u>Unmitigated Construction Off-Site</u>

	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	0.0240	0.8090	0.1501	2.3500e-003	0.0508	2.4700e-003	0.0533	0.0140	2.3700e-003	0.0164	0.0000	226.8124	226.8124	0.0112	0.0000	227.0935
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	0.0000	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
Total	**0.0240**	**0.8090**	**0.1501**	**2.3500e-003**	**0.0508**	**2.4700e-003**	**0.0533**	**0.0140**	**2.3700e-003**	**0.0164**	**0.0000**	**226.8124**	**226.8124**	**0.0112**	**0.0000**	**227.0935**

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	tons/yr										MT/yr					
Fugitive Dust					1.1600e-003	0.0000	1.1600e-003	1.8000e-004	0.0000	1.8000e-004	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.1600e-003**	**0.0000**	**1.1600e-003**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	0.0240	0.8090	0.1501	2.3500e-003	0.0474	2.4700e-003	0.0499	0.0131	2.3700e-003	0.0155	0.0000	226.8124	226.8124	0.0112	0.0000	227.0935
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	0.0000	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
Total	**0.0240**	**0.8090**	**0.1501**	**2.3500e-003**	**0.0474**	**2.4700e-003**	**0.0499**	**0.0131**	**2.3700e-003**	**0.0155**	**0.0000**	**226.8124**	**226.8124**	**0.0112**	**0.0000**	**227.0935**

3.7 Building Construction and Pile Driving - 2021

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	tons/yr										MT/yr					
Off-Road	4.6500e-003	0.0495	0.0420	9.0000e-005		2.4300e-003	2.4300e-003		2.2300e-003	2.2300e-003	0.0000	8.2270	8.2270	2.6600e-003	0.0000	8.2936
Total	**4.6500e-003**	**0.0495**	**0.0420**	**9.0000e-005**		**2.4300e-003**	**2.4300e-003**		**2.2300e-003**	**2.2300e-003**	**0.0000**	**8.2270**	**8.2270**	**2.6600e-003**	**0.0000**	**8.2936**

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	1.3400e-003	0.0462	9.7900e-003	1.2000e-004	2.8400e-003	1.0000e-004	2.9300e-003	8.2000e-004	9.0000e-005	9.1000e-004	0.0000	11.3171	11.3171	6.2000e-004	0.0000	11.3327
Worker	8.4500e-003	6.0200e-003	0.0631	2.0000e-004	0.0209	1.4000e-004	0.0211	5.5700e-003	1.3000e-004	5.6900e-003	0.0000	17.9524	17.9524	4.3000e-004	0.0000	17.9631
Total	**9.7900e-003**	**0.0522**	**0.0729**	**3.2000e-004**	**0.0238**	**2.4000e-004**	**0.0240**	**6.3900e-003**	**2.2000e-004**	**6.6000e-003**	**0.0000**	**29.2695**	**29.2695**	**1.0500e-003**	**0.0000**	**29.2958**

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	tons/yr										MT/yr					
Off-Road	1.7700e-003	0.0315	0.0586	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.2270	8.2270	2.6600e-003	0.0000	8.2935

Total	1.7700e-003	0.0315	0.0586	9.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	8.2270	8.2270	2.6600e-003	0.0000	8.2935

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	1.3400e-003	0.0462	9.7900e-003	1.2000e-004	2.6600e-003	1.0000e-004	2.7500e-003	7.8000e-004	9.0000e-005	8.7000e-004	0.0000	11.3171	11.3171	6.2000e-004	0.0000	11.3327
Worker	8.4500e-003	6.0200e-003	0.0631	2.0000e-004	0.0193	1.4000e-004	0.0194	5.1700e-003	1.3000e-004	5.3000e-003	0.0000	17.9524	17.9524	4.3000e-004	0.0000	17.9631
Total	**9.7900e-003**	**0.0522**	**0.0729**	**3.2000e-004**	**0.0220**	**2.4000e-004**	**0.0222**	**5.9500e-003**	**2.2000e-004**	**6.1700e-003**	**0.0000**	**29.2695**	**29.2695**	**1.0500e-003**	**0.0000**	**29.2958**

3.8 Building Construction - 2021

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	tons/yr										MT/yr					
Off-Road	8.1400e-003	0.0838	0.0763	1.2000e-004		4.7000e-003	4.7000e-003		4.3200e-003	4.3200e-003	0.0000	10.5086	10.5086	3.4000e-003	0.0000	10.5936
Total	**8.1400e-003**	**0.0838**	**0.0763**	**1.2000e-004**		**4.7000e-003**	**4.7000e-003**		**4.3200e-003**	**4.3200e-003**	**0.0000**	**10.5086**	**10.5086**	**3.4000e-003**	**0.0000**	**10.5936**

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	3.1200e-003	0.1078	0.0228	2.8000e-004	6.6200e-003	2.2000e-004	6.8400e-003	1.9200e-003	2.2000e-004	2.1300e-003	0.0000	26.4066	26.4066	1.4500e-003	0.0000	26.4429
Worker	0.0197	0.0141	0.1472	4.6000e-004	0.0488	3.3000e-004	0.0491	0.0130	3.0000e-004	0.0133	0.0000	41.8889	41.8889	1.0000e-003	0.0000	41.9139
Total	**0.0228**	**0.1219**	**0.1700**	**7.4000e-004**	**0.0554**	**5.5000e-004**	**0.0560**	**0.0149**	**5.2000e-004**	**0.0154**	**0.0000**	**68.2956**	**68.2956**	**2.4500e-003**	**0.0000**	**68.3568**

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	tons/yr										MT/yr					
Off-Road	2.5000e-003	0.0470	0.0836	1.2000e-004		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	10.5086	10.5086	3.4000e-003	0.0000	10.5936
Total	**2.5000e-003**	**0.0470**	**0.0836**	**1.2000e-004**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**10.5086**	**10.5086**	**3.4000e-003**	**0.0000**	**10.5936**

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	3.1200e-003	0.1078	0.0228	2.8000e-004	6.2000e-003	2.2000e-004	6.4300e-003	1.8100e-003	2.2000e-004	2.0300e-003	0.0000	26.4066	26.4066	1.4500e-003	0.0000	26.4429
Worker	0.0197	0.0141	0.1472	4.6000e-004	0.0450	3.3000e-004	0.0454	0.0121	3.0000e-004	0.0124	0.0000	41.8889	41.8889	1.0000e-003	0.0000	41.9139
Total	**0.0228**	**0.1219**	**0.1700**	**7.4000e-004**	**0.0512**	**5.5000e-004**	**0.0518**	**0.0139**	**5.2000e-004**	**0.0144**	**0.0000**	**68.2956**	**68.2956**	**2.4500e-003**	**0.0000**	**68.3568**

3.8 Building Construction - 2022

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	tons/yr										MT/yr					
Off-Road	0.0892	0.9134	0.9299	1.4800e-003		0.0484	0.0484		0.0445	0.0445	0.0000	130.1920	130.1920	0.0421	0.0000	131.2447
Total	**0.0892**	**0.9134**	**0.9299**	**1.4800e-003**		**0.0484**	**0.0484**		**0.0445**	**0.0445**	**0.0000**	**130.1920**	**130.1920**	**0.0421**	**0.0000**	**131.2447**

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	0.0361	1.2679	0.2649	3.3800e-003	0.0820	2.4100e-003	0.0844	0.0237	2.3000e-003	0.0260	0.0000	323.7424	323.7424	0.0172	0.0000	324.1715
Worker	0.2267	0.1557	1.6679	5.5300e-003	0.6044	3.9600e-003	0.6083	0.1608	3.6500e-003	0.1644	0.0000	499.7239	499.7239	0.0111	0.0000	500.0013
Total	**0.2628**	**1.4236**	**1.9328**	**8.9100e-003**	**0.6864**	**6.3700e-003**	**0.6927**	**0.1845**	**5.9500e-003**	**0.1904**	**0.0000**	**823.4664**	**823.4664**	**0.0283**	**0.0000**	**824.1728**

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	tons/yr										MT/yr					
Off-Road	0.0310	0.5823	1.0351	1.4800e-003		2.4200e-003	2.4200e-003		2.4200e-003	2.4200e-003	0.0000	130.1918	130.1918	0.0421	0.0000	131.2445
Total	**0.0310**	**0.5823**	**1.0351**	**1.4800e-003**		**2.4200e-003**	**2.4200e-003**		**2.4200e-003**	**2.4200e-003**	**0.0000**	**130.1918**	**130.1918**	**0.0421**	**0.0000**	**131.2445**

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	0.0361	1.2679	0.2649	3.3800e-003	0.0768	2.4100e-003	0.0792	0.0224	2.3000e-003	0.0247	0.0000	323.7424	323.7424	0.0172	0.0000	324.1715
Worker	0.2267	0.1557	1.6679	5.5300e-003	0.5574	3.9600e-003	0.5614	0.1492	3.6500e-003	0.1529	0.0000	499.7239	499.7239	0.0111	0.0000	500.0013
Total	**0.2628**	**1.4236**	**1.9328**	**8.9100e-003**	**0.6342**	**6.3700e-003**	**0.6405**	**0.1717**	**5.9500e-003**	**0.1776**	**0.0000**	**823.4664**	**823.4664**	**0.0283**	**0.0000**	**824.1728**

3.8 Building Construction - 2023

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	tons/yr										MT/yr					

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
Off-Road	0.0822	0.8344	0.9226	1.4800e-003		0.0416	0.0416		0.0383	0.0383	0.0000	130.2710	130.2710	0.0421	0.0000	131.3243
Total	**0.0822**	**0.8344**	**0.9226**	**1.4800e-003**		**0.0416**	**0.0416**		**0.0383**	**0.0383**	**0.0000**	**130.2710**	**130.2710**	**0.0421**	**0.0000**	**131.3243**

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	0.0265	0.9815	0.2315	3.2800e-003	0.0820	1.0400e-003	0.0830	0.0237	9.9000e-004	0.0247	0.0000	314.5321	314.5321	0.0137	0.0000	314.8747
Worker	0.2110	0.1397	1.5272	5.3100e-003	0.6044	3.8700e-003	0.6083	0.1608	3.5600e-003	0.1643	0.0000	480.6118	480.6118	9.9200e-003	0.0000	480.8599
Total	**0.2375**	**1.1212**	**1.7587**	**8.5900e-003**	**0.6864**	**4.9100e-003**	**0.6913**	**0.1845**	**4.5500e-003**	**0.1891**	**0.0000**	**795.1439**	**795.1439**	**0.0236**	**0.0000**	**795.7346**

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	tons/yr										MT/yr					
Off-Road	0.0310	0.5823	1.0351	1.4800e-003		2.4200e-003	2.4200e-003		2.4200e-003	2.4200e-003	0.0000	130.2708	130.2708	0.0421	0.0000	131.3241
Total	**0.0310**	**0.5823**	**1.0351**	**1.4800e-003**		**2.4200e-003**	**2.4200e-003**		**2.4200e-003**	**2.4200e-003**	**0.0000**	**130.2708**	**130.2708**	**0.0421**	**0.0000**	**131.3241**

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	0.0265	0.9815	0.2315	3.2800e-003	0.0768	1.0400e-003	0.0778	0.0224	9.9000e-004	0.0234	0.0000	314.5321	314.5321	0.0137	0.0000	314.8747
Worker	0.2110	0.1397	1.5272	5.3100e-003	0.5574	3.8700e-003	0.5613	0.1492	3.5600e-003	0.1528	0.0000	480.6118	480.6118	9.9200e-003	0.0000	480.8599
Total	**0.2375**	**1.1212**	**1.7587**	**8.5900e-003**	**0.6342**	**4.9100e-003**	**0.6391**	**0.1717**	**4.5500e-003**	**0.1762**	**0.0000**	**795.1439**	**795.1439**	**0.0236**	**0.0000**	**795.7346**

3.8 Building Construction - 2024

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	tons/yr										MT/yr					
Off-Road	0.0390	0.3913	0.4629	7.5000e-004		0.0185	0.0185		0.0170	0.0170	0.0000	65.6588	65.6588	0.0212	0.0000	66.1897
Total	**0.0390**	**0.3913**	**0.4629**	**7.5000e-004**		**0.0185**	**0.0185**		**0.0170**	**0.0170**	**0.0000**	**65.6588**	**65.6588**	**0.0212**	**0.0000**	**66.1897**

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	0.0129	0.4909	0.1117	1.6400e-003	0.0413	5.2000e-004	0.0418	0.0120	4.9000e-004	0.0124	0.0000	157.3782	157.3782	6.8200e-003	0.0000	157.5487
Worker	0.0995	0.0634	0.7103	2.5700e-003	0.3045	1.9100e-003	0.3064	0.0810	1.7600e-003	0.0828	0.0000	232.5564	232.5564	4.4900e-003	0.0000	232.6688
Total	**0.1124**	**0.5544**	**0.8220**	**4.2100e-003**	**0.3458**	**2.4300e-003**	**0.3483**	**0.0930**	**2.2500e-003**	**0.0952**	**0.0000**	**389.9347**	**389.9347**	**0.0113**	**0.0000**	**390.2175**

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	tons/yr										MT/yr					
Off-Road	0.0156	0.2934	0.5215	7.5000e-004		1.2200e-003	1.2200e-003		1.2200e-003	1.2200e-003	0.0000	65.6587	65.6587	0.0212	0.0000	66.1896
Total	**0.0156**	**0.2934**	**0.5215**	**7.5000e-004**		**1.2200e-003**	**1.2200e-003**		**1.2200e-003**	**1.2200e-003**	**0.0000**	**65.6587**	**65.6587**	**0.0212**	**0.0000**	**66.1896**

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	0.0129	0.4909	0.1117	1.6400e-003	0.0387	5.2000e-004	0.0392	0.0113	4.9000e-004	0.0118	0.0000	157.3782	157.3782	6.8200e-003	0.0000	157.5487
Worker	0.0995	0.0634	0.7103	2.5700e-003	0.2808	1.9100e-003	0.2828	0.0752	1.7600e-003	0.0770	0.0000	232.5564	232.5564	4.4900e-003	0.0000	232.6688
Total	**0.1124**	**0.5544**	**0.8220**	**4.2100e-003**	**0.3195**	**2.4300e-003**	**0.3220**	**0.0865**	**2.2500e-003**	**0.0888**	**0.0000**	**389.9347**	**389.9347**	**0.0113**	**0.0000**	**390.2175**

3.9 Paving - 2024

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	tons/yr										MT/yr					
Off-Road	0.0103	0.0915	0.1231	2.0000e-004		4.2500e-003	4.2500e-003		3.9700e-003	3.9700e-003	0.0000	16.4511	16.4511	4.7900e-003	0.0000	16.5709
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0103**	**0.0915**	**0.1231**	**2.0000e-004**		**4.2500e-003**	**4.2500e-003**		**3.9700e-003**	**3.9700e-003**	**0.0000**	**16.4511**	**16.4511**	**4.7900e-003**	**0.0000**	**16.5709**

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	8.1000e-004	5.2000e-004	5.8100e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.9020	1.9020	4.0000e-005	0.0000	1.9030
Total	**8.1000e-004**	**5.2000e-004**	**5.8100e-003**	**2.0000e-005**	**2.4900e-003**	**2.0000e-005**	**2.5100e-003**	**6.6000e-004**	**1.0000e-005**	**6.8000e-004**	**0.0000**	**1.9020**	**1.9020**	**4.0000e-005**	**0.0000**	**1.9030**

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	tons/yr										MT/yr					
Off-Road	5.9400e-003	0.0893	0.1370	2.0000e-004		1.0100e-003	1.0100e-003		1.0100e-003	1.0100e-003	0.0000	16.4510	16.4510	4.7900e-003	0.0000	16.5708
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.9400e-003**	**0.0893**	**0.1370**	**2.0000e-004**		**1.0100e-003**	**1.0100e-003**		**1.0100e-003**	**1.0100e-003**	**0.0000**	**16.4510**	**16.4510**	**4.7900e-003**	**0.0000**	**16.5708**

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	8.1000e-004	5.2000e-004	5.8100e-003	2.0000e-005	2.3000e-003	2.0000e-005	2.3100e-003	6.2000e-004	1.0000e-005	6.3000e-004	0.0000	1.9020	1.9020	4.0000e-005	0.0000	1.9030
Total	**8.1000e-004**	**5.2000e-004**	**5.8100e-003**	**2.0000e-005**	**2.3000e-003**	**2.0000e-005**	**2.3100e-003**	**6.2000e-004**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**1.9020**	**1.9020**	**4.0000e-005**	**0.0000**	**1.9030**

3.10 Architectural Coating - 2024

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	tons/yr										MT/yr					
Archit. Coating	3.4187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1600e-003	0.0213	0.0317	5.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	4.4682	4.4682	2.5000e-004	0.0000	4.4745
Total	**3.4218**	**0.0213**	**0.0317**	**5.0000e-005**		**1.0700e-003**	**1.0700e-003**		**1.0700e-003**	**1.0700e-003**	**0.0000**	**4.4682**	**4.4682**	**2.5000e-004**	**0.0000**	**4.4745**

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	5.3300e-003	3.4000e-003	0.0381	1.4000e-004	0.0163	1.0000e-004	0.0164	4.3400e-003	9.0000e-005	4.4400e-003	0.0000	12.4690	12.4690	2.4000e-004	0.0000	12.4750
Total	**5.3300e-003**	**3.4000e-003**	**0.0381**	**1.4000e-004**	**0.0163**	**1.0000e-004**	**0.0164**	**4.3400e-003**	**9.0000e-005**	**4.4400e-003**	**0.0000**	**12.4690**	**12.4690**	**2.4000e-004**	**0.0000**	**12.4750**

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	tons/yr										MT/yr					
Archit. Coating	3.4187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.5000e-004	0.0186	0.0321	5.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	4.4682	4.4682	2.5000e-004	0.0000	4.4745
Total	**3.4196**	**0.0186**	**0.0321**	**5.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**4.4682**	**4.4682**	**2.5000e-004**	**0.0000**	**4.4745**

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	5.3300e-003	3.4000e-003	0.0381	1.4000e-004	0.0151	1.0000e-004	0.0152	4.0300e-003	9.0000e-005	4.1300e-003	0.0000	12.4690	12.4690	2.4000e-004	0.0000	12.4750
Total	**5.3300e-003**	**3.4000e-003**	**0.0381**	**1.4000e-004**	**0.0151**	**1.0000e-004**	**0.0152**	**4.0300e-003**	**9.0000e-005**	**4.1300e-003**	**0.0000**	**12.4690**	**12.4690**	**2.4000e-004**	**0.0000**	**12.4750**

CalEEMod Operations Model

UC Berkeley Anchor House Development Operations Run

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	8.00	1000sqft	0.00	8,000.00	0
Enclosed Parking with Elevator	29.40	1000sqft	0.00	29,400.00	0
Other Non-Asphalt Surfaces	10.15	1000sqft	0.23	10,150.00	0
Health Club	22.60	1000sqft	0.00	22,600.00	0
Apartments High Rise	244.00	Dwelling Unit	0.69	451,000.00	698
Convenience Market (24 Hour)	15.00	1000sqft	0.00	15,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See assumptions for Anchor House

Land Use - See Anchor House Assumptions

Construction Phase - Operation Run = No Construction

Off-road Equipment - Operation Run = No Construction

Trips and VMT - Operation Run = No Construction

Architectural Coating - Operation Run = No Construction

Vehicle Trips - See Assumptions

Vehicle Emission Factors - See Asumptions

Woodstoves - no fireplace

Area Coating - accounting for parking area

Energy Use - See Assumptions

Water And Wastewater - see assumptions, assumes 100% aerobic treatment

Solid Waste - See Assumptions

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	0.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	0.00
tblArchitecturalCoating	EF_Parking	150.00	0.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	0.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	0.00
tblAreaCoating	Area_Parking	2373	1764
tblConstructionPhase	NumDays	5.00	1.00
tblEnergyUse	LightingElect	741.44	1,187.64
tblEnergyUse	LightingElect	4.88	7.82
tblEnergyUse	LightingElect	1.75	2.80
tblEnergyUse	LightingElect	3.58	5.73
tblEnergyUse	LightingElect	2.99	4.79
tblEnergyUse	NT24E	3,054.10	4,892.07
tblEnergyUse	NT24E	3.36	5.38
tblEnergyUse	NT24E	0.19	0.30
tblEnergyUse	NT24E	4.80	7.69
tblEnergyUse	NT24E	3.36	5.38
tblEnergyUse	NT24NG	2,615.00	0.00
tblEnergyUse	NT24NG	0.70	0.00
tblEnergyUse	NT24NG	1.01	0.00
tblEnergyUse	NT24NG	6.90	0.00
tblEnergyUse	T24E	426.45	610.00

tblEnergyUse	T24E	2.24	3.20
tblEnergyUse	T24E	3.92	5.61
tblEnergyUse	T24E	4.10	5.86
tblEnergyUse	T24E	1.21	1.73
tblEnergyUse	T24NG	6,115.43	0.00
tblEnergyUse	T24NG	3.90	0.00
tblEnergyUse	T24NG	18.32	0.00
tblEnergyUse	T24NG	17.85	0.00
tblFireplaces	NumberGas	36.60	0.00
tblFireplaces	NumberNoFireplace	9.76	244.00
tblFireplaces	NumberWood	41.48	0.00
tblFleetMix	HHD	0.05	5.4430e-003
tblFleetMix	LDA	0.56	0.70
tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.24
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1570e-003	0.00
tblFleetMix	MCY	5.4600e-003	6.8190e-003
tblFleetMix	MDV	0.11	0.00
tblFleetMix	MH	6.9000e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.2210e-003	0.00
tblFleetMix	SBUS	3.4300e-004	0.00
tblFleetMix	UBUS	2.3580e-003	0.00
tblLandUse	LandUseSquareFeet	244,000.00	451,000.00
tblLandUse	LotAcreage	0.18	0.00
tblLandUse	LotAcreage	0.67	0.00
tblLandUse	LotAcreage	0.52	0.00
tblLandUse	LotAcreage	3.94	0.69
tblLandUse	LotAcreage	0.34	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblProjectCharacteristics	CH4IntensityFactor	0.029	0
tblProjectCharacteristics	CO2IntensityFactor	641.35	0
tblProjectCharacteristics	N2OIntensityFactor	0.006	0
tblSolidWaste	SolidWasteGenerationRate	112.24	58.10
tblSolidWaste	SolidWasteGenerationRate	45.08	0.00
tblSolidWaste	SolidWasteGenerationRate	7.44	0.00
tblSolidWaste	SolidWasteGenerationRate	128.82	0.00
tblTripsAndVMT	WorkerTripNumber	42.00	0.00
tblVehicleEF	HHD	0.61	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.65	6.63
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tblVehicleEF	HHD	20.08	2.28
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tblVehicleEF	HHD	5.8270e-003	0.02
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tblVehicleEF	HHD	0.05	1.0000e-006
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tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	9.5000e-005	0.00
tblVehicleEF	HHD	4.6000e-005	1.0000e-006
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tblVehicleEF	HHD	20.07	2.28
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tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04

tblVehicleEF	HHD	6.0910e-003	0.03
tblVehicleEF	HHD	5.1000e-005	0.00
tblVehicleEF	HHD	4.7440e-003	1.9730e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8990e-003	8.9250e-003
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tblVehicleEF	HHD	4.7000e-005	0.00
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tblVehicleEF	HHD	0.09	0.02
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tblVehicleEF	HHD	0.04	1.0000e-006
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tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	9.2000e-005	0.00
tblVehicleEF	HHD	1.0900e-004	4.0000e-006
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tblVehicleEF	HHD	5.1000e-005	0.00
tblVehicleEF	HHD	6.8450e-003	2.5600e-003
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tblVehicleEF	HHD	8.8990e-003	8.8460e-003
tblVehicleEF	HHD	5.8270e-003	0.02
tblVehicleEF	HHD	4.7000e-005	0.00
tblVehicleEF	HHD	2.2000e-005	1.0000e-006
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tblVehicleEF	HHD	2.2600e-004	4.1100e-004
tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	9.8000e-005	0.00
tblVehicleEF	HHD	2.2000e-005	1.0000e-006
tblVehicleEF	HHD	2.7320e-003	7.6000e-005
tblVehicleEF	HHD	0.54	0.47
tblVehicleEF	HHD	1.6000e-005	0.00
tblVehicleEF	HHD	0.14	0.03
tblVehicleEF	HHD	2.2600e-004	4.1100e-004

tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	LDA	3.5140e-003	1.8590e-003
tblVehicleEF	LDA	4.9650e-003	0.05
tblVehicleEF	LDA	0.49	0.53
tblVehicleEF	LDA	1.13	2.17
tblVehicleEF	LDA	234.55	244.53
tblVehicleEF	LDA	54.04	51.83
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.07	0.18
tblVehicleEF	LDA	1.7060e-003	1.3780e-003
tblVehicleEF	LDA	2.2270e-003	1.7010e-003
tblVehicleEF	LDA	1.5720e-003	1.2690e-003
tblVehicleEF	LDA	2.0480e-003	1.5640e-003
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.10	0.09
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	8.8530e-003	7.0560e-003
tblVehicleEF	LDA	0.04	0.21
tblVehicleEF	LDA	0.07	0.21
tblVehicleEF	LDA	2.3480e-003	2.3700e-003
tblVehicleEF	LDA	5.5900e-004	5.0200e-004
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.10	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.21
tblVehicleEF	LDA	0.07	0.23
tblVehicleEF	LDA	3.9250e-003	2.1100e-003
tblVehicleEF	LDA	4.0500e-003	0.04
tblVehicleEF	LDA	0.58	0.63
tblVehicleEF	LDA	0.87	1.66

tblVehicleEF	LDA	253.53	263.96
tblVehicleEF	LDA	54.04	50.87
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.15
tblVehicleEF	LDA	1.7060e-003	1.3780e-003
tblVehicleEF	LDA	2.2270e-003	1.7010e-003
tblVehicleEF	LDA	1.5720e-003	1.2690e-003
tblVehicleEF	LDA	2.0480e-003	1.5640e-003
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	0.11	0.10
tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	9.8710e-003	7.8650e-003
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	2.5390e-003	2.5590e-003
tblVehicleEF	LDA	5.5500e-004	4.9300e-004
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	0.11	0.10
tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.19
tblVehicleEF	LDA	3.4320e-003	1.7940e-003
tblVehicleEF	LDA	5.6030e-003	0.05
tblVehicleEF	LDA	0.49	0.52
tblVehicleEF	LDA	1.32	2.54
tblVehicleEF	LDA	232.65	242.60
tblVehicleEF	LDA	54.04	52.51
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	1.7060e-003	1.3780e-003

tblVehicleEF	LDA	2.2270e-003	1.7010e-003
tblVehicleEF	LDA	1.5720e-003	1.2690e-003
tblVehicleEF	LDA	2.0480e-003	1.5640e-003
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	8.6500e-003	6.8930e-003
tblVehicleEF	LDA	0.04	0.25
tblVehicleEF	LDA	0.08	0.23
tblVehicleEF	LDA	2.3290e-003	2.3510e-003
tblVehicleEF	LDA	5.6300e-004	5.0900e-004
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.25
tblVehicleEF	LDA	0.08	0.26
tblVehicleEF	LDT1	7.2070e-003	3.6820e-003
tblVehicleEF	LDT1	0.01	0.06
tblVehicleEF	LDT1	0.90	0.84
tblVehicleEF	LDT1	2.40	2.36
tblVehicleEF	LDT1	289.66	292.82
tblVehicleEF	LDT1	66.92	62.69
tblVehicleEF	LDT1	0.09	0.07
tblVehicleEF	LDT1	0.13	0.23
tblVehicleEF	LDT1	2.2040e-003	1.7050e-003
tblVehicleEF	LDT1	2.9670e-003	2.1990e-003
tblVehicleEF	LDT1	2.0300e-003	1.5690e-003
tblVehicleEF	LDT1	2.7280e-003	2.0220e-003
tblVehicleEF	LDT1	0.08	0.08
tblVehicleEF	LDT1	0.22	0.16

tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.14	0.61
tblVehicleEF	LDT1	0.16	0.31
tblVehicleEF	LDT1	2.9060e-003	2.8390e-003
tblVehicleEF	LDT1	7.1100e-004	6.0800e-004
tblVehicleEF	LDT1	0.08	0.08
tblVehicleEF	LDT1	0.22	0.17
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.14	0.61
tblVehicleEF	LDT1	0.17	0.34
tblVehicleEF	LDT1	7.9710e-003	4.1390e-003
tblVehicleEF	LDT1	9.3730e-003	0.05
tblVehicleEF	LDT1	1.05	0.98
tblVehicleEF	LDT1	1.83	1.80
tblVehicleEF	LDT1	312.33	312.85
tblVehicleEF	LDT1	66.92	61.59
tblVehicleEF	LDT1	0.08	0.06
tblVehicleEF	LDT1	0.12	0.20
tblVehicleEF	LDT1	2.2040e-003	1.7050e-003
tblVehicleEF	LDT1	2.9670e-003	2.1990e-003
tblVehicleEF	LDT1	2.0300e-003	1.5690e-003
tblVehicleEF	LDT1	2.7280e-003	2.0220e-003
tblVehicleEF	LDT1	0.20	0.19
tblVehicleEF	LDT1	0.25	0.19
tblVehicleEF	LDT1	0.15	0.15
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.13	0.56
tblVehicleEF	LDT1	0.13	0.25
tblVehicleEF	LDT1	3.1350e-003	3.0330e-003

tblVehicleEF	LDT1	7.0100e-004	5.9700e-004
tblVehicleEF	LDT1	0.20	0.19
tblVehicleEF	LDT1	0.25	0.19
tblVehicleEF	LDT1	0.15	0.15
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.13	0.56
tblVehicleEF	LDT1	0.14	0.27
tblVehicleEF	LDT1	7.0800e-003	3.5670e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	0.90	0.83
tblVehicleEF	LDT1	2.82	2.77
tblVehicleEF	LDT1	287.39	290.83
tblVehicleEF	LDT1	66.92	63.49
tblVehicleEF	LDT1	0.10	0.08
tblVehicleEF	LDT1	0.15	0.25
tblVehicleEF	LDT1	2.2040e-003	1.7050e-003
tblVehicleEF	LDT1	2.9670e-003	2.1990e-003
tblVehicleEF	LDT1	2.0300e-003	1.5690e-003
tblVehicleEF	LDT1	2.7280e-003	2.0220e-003
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.17	0.75
tblVehicleEF	LDT1	0.18	0.35
tblVehicleEF	LDT1	2.8830e-003	2.8200e-003
tblVehicleEF	LDT1	7.1800e-004	6.1500e-004
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.03	0.02

tblVehicleEF	LDT1	0.17	0.75
tblVehicleEF	LDT1	0.19	0.38
tblVehicleEF	LDT2	4.6390e-003	2.8980e-003
tblVehicleEF	LDT2	6.1780e-003	0.06
tblVehicleEF	LDT2	0.62	0.70
tblVehicleEF	LDT2	1.40	2.78
tblVehicleEF	LDT2	326.25	312.25
tblVehicleEF	LDT2	74.96	67.40
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.10	0.26
tblVehicleEF	LDT2	1.7310e-003	1.3970e-003
tblVehicleEF	LDT2	2.3320e-003	1.7240e-003
tblVehicleEF	LDT2	1.5920e-003	1.2860e-003
tblVehicleEF	LDT2	2.1440e-003	1.5850e-003
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.06	0.43
tblVehicleEF	LDT2	0.08	0.30
tblVehicleEF	LDT2	3.2670e-003	3.0270e-003
tblVehicleEF	LDT2	7.7300e-004	6.5300e-004
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.43
tblVehicleEF	LDT2	0.09	0.32
tblVehicleEF	LDT2	5.1750e-003	3.2760e-003
tblVehicleEF	LDT2	5.0390e-003	0.05
tblVehicleEF	LDT2	0.74	0.83

tblVehicleEF	LDT2	1.08	2.12
tblVehicleEF	LDT2	352.16	331.63
tblVehicleEF	LDT2	74.96	66.16
tblVehicleEF	LDT2	0.06	0.05
tblVehicleEF	LDT2	0.09	0.23
tblVehicleEF	LDT2	1.7310e-003	1.3970e-003
tblVehicleEF	LDT2	2.3320e-003	1.7240e-003
tblVehicleEF	LDT2	1.5920e-003	1.2860e-003
tblVehicleEF	LDT2	2.1440e-003	1.5850e-003
tblVehicleEF	LDT2	0.09	0.13
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.08	0.12
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.07	0.24
tblVehicleEF	LDT2	3.5270e-003	3.2150e-003
tblVehicleEF	LDT2	7.6700e-004	6.4100e-004
tblVehicleEF	LDT2	0.09	0.13
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.08	0.12
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.07	0.26
tblVehicleEF	LDT2	4.5310e-003	2.7990e-003
tblVehicleEF	LDT2	6.9720e-003	0.07
tblVehicleEF	LDT2	0.62	0.70
tblVehicleEF	LDT2	1.63	3.26
tblVehicleEF	LDT2	323.66	310.32
tblVehicleEF	LDT2	74.96	68.30
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.11	0.28

tblVehicleEF	LDT2	1.7310e-003	1.3970e-003
tblVehicleEF	LDT2	2.3320e-003	1.7240e-003
tblVehicleEF	LDT2	1.5920e-003	1.2860e-003
tblVehicleEF	LDT2	2.1440e-003	1.5850e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.09	0.33
tblVehicleEF	LDT2	3.2410e-003	3.0080e-003
tblVehicleEF	LDT2	7.7700e-004	6.6200e-004
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LHD1	5.2260e-003	5.2020e-003
tblVehicleEF	LHD1	0.02	8.2270e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.19
tblVehicleEF	LHD1	1.00	0.75
tblVehicleEF	LHD1	2.48	1.08
tblVehicleEF	LHD1	9.01	8.87
tblVehicleEF	LHD1	687.36	791.34
tblVehicleEF	LHD1	32.03	11.92
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	1.16	0.67
tblVehicleEF	LHD1	1.00	0.32
tblVehicleEF	LHD1	8.6700e-004	8.0900e-004

tblVehicleEF	LHD1	0.01	9.7150e-003
tblVehicleEF	LHD1	0.02	9.8140e-003
tblVehicleEF	LHD1	8.9200e-004	2.5100e-004
tblVehicleEF	LHD1	8.3000e-004	7.7400e-004
tblVehicleEF	LHD1	2.5240e-003	2.4290e-003
tblVehicleEF	LHD1	0.01	9.3410e-003
tblVehicleEF	LHD1	8.2000e-004	2.3100e-004
tblVehicleEF	LHD1	2.2790e-003	1.7640e-003
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.3220e-003	1.0180e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.30	0.53
tblVehicleEF	LHD1	0.25	0.07
tblVehicleEF	LHD1	9.0000e-005	8.6000e-005
tblVehicleEF	LHD1	6.7450e-003	7.7310e-003
tblVehicleEF	LHD1	3.6700e-004	1.1800e-004
tblVehicleEF	LHD1	2.2790e-003	1.7640e-003
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.3220e-003	1.0180e-003
tblVehicleEF	LHD1	0.15	0.11
tblVehicleEF	LHD1	0.30	0.53
tblVehicleEF	LHD1	0.27	0.08
tblVehicleEF	LHD1	5.2260e-003	5.2190e-003
tblVehicleEF	LHD1	0.02	8.4480e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.19
tblVehicleEF	LHD1	1.02	0.77
tblVehicleEF	LHD1	2.27	0.99
tblVehicleEF	LHD1	9.01	8.87

tblVehicleEF	LHD1	687.36	791.37
tblVehicleEF	LHD1	32.03	11.77
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	1.11	0.64
tblVehicleEF	LHD1	0.92	0.30
tblVehicleEF	LHD1	8.6700e-004	8.0900e-004
tblVehicleEF	LHD1	0.01	9.7150e-003
tblVehicleEF	LHD1	0.02	9.8140e-003
tblVehicleEF	LHD1	8.9200e-004	2.5100e-004
tblVehicleEF	LHD1	8.3000e-004	7.7400e-004
tblVehicleEF	LHD1	2.5240e-003	2.4290e-003
tblVehicleEF	LHD1	0.01	9.3410e-003
tblVehicleEF	LHD1	8.2000e-004	2.3100e-004
tblVehicleEF	LHD1	5.5610e-003	4.3310e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.7900e-003	2.1680e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.29	0.51
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	9.0000e-005	8.6000e-005
tblVehicleEF	LHD1	6.7460e-003	7.7310e-003
tblVehicleEF	LHD1	3.6300e-004	1.1700e-004
tblVehicleEF	LHD1	5.5610e-003	4.3310e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	2.7900e-003	2.1680e-003
tblVehicleEF	LHD1	0.15	0.11
tblVehicleEF	LHD1	0.29	0.51
tblVehicleEF	LHD1	0.25	0.07
tblVehicleEF	LHD1	5.2260e-003	5.1900e-003

tblVehicleEF	LHD1	0.02	8.0700e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.15	0.19
tblVehicleEF	LHD1	0.98	0.73
tblVehicleEF	LHD1	2.66	1.16
tblVehicleEF	LHD1	9.01	8.87
tblVehicleEF	LHD1	687.36	791.32
tblVehicleEF	LHD1	32.03	12.06
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	1.19	0.69
tblVehicleEF	LHD1	1.06	0.34
tblVehicleEF	LHD1	8.6700e-004	8.0900e-004
tblVehicleEF	LHD1	0.01	9.7150e-003
tblVehicleEF	LHD1	0.02	9.8140e-003
tblVehicleEF	LHD1	8.9200e-004	2.5100e-004
tblVehicleEF	LHD1	8.3000e-004	7.7400e-004
tblVehicleEF	LHD1	2.5240e-003	2.4290e-003
tblVehicleEF	LHD1	0.01	9.3410e-003
tblVehicleEF	LHD1	8.2000e-004	2.3100e-004
tblVehicleEF	LHD1	9.5900e-004	7.3200e-004
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.5100e-004	4.9500e-004
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.33	0.59
tblVehicleEF	LHD1	0.26	0.08
tblVehicleEF	LHD1	9.0000e-005	8.6000e-005
tblVehicleEF	LHD1	6.7450e-003	7.7300e-003
tblVehicleEF	LHD1	3.7000e-004	1.1900e-004
tblVehicleEF	LHD1	9.5900e-004	7.3200e-004
tblVehicleEF	LHD1	0.11	0.08

tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	6.5100e-004	4.9500e-004
tblVehicleEF	LHD1	0.15	0.11
tblVehicleEF	LHD1	0.33	0.59
tblVehicleEF	LHD1	0.29	0.08
tblVehicleEF	LHD2	3.4370e-003	3.5400e-003
tblVehicleEF	LHD2	7.4090e-003	6.7490e-003
tblVehicleEF	LHD2	6.7280e-003	9.1710e-003
tblVehicleEF	LHD2	0.12	0.15
tblVehicleEF	LHD2	0.55	0.60
tblVehicleEF	LHD2	1.18	0.68
tblVehicleEF	LHD2	13.81	13.53
tblVehicleEF	LHD2	707.74	781.19
tblVehicleEF	LHD2	25.26	8.80
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.67	0.77
tblVehicleEF	LHD2	0.47	0.21
tblVehicleEF	LHD2	1.1760e-003	1.3170e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0000e-004	1.3600e-004
tblVehicleEF	LHD2	1.1250e-003	1.2600e-003
tblVehicleEF	LHD2	2.6790e-003	2.6510e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6800e-004	1.2500e-004
tblVehicleEF	LHD2	7.5500e-004	1.0140e-003
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	4.6500e-004	6.0000e-004
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.07	0.29

tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	1.3500e-004	1.3000e-004
tblVehicleEF	LHD2	6.8870e-003	7.5600e-003
tblVehicleEF	LHD2	2.7400e-004	8.7000e-005
tblVehicleEF	LHD2	7.5500e-004	1.0140e-003
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.6500e-004	6.0000e-004
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.07	0.29
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	LHD2	3.4370e-003	3.5510e-003
tblVehicleEF	LHD2	7.5270e-003	6.8390e-003
tblVehicleEF	LHD2	6.3330e-003	8.6070e-003
tblVehicleEF	LHD2	0.12	0.15
tblVehicleEF	LHD2	0.56	0.60
tblVehicleEF	LHD2	1.09	0.63
tblVehicleEF	LHD2	13.81	13.53
tblVehicleEF	LHD2	707.74	781.21
tblVehicleEF	LHD2	25.26	8.71
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.64	0.73
tblVehicleEF	LHD2	0.44	0.19
tblVehicleEF	LHD2	1.1760e-003	1.3170e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0000e-004	1.3600e-004
tblVehicleEF	LHD2	1.1250e-003	1.2600e-003
tblVehicleEF	LHD2	2.6790e-003	2.6510e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6800e-004	1.2500e-004

tblVehicleEF	LHD2	1.8290e-003	2.4810e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	9.8100e-004	1.2780e-003
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.06	0.28
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3500e-004	1.3000e-004
tblVehicleEF	LHD2	6.8870e-003	7.5600e-003
tblVehicleEF	LHD2	2.7200e-004	8.6000e-005
tblVehicleEF	LHD2	1.8290e-003	2.4810e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	9.8100e-004	1.2780e-003
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.06	0.28
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	3.4370e-003	3.5310e-003
tblVehicleEF	LHD2	7.3240e-003	6.6840e-003
tblVehicleEF	LHD2	7.0380e-003	9.6090e-003
tblVehicleEF	LHD2	0.12	0.15
tblVehicleEF	LHD2	0.55	0.59
tblVehicleEF	LHD2	1.27	0.73
tblVehicleEF	LHD2	13.81	13.53
tblVehicleEF	LHD2	707.74	781.19
tblVehicleEF	LHD2	25.26	8.89
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.68	0.78
tblVehicleEF	LHD2	0.49	0.22
tblVehicleEF	LHD2	1.1760e-003	1.3170e-003
tblVehicleEF	LHD2	0.01	0.01

tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0000e-004	1.3600e-004
tblVehicleEF	LHD2	1.1250e-003	1.2600e-003
tblVehicleEF	LHD2	2.6790e-003	2.6510e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6800e-004	1.2500e-004
tblVehicleEF	LHD2	3.3500e-004	4.3700e-004
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	2.3300e-004	2.9900e-004
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.07	0.32
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	1.3500e-004	1.3000e-004
tblVehicleEF	LHD2	6.8870e-003	7.5600e-003
tblVehicleEF	LHD2	2.7500e-004	8.8000e-005
tblVehicleEF	LHD2	3.3500e-004	4.3700e-004
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	2.3300e-004	2.9900e-004
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.07	0.32
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	MCY	0.47	0.34
tblVehicleEF	MCY	0.16	0.26
tblVehicleEF	MCY	19.70	19.81
tblVehicleEF	MCY	10.27	9.13
tblVehicleEF	MCY	175.14	215.26
tblVehicleEF	MCY	45.44	61.48
tblVehicleEF	MCY	1.16	1.16
tblVehicleEF	MCY	0.32	0.27

tblVehicleEF	MCY	2.1380e-003	2.0940e-003
tblVehicleEF	MCY	3.7350e-003	3.0600e-003
tblVehicleEF	MCY	1.9990e-003	1.9570e-003
tblVehicleEF	MCY	3.5160e-003	2.8790e-003
tblVehicleEF	MCY	0.80	0.80
tblVehicleEF	MCY	0.73	0.71
tblVehicleEF	MCY	0.49	0.49
tblVehicleEF	MCY	2.31	2.32
tblVehicleEF	MCY	0.58	2.09
tblVehicleEF	MCY	2.24	1.98
tblVehicleEF	MCY	2.1410e-003	2.1300e-003
tblVehicleEF	MCY	6.8800e-004	6.0800e-004
tblVehicleEF	MCY	0.80	0.80
tblVehicleEF	MCY	0.73	0.71
tblVehicleEF	MCY	0.49	0.49
tblVehicleEF	MCY	2.86	2.87
tblVehicleEF	MCY	0.58	2.09
tblVehicleEF	MCY	2.44	2.16
tblVehicleEF	MCY	0.45	0.33
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.68	18.77
tblVehicleEF	MCY	8.86	7.80
tblVehicleEF	MCY	175.14	213.27
tblVehicleEF	MCY	45.44	58.15
tblVehicleEF	MCY	1.02	1.02
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	2.1380e-003	2.0940e-003
tblVehicleEF	MCY	3.7350e-003	3.0600e-003
tblVehicleEF	MCY	1.9990e-003	1.9570e-003
tblVehicleEF	MCY	3.5160e-003	2.8790e-003
tblVehicleEF	MCY	2.34	2.33

tblVehicleEF	MCY	0.96	0.96
tblVehicleEF	MCY	1.43	1.42
tblVehicleEF	MCY	2.22	2.22
tblVehicleEF	MCY	0.54	1.94
tblVehicleEF	MCY	1.84	1.61
tblVehicleEF	MCY	2.1220e-003	2.1110e-003
tblVehicleEF	MCY	6.5300e-004	5.7500e-004
tblVehicleEF	MCY	2.34	2.33
tblVehicleEF	MCY	0.96	0.96
tblVehicleEF	MCY	1.43	1.42
tblVehicleEF	MCY	2.75	2.75
tblVehicleEF	MCY	0.54	1.94
tblVehicleEF	MCY	2.00	1.75
tblVehicleEF	MCY	0.48	0.35
tblVehicleEF	MCY	0.19	0.30
tblVehicleEF	MCY	21.32	21.44
tblVehicleEF	MCY	11.71	10.47
tblVehicleEF	MCY	175.14	218.19
tblVehicleEF	MCY	45.44	64.70
tblVehicleEF	MCY	1.25	1.25
tblVehicleEF	MCY	0.34	0.29
tblVehicleEF	MCY	2.1380e-003	2.0940e-003
tblVehicleEF	MCY	3.7350e-003	3.0600e-003
tblVehicleEF	MCY	1.9990e-003	1.9570e-003
tblVehicleEF	MCY	3.5160e-003	2.8790e-003
tblVehicleEF	MCY	0.21	0.21
tblVehicleEF	MCY	0.87	0.84
tblVehicleEF	MCY	0.17	0.17
tblVehicleEF	MCY	2.41	2.41
tblVehicleEF	MCY	0.68	2.48
tblVehicleEF	MCY	2.60	2.31

tblVehicleEF	MCY	2.1700e-003	2.1590e-003
tblVehicleEF	MCY	7.2300e-004	6.4000e-004
tblVehicleEF	MCY	0.21	0.21
tblVehicleEF	MCY	0.87	0.84
tblVehicleEF	MCY	0.17	0.17
tblVehicleEF	MCY	2.98	2.99
tblVehicleEF	MCY	0.68	2.48
tblVehicleEF	MCY	2.82	2.51
tblVehicleEF	MDV	8.7550e-003	3.3470e-003
tblVehicleEF	MDV	0.01	0.07
tblVehicleEF	MDV	0.96	0.75
tblVehicleEF	MDV	2.63	3.07
tblVehicleEF	MDV	441.32	375.20
tblVehicleEF	MDV	99.70	80.53
tblVehicleEF	MDV	0.12	0.07
tblVehicleEF	MDV	0.23	0.31
tblVehicleEF	MDV	1.8510e-003	1.4900e-003
tblVehicleEF	MDV	2.4720e-003	1.8540e-003
tblVehicleEF	MDV	1.7060e-003	1.3740e-003
tblVehicleEF	MDV	2.2730e-003	1.7040e-003
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.06	0.07
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	0.10	0.45
tblVehicleEF	MDV	0.20	0.37
tblVehicleEF	MDV	4.4170e-003	3.6350e-003
tblVehicleEF	MDV	1.0430e-003	7.8100e-004
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.06	0.07

tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.10	0.45
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MDV	9.7400e-003	3.7830e-003
tblVehicleEF	MDV	0.01	0.06
tblVehicleEF	MDV	1.13	0.88
tblVehicleEF	MDV	2.03	2.34
tblVehicleEF	MDV	475.38	394.67
tblVehicleEF	MDV	99.70	79.11
tblVehicleEF	MDV	0.11	0.06
tblVehicleEF	MDV	0.20	0.27
tblVehicleEF	MDV	1.8510e-003	1.4900e-003
tblVehicleEF	MDV	2.4720e-003	1.8540e-003
tblVehicleEF	MDV	1.7060e-003	1.3740e-003
tblVehicleEF	MDV	2.2730e-003	1.7040e-003
tblVehicleEF	MDV	0.14	0.15
tblVehicleEF	MDV	0.18	0.15
tblVehicleEF	MDV	0.12	0.14
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.09	0.42
tblVehicleEF	MDV	0.16	0.30
tblVehicleEF	MDV	4.7600e-003	3.8240e-003
tblVehicleEF	MDV	1.0320e-003	7.6700e-004
tblVehicleEF	MDV	0.14	0.15
tblVehicleEF	MDV	0.18	0.15
tblVehicleEF	MDV	0.12	0.14
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.09	0.42
tblVehicleEF	MDV	0.18	0.33
tblVehicleEF	MDV	8.5770e-003	3.2380e-003
tblVehicleEF	MDV	0.02	0.08

tblVehicleEF	MDV	0.95	0.74
tblVehicleEF	MDV	3.08	3.61
tblVehicleEF	MDV	437.91	373.26
tblVehicleEF	MDV	99.70	81.55
tblVehicleEF	MDV	0.13	0.08
tblVehicleEF	MDV	0.25	0.34
tblVehicleEF	MDV	1.8510e-003	1.4900e-003
tblVehicleEF	MDV	2.4720e-003	1.8540e-003
tblVehicleEF	MDV	1.7060e-003	1.3740e-003
tblVehicleEF	MDV	2.2730e-003	1.7040e-003
tblVehicleEF	MDV	0.02	0.03
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.22	0.41
tblVehicleEF	MDV	4.3830e-003	3.6160e-003
tblVehicleEF	MDV	1.0510e-003	7.9100e-004
tblVehicleEF	MDV	0.02	0.03
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.24	0.45
tblVehicleEF	MH	0.03	4.5420e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.78	0.34
tblVehicleEF	MH	5.46	0.00
tblVehicleEF	MH	1,209.12	985.92
tblVehicleEF	MH	59.04	0.00
tblVehicleEF	MH	1.21	3.71

tblVehicleEF	MH	0.81	0.00
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0960e-003	0.00
tblVehicleEF	MH	3.2140e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0080e-003	0.00
tblVehicleEF	MH	0.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.08	0.10
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.31	0.00
tblVehicleEF	MH	0.01	9.3210e-003
tblVehicleEF	MH	6.8500e-004	0.00
tblVehicleEF	MH	0.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.27	0.00
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tblVehicleEF	MH	0.34	0.00
tblVehicleEF	MH	0.03	4.5420e-003
tblVehicleEF	MH	0.02	0.00
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tblVehicleEF	MH	1,209.12	985.92
tblVehicleEF	MH	59.04	0.00
tblVehicleEF	MH	1.13	3.56
tblVehicleEF	MH	0.75	0.00
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.02	0.07

tblVehicleEF	MH	1.0960e-003	0.00
tblVehicleEF	MH	3.2140e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0080e-003	0.00
tblVehicleEF	MH	1.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.57	0.00
tblVehicleEF	MH	0.09	0.10
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.29	0.00
tblVehicleEF	MH	0.01	9.3210e-003
tblVehicleEF	MH	6.7600e-004	0.00
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tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.57	0.00
tblVehicleEF	MH	0.12	0.11
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.32	0.00
tblVehicleEF	MH	0.02	4.5420e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.73	0.34
tblVehicleEF	MH	5.91	0.00
tblVehicleEF	MH	1,209.12	985.92
tblVehicleEF	MH	59.04	0.00
tblVehicleEF	MH	1.25	3.77
tblVehicleEF	MH	0.86	0.00
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0960e-003	0.00
tblVehicleEF	MH	3.2140e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.07

tblVehicleEF	MH	1.0080e-003	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.08	0.00
tblVehicleEF	MH	0.13	0.00
tblVehicleEF	MH	0.08	0.10
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.33	0.00
tblVehicleEF	MH	0.01	9.3210e-003
tblVehicleEF	MH	6.9300e-004	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.08	0.00
tblVehicleEF	MH	0.13	0.00
tblVehicleEF	MH	0.11	0.11
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.36	0.00
tblVehicleEF	MHD	0.02	2.6790e-003
tblVehicleEF	MHD	3.4140e-003	1.3190e-003
tblVehicleEF	MHD	0.05	6.7490e-003
tblVehicleEF	MHD	0.28	0.35
tblVehicleEF	MHD	0.30	0.20
tblVehicleEF	MHD	4.19	0.78
tblVehicleEF	MHD	168.69	72.84
tblVehicleEF	MHD	1,181.03	1,042.25
tblVehicleEF	MHD	44.62	6.73
tblVehicleEF	MHD	0.47	0.41
tblVehicleEF	MHD	1.11	1.44
tblVehicleEF	MHD	13.14	1.83
tblVehicleEF	MHD	1.1400e-004	3.0900e-004
tblVehicleEF	MHD	3.0920e-003	6.8920e-003
tblVehicleEF	MHD	6.2600e-004	7.7000e-005
tblVehicleEF	MHD	1.0900e-004	2.9600e-004

tblVehicleEF	MHD	2.9540e-003	6.5900e-003
tblVehicleEF	MHD	5.7500e-004	7.1000e-005
tblVehicleEF	MHD	6.2600e-004	2.5400e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	3.7200e-004	1.5200e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.01	0.08
tblVehicleEF	MHD	0.25	0.04
tblVehicleEF	MHD	1.6180e-003	6.9000e-004
tblVehicleEF	MHD	0.01	9.9100e-003
tblVehicleEF	MHD	5.1900e-004	6.7000e-005
tblVehicleEF	MHD	6.2600e-004	2.5400e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	3.7200e-004	1.5200e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.01	0.08
tblVehicleEF	MHD	0.28	0.04
tblVehicleEF	MHD	0.01	2.5350e-003
tblVehicleEF	MHD	3.4750e-003	1.3550e-003
tblVehicleEF	MHD	0.04	6.3130e-003
tblVehicleEF	MHD	0.20	0.31
tblVehicleEF	MHD	0.30	0.20
tblVehicleEF	MHD	3.81	0.71
tblVehicleEF	MHD	178.81	72.63
tblVehicleEF	MHD	1,181.03	1,042.26
tblVehicleEF	MHD	44.62	6.61
tblVehicleEF	MHD	0.48	0.40
tblVehicleEF	MHD	1.07	1.38
tblVehicleEF	MHD	13.10	1.82

tblVehicleEF	MHD	9.6000e-005	2.6400e-004
tblVehicleEF	MHD	3.0920e-003	6.8920e-003
tblVehicleEF	MHD	6.2600e-004	7.7000e-005
tblVehicleEF	MHD	9.2000e-005	2.5300e-004
tblVehicleEF	MHD	2.9540e-003	6.5900e-003
tblVehicleEF	MHD	5.7500e-004	7.1000e-005
tblVehicleEF	MHD	1.5650e-003	6.3400e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	8.2200e-004	3.3400e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.23	0.03
tblVehicleEF	MHD	1.7140e-003	6.8800e-004
tblVehicleEF	MHD	0.01	9.9100e-003
tblVehicleEF	MHD	5.1300e-004	6.5000e-005
tblVehicleEF	MHD	1.5650e-003	6.3400e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	8.2200e-004	3.3400e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.26	0.04
tblVehicleEF	MHD	0.02	2.8200e-003
tblVehicleEF	MHD	3.3720e-003	1.2950e-003
tblVehicleEF	MHD	0.05	7.0730e-003
tblVehicleEF	MHD	0.37	0.40
tblVehicleEF	MHD	0.30	0.19
tblVehicleEF	MHD	4.50	0.84
tblVehicleEF	MHD	154.98	73.22
tblVehicleEF	MHD	1,181.03	1,042.25

tblVehicleEF	MHD	44.62	6.83
tblVehicleEF	MHD	0.44	0.43
tblVehicleEF	MHD	1.13	1.46
tblVehicleEF	MHD	13.18	1.83
tblVehicleEF	MHD	1.3900e-004	3.7100e-004
tblVehicleEF	MHD	3.0920e-003	6.8920e-003
tblVehicleEF	MHD	6.2600e-004	7.7000e-005
tblVehicleEF	MHD	1.3300e-004	3.5500e-004
tblVehicleEF	MHD	2.9540e-003	6.5900e-003
tblVehicleEF	MHD	5.7500e-004	7.1000e-005
tblVehicleEF	MHD	2.6200e-004	1.0700e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	1.7800e-004	7.3000e-005
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.01	0.09
tblVehicleEF	MHD	0.27	0.04
tblVehicleEF	MHD	1.4890e-003	6.9400e-004
tblVehicleEF	MHD	0.01	9.9100e-003
tblVehicleEF	MHD	5.2500e-004	6.8000e-005
tblVehicleEF	MHD	2.6200e-004	1.0700e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.7800e-004	7.3000e-005
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.01	0.09
tblVehicleEF	MHD	0.29	0.04
tblVehicleEF	OBUS	0.01	8.4040e-003
tblVehicleEF	OBUS	7.3300e-003	6.4160e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.58

tblVehicleEF	OBUS	0.50	0.72
tblVehicleEF	OBUS	5.48	2.46
tblVehicleEF	OBUS	109.46	84.59
tblVehicleEF	OBUS	1,291.14	1,439.19
tblVehicleEF	OBUS	66.03	19.38
tblVehicleEF	OBUS	0.24	0.33
tblVehicleEF	OBUS	0.92	1.26
tblVehicleEF	OBUS	3.02	0.82
tblVehicleEF	OBUS	2.2000e-005	1.1000e-004
tblVehicleEF	OBUS	2.7560e-003	7.2320e-003
tblVehicleEF	OBUS	8.6800e-004	1.9300e-004
tblVehicleEF	OBUS	2.1000e-005	1.0500e-004
tblVehicleEF	OBUS	2.6160e-003	6.9010e-003
tblVehicleEF	OBUS	7.9800e-004	1.7700e-004
tblVehicleEF	OBUS	1.1740e-003	1.4530e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	5.5600e-004	6.9000e-004
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.27
tblVehicleEF	OBUS	0.34	0.12
tblVehicleEF	OBUS	1.0560e-003	8.0500e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.5600e-004	1.9200e-004
tblVehicleEF	OBUS	1.1740e-003	1.4530e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	5.5600e-004	6.9000e-004
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	0.04	0.27
tblVehicleEF	OBUS	0.37	0.13

tblVehicleEF	OBUS	0.01	8.4980e-003
tblVehicleEF	OBUS	7.5590e-003	6.6620e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.58
tblVehicleEF	OBUS	0.52	0.74
tblVehicleEF	OBUS	4.95	2.22
tblVehicleEF	OBUS	115.00	83.64
tblVehicleEF	OBUS	1,291.14	1,439.24
tblVehicleEF	OBUS	66.03	18.97
tblVehicleEF	OBUS	0.25	0.31
tblVehicleEF	OBUS	0.88	1.19
tblVehicleEF	OBUS	2.95	0.81
tblVehicleEF	OBUS	1.8000e-005	9.8000e-005
tblVehicleEF	OBUS	2.7560e-003	7.2320e-003
tblVehicleEF	OBUS	8.6800e-004	1.9300e-004
tblVehicleEF	OBUS	1.7000e-005	9.3000e-005
tblVehicleEF	OBUS	2.6160e-003	6.9010e-003
tblVehicleEF	OBUS	7.9800e-004	1.7700e-004
tblVehicleEF	OBUS	2.8210e-003	3.4560e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.2010e-003	1.4620e-003
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.03	0.26
tblVehicleEF	OBUS	0.31	0.11
tblVehicleEF	OBUS	1.1090e-003	7.9600e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.4700e-004	1.8800e-004
tblVehicleEF	OBUS	2.8210e-003	3.4560e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07

tblVehicleEF	OBUS	1.2010e-003	1.4620e-003
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	0.03	0.26
tblVehicleEF	OBUS	0.34	0.12
tblVehicleEF	OBUS	0.01	8.2950e-003
tblVehicleEF	OBUS	7.1730e-003	6.2490e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.59
tblVehicleEF	OBUS	0.50	0.70
tblVehicleEF	OBUS	5.90	2.65
tblVehicleEF	OBUS	101.81	85.91
tblVehicleEF	OBUS	1,291.14	1,439.16
tblVehicleEF	OBUS	66.03	19.69
tblVehicleEF	OBUS	0.23	0.35
tblVehicleEF	OBUS	0.94	1.29
tblVehicleEF	OBUS	3.08	0.84
tblVehicleEF	OBUS	2.6000e-005	1.2700e-004
tblVehicleEF	OBUS	2.7560e-003	7.2320e-003
tblVehicleEF	OBUS	8.6800e-004	1.9300e-004
tblVehicleEF	OBUS	2.5000e-005	1.2100e-004
tblVehicleEF	OBUS	2.6160e-003	6.9010e-003
tblVehicleEF	OBUS	7.9800e-004	1.7700e-004
tblVehicleEF	OBUS	5.5100e-004	6.8700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	2.8900e-004	3.6000e-004
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.30
tblVehicleEF	OBUS	0.35	0.12
tblVehicleEF	OBUS	9.8300e-004	8.1800e-004
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	7.6300e-004	1.9500e-004
tblVehicleEF	OBUS	5.5100e-004	6.8700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	2.8900e-004	3.6000e-004
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	0.04	0.30
tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	SBUS	0.84	0.07
tblVehicleEF	SBUS	0.02	4.2520e-003
tblVehicleEF	SBUS	0.06	6.2910e-003
tblVehicleEF	SBUS	10.79	2.99
tblVehicleEF	SBUS	0.91	0.34
tblVehicleEF	SBUS	10.87	0.91
tblVehicleEF	SBUS	958.21	343.38
tblVehicleEF	SBUS	923.62	980.93
tblVehicleEF	SBUS	74.39	5.28
tblVehicleEF	SBUS	5.73	2.78
tblVehicleEF	SBUS	2.43	3.34
tblVehicleEF	SBUS	8.88	1.14
tblVehicleEF	SBUS	5.0660e-003	2.7620e-003
tblVehicleEF	SBUS	9.7390e-003	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.3330e-003	7.7000e-005
tblVehicleEF	SBUS	4.8470e-003	2.6430e-003
tblVehicleEF	SBUS	2.4350e-003	2.6270e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.2260e-003	7.0000e-005
tblVehicleEF	SBUS	2.9520e-003	3.7600e-004
tblVehicleEF	SBUS	0.03	3.6840e-003
tblVehicleEF	SBUS	1.29	0.33

tblVehicleEF	SBUS	1.4370e-003	1.8000e-004
tblVehicleEF	SBUS	0.08	0.06
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.53	0.03
tblVehicleEF	SBUS	9.5230e-003	3.2760e-003
tblVehicleEF	SBUS	8.9860e-003	9.4020e-003
tblVehicleEF	SBUS	9.3100e-004	5.2000e-005
tblVehicleEF	SBUS	2.9520e-003	3.7600e-004
tblVehicleEF	SBUS	0.03	3.6840e-003
tblVehicleEF	SBUS	1.87	0.48
tblVehicleEF	SBUS	1.4370e-003	1.8000e-004
tblVehicleEF	SBUS	0.11	0.07
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.59	0.04
tblVehicleEF	SBUS	0.84	0.07
tblVehicleEF	SBUS	0.02	4.3310e-003
tblVehicleEF	SBUS	0.05	5.2000e-003
tblVehicleEF	SBUS	10.72	2.96
tblVehicleEF	SBUS	0.94	0.34
tblVehicleEF	SBUS	7.76	0.65
tblVehicleEF	SBUS	993.34	348.62
tblVehicleEF	SBUS	923.62	980.94
tblVehicleEF	SBUS	74.39	4.84
tblVehicleEF	SBUS	5.91	2.82
tblVehicleEF	SBUS	2.32	3.20
tblVehicleEF	SBUS	8.81	1.13
tblVehicleEF	SBUS	4.2710e-003	2.3370e-003
tblVehicleEF	SBUS	9.7390e-003	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.3330e-003	7.7000e-005
tblVehicleEF	SBUS	4.0860e-003	2.2360e-003

tblVehicleEF	SBUS	2.4350e-003	2.6270e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.2260e-003	7.0000e-005
tblVehicleEF	SBUS	7.0680e-003	9.2700e-004
tblVehicleEF	SBUS	0.03	3.8710e-003
tblVehicleEF	SBUS	1.29	0.33
tblVehicleEF	SBUS	3.1150e-003	4.1000e-004
tblVehicleEF	SBUS	0.08	0.06
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.44	0.03
tblVehicleEF	SBUS	9.8580e-003	3.3250e-003
tblVehicleEF	SBUS	8.9870e-003	9.4020e-003
tblVehicleEF	SBUS	8.7900e-004	4.8000e-005
tblVehicleEF	SBUS	7.0680e-003	9.2700e-004
tblVehicleEF	SBUS	0.03	3.8710e-003
tblVehicleEF	SBUS	1.87	0.48
tblVehicleEF	SBUS	3.1150e-003	4.1000e-004
tblVehicleEF	SBUS	0.11	0.07
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.48	0.03
tblVehicleEF	SBUS	0.84	0.07
tblVehicleEF	SBUS	0.02	4.1970e-003
tblVehicleEF	SBUS	0.07	7.1210e-003
tblVehicleEF	SBUS	10.89	3.03
tblVehicleEF	SBUS	0.89	0.33
tblVehicleEF	SBUS	13.54	1.14
tblVehicleEF	SBUS	909.70	336.15
tblVehicleEF	SBUS	923.62	980.92
tblVehicleEF	SBUS	74.39	5.65
tblVehicleEF	SBUS	5.48	2.73
tblVehicleEF	SBUS	2.49	3.40

tblVehicleEF	SBUS	8.92	1.14
tblVehicleEF	SBUS	6.1650e-003	3.3490e-003
tblVehicleEF	SBUS	9.7390e-003	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.3330e-003	7.7000e-005
tblVehicleEF	SBUS	5.8980e-003	3.2040e-003
tblVehicleEF	SBUS	2.4350e-003	2.6270e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.2260e-003	7.0000e-005
tblVehicleEF	SBUS	1.4220e-003	1.7200e-004
tblVehicleEF	SBUS	0.03	3.7650e-003
tblVehicleEF	SBUS	1.29	0.33
tblVehicleEF	SBUS	7.5100e-004	9.1000e-005
tblVehicleEF	SBUS	0.08	0.06
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	0.61	0.04
tblVehicleEF	SBUS	9.0600e-003	3.2080e-003
tblVehicleEF	SBUS	8.9860e-003	9.4020e-003
tblVehicleEF	SBUS	9.7500e-004	5.6000e-005
tblVehicleEF	SBUS	1.4220e-003	1.7200e-004
tblVehicleEF	SBUS	0.03	3.7650e-003
tblVehicleEF	SBUS	1.87	0.48
tblVehicleEF	SBUS	7.5100e-004	9.1000e-005
tblVehicleEF	SBUS	0.10	0.07
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	0.66	0.04
tblVehicleEF	UBUS	0.27	1.12
tblVehicleEF	UBUS	0.04	1.0810e-003
tblVehicleEF	UBUS	6.32	8.27
tblVehicleEF	UBUS	7.57	0.07
tblVehicleEF	UBUS	2,189.07	1,618.25

tblVehicleEF	UBUS	79.76	0.84
tblVehicleEF	UBUS	14.47	0.71
tblVehicleEF	UBUS	16.33	9.1230e-003
tblVehicleEF	UBUS	0.65	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.30	5.1750e-003
tblVehicleEF	UBUS	9.3300e-004	6.0000e-006
tblVehicleEF	UBUS	0.28	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9020e-003
tblVehicleEF	UBUS	0.28	4.9510e-003
tblVehicleEF	UBUS	8.5800e-004	6.0000e-006
tblVehicleEF	UBUS	2.3250e-003	1.4400e-004
tblVehicleEF	UBUS	0.05	8.4600e-004
tblVehicleEF	UBUS	1.1670e-003	3.8000e-005
tblVehicleEF	UBUS	0.74	0.02
tblVehicleEF	UBUS	0.01	5.1720e-003
tblVehicleEF	UBUS	0.57	4.7200e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3400e-004	8.0000e-006
tblVehicleEF	UBUS	2.3250e-003	1.4400e-004
tblVehicleEF	UBUS	0.05	8.4600e-004
tblVehicleEF	UBUS	1.1670e-003	3.8000e-005
tblVehicleEF	UBUS	1.07	1.15
tblVehicleEF	UBUS	0.01	5.1720e-003
tblVehicleEF	UBUS	0.63	5.1680e-003
tblVehicleEF	UBUS	0.27	1.12
tblVehicleEF	UBUS	0.04	9.5100e-004
tblVehicleEF	UBUS	6.37	8.27
tblVehicleEF	UBUS	5.93	0.06
tblVehicleEF	UBUS	2,189.07	1,618.25
tblVehicleEF	UBUS	79.76	0.81

tblVehicleEF	UBUS	13.87	0.71
tblVehicleEF	UBUS	16.25	8.4230e-003
tblVehicleEF	UBUS	0.65	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.30	5.1750e-003
tblVehicleEF	UBUS	9.3300e-004	6.0000e-006
tblVehicleEF	UBUS	0.28	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9020e-003
tblVehicleEF	UBUS	0.28	4.9510e-003
tblVehicleEF	UBUS	8.5800e-004	6.0000e-006
tblVehicleEF	UBUS	5.8850e-003	3.4400e-004
tblVehicleEF	UBUS	0.06	9.3100e-004
tblVehicleEF	UBUS	2.5520e-003	7.9000e-005
tblVehicleEF	UBUS	0.75	0.02
tblVehicleEF	UBUS	0.01	4.6590e-003
tblVehicleEF	UBUS	0.49	4.1230e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.0500e-004	8.0000e-006
tblVehicleEF	UBUS	5.8850e-003	3.4400e-004
tblVehicleEF	UBUS	0.06	9.3100e-004
tblVehicleEF	UBUS	2.5520e-003	7.9000e-005
tblVehicleEF	UBUS	1.08	1.15
tblVehicleEF	UBUS	0.01	4.6590e-003
tblVehicleEF	UBUS	0.54	4.5140e-003
tblVehicleEF	UBUS	0.26	1.12
tblVehicleEF	UBUS	0.05	1.1780e-003
tblVehicleEF	UBUS	6.28	8.27
tblVehicleEF	UBUS	8.97	0.08
tblVehicleEF	UBUS	2,189.07	1,618.25
tblVehicleEF	UBUS	79.76	0.86
tblVehicleEF	UBUS	14.70	0.71

tblVehicleEF	UBUS	16.39	9.6430e-003
tblVehicleEF	UBUS	0.65	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.30	5.1750e-003
tblVehicleEF	UBUS	9.3300e-004	6.0000e-006
tblVehicleEF	UBUS	0.28	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9020e-003
tblVehicleEF	UBUS	0.28	4.9510e-003
tblVehicleEF	UBUS	8.5800e-004	6.0000e-006
tblVehicleEF	UBUS	9.1900e-004	7.3000e-005
tblVehicleEF	UBUS	0.06	8.7300e-004
tblVehicleEF	UBUS	5.6100e-004	2.0000e-005
tblVehicleEF	UBUS	0.74	0.02
tblVehicleEF	UBUS	0.02	6.4740e-003
tblVehicleEF	UBUS	0.63	5.1740e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.5800e-004	9.0000e-006
tblVehicleEF	UBUS	9.1900e-004	7.3000e-005
tblVehicleEF	UBUS	0.06	8.7300e-004
tblVehicleEF	UBUS	5.6100e-004	2.0000e-005
tblVehicleEF	UBUS	1.07	1.15
tblVehicleEF	UBUS	0.02	6.4740e-003
tblVehicleEF	UBUS	0.69	5.6640e-003
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	5.70	2.69
tblVehicleTrips	HS_TL	4.80	2.69
tblVehicleTrips	HW_TL	10.80	2.69
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.98	1.50
tblVehicleTrips	ST_TR	863.10	0.00

tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	SU_TR	3.65	1.50
tblVehicleTrips	SU_TR	758.45	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	WD_TR	4.20	1.50
tblVehicleTrips	WD_TR	737.99	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	15,897,582.25	16,727,950.00
tblWater	IndoorWaterUseRate	1,111,087.82	0.00
tblWater	IndoorWaterUseRate	1,421,869.98	0.00
tblWater	IndoorWaterUseRate	1,336,635.06	0.00
tblWater	OutdoorWaterUseRate	10,022,388.81	1,070,180.00
tblWater	OutdoorWaterUseRate	680,989.31	0.00
tblWater	OutdoorWaterUseRate	871,468.70	0.00
tblWater	OutdoorWaterUseRate	819,227.94	0.00
tblWater	SepticTankPercent	10.33	0.00

tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	4.88	0.00
tblWoodstoves	NumberNoncatalytic	4.88	0.00

2.0 Emissions Summary

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	2.3384	0.0209	1.8118	1.0000e-004		0.0100	0.0100		0.0100	0.0100	0.0000	2.9610	2.9610	2.8400e-003	0.0000	3.0320
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	0.1181	0.0594	0.6340	1.1100e-003	0.1310	8.6000e-004	0.1319	0.0348	7.9000e-004	0.0356	0.0000	104.4413	104.4413	8.7300e-003	0.0000	104.6595
Waste						0.0000	0.0000		0.0000	0.0000	11.7938	0.0000	11.7938	0.6970	0.0000	29.2186
Water						0.0000	0.0000		0.0000	0.0000	5.9184	0.0000	5.9184	0.0204	0.0129	10.2631
Total	**2.4565**	**0.0803**	**2.4457**	**1.2100e-003**	**0.1310**	**0.0109**	**0.1419**	**0.0348**	**0.0108**	**0.0457**	**17.7121**	**107.4022**	**125.1144**	**0.7289**	**0.0129**	**147.1732**

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	2.3384	0.0209	1.8118	1.0000e-004		0.0100	0.0100		0.0100	0.0100	0.0000	2.9610	2.9610	2.8400e-003	0.0000	3.0320
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	0.1181	0.0594	0.6340	1.1100e-003	0.1310	8.6000e-004	0.1319	0.0348	7.9000e-004	0.0356	0.0000	104.4413	104.4413	8.7300e-003	0.0000	104.6595
Waste						0.0000	0.0000		0.0000	0.0000	11.7938	0.0000	11.7938	0.6970	0.0000	29.2186
Water						0.0000	0.0000		0.0000	0.0000	5.9184	0.0000	5.9184	0.0204	0.0129	10.2631
Total	**2.4565**	**0.0803**	**2.4457**	**1.2100e-003**	**0.1310**	**0.0109**	**0.1419**	**0.0348**	**0.0108**	**0.0457**	**17.7121**	**107.4022**	**125.1144**	**0.7289**	**0.0129**	**147.1732**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	0.1181	0.0594	0.6340	1.1100e-003	0.1310	8.6000e-004	0.1319	0.0348	7.9000e-004	0.0356	0.0000	104.4413	104.4413	8.7300e-003	0.0000	104.6595
Unmitigated	0.1181	0.0594	0.6340	1.1100e-003	0.1310	8.6000e-004	0.1319	0.0348	7.9000e-004	0.0356	0.0000	104.4413	104.4413	8.7300e-003	0.0000	104.6595

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	366.57	366.57	366.57	358,275	358,275
Convenience Market (24 Hour)	0.00	0.00	0.00		
Enclosed Parking with Elevator	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Health Club	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		

Total	366.57	366.57	366.57	358,275	358,275

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	2.69	2.69	2.69	31.00	15.00	54.00	100	0	0
Convenience Market (24 Hour)	9.50	7.30	7.30	0.90	80.10	19.00	24	15	61
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Health Club	9.50	7.30	7.30	16.90	64.10	19.00	52	39	9
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.702522	0.047528	0.237688	0.000000	0.000000	0.000000	0.000000	0.005443	0.000000	0.000000	0.006819	0.000000	0.000000
Convenience Market (24 Hour)	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
Enclosed Parking with Elevator	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
General Office Building	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
Health Club	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
Other Non-Asphalt Surfaces	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	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	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	tons/yr										MT/yr					
Apartments High Rise	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
Convenience Market (24 Hour)	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
Enclosed Parking with Elevator	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
General Office Building	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
Health Club	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
Other Non-Asphalt Surfaces	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**

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					
Apartments High Rise	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
Convenience Market (24 Hour)	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
Enclosed Parking with Elevator	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
General Office Building	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
Health Club	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
Other Non-Asphalt Surfaces	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			
Apartments High Rise	1.63229e+006	0.0000	0.0000	0.0000	0.0000
Convenience Market (24 Hour)	246000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	256074	0.0000	0.0000	0.0000	0.0000
General Office Building	154240	0.0000	0.0000	0.0000	0.0000
Health Club	268940	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	1.63229e+006	0.0000	0.0000	0.0000	0.0000
Convenience Market (24 Hour)	246000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	256074	0.0000	0.0000	0.0000	0.0000
General Office Building	154240	0.0000	0.0000	0.0000	0.0000
Health Club	268940	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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

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
	tons/yr										MT/yr					
Mitigated	2.3384	0.0209	1.8118	1.0000e-004		0.0100	0.0100		0.0100	0.0100	0.0000	2.9610	2.9610	2.8400e-003	0.0000	3.0320
Unmitigated	2.3384	0.0209	1.8118	1.0000e-004		0.0100	0.0100		0.0100	0.0100	0.0000	2.9610	2.9610	2.8400e-003	0.0000	3.0320

6.2 Area by SubCategory

Unmitigated

SubCategory	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
	tons/yr										MT/yr					
Architectural Coating	0.3419					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.9420					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0545	0.0209	1.8118	1.0000e-004		0.0100	0.0100		0.0100	0.0100	0.0000	2.9610	2.9610	2.8400e-003	0.0000	3.0320
Total	**2.3384**	**0.0209**	**1.8118**	**1.0000e-004**		**0.0100**	**0.0100**		**0.0100**	**0.0100**	**0.0000**	**2.9610**	**2.9610**	**2.8400e-003**	**0.0000**	**3.0320**

Mitigated

SubCategory	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
	tons/yr										MT/yr					
Architectural Coating	0.3419					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.9420					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0545	0.0209	1.8118	1.0000e-004		0.0100	0.0100		0.0100	0.0100	0.0000	2.9610	2.9610	2.8400e-003	0.0000	3.0320
Total	**2.3384**	**0.0209**	**1.8118**	**1.0000e-004**		**0.0100**	**0.0100**		**0.0100**	**0.0100**	**0.0000**	**2.9610**	**2.9610**	**2.8400e-003**	**0.0000**	**3.0320**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	5.9184	0.0204	0.0129	10.2631
Unmitigated	5.9184	0.0204	0.0129	10.2631

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	16.728 / 1.07018	5.9184	0.0204	0.0129	10.2631
Convenience Market (24 Hour)	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Health Club	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**5.9184**	**0.0204**	**0.0129**	**10.2631**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	16.728 / 1.07018	5.9184	0.0204	0.0129	10.2631
Convenience Market (24 Hour)	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Health Club	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**5.9184**	**0.0204**	**0.0129**	**10.2631**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	11.7938	0.6970	0.0000	29.2186
Unmitigated	11.7938	0.6970	0.0000	29.2186

8.2 Waste by Land Use

Unmitigated

Land Use	Waste Disposed	Total CO2	CH4	N2O	CO2e
	tons	MT/yr			
Apartments High Rise	58.1	11.7938	0.6970	0.0000	29.2186
Convenience Market (24 Hour)	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Health Club	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**11.7938**	**0.6970**	**0.0000**	**29.2186**

Mitigated

Land Use	Waste Disposed	Total CO2	CH4	N2O	CO2e
	tons	MT/yr			
Apartments High Rise	58.1	11.7938	0.6970	0.0000	29.2186
Convenience Market (24 Hour)	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Health Club	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**11.7938**	**0.6970**	**0.0000**	**29.2186**

Appendix C3
Housing Project #2 (People's Park)
Air Quality and Greenhouse Gas Modeling

Emissions Worksheet

Criteria Air Pollutant Emissions Summary - Construction

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total		3.45	2.39	2.67	0.01	0.24	0.09	0.32	0.06	0.08	0.15

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Onsite		3.37	1.92	2.06	0.01	0.01	0.08	0.10	0.00	0.08	0.09
Total Offsite		0.08	0.48	0.61	0.00	0.22	0.00	0.22	0.06	0.00	0.06

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total 2023		0.24	1.84	1.95	0.01	0.19	0.07	0.25	0.05	0.06	0.11
Total 2024		3.21	0.55	0.72	0.00	0.05	0.02	0.07	0.01	0.02	0.03

FOR CONSTRUCTION RISK ASSESSMENT - Unmitigated Run

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2023 Onsite		0.18	1.44	1.47	0.01	0.01	0.06	0.08	0.00	0.06	0.07
2023 Offsite		0.07	0.41	0.49	0.00	0.18	0.00	0.18	0.05	0.00	0.05
2024 Onsite		3.20	0.48	0.60	0.00	0.00	0.02	0.02	0.00	0.02	0.02
2024 Offsite		0.02	0.07	0.12	0.00	0.05	0.00	0.05	0.01	0.00	0.01

Demolition - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						4.89E-03	0	4.89E-03	7.40E-04	0	7.40E-04
Off-Road		0.00147	0.0143	0.0135	2.00E-05		0.00068	0.00068		0.00063	0.00063
Hauling		2.70E-04	8.82E-03	2.27E-03	4.00E-05	8.40E-04	2.00E-05	8.50E-04	2.30E-04	1.00E-05	2.50E-04
Vendor		1.00E-05	3.10E-04	7.00E-05	0	2.00E-05	0	2.00E-05	1.00E-05	0	1.00E-05
Worker		4.00E-05	2.00E-05	2.60E-04	0	9.00E-05	0	1.00E-04	3.00E-05	0	3.00E-05
Total		0.00	0.02	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.03	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pile Driving - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00215	0.0204	0.0203	0.00009		0.00066	0.00066		0.00061	0.00061
Hauling		0	0	0	0.00E+00	0	0.00E+00	0	0	0.00E+00	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.00008	0.00005	0.0006	0	0.00022	0	0.00022	0.00006	0	0.00006
Total		0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Building Construction - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.1671	1.3283	1.3859	2.44E-03		0.0598	0.0598		0.0573	0.0573
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.00641	0.2377	0.0561	7.90E-04	0.0186	2.50E-04	0.0189	0.00543	2.40E-04	0.00568
Worker		0.0544	0.036	0.3935	1.37E-03	0.1436	1.00E-03	0.1446	0.0385	9.20E-04	0.0394
Total		0.23	1.60	1.84	0.00	0.16	0.06	0.22	0.04	0.06	0.10
TOTAL ONSITE		0.17	1.33	1.39	0.00	0.00	0.06	0.06	0.00	0.06	0.06
TOTAL OFFSITE		0.06	0.27	0.45	0.00	0.16	0.00	0.16	0.04	0.00	0.05

Site Prep/Grade/Trench - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00814	0	0.00814	0.00372	0	0.00372
Off-Road		0.00577	0.0608	0.0453	1.00E-04		0.00251	0.00251		0.00231	0.00231
Hauling		0.00E+00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vendor		2.00E-05	7.90E-04	1.90E-04	0.00E+00	6.00E-05	0.00E+00	6.00E-05	2.00E-05	0.00E+00	2.00E-05
Worker		1.00E-04	7.00E-05	7.50E-04	0.00E+00	2.70E-04	0.00E+00	2.80E-04	7.00E-05	0.00E+00	7.00E-05
Total		0.01	0.06	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.01
TOTAL ONSITE		0.01	0.06	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.01
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Site Preparation Soil Haul - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						3.00E-04	0	3.00E-04	5.00E-05	0	5.00E-05
Off-Road		0.00E+00	0	0	0.00E+00		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Hauling		3.98E-03	1.31E-01	3.37E-02	5.80E-04	1.24E-02	2.20E-04	1.26E-02	3.44E-03	2.20E-04	3.66E-03
Vendor		0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0	0.00E+00	0	0	0
Worker		4.00E-05	3.00E-05	3.20E-04	0	1.20E-04	0	1.20E-04	3.00E-05	0	3.00E-05
Total		0.00	0.13	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.13	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Building Construction - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.0391	0.3142	0.3455	6.10E-04		0.0132	0.0132		0.0126	0.0126
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.00156	0.0593	0.0135	2.00E-04	0.00467	6.00E-05	0.00474	0.00137	6.00E-05	0.00143
Worker		0.0128	0.00815	0.0913	3.30E-04	0.0361	2.50E-04	0.0363	0.00966	2.30E-04	0.00989
Total		0.05	0.38	0.45	0.00	0.04	0.01	0.05	0.01	0.01	0.02
TOTAL ONSITE		0.04	0.31	0.35	0.00	0.00	0.01	0.01	0.00	0.01	0.01
TOTAL OFFSITE		0.01	0.07	0.10	0.00	0.04	0.00	0.04	0.01	0.00	0.01

Architectural Coating - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Arch. Coating		3.1381					0	0		0	0
Off-Road		4.52E-03	3.67E-02	6.10E-02	1.00E-04		1.47E-03	1.47E-03		1.46E-03	1.46E-03
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		1.08E-03	6.90E-04	0.00775	3.00E-05	3.06E-03	2.00E-05	3.08E-03	8.20E-04	2.00E-05	8.40E-04
Total		3.14	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL ONSITE		3.14	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		9.69E-03	0.0932	0.1346	2.10E-04		4.55E-03	4.55E-03		4.20E-03	4.20E-03
Paving		0.0001					0	0		0	0
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		4.50E-04	2.80E-04	3.18E-03	1.00E-05	1.26E-03	0.00001	1.27E-03	3.40E-04	0.00001	3.40E-04
Total		0.01	0.09	0.14	0.00	0.00	0.00	0.01	0.00	0.00	0.00
TOTAL ONSITE		0.01	0.09	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Finishing/Landscaping - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00352	0.0385	0.0568	8.00E-05		0.00175	0.00175		0.00161	0.00161
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0	0.00E+00	0
Worker		0.00029	0.00019	0.00207	1.00E-05	0.00082	1.00E-05	0.00083	0.00022	1.00E-05	0.00022
Total		0.00	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Criteria Air Pollutant Emissions Summary - Construction

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Unmigated Run - with Best Control Measures for Fugitive Dust

avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total	20.74	14.35	16.03	0.04	1.41	0.52	1.93	0.39	0.495	0.88
BAAQMD Threshold	54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold	No	No	NA	NA	NA	No	No	NA	No	NA

avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
TOTAL 2023	2.48	18.99	20.03	0.11	1.94	0.67	2.61	0.54	0.64	1.18
TOTAL 2024	46.54	7.99	10.37	0.02	0.67	0.31	0.97	0.18	0.29	0.47

FOR CONSTRUCTION RISK ASSESSMENT

Onsite Details **avg lbs/day**

	days/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2023 Onsite	195	1.81	14.74	15.03	0.08	0.14	0.6528	0.79	0.05	0.6241	0.67
2024 Onsite	138	46.30	6.99	8.67	0.01	0.00	0.3039	0.30	0.00	0.2880	0.29

Offsite Details **avg lbs/day**

	days/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2023 Offsite	195	0.67	4.25	5.00	0.03	1.81	0.0153	1.82	0.49	0.0143	0.50
2024 Offsite	138	0.23	0.99	1.71	0.01	0.67	0.0051	0.67	0.18	0.0048	0.18

Criteria Air Pollutant Emissions Summary - Construction Mitigated (Tier 4 Interim)

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total		3.38	2.00	2.88	0.01	0.24	0.04	0.27	0.06	0.04	0.10

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Onsite		3.30	1.53	2.28	0.01	0.01	0.03	0.05	0.00	0.03	0.04
Total Offsite		0.08	0.48	0.61	0.00	0.22	0.00	0.22	0.06	0.00	0.06

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total 2023		0.18	1.52	2.12	0.01	0.19	0.02	0.21	0.05	0.02	0.08
Total 2024		3.20	0.49	0.76	0.00	0.05	0.01	0.06	0.01	0.01	0.02

FOR CONSTRUCTION RISK ASSESSMENT - Unmitigated Run

	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2023 Onsite		0.12	1.12	1.63	0.01	0.01	0.02	0.04	0.00	0.02	0.03
2023 Offsite		0.07	0.41	0.49	0.00	0.18	0.00	0.18	0.05	0.00	0.05
2024 Onsite		3.18	0.42	0.64	0.00	0.00	0.01	0.01	0.00	0.01	0.01
2024 Offsite		0.02	0.07	0.12	0.00	0.05	0.00	0.05	0.01	0.00	0.01

Demolition - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						4.89E-03	0	4.89E-03	7.40E-04	0	7.40E-04
Off-Road		0.00147	0.0143	0.0135	2.00E-05		0.00068	0.00068		0.00063	0.00063
Hauling		2.70E-04	8.82E-03	2.27E-03	4.00E-05	8.40E-04	2.00E-05	8.50E-04	2.30E-04	1.00E-05	2.50E-04
Vendor		1.00E-05	3.10E-04	7.00E-05	0	2.00E-05	0	2.00E-05	1.00E-05	0	1.00E-05
Worker		4.00E-05	2.00E-05	2.60E-04	0	9.00E-05	0	1.00E-04	3.00E-05	0	3.00E-05
Total		0.00	0.02	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.03	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pile Driving - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00215	0.0204	0.0203	0.00009		0.00066	0.00066		0.00061	0.00061
Hauling		0	0	0	0.00E+00	0	0.00E+00	0	0	0.00E+00	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.00008	0.00005	0.0006	0	0.00022	0	0.00022	0.00006	0	0.00006
Total		0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Building Construction - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.1064	1.0065	1.5553	2.44E-03		0.0187	0.0187		0.0187	0.0187
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.00641	0.2377	0.0561	7.90E-04	0.0186	2.50E-04	0.0189	0.00543	2.40E-04	0.00568
Worker		0.0544	0.036	0.3935	1.37E-03	0.1436	1.00E-03	0.1446	0.0385	9.20E-04	0.0394
Total		0.17	1.28	2.00	0.00	0.16	0.02	0.18	0.04	0.02	0.06
TOTAL ONSITE		0.11	1.01	1.56	0.00	0.00	0.02	0.02	0.00	0.02	0.02
TOTAL OFFSITE		0.06	0.27	0.45	0.00	0.16	0.00	0.16	0.04	0.00	0.05

Site Prep/Grade/Trench - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						0.00814	0	0.00814	0.00372	0	0.00372
Off-Road		0.00577	0.0608	0.0453	1.00E-04		0.00251	0.00251		0.00231	0.00231
Hauling		0.00E+00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vendor		2.00E-05	7.90E-04	1.90E-04	0.00E+00	6.00E-05	0.00E+00	6.00E-05	2.00E-05	0.00E+00	2.00E-05
Worker		1.00E-04	7.00E-05	7.50E-04	0.00E+00	2.70E-04	0.00E+00	2.80E-04	7.00E-05	0.00E+00	7.00E-05
Total		0.01	0.06	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.01
TOTAL ONSITE		0.01	0.06	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.01
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Site Preparation Soil Haul - 2023

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						3.00E-04	0	3.00E-04	5.00E-05	0	5.00E-05
Off-Road		0.00E+00	0	0	0.00E+00		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Hauling		3.98E-03	1.31E-01	3.37E-02	5.80E-04	1.24E-02	2.20E-04	1.26E-02	3.44E-03	2.20E-04	3.66E-03
Vendor		0.00E+00	0.00E+00	0.00E+00	0	0.00E+00	0	0.00E+00	0	0	0
Worker		4.00E-05	3.00E-05	3.20E-04	0	1.20E-04	0	1.20E-04	3.00E-05	0	3.00E-05
Total		0.00	0.13	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.13	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00

Building Construction - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.0254	0.25	0.3898	6.10E-04		4.14E-03	4.14E-03		4.14E-03	4.14E-03
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		1.56E-03	0.0593	0.0135	2.00E-04	4.67E-03	6.00E-05	4.74E-03	1.37E-03	6.00E-05	1.43E-03
Worker		0.0128	8.15E-03	0.0913	3.30E-04	0.0361	2.50E-04	0.0363	9.66E-03	2.30E-04	9.89E-03
Total		0.04	0.32	0.49	0.00	0.04	0.00	0.05	0.01	0.00	0.02
TOTAL ONSITE		0.03	0.25	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.01	0.07	0.10	0.00	0.04	0.00	0.04	0.01	0.00	0.01

Architectural Coating - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Arch. Coating		3.1381					0	0		0	0
Off-Road		4.52E-03	3.67E-02	6.10E-02	1.00E-04		1.47E-03	1.47E-03		1.46E-03	1.46E-03
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		1.08E-03	6.90E-04	0.00775	3.00E-05	3.06E-03	2.00E-05	3.08E-03	8.20E-04	2.00E-05	8.40E-04
Total		3.14	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL ONSITE		3.14	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		9.69E-03	0.0932	0.1346	2.10E-04		4.55E-03	4.55E-03		4.20E-03	4.20E-03
Paving		0.0001					0	0		0	0
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		4.50E-04	2.80E-04	3.18E-03	1.00E-05	1.26E-03	0.00001	1.27E-03	3.40E-04	0.00001	3.40E-04
Total		0.01	0.09	0.14	0.00	0.00	0.00	0.01	0.00	0.00	0.00
TOTAL ONSITE		0.01	0.09	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Finishing/Landscaping - 2024

Unmitigated Construction

Category	tons/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.00352	0.0385	0.0568	8.00E-05		0.00175	0.00175		0.00161	0.00161
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0	0.00E+00	0
Worker		0.00029	0.00019	0.00207	1.00E-05	0.00082	1.00E-05	0.00083	0.00022	1.00E-05	0.00022
Total		0.00	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL ONSITE		0.00	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL OFFSITE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Criteria Air Pollutant Emissions Summary - Construction

Annual emissions divided by total construction duration to obtain average daily emissions. Average construction emissions accounts for the duration of each construction phase and the time each piece of construction equipment is onsite.

Mitigated Run - with Tier 4 Interim Equipment for Building Construction Activities and Best Control Measures for Fugitive Dust

avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total	20.29	12.03	17.31	0.04	1.41	0.22	1.63	0.39	0.21	0.60
BAAQMD Threshold	54	54	NA	NA	BMP	82	54	BMP	54	NA
Exceeds Threshold	No	No	NA	NA	NA	No	No	NA	No	NA

avg lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
TOTAL 2023	1.86	15.69	21.77	0.11	1.94	0.25	2.19	0.54	0.24	0.78
TOTAL 2024	46.34	7.06	11.01	0.02	0.67	0.18	0.84	0.18	0.17	0.35

FOR CONSTRUCTION RISK ASSESSMENT

Onsite Details **avg lbs/day**

	days/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2023 Onsite	195	1.19	11.44	16.76	0.08	0.14	0.2313	0.37	0.05	0.2282	0.27
2024 Onsite	138	46.11	6.06	9.31	0.01	0.00	0.1726	0.17	0.00	0.1654	0.17

Offsite Details **avg lbs/day**

	days/yr	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
2023 Offsite	195	0.67	4.25	5.00	0.03	1.81	0.0153	1.82	0.49	0.0143	0.50
2024 Offsite	138	0.23	0.99	1.71	0.01	0.67	0.0051	0.67	0.18	0.0048	0.18

Criteria Air Pollutant Emissions Summary - Operation (Annual)

Year 2024

Source	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
	Tons/yr									
Area	2.75	0.04	2.94	0.00		0.14	0.14		0.14	0.14
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00
Mobile Sources (Passenger)	0.17	0.09	1.00	0.00	0.23	0.00	0.24	0.06	0.00	0.06
Waste						0.00	0.00		0.00	0.00
Water						0.00	0.00		0.00	0.00
Total	2.93	0.13	3.94	0.00	0.23	0.14	0.37	0.06	0.14	0.20
BAAQMD Threshold (Annual)	10.00	10.00	NA	NA	NA	NA	15.00	NA	NA	10.00
Exceeds Threshold	No	No	NA	NA	NA	NA	No	NA	NA	No

Criteria Air Pollutant Emissions Summary - Operation (Average Daily)

Annual emissions divided by 365 days/year to obtain average daily emissions.

Year 2024

lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area Sources	15.10	0.21	16.09	0.01	0.00	0.75	0.75	0.00	0.75	0.75
Energy Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile Sources (Passenger)	0.94	0.50	5.50	0.01	1.28	0.01	1.29	0.34	0.01	0.35
Waste Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water/Wastewater	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	16.03	0.71	21.58	0.02	1.28	0.76	2.04	0.34	0.76	1.10
BAAQMD Threshold (Daily)	54	54	NA	NA	NA	NA	82	NA	NA	54
Exceeds Threshold	No	No	NA	NA	NA	NA	No	NA	NA	No

GHG Emissions Inventory

Construction*

	MTCO$_2$e Total Project**	
2023	484.3949	
2024	137.9618	
Total Construction	**622**	
30-Yr Amortized Construction Emissions***	**21**	
UCOP Carbon Neutrality Threshold	0	MTCO$_2$e/Year
Exceed Threshold?	**Yes**	

*CalEEMod, Version 2016.3.2.

Operation*

Project Operations		
Area	22	MTCO$_2$e/Year**
Energy	0	MTCO$_2$e/Year
Mobile	183	MTCO$_2$e/Year
Solid Waste	48	MTCO$_2$e/Year
Water	16	MTCO$_2$e/Year
30-Yr Amortized Construction	21	
Total Emissions	**291**	
UCOP Carbon Neutrality Threshold	0	MTCO$_2$e/Year
Exceed Threshold?	**Yes**	

*CalEEMod, Version 2016.3.2.25.

** MTCO$_2$e=metric tons of carbon dioxide equivalent.

*** Total construction emissions are amortized over 30 years per BAAQMD methodology; International Energy Agency, 2008, Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, March.

Assumptions Worksheet

CalEEMod Project Characteristics Inputs (Construction): Housing Project #2

Name:	People's Park Housing Site (#2)
County:	Alameda
Climate Zone:	5
Land Use Setting:	Urban
Air Basin:	San Francisco Bay
Air District:	BAAQMD

Total Project Site Area:	2.80	acres
Disturbed Site Area	1.88	Acres

Project Components	Units	SQFT	Acres
RSSP	166	353,005	
Supportive Housing	111	88,691	
Public Market		4,000	
Parking	11	3,300	0.08
Hardscape		22,187	0.51
Landscaping		59,824	1.37
			1.88

CalEEMod Land Use Inputs

Land Use	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
RSSP	Residential	Apartment High Rise	166.00	DU	0.75	353,005
Supportive Housing	Residential	Apartment Mid Rise	111.00	DU	0.00	88,691
Public Market	Retail	Strip Mall	4.00	1000sqft	0.09	4,000
Parking Lot	Parking	Parking Lot	0.08	acres	0.08	3,300
Hardscape+Landscape	Parking	Other Non-asphalt	1.88	acres	1.88	0
					2.80	

Demolition

Component	Amount to be Demolished (SQFT)	Amount to be Demolished (Tons)*	Haul Truck Capacity (tons)*	Haul Distance (miles)*	Total Trip Ends
Building Demo	20,000	920	20	20	91
Asphalt Demo		150	20	20	15
Total		**1,070**			**106**

***Based on information provided by and CalEEMod defaults verified by the University.*

Soil Haul

Component	Total Soil Haul Import (CY)*	Total Soil Haul Export (CY)*	Haul Truck Capacity (CY)*	Haul Distance (miles)*	Total Trip Ends
Site Preparation		**10,927**	16	20	**1,366**
Site Preparation	1,645		16	20	**206**
					1,572

***Based on information provided by and CalEEMod defaults verified by the University.*

Architectural Coating

Percentage of Buildings' Interior Painted:*	100%
Percentage of Buildings' Exterior Painted:*	100%

** Per the University*

BAAQMD Regulation 8 Rule 3

Interior Paint VOC content:	150	grams per liter
Exterior Paint VOC content:	150	grams per liter

Uses	Land Use Square Feet	CalEEMod Paintable Surface Area Factor	Total Paintable Surface Area[2]	Paintable Interior Area[1]	Paintable Exterior Area[1]	Parking Lot Area
RSSP	353,005	2.7	953,114	714,835	238,278	
Supportive Housing	88,691	2.7	239,466	179,599	59,866	
			Subtotal	***894,434***	***298,145***	
Public Market	4,000	2.7	10,800	8,100	2,700	
			Subtotal	***8,100***	***2,700***	
Parking Lot	3,300	0.06	198			198
			Total	902,534	300,845	198

**CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively. Architectural coatings for the parking lot is based on CalEEMod methodology applied to a surface parking lot (i.e., striping), in which 6% of surface area is painted.*

Applied CalEEMod Methodology in calculating total

Construction - Unmitigated Run

BAAQMD Basic Control Measures

Replace Ground Cover	PM10:	5	% Reduction
	PM25:	5	% Reduction
Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	15	mph
Clean Paved Road		9	% PM Reduction

Construction Phasing: Housing Project #2

Schedule Per the University

Phase Name	Start Date	End Date	Workdays*	Total Calendar Days
Building Demolition	4/1/2023	4/2/2023	0	1
Building Demolition Debris Haul	*4/1/2023*	*4/2/2023*	*0*	1
Asphalt Demolition	4/1/2023	4/2/2023	0	1
Asphalt Demolition Debris Haul (if applicable)	*4/1/2023*	*4/2/2023*	0	1
Site Preparation	4/2/2023	4/5/2023	3	3
Site Preparation Soil Haul (if applicable)	*4/2/2023*	*4/5/2023*	3	3
Rough Grading	4/2/2023	4/7/2023	5	5
Fine Grading	4/2/2023	4/7/2023	5	5
Utility Trenching	4/2/2023	4/7/2023	5	5
Building Construction - RSSP Building	4/1/2023	3/5/2024	242	339
Architectural Coating - RSSP Building	4/4/2024	5/4/2024	22	30
Building Construction - Supportive Housing	4/1/2023	3/5/2024	242	339
Architectural Coating - Supportive Housing Building	4/4/2024	5/4/2024	22	30
Paving	6/3/2024	7/3/2024	23	30
Finishing/Landscaping	8/2/2024	10/1/2024	43	60

**5-day work week*

Adjusted Schedule to Account for Shared Equipment

Phase Name	Start Date	End Date	Workdays	Total Calendar Days
Building Demolition	4/3/2023	4/4/2023	2	1
Building Demolition Debris Haul	*4/3/2023*	*4/4/2023*	*2*	1
Asphalt Demolition	4/3/2023	4/4/2023	2	1
Asphalt Demolition Debris Haul (if applicable)	*4/3/2023*	*4/4/2023*	2	1
Site Preparation	4/4/2023	4/7/2023	4	3
Site Preparation Soil Haul (if applicable)	*4/4/2023*	*4/7/2023*	4	3
Rough Grading	4/4/2023	4/10/2023	5	6
Fine Grading	4/4/2023	4/10/2023	5	6
Utility Trenching	4/4/2023	4/10/2023	5	6
Building Construction - RSSP Building	4/3/2023	3/7/2024	244	339
Architectural Coating - RSSP Building	4/5/2024	5/5/2024	21	30
Building Construction - Supportive Housing	4/3/2023	3/7/2024	244	339
Architectural Coating - Supportive Housing Building	4/5/2024	5/5/2024	21	30
Paving	6/4/2024	7/4/2024	23	30
Finishing/Landscaping	8/5/2024	10/4/2024	45	60

Final Adjusted Schedule to Account for Shared Equipment

Phase Name	Start Date	End Date	Workdays	Total Calendar Days
Building and Asphalt Demolition and Debris Haul	4/3/2023	4/4/2023	2	1
Building Construction (all)	4/3/2023	3/7/2024	244	339
Pile Driving	4/3/2023	4/30/2023	20	27
Site Preparation, Grading, and Trenching	4/4/2023	4/10/2023	5	6
Site Preparation Soil Haul	4/4/2023	4/7/2023	4	3
Rough Grading	4/4/2023	4/10/2023	5	6
Fine Grading	4/4/2023	4/10/2023	5	6
Utility Trenching	4/4/2023	4/10/2023	5	6
Architectural Coating (all)	4/5/2024	5/5/2024	21	30
Paving	6/4/2024	7/4/2024	23	30
Finishing/Landscaping	8/5/2024	10/4/2024	45	60

CalEEMod Construction Off-Road Equipment Inputs*

**Based on information provided by and CalEEMod defaults verified by the University.*

Equipment Type	CalEEMod Equipment Type	Unit Amount	Average Hours/Day	HP	LF	CalEEMod Vendor Trips
Building Demolition[1]						Default+4
Concrete/Industrial Saws	Concrete/Industrial Saws	1	8	81	0.73	
Rubber Tired Dozers	Rubber Tired Dozers	1	8	247	0.4	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	3	8	97	0.37	
Water Trucks[2]						4
Asphalt Demolition[1]						Default+4
Concrete/Industrial Saws	Concrete/Industrial Saws	1	8	81	0.73	
Rubber Tired Dozers	Rubber Tired Dozers	1	8	247	0.4	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	3	8	97	0.37	
Water Trucks[2]						4
Building Construction - Both Buildings						**Default**
Crane	Crane	1	8	231	0.29	
Forklifts	Forklifts	2	7	89	0.2	
Generator Set	Generator Set	1	8	84	0.74	
Tractor/Loader/Backhoe	Tractor/Loader/Backhoe	1	6	97	0.37	
Welders	Welders	3	8	46	0.45	
Site Preparation[1]						Default+4
Graders	Graders	1	8	187	0.41	
Scrapers	Scrapers	1	8	367	0.48	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	1	7	97	0.37	
Water Trucks[2]						4
Rough Grading						Default+4
Graders	Graders	1	8	187	0.41	
Rubber Tired Dozers	Rubber Tired Dozers	1	8	247	0.4	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	2	7	97	0.37	
Water Trucks						4
Fine Grading						Default+4
Graders	Graders	1	8	187	0.41	
Rubber Tired Dozers	Rubber Tired Dozers	1	8	247	0.4	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	2	7	97	0.37	
Water Trucks[2]						4
Utility Trenching						Default+4
Excavator	Excavator	1				
Water Trucks						4
Painting						**Default**
Air Compressors	Air Compressors	2	6	78		
Aerial Lift	Aerial Lift	2				
Paving						**Default**
Cement and Mortar Mixers	Cement and Mortar Mixers	1	8	9	0.56	
Pavers	Pavers	1	8	130	0.42	
Paving Equipment	Paving Equipment	1	8	132	0.36	
Rollers	Rollers	2	8	80	0.38	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	1	8	97	0.37	
Finishing/Landscaping						**Default**
Forklift	Forklifts	1	8	89	0.20	
Skid Steer Loader	Skid Steer Loader	1	8	65	0.37	

[1] Assumes no additional equipment from the equipment used for demolition and site preparation activities.

[2] Assume 4 water truck trips per truck per day.

Adjusted Equipment Mix to Account for Shared Equipment and Overlapping Acitvities*

Equipment Type	CalEEMod Equipment Type	Unit Amount	Average Hours/Day	HP	LF	CalEEMod Vendor Trips
Building and Asphalt Demolition						Default+4
Concrete/Industrial Saws	Concrete/Industrial Saws	1	8	81	0.73	
Rubber Tired Dozers	Rubber Tired Dozers	1	8	247	0.4	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	3	8	97	0.37	
Water Trucks						4
Building Construction - Both Buildings						**Default**
Crane	Crane	1	8	231	0.29	
Forklifts	Forklifts	2	7	89	0.2	
Generator Set	Generator Set	1	8	84	0.74	
Tractor/Loader/Backhoe	Tractor/Loader/Backhoe	1	6	97	0.37	
Welders	Welders	3	8	46	0.45	
Pile Driving						**Default**
Bore/Drill Rigs	Bore/Drill Rigs	1	8	221	0.5	
Site Preparation, Grading, & Trenching						Default+4
Graders	Graders	1	8	187	0.41	
Scrapers	Scrapers	1	8	367	0.48	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	2	7	97	0.37	
Rubber Tired Dozers	Rubber Tired Dozers	1	8	247	0.4	
Excavator	Excavator	1	8	158	0.38	
Water Trucks						4
Painting						**Default**
Air Compressors	Air Compressors	2	6	78	0.48	
Aerial Lift	Aerial Lift	2	8	63	0.31	
Paving						**Default**
Cement and Mortar Mixers	Cement and Mortar Mixers	1	8	9	0.56	
Pavers	Pavers	1	8	130	0.42	
Paving Equipment	Paving Equipment	1	8	132	0.36	
Rollers	Rollers	2	8	80	0.38	
Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	1	8	97	0.37	
Finishing/Landscaping						**Default**
Forklift	Forklifts	1	8	89	0.20	
Skid Steer Loader	Skid Steer Loader	1	8	65	0.37	

**Per the University, overlapping activities that require the same equipment would share equipment.*

Construction Trips Worksheet

PhaseName	Worker Trips/Day	Vendor Trips/Day	Haul Trips/Day	Total Haul Trips	Workdays	Start Date	End Date
Demolition	13	4	54	108	2	2023/04/03	2023/04/04
Building Construction	202	31	0	0	244	2023/04/03	2024/03/07
Pile Driving	3	0	0	0	20	2023/04/03	2023/04/28
Site Prep/Grade/Trench	15	4	0	0	5	2023/04/04	2023/04/10
Site Prep Soil Haul	0	0	393	1,572	4	2023/04/04	4/7/2023
Architectural Coating	40	0	0	0	21	2024/04/05	2024/05/05
Paving	15	0	0	0	23	2024/06/04	2024/07/04
Finishing/Landscaping	5	0	0	0	45	2024/08/05	2024/10/04

Construction Trips Summary

PhaseName	Worker Trips/Day	Vendor Trips/Day	Haul Trips/Day	Total Trips/Day	Workdays	Start Date	End Date
Demolition, Building Construction, Pile Driving, Site Prep/Grade/Trench, & Site Prep Haul	**233**	**39**	**447**	**719**	**2**	**4/3/2023**	**4/4/2023**
Building Construction, Pile Driving, Site Prep/Grade/Trench, & Site Prep Haul	220	35	393	648	3	4/5/2023	4/7/2023
Building Construction, Pile Driving, & Site Prep/Grade/Trench	220	35	0	255	1	4/8/2023	4/10/2023
Building Construction & Pile Driving	205	31	0	236	14	4/11/2023	4/28/2023
Building Construction	202	31	0	233	224	4/29/2023	3/7/2024
Architectural Coating	40	0	0	40	21	2024/04/05	2024/05/05
Paving	15	0	0	15	23	2024/06/04	2024/07/04
Finishing/Landscaping	5	0	0	5	45	2024/08/05	2024/10/04
Max Daily	**233**	**39**	**447**	**719**			

CalEEMod Project Characteristics Inputs: Housing Project #2

Name:	People's Park Housing Site (#2)
County:	Alameda
Climate Zone:	5
Land Use Setting:	Urban
Operational Year:	2024
Utility Company:	East Bay Community Energy
Air Basin:	San Francisco Bay Area
Air District:	BAAQMD

Total Project Site Area: 2.80 acres

Land Use	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
RSSP	Residential	Apartment High Rise	166	DU	0.750	353,005
Supportive Housing	Residential	Apartment Mid Rise	111	DU	0	88,691
Public Market	Retail	Strip Mall	4.000	1000sqft	0.092	4,000
Parking Lot	Parking	Parking Lot	0.076	acres	0.076	3,300
Hardscape+Landscape	Parking	Other Non-asphalt	1.883	acres	1.883	0
					2.80	

Trip Generation and Vehicle Miles Traveled

Housing Project #2: People's Park

Use	Amount	Units	Trip Rate	Daily Trips Trips[1]	Annual VMT[1]	Daily VMT[2]	
Beds	1,192	beds	0.30	358	270,208	742	42.27%
Faculty Housing	8	units	3.69	30	22,971	63	3.59%
Supportive Housing Beds	112	beds	0.30	34	25,389	70	3.97%
Staff	51	staf	1.04	53	277,972	764	43.49%
Market (retail)	3	KSF	7.47	22	39,420	108	6.17%
Misc (Deliveries, etc.)				25	3,224	9	0.50%
Total				**520.97**	**639,182.88**	**1,756.00**	**100%**

[1] *Based on information provided Fehr & Peers.*

[2] *Based on 364 days per year per CalEEMod methodology.*

Daily Trips

	Housing	Public Market	Total
Passenger	474	22	496
Heavy Vehicle	25		25
Total	499	22	521

Daily VMT

	Housing	Public Market	Total	Fleet Mix
Passenger	1,639	108	1,747	99.50%
Heavy Vehicle	9	0	9	0.50%
Total	1,648	108	1,756	100%

Total Daily Trips

	Weekday	Saturday	Sunday	Fleet Mix
Light Duty	496	496	496	95.24%
Delivery Vans/Trucks	25	25	25	4.76%
	521	521	521	100%

	Trip Rate per DU		
	Weekday	**Saturday**	**Sunday**
	3.1384	3.1384	3.1384

Trips[2]	**Average VMT/Trip**[3]	**Miles/day**	
521	3.3706	1,756	639,182.88

Land Use Trip Breakdown:

Weekday Trip Rate	3.1384	trips/DU
Saturday Trip Rate	3.1384	trips/DU
Sunday Trip Rate	3.1384	trips/DU
H-W Trip Length	3.3706	miles/trip
H-S Trip Length	0	miles/trip
H-O Trip Length	0	miles/trip
Primary Trip %	100%	
Divert Trip %	0%	
Passby Trip %	0%	
H-W Trip %	100%	
H-S Trip %	0%	
H-O Trip %	0%	

Water Use

Septic Tank	0%	
Aerobic	100%	
Facultative Lagoons	0%	
Total Water Demand:[1]	27,603,782	gallons/year
Total Indoor Water Use:[2]	26,558,130	gallons/year
Total Outdoor Water Use:[3]	1,045,652	gallons/year

[1] *Based on Table 5.17-5 in Chapter 5-17, Utilities and Service Systems, in the DEIR.*

[2] *Based on Table 5.17-9 in Chapter 5-17, Utilities and Service Systems, in the DEIR.*

[3] *Difference between Total Water Demand and Total Indoor Water Use.*

Solid Waste

Solid Waste Generation:*	95.8	tons/year**

**Based on Table 5.17-12 in Chapter 5-17, Utilities and Service Systems, in the DEIR.*

***For purposes of modeling, solid waste for the entirety of Housing Project #2 is assigned to the student housing land use.*

Water Mitigation

Install Low Flow Bathroom Faucet	32	% Reduction in flow
Install Low Flow Kitchen Faucet	18	% Reduction in flow
Install Low Flow Toilet	20	% Reduction in flow
Install Low Flow Shower	20	% Reduction in flow
Use Water Efficiency Irrigation System	6.1	% Reduction in flow

Architectural Coating

Land Use	Land Use Amount	Paintable Surface Area Factor	Total Paintable Surface Area	Interior Area*	Exterior Area*	Parking Lot Area
Supportive Housing	88,691	2.7	239,466	179,599	59,866	
RSSP	353,005	2.7	953,114	714,835	238,278	
			Total Building	**894,434**	**298,145**	
Public Market	4,000	2.7	10,800	8,100	2,700	
Parking Lot	3,300	0.06	198			198

Electricity (Buildings)

Buildings constructed after January 1, 2020 are required to meet the 2019 Building Energy Efficiency Standards, which are result in 10.7 percent and 1 percent more energy efficiency for electricity and natural gas, respectively, for non-residential uses compared to the 2016 Building Energy Efficiency Standards. For purposes of this analysis, the increases in energy efficiencies for non-residential buildings are used because the proposed residential buildings are taller than three stories in height.

	Electricty	Natural Gas
Energy Efficiency Increase Over 2016 Title 24:[1]	10.7%	1.0%

[1] *NORESCO. 2018, June 29. Impact Analysis: 2019 Update to California Energy Efficiency Standards for Residential and Non-Residential Buildings.*

CalEEMod Default Energy Rates

Land Use	Title 25 Electricity	Non-Title 24 Electricity	Lighting Electricity	Title 24 Natural Gas	Non-Title 24 Natural Gas
Apartment High Rise	426.45	3,054.10	741.44	6,115.43	2,615
Apartment Mid Rise	426.45	3,054.10	741.44	6,115.43	2,615
Regional Shopping Center	2.24	3.36	4.88	3.9	0.7

Adjusted Energy Rates

Land Use	Title 25 Electricity	Non-Title 24 Electricity	Lighting Electricity	Title 24 Natural Gas	Non-Title 24 Natural Gas
Apartment High Rise	380.82	3054.10	741.44	6054.28	2615.00
Apartment Mid Rise	380.82	3054.10	741.44	6054.28	2615.00
Regional Shopping Center	2.00	3.36	4.88	3.86	0.70

Fuel Switching - Adjustment Factor[1]

	Annual Energy Consumption[2]	
PGE Cimate Zone 3	**Electricity (kwh/yr)**	**Natural Gas (therms/yr)**
Mixed Fuel Baseline	183,772	12,341
Package 2 Fuel Switching Net Change[3]	110,595	(12,322)
Total	294,367	19
Percent Net Change	**60.18%**	**-99.85%**

Adjusted Energy Rates with Fuel Switching

Land Use	Title 24 Electricity	Non-Title 24 Electricity	Lighting Electricity	Title 24 Natural Gas	Non-Title 24 Natural Gas
Apartment High Rise	610.00	4892.07	1187.64	9.32	4.03
Apartment Mid Rise	610.00	4892.07	1187.64	9.32	4.03
Regional Shopping Center	3.20	5.38	7.82	0.01	0.00

[1] California Energy Codes & Standards. 2019, July 25. 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study.
[2] Based on the Small Hotel results.
[3] Package 2: All-Electric Federal Code-Minimum Reference is defined as all-electric design with federal code minimum appliance efficiency with no solar photovoltaic or battery included.

Carbon Intensity Factors

East Bay Community Carbon Intensity Factors

EBC CO_2 Intensity Factor[1] 0 pounds per megawatt hour

[1] The University subscribes to EBCE's Brilliant 100 plan, which provides 100% carbon free electricity.

Changes to the CalEEMod Defaults - Year 2024

Total VMT 1,756

Commercial Default	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	
FleetMix (Model Default)	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690	100%
Trips	1,573	106	532	297	41	14	70	131	6	7	15	1	2	2,796
Percent	80%			16%				5%						100%
Proportion	0.706367	0.047788	0.238989	0.677998	0.094499	0.032897	0.158807	1.000000	0.014168	0.015042	0.006856	0.002188	0.004402	
Assumed Mix	99.50%			0.00%				0.50%						100.00%
adjusted with Assumed	0.702804	0.047547	0.237784	0	0	0	0	0.005044	0	0	0.006822	0	0	100%
Trips	1,234	83	418	0	0	0	0	9	0	0	12	0	0	1,756
	70%	5%	24%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	100%
Modified	0.702804	0.047547	0.237784	0	0	0	0	0.005044	0	0	0.006822	0	0	100.0%
Final Check Trips	1,234	83	418	0	0	0	0	9	0	0	12	0	0	1,756
	99.50%					0%		0.50%						

CalEEMod Construction Model

People's Park Construction

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.88	Acre	1.88	0.00	0
Parking Lot	3.30	1000sqft	0.08	3,300.00	0
Apartments High Rise	166.00	Dwelling Unit	0.75	353,005.00	475
Apartments Mid Rise	111.00	Dwelling Unit	0.00	88,691.00	317
Strip Mall	4.00	1000sqft	0.09	4,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - See assumptions file.

Construction Phase - See assumptions file.

Off-road Equipment - See assumptions file.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - See assumptions file.

Trips and VMT - See assumptions file.

Demolition -

Grading - No additional acres graded.

Architectural Coating - See assumptions file.

Construction Off-road Equipment Mitigation - See assumptions file.

Off-road Equipment - No Additional Equipment

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	2,000.00	2,700.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	6,000.00	8,100.00
tblAreaCoating	Area_Residential_Exterior	298145	60105
tblAreaCoating	Area_Residential_Interior	894434	180314
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	20.00	2.00
tblConstructionPhase	NumDays	220.00	244.00
tblConstructionPhase	NumDays	6.00	5.00
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	10.00	23.00
tblConstructionPhase	NumDays	3.00	4.00
tblGrading	MaterialExported	0.00	10,927.00

tblGrading	MaterialImported	0.00	1,645.00
tblLandUse	LandUseSquareFeet	81,892.80	0.00
tblLandUse	LandUseSquareFeet	166,000.00	353,005.00
tblLandUse	LandUseSquareFeet	111,000.00	88,691.00
tblLandUse	LotAcreage	2.68	0.75
tblLandUse	LotAcreage	2.92	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00

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					
2023	0.2418	1.8385	1.9526	5.4600e-003	0.2218	0.0652	0.2870	0.0619	0.0623	0.1241	0.0000	483.0727	483.0727	0.0529	0.0000	484.3951
2024	3.2113	0.5511	0.7156	1.5700e-003	0.0497	0.0213	0.0710	0.0133	0.0202	0.0335	0.0000	137.4564	137.4564	0.0202	0.0000	137.9619
Maximum	**3.2113**	**1.8385**	**1.9526**	**5.4600e-003**	**0.2218**	**0.0652**	**0.2870**	**0.0619**	**0.0623**	**0.1241**	**0.0000**	**483.0727**	**483.0727**	**0.0529**	**0.0000**	**484.3951**

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					
2023	0.2418	1.8384	1.9526	5.4600e-003	0.1896	0.0652	0.2548	0.0523	0.0623	0.1146	0.0000	483.0724	483.0724	0.0529	0.0000	484.3949
2024	3.2113	0.5511	0.7156	1.5700e-003	0.0459	0.0213	0.0672	0.0124	0.0202	0.0326	0.0000	137.4563	137.4563	0.0202	0.0000	137.9618
Maximum	**3.2113**	**1.8384**	**1.9526**	**5.4600e-003**	**0.1896**	**0.0652**	**0.2548**	**0.0523**	**0.0623**	**0.1146**	**0.0000**	**483.0724**	**483.0724**	**0.0529**	**0.0000**	**484.3949**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**13.27**	**0.00**	**10.06**	**13.96**	**0.00**	**6.66**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
10	**2-9-2023**	**5-8-2023**	0.4424	0.4424
11	**5-9-2023**	**8-8-2023**	0.6157	0.6157
12	**8-9-2023**	**11-8-2023**	0.6173	0.6173
13	**11-9-2023**	**2-8-2024**	0.6055	0.6055
14	**2-9-2024**	**5-8-2024**	3.5326	3.5326
15	**5-9-2024**	**8-8-2024**	0.1025	0.1025
16	**8-9-2024**	**9-30-2024**	0.0357	0.0357
		Highest	3.5326	3.5326

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/3/2023	4/4/2023	5	2	
2	Pile Driving	Trenching	4/3/2023	4/28/2023	5	20	
3	Building Construction	Building Construction	4/3/2023	3/7/2024	5	244	
4	Site Prep/Grade/Trench	Grading	4/4/2023	4/10/2023	5	5	
5	Site Prep Soil Haul	Site Preparation	4/4/2023	4/7/2023	5	4	
6	Architectural Coating	Architectural Coating	4/5/2024	5/5/2024	5	21	
7	Paving	Paving	6/4/2024	7/4/2024	5	23	
8	Finishing/Landscaping	Trenching	8/5/2024	10/4/2024	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.96

Residential Indoor: 894,434; Residential Outdoor: 298,145; Non-Residential Indoor: 8,100; Non-Residential Outdoor: 2,700; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Building Construction	Welders	3	8.00	46	0.45
Pile Driving	Bore/Drill Rigs	1	8.00	221	0.50
Site Prep/Grade/Trench	Excavators	1	8.00	158	0.38
Site Prep/Grade/Trench	Graders	1	8.00	187	0.41
Site Prep/Grade/Trench	Rubber Tired Dozers	1	8.00	247	0.40
Site Prep/Grade/Trench	Scrapers	1	8.00	367	0.48
Site Prep/Grade/Trench	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Architectural Coating	Aerial Lifts	2	8.00	63	0.31
Architectural Coating	Air Compressors	2	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Finishing/Landscaping	Forklifts	1	8.00	89	0.20
Finishing/Landscaping	Skid Steer Loaders	1	8.00	65	0.37
Site Prep Soil Haul	Graders	0	8.00	187	0.41
Site Prep Soil Haul	Scrapers	0	8.00	367	0.48
Site Prep Soil Haul	Tractors/Loaders/Backhoes	0	7.00	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
Demolition	5	13.00	4.00	106.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	202.00	31.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving	1	3.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Prep/Grade/Trench	6	15.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	40.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Finishing/Landscaping	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Prep Soil Haul	0	8.00	0.00	1,572.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2023

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	tons/yr										MT/yr					
Fugitive Dust					0.0115	0.0000	0.0115	1.7300e-003	0.0000	1.7300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4700e-003	0.0143	0.0135	2.0000e-005		6.8000e-004	6.8000e-004		6.3000e-004	6.3000e-004	0.0000	2.1087	2.1087	5.3000e-004	0.0000	2.1220
Total	**1.4700e-003**	**0.0143**	**0.0135**	**2.0000e-005**	**0.0115**	**6.8000e-004**	**0.0121**	**1.7300e-003**	**6.3000e-004**	**2.3600e-003**	**0.0000**	**2.1087**	**2.1087**	**5.3000e-004**	**0.0000**	**2.1220**

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	2.7000e-004	8.8200e-003	2.2700e-003	4.0000e-005	9.0000e-004	2.0000e-005	9.1000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	3.8022	3.8022	1.6000e-004	0.0000	3.8062
Vendor	1.0000e-005	3.1000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1008	0.1008	0.0000	0.0000	0.1009
Worker	4.0000e-005	2.0000e-005	2.6000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0817	0.0817	0.0000	0.0000	0.0818
Total	**3.2000e-004**	**9.1500e-003**	**2.6000e-003**	**4.0000e-005**	**1.0300e-003**	**2.0000e-005**	**1.0400e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**3.9847**	**3.9847**	**1.6000e-004**	**0.0000**	**3.9889**

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	tons/yr										MT/yr					
Fugitive Dust					4.8900e-003	0.0000	4.8900e-003	7.4000e-004	0.0000	7.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4700e-003	0.0143	0.0135	2.0000e-005		6.8000e-004	6.8000e-004		6.3000e-004	6.3000e-004	0.0000	2.1087	2.1087	5.3000e-004	0.0000	2.1220
Total	**1.4700e-003**	**0.0143**	**0.0135**	**2.0000e-005**	**4.8900e-003**	**6.8000e-004**	**5.5700e-003**	**7.4000e-004**	**6.3000e-004**	**1.3700e-003**	**0.0000**	**2.1087**	**2.1087**	**5.3000e-004**	**0.0000**	**2.1220**

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	2.7000e-004	8.8200e-003	2.2700e-003	4.0000e-005	8.4000e-004	2.0000e-005	8.5000e-004	2.3000e-004	1.0000e-005	2.5000e-004	0.0000	3.8022	3.8022	1.6000e-004	0.0000	3.8062
Vendor	1.0000e-005	3.1000e-004	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1008	0.1008	0.0000	0.0000	0.1009
Worker	4.0000e-005	2.0000e-005	2.6000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0817	0.0817	0.0000	0.0000	0.0818
Total	**3.2000e-004**	**9.1500e-003**	**2.6000e-003**	**4.0000e-005**	**9.5000e-004**	**2.0000e-005**	**9.7000e-004**	**2.7000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**3.9847**	**3.9847**	**1.6000e-004**	**0.0000**	**3.9889**

3.3 Pile Driving - 2023

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	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0204	0.0203	9.0000e-005		6.6000e-004	6.6000e-004		6.1000e-004	6.1000e-004	0.0000	8.3044	8.3044	2.6900e-003	0.0000	8.3715
Total	**2.1500e-003**	**0.0204**	**0.0203**	**9.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**8.3044**	**8.3044**	**2.6900e-003**	**0.0000**	**8.3715**

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	8.0000e-005	5.0000e-005	6.0000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1886	0.1886	0.0000	0.0000	0.1887
Total	**8.0000e-005**	**5.0000e-005**	**6.0000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1886**	**0.1886**	**0.0000**	**0.0000**	**0.1887**

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	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0204	0.0203	9.0000e-005		6.6000e-004	6.6000e-004		6.1000e-004	6.1000e-004	0.0000	8.3044	8.3044	2.6900e-003	0.0000	8.3715
Total	**2.1500e-003**	**0.0204**	**0.0203**	**9.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**8.3044**	**8.3044**	**2.6900e-003**	**0.0000**	**8.3715**

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	8.0000e-005	5.0000e-005	6.0000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1886	0.1886	0.0000	0.0000	0.1887
Total	**8.0000e-005**	**5.0000e-005**	**6.0000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1886**	**0.1886**	**0.0000**	**0.0000**	**0.1887**

3.4 Building Construction - 2023

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	tons/yr										MT/yr					
Off-Road	0.1671	1.3283	1.3859	2.4400e-003		0.0598	0.0598		0.0573	0.0573	0.0000	202.5095	202.5095	0.0383	0.0000	203.4670
Total	**0.1671**	**1.3283**	**1.3859**	**2.4400e-003**		**0.0598**	**0.0598**		**0.0573**	**0.0573**	**0.0000**	**202.5095**	**202.5095**	**0.0383**	**0.0000**	**203.4670**

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	6.4100e-003	0.2377	0.0561	7.9000e-004	0.0199	2.5000e-004	0.0201	5.7400e-003	2.4000e-004	5.9800e-003	0.0000	76.1757	76.1757	3.3200e-003	0.0000	76.2587
Worker	0.0544	0.0360	0.3935	1.3700e-003	0.1557	1.0000e-003	0.1567	0.0414	9.2000e-004	0.0423	0.0000	123.8311	123.8311	2.5600e-003	0.0000	123.8950
Total	**0.0608**	**0.2737**	**0.4496**	**2.1600e-003**	**0.1756**	**1.2500e-003**	**0.1768**	**0.0472**	**1.1600e-003**	**0.0483**	**0.0000**	**200.0068**	**200.0068**	**5.8800e-003**	**0.0000**	**200.1537**

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	tons/yr										MT/yr					
Off-Road	0.1671	1.3283	1.3859	2.4400e-003		0.0598	0.0598		0.0573	0.0573	0.0000	202.5093	202.5093	0.0383	0.0000	203.4667
Total	**0.1671**	**1.3283**	**1.3859**	**2.4400e-003**		**0.0598**	**0.0598**		**0.0573**	**0.0573**	**0.0000**	**202.5093**	**202.5093**	**0.0383**	**0.0000**	**203.4667**

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	6.4100e-003	0.2377	0.0561	7.9000e-004	0.0186	2.5000e-004	0.0189	5.4300e-003	2.4000e-004	5.6800e-003	0.0000	76.1757	76.1757	3.3200e-003	0.0000	76.2587
Worker	0.0544	0.0360	0.3935	1.3700e-003	0.1436	1.0000e-003	0.1446	0.0385	9.2000e-004	0.0394	0.0000	123.8311	123.8311	2.5600e-003	0.0000	123.8950
Total	**0.0608**	**0.2737**	**0.4496**	**2.1600e-003**	**0.1622**	**1.2500e-003**	**0.1635**	**0.0439**	**1.1600e-003**	**0.0451**	**0.0000**	**200.0068**	**200.0068**	**5.8800e-003**	**0.0000**	**200.1537**

3.4 Building Construction - 2024

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	tons/yr										MT/yr					
Off-Road	0.0391	0.3142	0.3455	6.1000e-004		0.0132	0.0132		0.0126	0.0126	0.0000	50.8899	50.8899	9.4800e-003	0.0000	51.1269
Total	**0.0391**	**0.3142**	**0.3455**	**6.1000e-004**		**0.0132**	**0.0132**		**0.0126**	**0.0126**	**0.0000**	**50.8899**	**50.8899**	**9.4800e-003**	**0.0000**	**51.1269**

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	1.5600e-003	0.0593	0.0135	2.0000e-004	4.9900e-003	6.0000e-005	5.0500e-003	1.4400e-003	6.0000e-005	1.5000e-003	0.0000	19.0090	19.0090	8.2000e-004	0.0000	19.0296
Worker	0.0128	8.1500e-003	0.0913	3.3000e-004	0.0391	2.5000e-004	0.0394	0.0104	2.3000e-004	0.0106	0.0000	29.8832	29.8832	5.8000e-004	0.0000	29.8976
Total	**0.0143**	**0.0675**	**0.1048**	**5.3000e-004**	**0.0441**	**3.1000e-004**	**0.0444**	**0.0119**	**2.9000e-004**	**0.0121**	**0.0000**	**48.8922**	**48.8922**	**1.4000e-003**	**0.0000**	**48.9273**

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	tons/yr										MT/yr					
Off-Road	0.0391	0.3142	0.3455	6.1000e-004		0.0132	0.0132		0.0126	0.0126	0.0000	50.8899	50.8899	9.4800e-003	0.0000	51.1268
Total	**0.0391**	**0.3142**	**0.3455**	**6.1000e-004**		**0.0132**	**0.0132**		**0.0126**	**0.0126**	**0.0000**	**50.8899**	**50.8899**	**9.4800e-003**	**0.0000**	**51.1268**

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	1.5600e-003	0.0593	0.0135	2.0000e-004	4.6700e-003	6.0000e-005	4.7400e-003	1.3700e-003	6.0000e-005	1.4300e-003	0.0000	19.0090	19.0090	8.2000e-004	0.0000	19.0296
Worker	0.0128	8.1500e-003	0.0913	3.3000e-004	0.0361	2.5000e-004	0.0363	9.6600e-003	2.3000e-004	9.8900e-003	0.0000	29.8832	29.8832	5.8000e-004	0.0000	29.8976
Total	**0.0143**	**0.0675**	**0.1048**	**5.3000e-004**	**0.0408**	**3.1000e-004**	**0.0411**	**0.0110**	**2.9000e-004**	**0.0113**	**0.0000**	**48.8922**	**48.8922**	**1.4000e-003**	**0.0000**	**48.9273**

3.5 Site Prep/Grade/Trench - 2023

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	tons/yr										MT/yr					
Fugitive Dust					0.0190	0.0000	0.0190	8.7000e-003	0.0000	8.7000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7700e-003	0.0608	0.0453	1.0000e-004		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	8.9944	8.9944	2.9100e-003	0.0000	9.0671
Total	**5.7700e-003**	**0.0608**	**0.0453**	**1.0000e-004**	**0.0190**	**2.5100e-003**	**0.0215**	**8.7000e-003**	**2.3100e-003**	**0.0110**	**0.0000**	**8.9944**	**8.9944**	**2.9100e-003**	**0.0000**	**9.0671**

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	2.0000e-005	7.9000e-004	1.9000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2520	0.2520	1.0000e-005	0.0000	0.2523
Worker	1.0000e-004	7.0000e-005	7.5000e-004	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2358	0.2358	0.0000	0.0000	0.2359
Total	**1.2000e-004**	**8.6000e-004**	**9.4000e-004**	**0.0000**	**3.7000e-004**	**0.0000**	**3.7000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.4878**	**0.4878**	**1.0000e-005**	**0.0000**	**0.4882**

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	tons/yr										MT/yr					
Fugitive Dust					8.1400e-003	0.0000	8.1400e-003	3.7200e-003	0.0000	3.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7700e-003	0.0608	0.0453	1.0000e-004		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	8.9944	8.9944	2.9100e-003	0.0000	9.0671
Total	**5.7700e-003**	**0.0608**	**0.0453**	**1.0000e-004**	**8.1400e-003**	**2.5100e-003**	**0.0107**	**3.7200e-003**	**2.3100e-003**	**6.0300e-003**	**0.0000**	**8.9944**	**8.9944**	**2.9100e-003**	**0.0000**	**9.0671**

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	2.0000e-005	7.9000e-004	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2520	0.2520	1.0000e-005	0.0000	0.2523
Worker	1.0000e-004	7.0000e-005	7.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2358	0.2358	0.0000	0.0000	0.2359
Total	**1.2000e-004**	**8.6000e-004**	**9.4000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.4000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.4878**	**0.4878**	**1.0000e-005**	**0.0000**	**0.4882**

3.6 Site Prep Soil Haul - 2023

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	tons/yr										MT/yr					
Fugitive Dust					7.1000e-004	0.0000	7.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	3.9800e-003	0.1309	0.0337	5.8000e-004	0.0133	2.2000e-004	0.0135	3.6600e-003	2.2000e-004	3.8800e-003	0.0000	56.3872	56.3872	2.4000e-003	0.0000	56.4472
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	4.0000e-005	3.0000e-005	3.2000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1006	0.1006	0.0000	0.0000	0.1007
Total	**4.0200e-003**	**0.1309**	**0.0340**	**5.8000e-004**	**0.0134**	**2.2000e-004**	**0.0137**	**3.6900e-003**	**2.2000e-004**	**3.9100e-003**	**0.0000**	**56.4878**	**56.4878**	**2.4000e-003**	**0.0000**	**56.5479**

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	tons/yr										MT/yr					
Fugitive Dust					3.0000e-004	0.0000	3.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	3.9800e-003	0.1309	0.0337	5.8000e-004	0.0124	2.2000e-004	0.0126	3.4400e-003	2.2000e-004	3.6600e-003	0.0000	56.3872	56.3872	2.4000e-003	0.0000	56.4472
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	4.0000e-005	3.0000e-005	3.2000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1006	0.1006	0.0000	0.0000	0.1007
Total	**4.0200e-003**	**0.1309**	**0.0340**	**5.8000e-004**	**0.0125**	**2.2000e-004**	**0.0128**	**3.4700e-003**	**2.2000e-004**	**3.6900e-003**	**0.0000**	**56.4878**	**56.4878**	**2.4000e-003**	**0.0000**	**56.5479**

3.7 Architectural Coating - 2024

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	tons/yr										MT/yr					
Archit. Coating	3.1381					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5200e-003	0.0367	0.0610	1.0000e-004		1.4700e-003	1.4700e-003		1.4600e-003	1.4600e-003	0.0000	8.4599	8.4599	1.3000e-003	0.0000	8.4925
Total	**3.1426**	**0.0367**	**0.0610**	**1.0000e-004**		**1.4700e-003**	**1.4700e-003**		**1.4600e-003**	**1.4600e-003**	**0.0000**	**8.4599**	**8.4599**	**1.3000e-003**	**0.0000**	**8.4925**

Unmitigated Construction Off-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
	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	1.0800e-003	6.9000e-004	7.7500e-003	3.0000e-005	3.3200e-003	2.0000e-005	3.3400e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	2.5361	2.5361	5.0000e-005	0.0000	2.5373
Total	**1.0800e-003**	**6.9000e-004**	**7.7500e-003**	**3.0000e-005**	**3.3200e-003**	**2.0000e-005**	**3.3400e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**2.5361**	**2.5361**	**5.0000e-005**	**0.0000**	**2.5373**

Mitigated 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
	tons/yr										MT/yr					
Archit. Coating	3.1381					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5200e-003	0.0367	0.0610	1.0000e-004		1.4700e-003	1.4700e-003		1.4600e-003	1.4600e-003	0.0000	8.4599	8.4599	1.3000e-003	0.0000	8.4925
Total	**3.1426**	**0.0367**	**0.0610**	**1.0000e-004**		**1.4700e-003**	**1.4700e-003**		**1.4600e-003**	**1.4600e-003**	**0.0000**	**8.4599**	**8.4599**	**1.3000e-003**	**0.0000**	**8.4925**

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	1.0800e-003	6.9000e-004	7.7500e-003	3.0000e-005	3.0600e-003	2.0000e-005	3.0800e-003	8.2000e-004	2.0000e-005	8.4000e-004	0.0000	2.5361	2.5361	5.0000e-005	0.0000	2.5373
Total	**1.0800e-003**	**6.9000e-004**	**7.7500e-003**	**3.0000e-005**	**3.0600e-003**	**2.0000e-005**	**3.0800e-003**	**8.2000e-004**	**2.0000e-005**	**8.4000e-004**	**0.0000**	**2.5361**	**2.5361**	**5.0000e-005**	**0.0000**	**2.5373**

3.8 Paving - 2024

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	tons/yr										MT/yr					
Off-Road	9.6900e-003	0.0932	0.1346	2.1000e-004		4.5500e-003	4.5500e-003		4.2000e-003	4.2000e-003	0.0000	17.8419	17.8419	5.6500e-003	0.0000	17.9833
Paving	1.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.7900e-003**	**0.0932**	**0.1346**	**2.1000e-004**		**4.5500e-003**	**4.5500e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**17.8419**	**17.8419**	**5.6500e-003**	**0.0000**	**17.9833**

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	4.5000e-004	2.8000e-004	3.1800e-003	1.0000e-005	1.3600e-003	1.0000e-005	1.3700e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0416	1.0416	2.0000e-005	0.0000	1.0421
Total	**4.5000e-004**	**2.8000e-004**	**3.1800e-003**	**1.0000e-005**	**1.3600e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.0416**	**1.0416**	**2.0000e-005**	**0.0000**	**1.0421**

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	tons/yr										MT/yr					
Off-Road	9.6900e-003	0.0932	0.1346	2.1000e-004		4.5500e-003	4.5500e-003		4.2000e-003	4.2000e-003	0.0000	17.8419	17.8419	5.6500e-003	0.0000	17.9833
Paving	1.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.7900e-003**	**0.0932**	**0.1346**	**2.1000e-004**		**4.5500e-003**	**4.5500e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**17.8419**	**17.8419**	**5.6500e-003**	**0.0000**	**17.9833**

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	4.5000e-004	2.8000e-004	3.1800e-003	1.0000e-005	1.2600e-003	1.0000e-005	1.2700e-003	3.4000e-004	1.0000e-005	3.4000e-004	0.0000	1.0416	1.0416	2.0000e-005	0.0000	1.0421
Total	**4.5000e-004**	**2.8000e-004**	**3.1800e-003**	**1.0000e-005**	**1.2600e-003**	**1.0000e-005**	**1.2700e-003**	**3.4000e-004**	**1.0000e-005**	**3.4000e-004**	**0.0000**	**1.0416**	**1.0416**	**2.0000e-005**	**0.0000**	**1.0421**

3.9 Finishing/Landscaping - 2024

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	tons/yr										MT/yr					
Off-Road	3.5200e-003	0.0385	0.0568	8.0000e-005		1.7500e-003	1.7500e-003		1.6100e-003	1.6100e-003	0.0000	7.1155	7.1155	2.3000e-003	0.0000	7.1730
Total	**3.5200e-003**	**0.0385**	**0.0568**	**8.0000e-005**		**1.7500e-003**	**1.7500e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**7.1155**	**7.1155**	**2.3000e-003**	**0.0000**	**7.1730**

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	2.9000e-004	1.9000e-004	2.0700e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.6793	0.6793	1.0000e-005	0.0000	0.6796
Total	**2.9000e-004**	**1.9000e-004**	**2.0700e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**9.0000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.6793**	**0.6793**	**1.0000e-005**	**0.0000**	**0.6796**

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	tons/yr										MT/yr					
Off-Road	3.5200e-003	0.0385	0.0568	8.0000e-005		1.7500e-003	1.7500e-003		1.6100e-003	1.6100e-003	0.0000	7.1155	7.1155	2.3000e-003	0.0000	7.1730
Total	**3.5200e-003**	**0.0385**	**0.0568**	**8.0000e-005**		**1.7500e-003**	**1.7500e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**7.1155**	**7.1155**	**2.3000e-003**	**0.0000**	**7.1730**

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	2.9000e-004	1.9000e-004	2.0700e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.6793	0.6793	1.0000e-005	0.0000	0.6796
Total	**2.9000e-004**	**1.9000e-004**	**2.0700e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.6793**	**0.6793**	**1.0000e-005**	**0.0000**	**0.6796**

People's Park Construction

Alameda County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finishing/Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile Driving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Prep Soil Haul	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Prep/Grade/Trench	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Aerial Lifts	Diesel	No Change	0	2	No Change	0.00
Air Compressors	Diesel	No Change	0	2	No Change	0.00
Bore/Drill Rigs	Diesel	No Change	0	1	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	1	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	1	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Excavators	Diesel	No Change	0	1	No Change	0.00

Forklifts	Diesel	No Change	0	3	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Graders	Diesel	No Change	0	1	No Change	0.00
Pavers	Diesel	No Change	0	1	No Change	0.00
Paving Equipment	Diesel	No Change	0	1	No Change	0.00
Rollers	Diesel	No Change	0	2	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	2	No Change	0.00
Scrapers	Diesel	No Change	0	1	No Change	0.00
Skid Steer Loaders	Diesel	No Change	0	1	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	7	No Change	0.00
Welders	Diesel	No Change	0	3	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Unmitigated tons/yr							Unmitigated mt/yr					
Aerial Lifts	7.30000E-004	1.10500E-002	2.29500E-002	4.00000E-005	1.90000E-004	1.80000E-004	0.00000E+000	3.09805E+000	3.09805E+000	1.00000E-003	0.00000E+000	3.12310E+000
Air Compressors	3.80000E-003	2.55900E-002	3.80100E-002	6.00000E-005	1.28000E-003	1.28000E-003	0.00000E+000	5.36183E+000	5.36183E+000	3.00000E-004	0.00000E+000	5.36938E+000
Bore/Drill Rigs	2.15000E-003	2.04000E-002	2.03300E-002	9.00000E-005	6.60000E-004	6.10000E-004	0.00000E+000	8.30440E+000	8.30440E+000	2.69000E-003	0.00000E+000	8.37154E+000
Cement and Mortar Mixers	6.80000E-004	4.23000E-003	3.55000E-003	1.00000E-005	1.60000E-004	1.60000E-004	0.00000E+000	5.27020E-001	5.27020E-001	5.00000E-005	0.00000E+000	5.28390E-001
Concrete/Industrial Saws	3.30000E-004	2.58000E-003	3.66000E-003	1.00000E-005	1.30000E-004	1.30000E-004	0.00000E+000	5.37660E-001	5.37660E-001	3.00000E-005	0.00000E+000	5.38320E-001
Cranes	4.23900E-002	4.57870E-001	2.22340E-001	7.00000E-004	1.91100E-002	1.75800E-002	0.00000E+000	6.18479E+001	6.18479E+001	2.00000E-002	0.00000E+000	6.23480E+001
Excavators	4.70000E-004	3.87000E-003	8.14000E-003	1.00000E-005	1.90000E-004	1.70000E-004	0.00000E+000	1.13422E+000	1.13422E+000	3.70000E-004	0.00000E+000	1.14339E+000
Forklifts	2.36500E-002	2.21510E-001	2.69810E-001	3.60000E-004	1.34500E-002	1.23800E-002	0.00000E+000	3.16928E+001	3.16928E+001	1.02500E-002	0.00000E+000	3.19490E+001
Generator Sets	3.68100E-002	3.27110E-001	4.47530E-001	8.00000E-004	1.52200E-002	1.52200E-002	0.00000E+000	6.89553E+001	6.89553E+001	2.98000E-003	0.00000E+000	6.90299E+001
Graders	9.60000E-004	1.16300E-002	4.23000E-003	2.00000E-005	3.80000E-004	3.50000E-004	0.00000E+000	1.45344E+000	1.45344E+000	4.70000E-004	0.00000E+000	1.46519E+000
Pavers	2.11000E-003	2.00300E-002	3.32700E-002	5.00000E-005	9.40000E-004	8.60000E-004	0.00000E+000	4.74854E+000	4.74854E+000	1.54000E-003	0.00000E+000	4.78693E+000
Paving Equipment	1.89000E-003	1.72100E-002	2.95500E-002	5.00000E-005	8.30000E-004	7.60000E-004	0.00000E+000	4.11531E+000	4.11531E+000	1.33000E-003	0.00000E+000	4.14859E+000
Rollers	3.35000E-003	3.50600E-002	4.25500E-002	6.00000E-005	1.86000E-003	1.71000E-003	0.00000E+000	5.30281E+000	5.30281E+000	1.72000E-003	0.00000E+000	5.34569E+000
Rubber Tired Dozers	2.40000E-003	2.49500E-002	1.08700E-002	3.00000E-005	1.12000E-003	1.03000E-003	0.00000E+000	2.62585E+000	2.62585E+000	8.50000E-004	0.00000E+000	2.64708E+000

Scrapers	1.97000E-003	2.07100E-002	1.53400E-002	4.00000E-005	8.10000E-004	7.50000E-004	0.00000E+000	3.33420E+000	3.33420E+000	1.08000E-003	0.00000E+000	3.36115E+000
Skid Steer Loaders	1.40000E-003	1.86000E-002	3.11500E-002	5.00000E-005	6.00000E-004	5.50000E-004	0.00000E+000	4.09391E+000	4.09391E+000	1.32000E-003	0.00000E+000	4.12701E+000
Tractors/Loaders/Backhoes	1.64800E-002	1.66890E-001	2.46410E-001	3.40000E-004	8.09000E-003	7.44000E-003	0.00000E+000	3.02022E+001	3.02022E+001	9.77000E-003	0.00000E+000	3.04464E+001
Welders	9.17700E-002	5.17000E-001	6.13080E-001	9.40000E-004	1.96100E-002	1.96100E-002	0.00000E+000	6.88888E+001	6.88888E+001	7.42000E-003	0.00000E+000	6.90742E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Aerial Lifts	7.30000E-004	1.10500E-002	2.29500E-002	4.00000E-005	1.90000E-004	1.80000E-004	0.00000E+000	3.09805E+000	3.09805E+000	1.00000E-003	0.00000E+000	3.12310E+000
Air Compressors	3.80000E-003	2.55900E-002	3.80100E-002	6.00000E-005	1.28000E-003	1.28000E-003	0.00000E+000	5.36183E+000	5.36183E+000	3.00000E-004	0.00000E+000	5.36937E+000
Bore/Drill Rigs	2.15000E-003	2.04000E-002	2.03300E-002	9.00000E-005	6.60000E-004	6.10000E-004	0.00000E+000	8.30439E+000	8.30439E+000	2.69000E-003	0.00000E+000	8.37153E+000
Cement and Mortar Mixers	6.80000E-004	4.23000E-003	3.55000E-003	1.00000E-005	1.60000E-004	1.60000E-004	0.00000E+000	5.27020E-001	5.27020E-001	5.00000E-005	0.00000E+000	5.28380E-001
Concrete/Industrial Saws	3.30000E-004	2.58000E-003	3.66000E-003	1.00000E-005	1.30000E-004	1.30000E-004	0.00000E+000	5.37660E-001	5.37660E-001	3.00000E-005	0.00000E+000	5.38320E-001
Cranes	4.23900E-002	4.57870E-001	2.22340E-001	7.00000E-004	1.91100E-002	1.75800E-002	0.00000E+000	6.18478E+001	6.18478E+001	2.00000E-002	0.00000E+000	6.23479E+001
Excavators	4.70000E-004	3.87000E-003	8.14000E-003	1.00000E-005	1.90000E-004	1.70000E-004	0.00000E+000	1.13422E+000	1.13422E+000	3.70000E-004	0.00000E+000	1.14339E+000
Forklifts	2.36500E-002	2.21500E-001	2.69810E-001	3.60000E-004	1.34500E-002	1.23800E-002	0.00000E+000	3.16927E+001	3.16927E+001	1.02500E-002	0.00000E+000	3.19490E+001
Generator Sets	3.68100E-002	3.27110E-001	4.47530E-001	8.00000E-004	1.52200E-002	1.52200E-002	0.00000E+000	6.89552E+001	6.89552E+001	2.98000E-003	0.00000E+000	6.90298E+001
Graders	9.60000E-004	1.16300E-002	4.23000E-003	2.00000E-005	3.80000E-004	3.50000E-004	0.00000E+000	1.45343E+000	1.45343E+000	4.70000E-004	0.00000E+000	1.46519E+000
Pavers	2.11000E-003	2.00300E-002	3.32700E-002	5.00000E-005	9.40000E-004	8.60000E-004	0.00000E+000	4.74853E+000	4.74853E+000	1.54000E-003	0.00000E+000	4.78692E+000
Paving Equipment	1.89000E-003	1.72100E-002	2.95500E-002	5.00000E-005	8.30000E-004	7.60000E-004	0.00000E+000	4.11531E+000	4.11531E+000	1.33000E-003	0.00000E+000	4.14858E+000
Rollers	3.35000E-003	3.50600E-002	4.25500E-002	6.00000E-005	1.86000E-003	1.71000E-003	0.00000E+000	5.30281E+000	5.30281E+000	1.72000E-003	0.00000E+000	5.34568E+000
Rubber Tired Dozers	2.40000E-003	2.49400E-002	1.08700E-002	3.00000E-005	1.12000E-003	1.03000E-003	0.00000E+000	2.62585E+000	2.62585E+000	8.50000E-004	0.00000E+000	2.64708E+000
Scrapers	1.97000E-003	2.07100E-002	1.53400E-002	4.00000E-005	8.10000E-004	7.50000E-004	0.00000E+000	3.33419E+000	3.33419E+000	1.08000E-003	0.00000E+000	3.36115E+000
Skid Steer Loaders	1.40000E-003	1.86000E-002	3.11500E-002	5.00000E-005	6.00000E-004	5.50000E-004	0.00000E+000	4.09390E+000	4.09390E+000	1.32000E-003	0.00000E+000	4.12701E+000
Tractors/Loaders/Backhoes	1.64800E-002	1.66890E-001	2.46410E-001	3.40000E-004	8.09000E-003	7.44000E-003	0.00000E+000	3.02021E+001	3.02021E+001	9.77000E-003	0.00000E+000	3.04463E+001
Welders	9.17700E-002	5.16990E-001	6.13080E-001	9.40000E-004	1.96100E-002	1.96100E-002	0.00000E+000	6.88887E+001	6.88887E+001	7.42000E-003	0.00000E+000	6.90741E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Aerial Lifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.86241E-006
Bore/Drill Rigs	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.20418E-006	1.20418E-006	0.00000E+000	0.00000E+000	1.19452E-006
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.89254E-005
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.13181E-006	1.13181E-006	0.00000E+000	0.00000E+000	1.28312E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Forklifts	0.00000E+000	4.51447E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.26212E-006	1.26212E-006	0.00000E+000	0.00000E+000	1.25200E-006
Generator Sets	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16017E-006	1.16017E-006	0.00000E+000	0.00000E+000	1.30378E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	6.88023E-006	6.88023E-006	0.00000E+000	0.00000E+000	0.00000E+000
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.10591E-006	2.10591E-006	0.00000E+000	0.00000E+000	2.08902E-006
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.41046E-006
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.87067E-006
Rubber Tired Dozers	0.00000E+000	4.00802E-004	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Scrapers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.99922E-006	2.99922E-006	0.00000E+000	0.00000E+000	0.00000E+000
Skid Steer Loaders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.44265E-006	2.44265E-006	0.00000E+000	0.00000E+000	0.00000E+000
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.32441E-006	1.32441E-006	0.00000E+000	0.00000E+000	1.31379E-006
Welders	0.00000E+000	1.93424E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16129E-006	1.16129E-006	0.00000E+000	0.00000E+000	1.30295E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Replace Ground Cover of Area Disturbed	PM10 Reduction	5.00	PM2.5 Reduction	5.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	15.00		
Yes	Clean Paved Road	% PM Reduction	9.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.00	0.00	0.00	0.00	0.08	0.07
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.22	0.06	0.20	0.05	0.08	0.07
Demolition	Fugitive Dust	0.01	0.00	0.00	0.00	0.57	0.57
Demolition	Roads	0.00	0.00	0.00	0.00	0.08	0.07
Finishing/Landscaping	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Finishing/Landscaping	Roads	0.00	0.00	0.00	0.00	0.08	0.08
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.07	0.06
Pile Driving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Pile Driving	Roads	0.00	0.00	0.00	0.00	0.08	0.00
Site Prep Soil Haul	Fugitive Dust	0.00	0.00	0.00	0.00	0.58	0.55
Site Prep Soil Haul	Roads	0.01	0.00	0.01	0.00	0.07	0.06
Site Prep/Grade/Trench	Fugitive Dust	0.02	0.01	0.01	0.00	0.57	0.57
Site Prep/Grade/Trench	Roads	0.00	0.00	0.00	0.00	0.11	0.10

CalEEMod Mitigated Construction Model

People's Park Construction - Mitigated (Tier 4 Interim Equip)

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.88	Acre	1.88	0.00	0
Parking Lot	3.30	1000sqft	0.08	3,300.00	0
Apartments High Rise	166.00	Dwelling Unit	0.75	353,005.00	475
Apartments Mid Rise	111.00	Dwelling Unit	0.00	88,691.00	317
Strip Mall	4.00	1000sqft	0.09	4,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - See assumptions file.

Construction Phase - See assumptions file.

Off-road Equipment - See assumptions file.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - No Additional Equipment

Off-road Equipment - See assumptions file.

Trips and VMT - See assumptions file.

Demolition -

Grading - No additional acres graded.

Architectural Coating - See assumptions file.

Construction Off-road Equipment Mitigation - See assumptions file.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	2,000.00	2,700.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	6,000.00	8,100.00
tblAreaCoating	Area_Residential_Exterior	298145	60105
tblAreaCoating	Area_Residential_Interior	894434	180314
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	9
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	10.00	21.00
tblConstructionPhase	NumDays	220.00	244.00

tblConstructionPhase	NumDays	20.00	2.00
tblConstructionPhase	NumDays	6.00	5.00
tblConstructionPhase	NumDays	10.00	23.00
tblConstructionPhase	NumDays	3.00	4.00
tblGrading	MaterialExported	0.00	10,927.00
tblGrading	MaterialImported	0.00	1,645.00
tblLandUse	LandUseSquareFeet	81,892.80	0.00
tblLandUse	LandUseSquareFeet	166,000.00	353,005.00
tblLandUse	LandUseSquareFeet	111,000.00	88,691.00
tblLandUse	LotAcreage	2.68	0.75
tblLandUse	LotAcreage	2.92	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00

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					
2023	0.2418	1.8385	1.9526	5.4600e-003	0.2218	0.0652	0.2870	0.0619	0.0623	0.1241	0.0000	483.0727	483.0727	0.0529	0.0000	484.3951
2024	3.2113	0.5511	0.7156	1.5700e-003	0.0497	0.0213	0.0710	0.0133	0.0202	0.0335	0.0000	137.4564	137.4564	0.0202	0.0000	137.9619
Maximum	**3.2113**	**1.8385**	**1.9526**	**5.4600e-003**	**0.2218**	**0.0652**	**0.2870**	**0.0619**	**0.0623**	**0.1241**	**0.0000**	**483.0727**	**483.0727**	**0.0529**	**0.0000**	**484.3951**

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					
2023	0.1754	1.4865	2.1694	5.4600e-003	0.1896	0.0206	0.2101	0.0523	0.0205	0.0727	0.0000	483.0724	483.0724	0.0529	0.0000	484.3949
2024	3.1878	0.4927	0.7870	1.5700e-003	0.0459	6.9800e-003	0.0529	0.0124	6.9600e-003	0.0194	0.0000	137.4563	137.4563	0.0202	0.0000	137.9618
Maximum	**3.1878**	**1.4865**	**2.1694**	**5.4600e-003**	**0.1896**	**0.0206**	**0.2101**	**0.0523**	**0.0205**	**0.0727**	**0.0000**	**483.0724**	**483.0724**	**0.0529**	**0.0000**	**484.3949**

	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**	**N20**	**CO2e**
Percent Reduction	**2.60**	**17.17**	**-10.80**	**0.00**	**13.27**	**68.15**	**26.52**	**13.96**	**66.77**	**41.59**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
10	2-9-2023	5-8-2023	0.4424	0.3578
11	5-9-2023	8-8-2023	0.6157	0.4868
12	8-9-2023	11-8-2023	0.6173	0.4884
13	11-9-2023	2-8-2024	0.6055	0.4869
14	2-9-2024	5-8-2024	3.5326	3.5039
15	5-9-2024	8-8-2024	0.1025	0.0948
16	8-9-2024	9-30-2024	0.0357	0.0367
		Highest	3.5326	3.5039

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/3/2023	4/4/2023	5	2	
2	Pile Driving	Trenching	4/3/2023	4/28/2023	5	20	
3	Building Construction	Building Construction	4/3/2023	3/7/2024	5	244	
4	Site Prep Soil Haul	Site Preparation	4/4/2023	4/7/2023	5	4	
5	Site Prep/Grade/Trench	Grading	4/4/2023	4/10/2023	5	5	
6	Architectural Coating	Architectural Coating	4/5/2024	5/5/2024	5	21	
7	Paving	Paving	6/4/2024	7/4/2024	5	23	
8	Finishing/Landscaping	Trenching	8/5/2024	10/4/2024	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 1.96

Residential Indoor: 894,434; Residential Outdoor: 298,145; Non-Residential Indoor: 8,100; Non-Residential Outdoor: 2,700; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Pile Driving	Bore/Drill Rigs	1	8.00	221	0.50
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Site Prep/Grade/Trench	Excavators	1	8.00	158	0.38
Site Prep/Grade/Trench	Graders	1	8.00	187	0.41
Site Prep/Grade/Trench	Rubber Tired Dozers	1	8.00	247	0.40
Site Prep/Grade/Trench	Scrapers	1	8.00	367	0.48
Site Prep/Grade/Trench	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Site Prep Soil Haul	Graders	0	8.00	187	0.41
Site Prep Soil Haul	Scrapers	0	8.00	367	0.48
Site Prep Soil Haul	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Architectural Coating	Aerial Lifts	2	8.00	63	0.31
Architectural Coating	Air Compressors	2	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Finishing/Landscaping	Forklifts	1	8.00	89	0.20
Finishing/Landscaping	Skid Steer Loaders	1	8.00	65	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
Demolition	5	13.00	4.00	106.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving	1	3.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	202.00	31.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Prep/Grade/Trench	6	15.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Prep Soil Haul	0	8.00	0.00	1,572.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	40.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Finishing/Landscaping	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2023

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	tons/yr										MT/yr					
Fugitive Dust					0.0115	0.0000	0.0115	1.7300e-003	0.0000	1.7300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4700e-003	0.0143	0.0135	2.0000e-005		6.8000e-004	6.8000e-004		6.3000e-004	6.3000e-004	0.0000	2.1087	2.1087	5.3000e-004	0.0000	2.1220
Total	**1.4700e-003**	**0.0143**	**0.0135**	**2.0000e-005**	**0.0115**	**6.8000e-004**	**0.0121**	**1.7300e-003**	**6.3000e-004**	**2.3600e-003**	**0.0000**	**2.1087**	**2.1087**	**5.3000e-004**	**0.0000**	**2.1220**

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	2.7000e-004	8.8200e-003	2.2700e-003	4.0000e-005	9.0000e-004	2.0000e-005	9.1000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	3.8022	3.8022	1.6000e-004	0.0000	3.8062
Vendor	1.0000e-005	3.1000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1008	0.1008	0.0000	0.0000	0.1009
Worker	4.0000e-005	2.0000e-005	2.6000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0817	0.0817	0.0000	0.0000	0.0818
Total	**3.2000e-004**	**9.1500e-003**	**2.6000e-003**	**4.0000e-005**	**1.0300e-003**	**2.0000e-005**	**1.0400e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**3.9847**	**3.9847**	**1.6000e-004**	**0.0000**	**3.9889**

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	tons/yr										MT/yr					
Fugitive Dust					4.8900e-003	0.0000	4.8900e-003	7.4000e-004	0.0000	7.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6000e-004	8.5400e-003	0.0154	2.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.1087	2.1087	5.3000e-004	0.0000	2.1220
Total	**4.6000e-004**	**8.5400e-003**	**0.0154**	**2.0000e-005**	**4.8900e-003**	**4.0000e-005**	**4.9300e-003**	**7.4000e-004**	**4.0000e-005**	**7.8000e-004**	**0.0000**	**2.1087**	**2.1087**	**5.3000e-004**	**0.0000**	**2.1220**

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	2.7000e-004	8.8200e-003	2.2700e-003	4.0000e-005	8.4000e-004	2.0000e-005	8.5000e-004	2.3000e-004	1.0000e-005	2.5000e-004	0.0000	3.8022	3.8022	1.6000e-004	0.0000	3.8062
Vendor	1.0000e-005	3.1000e-004	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1008	0.1008	0.0000	0.0000	0.1009
Worker	4.0000e-005	2.0000e-005	2.6000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0817	0.0817	0.0000	0.0000	0.0818
Total	**3.2000e-004**	**9.1500e-003**	**2.6000e-003**	**4.0000e-005**	**9.5000e-004**	**2.0000e-005**	**9.7000e-004**	**2.7000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**3.9847**	**3.9847**	**1.6000e-004**	**0.0000**	**3.9889**

3.3 Pile Driving - 2023

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	tons/yr										MT/yr					
Off-Road	2.1500e-003	0.0204	0.0203	9.0000e-005		6.6000e-004	6.6000e-004		6.1000e-004	6.1000e-004	0.0000	8.3044	8.3044	2.6900e-003	0.0000	8.3715
Total	**2.1500e-003**	**0.0204**	**0.0203**	**9.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**8.3044**	**8.3044**	**2.6900e-003**	**0.0000**	**8.3715**

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	8.0000e-005	5.0000e-005	6.0000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1886	0.1886	0.0000	0.0000	0.1887
Total	**8.0000e-005**	**5.0000e-005**	**6.0000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1886**	**0.1886**	**0.0000**	**0.0000**	**0.1887**

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	tons/yr										MT/yr					
Off-Road	1.5600e-003	0.0251	0.0507	9.0000e-005		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	8.3044	8.3044	2.6900e-003	0.0000	8.3715
Total	**1.5600e-003**	**0.0251**	**0.0507**	**9.0000e-005**		**1.6000e-004**	**1.6000e-004**		**1.6000e-004**	**1.6000e-004**	**0.0000**	**8.3044**	**8.3044**	**2.6900e-003**	**0.0000**	**8.3715**

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	8.0000e-005	5.0000e-005	6.0000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1886	0.1886	0.0000	0.0000	0.1887
Total	**8.0000e-005**	**5.0000e-005**	**6.0000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1886**	**0.1886**	**0.0000**	**0.0000**	**0.1887**

3.4 Building Construction - 2023

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	tons/yr										MT/yr					
Off-Road	0.1671	1.3283	1.3859	2.4400e-003		0.0598	0.0598		0.0573	0.0573	0.0000	202.5095	202.5095	0.0383	0.0000	203.4670
Total	**0.1671**	**1.3283**	**1.3859**	**2.4400e-003**		**0.0598**	**0.0598**		**0.0573**	**0.0573**	**0.0000**	**202.5095**	**202.5095**	**0.0383**	**0.0000**	**203.4670**

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	6.4100e-003	0.2377	0.0561	7.9000e-004	0.0199	2.5000e-004	0.0201	5.7400e-003	2.4000e-004	5.9800e-003	0.0000	76.1757	76.1757	3.3200e-003	0.0000	76.2587
Worker	0.0544	0.0360	0.3935	1.3700e-003	0.1557	1.0000e-003	0.1567	0.0414	9.2000e-004	0.0423	0.0000	123.8311	123.8311	2.5600e-003	0.0000	123.8950
Total	**0.0608**	**0.2737**	**0.4496**	**2.1600e-003**	**0.1756**	**1.2500e-003**	**0.1768**	**0.0472**	**1.1600e-003**	**0.0483**	**0.0000**	**200.0068**	**200.0068**	**5.8800e-003**	**0.0000**	**200.1537**

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	tons/yr										MT/yr					
Off-Road	0.1064	1.0065	1.5553	2.4400e-003		0.0187	0.0187		0.0187	0.0187	0.0000	202.5093	202.5093	0.0383	0.0000	203.4667
Total	**0.1064**	**1.0065**	**1.5553**	**2.4400e-003**		**0.0187**	**0.0187**		**0.0187**	**0.0187**	**0.0000**	**202.5093**	**202.5093**	**0.0383**	**0.0000**	**203.4667**

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	6.4100e-003	0.2377	0.0561	7.9000e-004	0.0186	2.5000e-004	0.0189	5.4300e-003	2.4000e-004	5.6800e-003	0.0000	76.1757	76.1757	3.3200e-003	0.0000	76.2587
Worker	0.0544	0.0360	0.3935	1.3700e-003	0.1436	1.0000e-003	0.1446	0.0385	9.2000e-004	0.0394	0.0000	123.8311	123.8311	2.5600e-003	0.0000	123.8950
Total	**0.0608**	**0.2737**	**0.4496**	**2.1600e-003**	**0.1622**	**1.2500e-003**	**0.1635**	**0.0439**	**1.1600e-003**	**0.0451**	**0.0000**	**200.0068**	**200.0068**	**5.8800e-003**	**0.0000**	**200.1537**

3.4 Building Construction - 2024

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	tons/yr										MT/yr					
Off-Road	0.0391	0.3142	0.3455	6.1000e-004		0.0132	0.0132		0.0126	0.0126	0.0000	50.8899	50.8899	9.4800e-003	0.0000	51.1269
Total	**0.0391**	**0.3142**	**0.3455**	**6.1000e-004**		**0.0132**	**0.0132**		**0.0126**	**0.0126**	**0.0000**	**50.8899**	**50.8899**	**9.4800e-003**	**0.0000**	**51.1269**

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	1.5600e-003	0.0593	0.0135	2.0000e-004	4.9900e-003	6.0000e-005	5.0500e-003	1.4400e-003	6.0000e-005	1.5000e-003	0.0000	19.0090	19.0090	8.2000e-004	0.0000	19.0296
Worker	0.0128	8.1500e-003	0.0913	3.3000e-004	0.0391	2.5000e-004	0.0394	0.0104	2.3000e-004	0.0106	0.0000	29.8832	29.8832	5.8000e-004	0.0000	29.8976
Total	**0.0143**	**0.0675**	**0.1048**	**5.3000e-004**	**0.0441**	**3.1000e-004**	**0.0444**	**0.0119**	**2.9000e-004**	**0.0121**	**0.0000**	**48.8922**	**48.8922**	**1.4000e-003**	**0.0000**	**48.9273**

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	tons/yr										MT/yr					
Off-Road	0.0254	0.2500	0.3898	6.1000e-004		4.1400e-003	4.1400e-003		4.1400e-003	4.1400e-003	0.0000	50.8899	50.8899	9.4800e-003	0.0000	51.1268
Total	**0.0254**	**0.2500**	**0.3898**	**6.1000e-004**		**4.1400e-003**	**4.1400e-003**		**4.1400e-003**	**4.1400e-003**	**0.0000**	**50.8899**	**50.8899**	**9.4800e-003**	**0.0000**	**51.1268**

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	1.5600e-003	0.0593	0.0135	2.0000e-004	4.6700e-003	6.0000e-005	4.7400e-003	1.3700e-003	6.0000e-005	1.4300e-003	0.0000	19.0090	19.0090	8.2000e-004	0.0000	19.0296
Worker	0.0128	8.1500e-003	0.0913	3.3000e-004	0.0361	2.5000e-004	0.0363	9.6600e-003	2.3000e-004	9.8900e-003	0.0000	29.8832	29.8832	5.8000e-004	0.0000	29.8976
Total	**0.0143**	**0.0675**	**0.1048**	**5.3000e-004**	**0.0408**	**3.1000e-004**	**0.0411**	**0.0110**	**2.9000e-004**	**0.0113**	**0.0000**	**48.8922**	**48.8922**	**1.4000e-003**	**0.0000**	**48.9273**

3.5 Site Prep Soil Haul - 2023

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	tons/yr										MT/yr					
Fugitive Dust					7.1000e-004	0.0000	7.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	3.9800e-003	0.1309	0.0337	5.8000e-004	0.0133	2.2000e-004	0.0135	3.6600e-003	2.2000e-004	3.8800e-003	0.0000	56.3872	56.3872	2.4000e-003	0.0000	56.4472
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	4.0000e-005	3.0000e-005	3.2000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1006	0.1006	0.0000	0.0000	0.1007
Total	**4.0200e-003**	**0.1309**	**0.0340**	**5.8000e-004**	**0.0134**	**2.2000e-004**	**0.0137**	**3.6900e-003**	**2.2000e-004**	**3.9100e-003**	**0.0000**	**56.4878**	**56.4878**	**2.4000e-003**	**0.0000**	**56.5479**

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	tons/yr										MT/yr					
Fugitive Dust					3.0000e-004	0.0000	3.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	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	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**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	tons/yr										MT/yr					
Hauling	3.9800e-003	0.1309	0.0337	5.8000e-004	0.0124	2.2000e-004	0.0126	3.4400e-003	2.2000e-004	3.6600e-003	0.0000	56.3872	56.3872	2.4000e-003	0.0000	56.4472
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	4.0000e-005	3.0000e-005	3.2000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1006	0.1006	0.0000	0.0000	0.1007
Total	**4.0200e-003**	**0.1309**	**0.0340**	**5.8000e-004**	**0.0125**	**2.2000e-004**	**0.0128**	**3.4700e-003**	**2.2000e-004**	**3.6900e-003**	**0.0000**	**56.4878**	**56.4878**	**2.4000e-003**	**0.0000**	**56.5479**

3.6 Site Prep/Grade/Trench - 2023

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	tons/yr										MT/yr					
Fugitive Dust					0.0190	0.0000	0.0190	8.7000e-003	0.0000	8.7000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7700e-003	0.0608	0.0453	1.0000e-004		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003	0.0000	8.9944	8.9944	2.9100e-003	0.0000	9.0671
Total	**5.7700e-003**	**0.0608**	**0.0453**	**1.0000e-004**	**0.0190**	**2.5100e-003**	**0.0215**	**8.7000e-003**	**2.3100e-003**	**0.0110**	**0.0000**	**8.9944**	**8.9944**	**2.9100e-003**	**0.0000**	**9.0671**

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	2.0000e-005	7.9000e-004	1.9000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2520	0.2520	1.0000e-005	0.0000	0.2523
Worker	1.0000e-004	7.0000e-005	7.5000e-004	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2358	0.2358	0.0000	0.0000	0.2359
Total	**1.2000e-004**	**8.6000e-004**	**9.4000e-004**	**0.0000**	**3.7000e-004**	**0.0000**	**3.7000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.4878**	**0.4878**	**1.0000e-005**	**0.0000**	**0.4882**

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	tons/yr										MT/yr					
Fugitive Dust					8.1400e-003	0.0000	8.1400e-003	3.7200e-003	0.0000	3.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7000e-003	0.0316	0.0604	1.0000e-004		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	8.9944	8.9944	2.9100e-003	0.0000	9.0671
Total	**1.7000e-003**	**0.0316**	**0.0604**	**1.0000e-004**	**8.1400e-003**	**1.7000e-004**	**8.3100e-003**	**3.7200e-003**	**1.7000e-004**	**3.8900e-003**	**0.0000**	**8.9944**	**8.9944**	**2.9100e-003**	**0.0000**	**9.0671**

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	2.0000e-005	7.9000e-004	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2520	0.2520	1.0000e-005	0.0000	0.2523
Worker	1.0000e-004	7.0000e-005	7.5000e-004	0.0000	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2358	0.2358	0.0000	0.0000	0.2359
Total	**1.2000e-004**	**8.6000e-004**	**9.4000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.4000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.4878**	**0.4878**	**1.0000e-005**	**0.0000**	**0.4882**

3.7 Architectural Coating - 2024

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	tons/yr										MT/yr					
Archit. Coating	3.1381					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5200e-003	0.0367	0.0610	1.0000e-004		1.4700e-003	1.4700e-003		1.4600e-003	1.4600e-003	0.0000	8.4599	8.4599	1.3000e-003	0.0000	8.4925
Total	**3.1426**	**0.0367**	**0.0610**	**1.0000e-004**		**1.4700e-003**	**1.4700e-003**		**1.4600e-003**	**1.4600e-003**	**0.0000**	**8.4599**	**8.4599**	**1.3000e-003**	**0.0000**	**8.4925**

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	1.0800e-003	6.9000e-004	7.7500e-003	3.0000e-005	3.3200e-003	2.0000e-005	3.3400e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	2.5361	2.5361	5.0000e-005	0.0000	2.5373
Total	**1.0800e-003**	**6.9000e-004**	**7.7500e-003**	**3.0000e-005**	**3.3200e-003**	**2.0000e-005**	**3.3400e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**2.5361**	**2.5361**	**5.0000e-005**	**0.0000**	**2.5373**

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	tons/yr										MT/yr					
Archit. Coating	3.1381					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0100e-003	0.0421	0.0652	1.0000e-004		8.9000e-004	8.9000e-004		8.9000e-004	8.9000e-004	0.0000	8.4599	8.4599	1.3000e-003	0.0000	8.4925
Total	**3.1401**	**0.0421**	**0.0652**	**1.0000e-004**		**8.9000e-004**	**8.9000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**8.4599**	**8.4599**	**1.3000e-003**	**0.0000**	**8.4925**

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	1.0800e-003	6.9000e-004	7.7500e-003	3.0000e-005	3.0600e-003	2.0000e-005	3.0800e-003	8.2000e-004	2.0000e-005	8.4000e-004	0.0000	2.5361	2.5361	5.0000e-005	0.0000	2.5373
Total	**1.0800e-003**	**6.9000e-004**	**7.7500e-003**	**3.0000e-005**	**3.0600e-003**	**2.0000e-005**	**3.0800e-003**	**8.2000e-004**	**2.0000e-005**	**8.4000e-004**	**0.0000**	**2.5361**	**2.5361**	**5.0000e-005**	**0.0000**	**2.5373**

3.8 Paving - 2024

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	tons/yr										MT/yr					
Off-Road	9.6900e-003	0.0932	0.1346	2.1000e-004		4.5500e-003	4.5500e-003		4.2000e-003	4.2000e-003	0.0000	17.8419	17.8419	5.6500e-003	0.0000	17.9833
Paving	1.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.7900e-003**	**0.0932**	**0.1346**	**2.1000e-004**		**4.5500e-003**	**4.5500e-003**		**4.2000e-003**	**4.2000e-003**	**0.0000**	**17.8419**	**17.8419**	**5.6500e-003**	**0.0000**	**17.9833**

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	4.5000e-004	2.8000e-004	3.1800e-003	1.0000e-005	1.3600e-003	1.0000e-005	1.3700e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0416	1.0416	2.0000e-005	0.0000	1.0421
Total	**4.5000e-004**	**2.8000e-004**	**3.1800e-003**	**1.0000e-005**	**1.3600e-003**	**1.0000e-005**	**1.3700e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.0416**	**1.0416**	**2.0000e-005**	**0.0000**	**1.0421**

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	tons/yr										MT/yr					
Off-Road	4.0800e-003	0.0907	0.1527	2.1000e-004		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	17.8419	17.8419	5.6500e-003	0.0000	17.9833
Paving	1.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.1800e-003**	**0.0907**	**0.1527**	**2.1000e-004**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**17.8419**	**17.8419**	**5.6500e-003**	**0.0000**	**17.9833**

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	4.5000e-004	2.8000e-004	3.1800e-003	1.0000e-005	1.2600e-003	1.0000e-005	1.2700e-003	3.4000e-004	1.0000e-005	3.4000e-004	0.0000	1.0416	1.0416	2.0000e-005	0.0000	1.0421
Total	**4.5000e-004**	**2.8000e-004**	**3.1800e-003**	**1.0000e-005**	**1.2600e-003**	**1.0000e-005**	**1.2700e-003**	**3.4000e-004**	**1.0000e-005**	**3.4000e-004**	**0.0000**	**1.0416**	**1.0416**	**2.0000e-005**	**0.0000**	**1.0421**

3.9 Finishing/Landscaping - 2024

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	tons/yr										MT/yr					
Off-Road	3.5200e-003	0.0385	0.0568	8.0000e-005		1.7500e-003	1.7500e-003		1.6100e-003	1.6100e-003	0.0000	7.1155	7.1155	2.3000e-003	0.0000	7.1730
Total	**3.5200e-003**	**0.0385**	**0.0568**	**8.0000e-005**		**1.7500e-003**	**1.7500e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**7.1155**	**7.1155**	**2.3000e-003**	**0.0000**	**7.1730**

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	2.9000e-004	1.9000e-004	2.0700e-003	1.0000e-005	8.9000e-004	1.0000e-005	9.0000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.6793	0.6793	1.0000e-005	0.0000	0.6796
Total	**2.9000e-004**	**1.9000e-004**	**2.0700e-003**	**1.0000e-005**	**8.9000e-004**	**1.0000e-005**	**9.0000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.6793**	**0.6793**	**1.0000e-005**	**0.0000**	**0.6796**

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	tons/yr										MT/yr					
Off-Road	1.9200e-003	0.0413	0.0615	8.0000e-005		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	7.1155	7.1155	2.3000e-003	0.0000	7.1730
Total	**1.9200e-003**	**0.0413**	**0.0615**	**8.0000e-005**		**1.1300e-003**	**1.1300e-003**		**1.1300e-003**	**1.1300e-003**	**0.0000**	**7.1155**	**7.1155**	**2.3000e-003**	**0.0000**	**7.1730**

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	2.9000e-004	1.9000e-004	2.0700e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.6793	0.6793	1.0000e-005	0.0000	0.6796
Total	**2.9000e-004**	**1.9000e-004**	**2.0700e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.6793**	**0.6793**	**1.0000e-005**	**0.0000**	**0.6796**

People's Park Construction - Mitigated (Tier 4 Interim Equip)

Alameda County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	-0.15	-0.06	0.00	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.26	0.19	-0.09	0.00	0.67	0.66	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.56	0.25	-0.12	0.00	0.91	0.92	0.00	0.00	0.00	0.00	0.00	0.00
Finishing/Landscaping	0.42	-0.07	-0.08	0.00	0.35	0.30	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.55	0.03	-0.13	0.00	0.89	0.88	0.00	0.00	0.00	0.00	0.00	0.00
Pile Driving	0.26	-0.23	-1.45	0.00	0.76	0.74	0.00	0.00	0.00	0.00	0.00	0.00
Site Prep Soil Haul	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Prep/Grade/Trench	0.69	0.47	-0.33	0.00	0.93	0.93	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Aerial Lifts	Diesel	Tier 4 Interim	2	2	No Change	0.00
Air Compressors	Diesel	Tier 4 Interim	2	2	No Change	0.00
Bore/Drill Rigs	Diesel	Tier 4 Interim	1	1	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	1	No Change	0.00
Concrete/Industrial Saws	Diesel	Tier 4 Interim	1	1	No Change	0.00
Cranes	Diesel	Tier 4 Interim	1	1	No Change	0.00
Excavators	Diesel	Tier 4 Interim	1	1	No Change	0.00

Forklifts	Diesel	Tier 4 Interim	3	3	No Change		0.00
Generator Sets	Diesel	Tier 4 Interim	1	1	No Change		0.00
Graders	Diesel	Tier 4 Interim	1	1	No Change		0.00
Pavers	Diesel	Tier 4 Interim	1	1	No Change		0.00
Paving Equipment	Diesel	Tier 4 Interim	1	1	No Change		0.00
Rollers	Diesel	Tier 4 Interim	2	2	No Change		0.00
Rubber Tired Dozers	Diesel	Tier 4 Interim	2	2	No Change		0.00
Scrapers	Diesel	Tier 4 Interim	1	1	No Change		0.00
Skid Steer Loaders	Diesel	Tier 4 Interim	1	1	No Change		0.00
Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	7	7	No Change		0.00
Welders	Diesel	No Change	0	3	No Change		0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Unmitigated tons/yr							Unmitigated mt/yr					
Aerial Lifts	7.30000E-004	1.10500E-002	2.29500E-002	4.00000E-005	1.90000E-004	1.80000E-004	0.00000E+000	3.09805E+000	3.09805E+000	1.00000E-003	0.00000E+000	3.12310E+000
Air Compressors	3.80000E-003	2.55900E-002	3.80100E-002	6.00000E-005	1.28000E-003	1.28000E-003	0.00000E+000	5.36183E+000	5.36183E+000	3.00000E-004	0.00000E+000	5.36938E+000
Bore/Drill Rigs	2.15000E-003	2.04000E-002	2.03300E-002	9.00000E-005	6.60000E-004	6.10000E-004	0.00000E+000	8.30440E+000	8.30440E+000	2.69000E-003	0.00000E+000	8.37154E+000
Cement and Mortar Mixers	6.80000E-004	4.23000E-003	3.55000E-003	1.00000E-005	1.60000E-004	1.60000E-004	0.00000E+000	5.27020E-001	5.27020E-001	5.00000E-005	0.00000E+000	5.28390E-001
Concrete/Industrial Saws	3.30000E-004	2.58000E-003	3.66000E-003	1.00000E-005	1.30000E-004	1.30000E-004	0.00000E+000	5.37660E-001	5.37660E-001	3.00000E-005	0.00000E+000	5.38320E-001
Cranes	4.23900E-002	4.57870E-001	2.22340E-001	7.00000E-004	1.91100E-002	1.75800E-002	0.00000E+000	6.18479E+001	6.18479E+001	2.00000E-002	0.00000E+000	6.23480E+001
Excavators	4.70000E-004	3.87000E-003	8.14000E-003	1.00000E-005	1.90000E-004	1.70000E-004	0.00000E+000	1.13422E+000	1.13422E+000	3.70000E-004	0.00000E+000	1.14339E+000
Forklifts	2.36500E-002	2.21510E-001	2.69810E-001	3.60000E-004	1.34500E-002	1.23800E-002	0.00000E+000	3.16928E+001	3.16928E+001	1.02500E-002	0.00000E+000	3.19490E+001
Generator Sets	3.68100E-002	3.27110E-001	4.47530E-001	8.00000E-004	1.52200E-002	1.52200E-002	0.00000E+000	6.89553E+001	6.89553E+001	2.98000E-003	0.00000E+000	6.90299E+001
Graders	9.60000E-004	1.16300E-002	4.23000E-003	2.00000E-005	3.80000E-004	3.50000E-004	0.00000E+000	1.45344E+000	1.45344E+000	4.70000E-004	0.00000E+000	1.46519E+000
Pavers	2.11000E-003	2.00300E-002	3.32700E-002	5.00000E-005	9.40000E-004	8.60000E-004	0.00000E+000	4.74854E+000	4.74854E+000	1.54000E-003	0.00000E+000	4.78693E+000
Paving Equipment	1.89000E-003	1.72100E-002	2.95500E-002	5.00000E-005	8.30000E-004	7.60000E-004	0.00000E+000	4.11531E+000	4.11531E+000	1.33000E-003	0.00000E+000	4.14859E+000
Rollers	3.35000E-003	3.50600E-002	4.25500E-002	6.00000E-005	1.86000E-003	1.71000E-003	0.00000E+000	5.30281E+000	5.30281E+000	1.72000E-003	0.00000E+000	5.34569E+000
Rubber Tired Dozers	2.40000E-003	2.49500E-002	1.08700E-002	3.00000E-005	1.12000E-003	1.03000E-003	0.00000E+000	2.62585E+000	2.62585E+000	8.50000E-004	0.00000E+000	2.64708E+000

Scrapers	1.97000E-003	2.07100E-002	1.53400E-002	4.00000E-005	8.10000E-004	7.50000E-004	0.00000E+000	3.33420E+000	3.33420E+000	1.08000E-003	0.00000E+000	3.36115E+000
Skid Steer Loaders	1.40000E-003	1.86000E-002	3.11500E-002	5.00000E-005	6.00000E-004	5.50000E-004	0.00000E+000	4.09391E+000	4.09391E+000	1.32000E-003	0.00000E+000	4.12701E+000
Tractors/Loaders/Backhoes	1.64800E-002	1.66890E-001	2.46410E-001	3.40000E-004	8.09000E-003	7.44000E-003	0.00000E+000	3.02022E+001	3.02022E+001	9.77000E-003	0.00000E+000	3.04464E+001
Welders	9.17700E-002	5.17000E-001	6.13080E-001	9.40000E-004	1.96100E-002	1.96100E-002	0.00000E+000	6.88888E+001	6.88888E+001	7.42000E-003	0.00000E+000	6.90742E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Mitigated tons/yr							Mitigated mt/yr					
Aerial Lifts	8.70000E-004	1.98200E-002	2.67600E-002	4.00000E-005	8.10000E-004	8.10000E-004	0.00000E+000	3.09805E+000	3.09805E+000	1.00000E-003	0.00000E+000	3.12310E+000
Air Compressors	1.14000E-003	2.22600E-002	3.84800E-002	6.00000E-005	8.00000E-005	8.00000E-005	0.00000E+000	5.36183E+000	5.36183E+000	3.00000E-004	0.00000E+000	5.36937E+000
Bore/Drill Rigs	1.56000E-003	2.51400E-002	5.06700E-002	9.00000E-005	1.60000E-004	1.60000E-004	0.00000E+000	8.30439E+000	8.30439E+000	2.69000E-003	0.00000E+000	8.37153E+000
Cement and Mortar Mixers	6.80000E-004	4.23000E-003	3.55000E-003	1.00000E-005	1.60000E-004	1.60000E-004	0.00000E+000	5.27020E-001	5.27020E-001	5.00000E-005	0.00000E+000	5.28380E-001
Concrete/Industrial Saws	1.10000E-004	2.23000E-003	3.86000E-003	1.00000E-005	1.00000E-005	1.00000E-005	0.00000E+000	5.37660E-001	5.37660E-001	3.00000E-005	0.00000E+000	5.38320E-001
Cranes	1.15300E-002	1.85940E-001	3.74770E-001	7.00000E-004	1.15000E-003	1.15000E-003	0.00000E+000	6.18478E+001	6.18478E+001	2.00000E-002	0.00000E+000	6.23479E+001
Excavators	1.60000E-004	5.69000E-003	9.80000E-003	1.00000E-005	2.00000E-005	2.00000E-005	0.00000E+000	1.13422E+000	1.13422E+000	3.70000E-004	0.00000E+000	1.14339E+000
Forklifts	8.15000E-003	1.58550E-001	2.74130E-001	3.60000E-004	5.90000E-004	5.90000E-004	0.00000E+000	3.16927E+001	3.16927E+001	1.02500E-002	0.00000E+000	3.19490E+001
Generator Sets	1.47100E-002	2.86230E-001	4.94880E-001	8.00000E-004	1.07000E-003	1.07000E-003	0.00000E+000	6.89552E+001	6.89552E+001	2.98000E-003	0.00000E+000	6.90298E+001
Graders	2.70000E-004	4.36000E-003	8.79000E-003	2.00000E-005	3.00000E-005	3.00000E-005	0.00000E+000	1.45343E+000	1.45343E+000	4.70000E-004	0.00000E+000	1.46519E+000
Pavers	6.60000E-004	2.38100E-002	4.09700E-002	5.00000E-005	9.00000E-005	9.00000E-005	0.00000E+000	4.74853E+000	4.74853E+000	1.54000E-003	0.00000E+000	4.78692E+000
Paving Equipment	5.80000E-004	2.07200E-002	3.56600E-002	5.00000E-005	8.00000E-005	8.00000E-005	0.00000E+000	4.11531E+000	4.11531E+000	1.33000E-003	0.00000E+000	4.14858E+000
Rollers	1.36000E-003	2.63900E-002	4.56300E-002	6.00000E-005	1.00000E-004	1.00000E-004	0.00000E+000	5.30281E+000	5.30281E+000	1.72000E-003	0.00000E+000	5.34568E+000
Rubber Tired Dozers	4.90000E-004	7.87000E-003	1.58600E-002	3.00000E-005	5.00000E-005	5.00000E-005	0.00000E+000	2.62585E+000	2.62585E+000	8.50000E-004	0.00000E+000	2.64708E+000
Scrapers	6.20000E-004	1.00200E-002	2.02000E-002	4.00000E-005	6.00000E-005	6.00000E-005	0.00000E+000	3.33419E+000	3.33419E+000	1.08000E-003	0.00000E+000	3.36115E+000
Skid Steer Loaders	1.15000E-003	2.61500E-002	3.53100E-002	5.00000E-005	1.07000E-003	1.07000E-003	0.00000E+000	4.09390E+000	4.09390E+000	1.32000E-003	0.00000E+000	4.12701E+000
Tractors/Loaders/Backhoes	7.69000E-003	1.49510E-001	2.58510E-001	3.40000E-004	5.60000E-004	5.60000E-004	0.00000E+000	3.02021E+001	3.02021E+001	9.77000E-003	0.00000E+000	3.04463E+001
Welders	9.17700E-002	5.16990E-001	6.13080E-001	9.40000E-004	1.96100E-002	1.96100E-002	0.00000E+000	6.88887E+001	6.88887E+001	7.42000E-003	0.00000E+000	6.90741E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Aerial Lifts	-1.91781E-001	-7.93665E-001	-1.66013E-001	0.00000E+000	-3.26316E+000	-3.50000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Air Compressors	7.00000E-001	1.30129E-001	-1.23652E-002	0.00000E+000	9.37500E-001	9.37500E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.86241E-006
Bore/Drill Rigs	2.74419E-001	-2.32353E-001	-1.49238E+000	0.00000E+000	7.57576E-001	7.37705E-001	0.00000E+000	1.20418E-006	1.20418E-006	0.00000E+000	0.00000E+000	1.19452E-006
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.89254E-005
Concrete/Industrial Saws	6.66667E-001	1.35659E-001	-5.46448E-002	0.00000E+000	9.23077E-001	9.23077E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Cranes	7.28002E-001	5.93902E-001	-6.85572E-001	0.00000E+000	9.39822E-001	9.34585E-001	0.00000E+000	1.13181E-006	1.13181E-006	0.00000E+000	0.00000E+000	1.28312E-006
Excavators	6.59574E-001	-4.70284E-001	-2.03931E-001	0.00000E+000	8.94737E-001	8.82353E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Forklifts	6.55391E-001	2.84231E-001	-1.60113E-002	0.00000E+000	9.56134E-001	9.52342E-001	0.00000E+000	1.26212E-006	1.26212E-006	0.00000E+000	0.00000E+000	1.25200E-006
Generator Sets	6.00380E-001	1.24973E-001	-1.05803E-001	0.00000E+000	9.29698E-001	9.29698E-001	0.00000E+000	1.16017E-006	1.16017E-006	0.00000E+000	0.00000E+000	1.30378E-006
Graders	7.18750E-001	6.25107E-001	-1.07801E+000	0.00000E+000	9.21053E-001	9.14286E-001	0.00000E+000	6.88023E-006	6.88023E-006	0.00000E+000	0.00000E+000	0.00000E+000
Pavers	6.87204E-001	-1.88717E-001	-2.31440E-001	0.00000E+000	9.04255E-001	8.95349E-001	0.00000E+000	2.10591E-006	2.10591E-006	0.00000E+000	0.00000E+000	2.08902E-006
Paving Equipment	6.93122E-001	-2.03951E-001	-2.06768E-001	0.00000E+000	9.03614E-001	8.94737E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.41046E-006
Rollers	5.94030E-001	2.47290E-001	-7.23854E-002	0.00000E+000	9.46237E-001	9.41520E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.87067E-006
Rubber Tired Dozers	7.95833E-001	6.84569E-001	-4.59062E-001	0.00000E+000	9.55357E-001	9.51456E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Scrapers	6.85279E-001	5.16176E-001	-3.16819E-001	0.00000E+000	9.25926E-001	9.20000E-001	0.00000E+000	2.99922E-006	2.99922E-006	0.00000E+000	0.00000E+000	0.00000E+000
Skid Steer Loaders	1.78571E-001	-4.05914E-001	-1.33547E-001	0.00000E+000	-7.83333E-001	-9.45455E-001	0.00000E+000	2.44265E-006	2.44265E-006	0.00000E+000	0.00000E+000	0.00000E+000
Tractors/Loaders/Backhoes	5.33374E-001	1.04140E-001	-4.91051E-002	0.00000E+000	9.30779E-001	9.24731E-001	0.00000E+000	1.32441E-006	1.32441E-006	0.00000E+000	0.00000E+000	1.31379E-006
Welders	0.00000E+000	1.93424E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16129E-006	1.16129E-006	0.00000E+000	0.00000E+000	1.30295E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Replace Ground Cover of Area Disturbed	PM10 Reduction	5.00	PM2.5 Reduction	5.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	15.00		
Yes	Clean Paved Road	% PM Reduction	9.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.00	0.00	0.00	0.00	0.08	0.07
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.22	0.06	0.20	0.05	0.08	0.07
Demolition	Fugitive Dust	0.01	0.00	0.00	0.00	0.57	0.57
Demolition	Roads	0.00	0.00	0.00	0.00	0.08	0.07
Finishing/Landscaping	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Finishing/Landscaping	Roads	0.00	0.00	0.00	0.00	0.08	0.08
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.07	0.06
Pile Driving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Pile Driving	Roads	0.00	0.00	0.00	0.00	0.08	0.00
Site Prep Soil Haul	Fugitive Dust	0.00	0.00	0.00	0.00	0.58	0.55
Site Prep Soil Haul	Roads	0.01	0.00	0.01	0.00	0.07	0.06
Site Prep/Grade/Trench	Fugitive Dust	0.02	0.01	0.01	0.00	0.57	0.57
Site Prep/Grade/Trench	Roads	0.00	0.00	0.00	0.00	0.11	0.10

CalEEMod Operations Model

Operation_Housing Project #2

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.88	Acre	1.88	0.00	0
Parking Lot	0.08	Acre	0.08	3,300.00	0
Apartments High Rise	166.00	Dwelling Unit	0.75	353,005.00	475
Apartments Mid Rise	111.00	Dwelling Unit	0.00	88,691.00	317
Strip Mall	4.00	1000sqft	0.09	4,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2024
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - See assumptions file.

Vehicle Trips - See assumptions file.

Vehicle Emission Factors - Based on EMFAC2017 emissions data.

Vehicle Emission Factors - Based on EMFAC2017 emissions data.

Vehicle Emission Factors - Based on EMFAC2017 emissions data.

Energy Use - See assumptions file.

Water And Wastewater - Assumes 100% aerobic. See assumptions file for water use.

Solid Waste - See assumptions file.

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	741.44	1,187.64
tblEnergyUse	LightingElect	741.44	1,187.64
tblEnergyUse	LightingElect	4.88	7.82
tblEnergyUse	NT24E	3,054.10	4,892.07
tblEnergyUse	NT24E	3,054.10	4,892.07
tblEnergyUse	NT24E	3.36	5.38
tblEnergyUse	NT24NG	2,615.00	0.00
tblEnergyUse	NT24NG	2,615.00	0.00
tblEnergyUse	NT24NG	0.70	0.00
tblEnergyUse	T24E	426.45	610.00
tblEnergyUse	T24E	426.45	610.00
tblEnergyUse	T24E	2.24	3.20
tblEnergyUse	T24NG	6,115.43	0.00
tblEnergyUse	T24NG	6,115.43	0.00
tblEnergyUse	T24NG	3.90	0.00
tblFleetMix	HHD	0.05	5.0440e-003
tblFleetMix	LDA	0.56	0.70

tblFleetMix	LDT1	0.04	0.05
tblFleetMix	LDT2	0.19	0.24
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.1570e-003	0.00
tblFleetMix	MCY	5.4600e-003	6.8220e-003
tblFleetMix	MDV	0.11	0.00
tblFleetMix	MH	6.9000e-004	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	2.2210e-003	0.00
tblFleetMix	SBUS	3.4300e-004	0.00
tblFleetMix	UBUS	2.3580e-003	0.00
tblLandUse	LandUseSquareFeet	81,892.80	0.00
tblLandUse	LandUseSquareFeet	3,484.80	3,300.00
tblLandUse	LandUseSquareFeet	166,000.00	353,005.00
tblLandUse	LandUseSquareFeet	111,000.00	88,691.00
tblLandUse	LotAcreage	2.68	0.75
tblLandUse	LotAcreage	2.92	0.00
tblSolidWaste	SolidWasteGenerationRate	76.36	95.80
tblSolidWaste	SolidWasteGenerationRate	51.06	0.00
tblSolidWaste	SolidWasteGenerationRate	4.20	0.00
tblVehicleEF	HHD	0.61	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.65	6.63
tblVehicleEF	HHD	0.78	0.35
tblVehicleEF	HHD	1.99	3.9270e-003
tblVehicleEF	HHD	4,686.99	1,083.40

tblVehicleEF	HHD	1,538.13	1,374.34
tblVehicleEF	HHD	6.28	0.04
tblVehicleEF	HHD	14.17	5.47
tblVehicleEF	HHD	1.99	2.59
tblVehicleEF	HHD	20.08	2.28
tblVehicleEF	HHD	5.8810e-003	2.3430e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	6.0910e-003	0.03
tblVehicleEF	HHD	5.1000e-005	0.00
tblVehicleEF	HHD	5.6260e-003	2.2410e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8990e-003	8.9250e-003
tblVehicleEF	HHD	5.8270e-003	0.02
tblVehicleEF	HHD	4.7000e-005	0.00
tblVehicleEF	HHD	4.6000e-005	1.0000e-006
tblVehicleEF	HHD	2.6580e-003	7.2000e-005
tblVehicleEF	HHD	0.43	0.45
tblVehicleEF	HHD	3.2000e-005	1.0000e-006
tblVehicleEF	HHD	0.09	0.02
tblVehicleEF	HHD	2.0200e-004	3.6900e-004
tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	9.5000e-005	0.00
tblVehicleEF	HHD	4.6000e-005	1.0000e-006
tblVehicleEF	HHD	2.6580e-003	7.2000e-005

tblVehicleEF	HHD	0.50	0.51
tblVehicleEF	HHD	3.2000e-005	1.0000e-006
tblVehicleEF	HHD	0.14	0.06
tblVehicleEF	HHD	2.0200e-004	3.6900e-004
tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	HHD	0.58	0.03
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.20	6.54
tblVehicleEF	HHD	0.79	0.35
tblVehicleEF	HHD	1.81	3.5730e-003
tblVehicleEF	HHD	4,965.45	1,070.12
tblVehicleEF	HHD	1,538.13	1,374.35
tblVehicleEF	HHD	6.28	0.04
tblVehicleEF	HHD	14.63	5.21
tblVehicleEF	HHD	1.91	2.50
tblVehicleEF	HHD	20.07	2.28
tblVehicleEF	HHD	4.9580e-003	2.0620e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	6.0910e-003	0.03
tblVehicleEF	HHD	5.1000e-005	0.00
tblVehicleEF	HHD	4.7440e-003	1.9730e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8990e-003	8.9250e-003
tblVehicleEF	HHD	5.8270e-003	0.02
tblVehicleEF	HHD	4.7000e-005	0.00

tblVehicleEF	HHD	1.0900e-004	4.0000e-006
tblVehicleEF	HHD	2.8500e-003	7.8000e-005
tblVehicleEF	HHD	0.41	0.47
tblVehicleEF	HHD	6.7000e-005	2.0000e-006
tblVehicleEF	HHD	0.09	0.02
tblVehicleEF	HHD	1.9400e-004	3.5900e-004
tblVehicleEF	HHD	0.04	1.0000e-006
tblVehicleEF	HHD	0.05	0.01
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	9.2000e-005	0.00
tblVehicleEF	HHD	1.0900e-004	4.0000e-006
tblVehicleEF	HHD	2.8500e-003	7.8000e-005
tblVehicleEF	HHD	0.47	0.54
tblVehicleEF	HHD	6.7000e-005	2.0000e-006
tblVehicleEF	HHD	0.14	0.06
tblVehicleEF	HHD	1.9400e-004	3.5900e-004
tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	HHD	0.66	0.02
tblVehicleEF	HHD	0.04	1.1110e-003
tblVehicleEF	HHD	0.08	0.00
tblVehicleEF	HHD	2.27	6.70
tblVehicleEF	HHD	0.78	0.25
tblVehicleEF	HHD	2.14	4.2250e-003
tblVehicleEF	HHD	4,302.45	1,091.80
tblVehicleEF	HHD	1,538.13	1,347.62
tblVehicleEF	HHD	6.28	0.04
tblVehicleEF	HHD	13.54	5.77

tblVehicleEF	HHD	2.02	2.63
tblVehicleEF	HHD	20.09	2.28
tblVehicleEF	HHD	7.1550e-003	2.6760e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	6.0910e-003	0.03
tblVehicleEF	HHD	5.1000e-005	0.00
tblVehicleEF	HHD	6.8450e-003	2.5600e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8990e-003	8.8460e-003
tblVehicleEF	HHD	5.8270e-003	0.02
tblVehicleEF	HHD	4.7000e-005	0.00
tblVehicleEF	HHD	2.2000e-005	1.0000e-006
tblVehicleEF	HHD	2.7320e-003	7.6000e-005
tblVehicleEF	HHD	0.46	0.41
tblVehicleEF	HHD	1.6000e-005	0.00
tblVehicleEF	HHD	0.09	0.02
tblVehicleEF	HHD	2.2600e-004	4.1100e-004
tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	9.8000e-005	0.00
tblVehicleEF	HHD	2.2000e-005	1.0000e-006
tblVehicleEF	HHD	2.7320e-003	7.6000e-005
tblVehicleEF	HHD	0.54	0.47
tblVehicleEF	HHD	1.6000e-005	0.00
tblVehicleEF	HHD	0.14	0.03

tblVehicleEF	HHD	2.2600e-004	4.1100e-004
tblVehicleEF	HHD	0.05	1.0000e-006
tblVehicleEF	LDA	3.5140e-003	1.8590e-003
tblVehicleEF	LDA	4.9650e-003	0.05
tblVehicleEF	LDA	0.49	0.53
tblVehicleEF	LDA	1.13	2.17
tblVehicleEF	LDA	234.55	244.53
tblVehicleEF	LDA	54.04	51.83
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.07	0.18
tblVehicleEF	LDA	1.7060e-003	1.3780e-003
tblVehicleEF	LDA	2.2270e-003	1.7010e-003
tblVehicleEF	LDA	1.5720e-003	1.2690e-003
tblVehicleEF	LDA	2.0480e-003	1.5640e-003
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.10	0.09
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	8.8530e-003	7.0560e-003
tblVehicleEF	LDA	0.04	0.21
tblVehicleEF	LDA	0.07	0.21
tblVehicleEF	LDA	2.3480e-003	2.3700e-003
tblVehicleEF	LDA	5.5900e-004	5.0200e-004
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.10	0.09
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.21

tblVehicleEF	LDA	0.07	0.23
tblVehicleEF	LDA	3.9250e-003	2.1100e-003
tblVehicleEF	LDA	4.0500e-003	0.04
tblVehicleEF	LDA	0.58	0.63
tblVehicleEF	LDA	0.87	1.66
tblVehicleEF	LDA	253.53	263.96
tblVehicleEF	LDA	54.04	50.87
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.15
tblVehicleEF	LDA	1.7060e-003	1.3780e-003
tblVehicleEF	LDA	2.2270e-003	1.7010e-003
tblVehicleEF	LDA	1.5720e-003	1.2690e-003
tblVehicleEF	LDA	2.0480e-003	1.5640e-003
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	0.11	0.10
tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	9.8710e-003	7.8650e-003
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	2.5390e-003	2.5590e-003
tblVehicleEF	LDA	5.5500e-004	4.9300e-004
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	0.11	0.10
tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.06	0.19

tblVehicleEF	LDA	3.4320e-003	1.7940e-003
tblVehicleEF	LDA	5.6030e-003	0.05
tblVehicleEF	LDA	0.49	0.52
tblVehicleEF	LDA	1.32	2.54
tblVehicleEF	LDA	232.65	242.60
tblVehicleEF	LDA	54.04	52.51
tblVehicleEF	LDA	0.05	0.03
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	1.7060e-003	1.3780e-003
tblVehicleEF	LDA	2.2270e-003	1.7010e-003
tblVehicleEF	LDA	1.5720e-003	1.2690e-003
tblVehicleEF	LDA	2.0480e-003	1.5640e-003
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	8.6500e-003	6.8930e-003
tblVehicleEF	LDA	0.04	0.25
tblVehicleEF	LDA	0.08	0.23
tblVehicleEF	LDA	2.3290e-003	2.3510e-003
tblVehicleEF	LDA	5.6300e-004	5.0900e-004
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.25
tblVehicleEF	LDA	0.08	0.26
tblVehicleEF	LDT1	7.2070e-003	3.6820e-003

tblVehicleEF	LDT1	0.01	0.06
tblVehicleEF	LDT1	0.90	0.84
tblVehicleEF	LDT1	2.40	2.36
tblVehicleEF	LDT1	289.66	292.82
tblVehicleEF	LDT1	66.92	62.69
tblVehicleEF	LDT1	0.09	0.07
tblVehicleEF	LDT1	0.13	0.23
tblVehicleEF	LDT1	2.2040e-003	1.7050e-003
tblVehicleEF	LDT1	2.9670e-003	2.1990e-003
tblVehicleEF	LDT1	2.0300e-003	1.5690e-003
tblVehicleEF	LDT1	2.7280e-003	2.0220e-003
tblVehicleEF	LDT1	0.08	0.08
tblVehicleEF	LDT1	0.22	0.16
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.14	0.61
tblVehicleEF	LDT1	0.16	0.31
tblVehicleEF	LDT1	2.9060e-003	2.8390e-003
tblVehicleEF	LDT1	7.1100e-004	6.0800e-004
tblVehicleEF	LDT1	0.08	0.08
tblVehicleEF	LDT1	0.22	0.17
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.14	0.61
tblVehicleEF	LDT1	0.17	0.34
tblVehicleEF	LDT1	7.9710e-003	4.1390e-003
tblVehicleEF	LDT1	9.3730e-003	0.05

tblVehicleEF	LDT1	1.05	0.98
tblVehicleEF	LDT1	1.83	1.80
tblVehicleEF	LDT1	312.33	312.85
tblVehicleEF	LDT1	66.92	61.59
tblVehicleEF	LDT1	0.08	0.06
tblVehicleEF	LDT1	0.12	0.20
tblVehicleEF	LDT1	2.2040e-003	1.7050e-003
tblVehicleEF	LDT1	2.9670e-003	2.1990e-003
tblVehicleEF	LDT1	2.0300e-003	1.5690e-003
tblVehicleEF	LDT1	2.7280e-003	2.0220e-003
tblVehicleEF	LDT1	0.20	0.19
tblVehicleEF	LDT1	0.25	0.19
tblVehicleEF	LDT1	0.15	0.15
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.13	0.56
tblVehicleEF	LDT1	0.13	0.25
tblVehicleEF	LDT1	3.1350e-003	3.0330e-003
tblVehicleEF	LDT1	7.0100e-004	5.9700e-004
tblVehicleEF	LDT1	0.20	0.19
tblVehicleEF	LDT1	0.25	0.19
tblVehicleEF	LDT1	0.15	0.15
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.13	0.56
tblVehicleEF	LDT1	0.14	0.27
tblVehicleEF	LDT1	7.0800e-003	3.5670e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	0.90	0.83

tblVehicleEF	LDT1	2.82	2.77
tblVehicleEF	LDT1	287.39	290.83
tblVehicleEF	LDT1	66.92	63.49
tblVehicleEF	LDT1	0.10	0.08
tblVehicleEF	LDT1	0.15	0.25
tblVehicleEF	LDT1	2.2040e-003	1.7050e-003
tblVehicleEF	LDT1	2.9670e-003	2.1990e-003
tblVehicleEF	LDT1	2.0300e-003	1.5690e-003
tblVehicleEF	LDT1	2.7280e-003	2.0220e-003
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.17	0.75
tblVehicleEF	LDT1	0.18	0.35
tblVehicleEF	LDT1	2.8830e-003	2.8200e-003
tblVehicleEF	LDT1	7.1800e-004	6.1500e-004
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.17	0.75
tblVehicleEF	LDT1	0.19	0.38
tblVehicleEF	LDT2	4.6390e-003	2.8980e-003
tblVehicleEF	LDT2	6.1780e-003	0.06
tblVehicleEF	LDT2	0.62	0.70
tblVehicleEF	LDT2	1.40	2.78

tblVehicleEF	LDT2	326.25	312.25
tblVehicleEF	LDT2	74.96	67.40
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.10	0.26
tblVehicleEF	LDT2	1.7310e-003	1.3970e-003
tblVehicleEF	LDT2	2.3320e-003	1.7240e-003
tblVehicleEF	LDT2	1.5920e-003	1.2860e-003
tblVehicleEF	LDT2	2.1440e-003	1.5850e-003
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.06	0.43
tblVehicleEF	LDT2	0.08	0.30
tblVehicleEF	LDT2	3.2670e-003	3.0270e-003
tblVehicleEF	LDT2	7.7300e-004	6.5300e-004
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.43
tblVehicleEF	LDT2	0.09	0.32
tblVehicleEF	LDT2	5.1750e-003	3.2760e-003
tblVehicleEF	LDT2	5.0390e-003	0.05
tblVehicleEF	LDT2	0.74	0.83
tblVehicleEF	LDT2	1.08	2.12
tblVehicleEF	LDT2	352.16	331.63

tblVehicleEF	LDT2	74.96	66.16
tblVehicleEF	LDT2	0.06	0.05
tblVehicleEF	LDT2	0.09	0.23
tblVehicleEF	LDT2	1.7310e-003	1.3970e-003
tblVehicleEF	LDT2	2.3320e-003	1.7240e-003
tblVehicleEF	LDT2	1.5920e-003	1.2860e-003
tblVehicleEF	LDT2	2.1440e-003	1.5850e-003
tblVehicleEF	LDT2	0.09	0.13
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.08	0.12
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.07	0.24
tblVehicleEF	LDT2	3.5270e-003	3.2150e-003
tblVehicleEF	LDT2	7.6700e-004	6.4100e-004
tblVehicleEF	LDT2	0.09	0.13
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.08	0.12
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.06	0.39
tblVehicleEF	LDT2	0.07	0.26
tblVehicleEF	LDT2	4.5310e-003	2.7990e-003
tblVehicleEF	LDT2	6.9720e-003	0.07
tblVehicleEF	LDT2	0.62	0.70
tblVehicleEF	LDT2	1.63	3.26
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tblVehicleEF	LDT2	74.96	68.30

tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.11	0.28
tblVehicleEF	LDT2	1.7310e-003	1.3970e-003
tblVehicleEF	LDT2	2.3320e-003	1.7240e-003
tblVehicleEF	LDT2	1.5920e-003	1.2860e-003
tblVehicleEF	LDT2	2.1440e-003	1.5850e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.09	0.33
tblVehicleEF	LDT2	3.2410e-003	3.0080e-003
tblVehicleEF	LDT2	7.7700e-004	6.6200e-004
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.11	0.13
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LHD1	5.2260e-003	5.2020e-003
tblVehicleEF	LHD1	0.02	8.2270e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.19
tblVehicleEF	LHD1	1.00	0.75
tblVehicleEF	LHD1	2.48	1.08
tblVehicleEF	LHD1	9.01	8.87

tblVehicleEF	LHD1	687.36	791.34
tblVehicleEF	LHD1	32.03	11.92
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	1.16	0.67
tblVehicleEF	LHD1	1.00	0.32
tblVehicleEF	LHD1	8.6700e-004	8.0900e-004
tblVehicleEF	LHD1	0.01	9.7150e-003
tblVehicleEF	LHD1	0.02	9.8140e-003
tblVehicleEF	LHD1	8.9200e-004	2.5100e-004
tblVehicleEF	LHD1	8.3000e-004	7.7400e-004
tblVehicleEF	LHD1	2.5240e-003	2.4290e-003
tblVehicleEF	LHD1	0.01	9.3410e-003
tblVehicleEF	LHD1	8.2000e-004	2.3100e-004
tblVehicleEF	LHD1	2.2790e-003	1.7640e-003
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.3220e-003	1.0180e-003
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.30	0.53
tblVehicleEF	LHD1	0.25	0.07
tblVehicleEF	LHD1	9.0000e-005	8.6000e-005
tblVehicleEF	LHD1	6.7450e-003	7.7310e-003
tblVehicleEF	LHD1	3.6700e-004	1.1800e-004
tblVehicleEF	LHD1	2.2790e-003	1.7640e-003
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.3220e-003	1.0180e-003

tblVehicleEF	LHD1	0.15	0.11
tblVehicleEF	LHD1	0.30	0.53
tblVehicleEF	LHD1	0.27	0.08
tblVehicleEF	LHD1	5.2260e-003	5.2190e-003
tblVehicleEF	LHD1	0.02	8.4480e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.15	0.19
tblVehicleEF	LHD1	1.02	0.77
tblVehicleEF	LHD1	2.27	0.99
tblVehicleEF	LHD1	9.01	8.87
tblVehicleEF	LHD1	687.36	791.37
tblVehicleEF	LHD1	32.03	11.77
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	1.11	0.64
tblVehicleEF	LHD1	0.92	0.30
tblVehicleEF	LHD1	8.6700e-004	8.0900e-004
tblVehicleEF	LHD1	0.01	9.7150e-003
tblVehicleEF	LHD1	0.02	9.8140e-003
tblVehicleEF	LHD1	8.9200e-004	2.5100e-004
tblVehicleEF	LHD1	8.3000e-004	7.7400e-004
tblVehicleEF	LHD1	2.5240e-003	2.4290e-003
tblVehicleEF	LHD1	0.01	9.3410e-003
tblVehicleEF	LHD1	8.2000e-004	2.3100e-004
tblVehicleEF	LHD1	5.5610e-003	4.3310e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.7900e-003	2.1680e-003

tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.29	0.51
tblVehicleEF	LHD1	0.23	0.07
tblVehicleEF	LHD1	9.0000e-005	8.6000e-005
tblVehicleEF	LHD1	6.7460e-003	7.7310e-003
tblVehicleEF	LHD1	3.6300e-004	1.1700e-004
tblVehicleEF	LHD1	5.5610e-003	4.3310e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	2.7900e-003	2.1680e-003
tblVehicleEF	LHD1	0.15	0.11
tblVehicleEF	LHD1	0.29	0.51
tblVehicleEF	LHD1	0.25	0.07
tblVehicleEF	LHD1	5.2260e-003	5.1900e-003
tblVehicleEF	LHD1	0.02	8.0700e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.15	0.19
tblVehicleEF	LHD1	0.98	0.73
tblVehicleEF	LHD1	2.66	1.16
tblVehicleEF	LHD1	9.01	8.87
tblVehicleEF	LHD1	687.36	791.32
tblVehicleEF	LHD1	32.03	12.06
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	1.19	0.69
tblVehicleEF	LHD1	1.06	0.34
tblVehicleEF	LHD1	8.6700e-004	8.0900e-004
tblVehicleEF	LHD1	0.01	9.7150e-003

tblVehicleEF	LHD1	0.02	9.8140e-003
tblVehicleEF	LHD1	8.9200e-004	2.5100e-004
tblVehicleEF	LHD1	8.3000e-004	7.7400e-004
tblVehicleEF	LHD1	2.5240e-003	2.4290e-003
tblVehicleEF	LHD1	0.01	9.3410e-003
tblVehicleEF	LHD1	8.2000e-004	2.3100e-004
tblVehicleEF	LHD1	9.5900e-004	7.3200e-004
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.5100e-004	4.9500e-004
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.33	0.59
tblVehicleEF	LHD1	0.26	0.08
tblVehicleEF	LHD1	9.0000e-005	8.6000e-005
tblVehicleEF	LHD1	6.7450e-003	7.7300e-003
tblVehicleEF	LHD1	3.7000e-004	1.1900e-004
tblVehicleEF	LHD1	9.5900e-004	7.3200e-004
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	6.5100e-004	4.9500e-004
tblVehicleEF	LHD1	0.15	0.11
tblVehicleEF	LHD1	0.33	0.59
tblVehicleEF	LHD1	0.29	0.08
tblVehicleEF	LHD2	3.4370e-003	3.5400e-003
tblVehicleEF	LHD2	7.4090e-003	6.7490e-003
tblVehicleEF	LHD2	6.7280e-003	9.1710e-003
tblVehicleEF	LHD2	0.12	0.15

tblVehicleEF	LHD2	0.55	0.60
tblVehicleEF	LHD2	1.18	0.68
tblVehicleEF	LHD2	13.81	13.53
tblVehicleEF	LHD2	707.74	781.19
tblVehicleEF	LHD2	25.26	8.80
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.67	0.77
tblVehicleEF	LHD2	0.47	0.21
tblVehicleEF	LHD2	1.1760e-003	1.3170e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0000e-004	1.3600e-004
tblVehicleEF	LHD2	1.1250e-003	1.2600e-003
tblVehicleEF	LHD2	2.6790e-003	2.6510e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6800e-004	1.2500e-004
tblVehicleEF	LHD2	7.5500e-004	1.0140e-003
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	4.6500e-004	6.0000e-004
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.07	0.29
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	1.3500e-004	1.3000e-004
tblVehicleEF	LHD2	6.8870e-003	7.5600e-003
tblVehicleEF	LHD2	2.7400e-004	8.7000e-005
tblVehicleEF	LHD2	7.5500e-004	1.0140e-003

tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.6500e-004	6.0000e-004
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.07	0.29
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	LHD2	3.4370e-003	3.5510e-003
tblVehicleEF	LHD2	7.5270e-003	6.8390e-003
tblVehicleEF	LHD2	6.3330e-003	8.6070e-003
tblVehicleEF	LHD2	0.12	0.15
tblVehicleEF	LHD2	0.56	0.60
tblVehicleEF	LHD2	1.09	0.63
tblVehicleEF	LHD2	13.81	13.53
tblVehicleEF	LHD2	707.74	781.21
tblVehicleEF	LHD2	25.26	8.71
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.64	0.73
tblVehicleEF	LHD2	0.44	0.19
tblVehicleEF	LHD2	1.1760e-003	1.3170e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0000e-004	1.3600e-004
tblVehicleEF	LHD2	1.1250e-003	1.2600e-003
tblVehicleEF	LHD2	2.6790e-003	2.6510e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6800e-004	1.2500e-004
tblVehicleEF	LHD2	1.8290e-003	2.4810e-003

tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	9.8100e-004	1.2780e-003
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.06	0.28
tblVehicleEF	LHD2	0.09	0.04
tblVehicleEF	LHD2	1.3500e-004	1.3000e-004
tblVehicleEF	LHD2	6.8870e-003	7.5600e-003
tblVehicleEF	LHD2	2.7200e-004	8.6000e-005
tblVehicleEF	LHD2	1.8290e-003	2.4810e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	9.8100e-004	1.2780e-003
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.06	0.28
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	3.4370e-003	3.5310e-003
tblVehicleEF	LHD2	7.3240e-003	6.6840e-003
tblVehicleEF	LHD2	7.0380e-003	9.6090e-003
tblVehicleEF	LHD2	0.12	0.15
tblVehicleEF	LHD2	0.55	0.59
tblVehicleEF	LHD2	1.27	0.73
tblVehicleEF	LHD2	13.81	13.53
tblVehicleEF	LHD2	707.74	781.19
tblVehicleEF	LHD2	25.26	8.89
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.68	0.78

tblVehicleEF	LHD2	0.49	0.22
tblVehicleEF	LHD2	1.1760e-003	1.3170e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.0000e-004	1.3600e-004
tblVehicleEF	LHD2	1.1250e-003	1.2600e-003
tblVehicleEF	LHD2	2.6790e-003	2.6510e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.6800e-004	1.2500e-004
tblVehicleEF	LHD2	3.3500e-004	4.3700e-004
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	2.3300e-004	2.9900e-004
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.07	0.32
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	1.3500e-004	1.3000e-004
tblVehicleEF	LHD2	6.8870e-003	7.5600e-003
tblVehicleEF	LHD2	2.7500e-004	8.8000e-005
tblVehicleEF	LHD2	3.3500e-004	4.3700e-004
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	2.3300e-004	2.9900e-004
tblVehicleEF	LHD2	0.12	0.12
tblVehicleEF	LHD2	0.07	0.32
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	MCY	0.47	0.34

tblVehicleEF	MCY	0.16	0.26
tblVehicleEF	MCY	19.70	19.81
tblVehicleEF	MCY	10.27	9.13
tblVehicleEF	MCY	175.14	215.26
tblVehicleEF	MCY	45.44	61.48
tblVehicleEF	MCY	1.16	1.16
tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	2.1380e-003	2.0940e-003
tblVehicleEF	MCY	3.7350e-003	3.0600e-003
tblVehicleEF	MCY	1.9990e-003	1.9570e-003
tblVehicleEF	MCY	3.5160e-003	2.8790e-003
tblVehicleEF	MCY	0.80	0.80
tblVehicleEF	MCY	0.73	0.71
tblVehicleEF	MCY	0.49	0.49
tblVehicleEF	MCY	2.31	2.32
tblVehicleEF	MCY	0.58	2.09
tblVehicleEF	MCY	2.24	1.98
tblVehicleEF	MCY	2.1410e-003	2.1300e-003
tblVehicleEF	MCY	6.8800e-004	6.0800e-004
tblVehicleEF	MCY	0.80	0.80
tblVehicleEF	MCY	0.73	0.71
tblVehicleEF	MCY	0.49	0.49
tblVehicleEF	MCY	2.86	2.87
tblVehicleEF	MCY	0.58	2.09
tblVehicleEF	MCY	2.44	2.16
tblVehicleEF	MCY	0.45	0.33
tblVehicleEF	MCY	0.13	0.21

tblVehicleEF	MCY	18.68	18.77
tblVehicleEF	MCY	8.86	7.80
tblVehicleEF	MCY	175.14	213.27
tblVehicleEF	MCY	45.44	58.15
tblVehicleEF	MCY	1.02	1.02
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	2.1380e-003	2.0940e-003
tblVehicleEF	MCY	3.7350e-003	3.0600e-003
tblVehicleEF	MCY	1.9990e-003	1.9570e-003
tblVehicleEF	MCY	3.5160e-003	2.8790e-003
tblVehicleEF	MCY	2.34	2.33
tblVehicleEF	MCY	0.96	0.96
tblVehicleEF	MCY	1.43	1.42
tblVehicleEF	MCY	2.22	2.22
tblVehicleEF	MCY	0.54	1.94
tblVehicleEF	MCY	1.84	1.61
tblVehicleEF	MCY	2.1220e-003	2.1110e-003
tblVehicleEF	MCY	6.5300e-004	5.7500e-004
tblVehicleEF	MCY	2.34	2.33
tblVehicleEF	MCY	0.96	0.96
tblVehicleEF	MCY	1.43	1.42
tblVehicleEF	MCY	2.75	2.75
tblVehicleEF	MCY	0.54	1.94
tblVehicleEF	MCY	2.00	1.75
tblVehicleEF	MCY	0.48	0.35
tblVehicleEF	MCY	0.19	0.30
tblVehicleEF	MCY	21.32	21.44

tblVehicleEF	MCY	11.71	10.47
tblVehicleEF	MCY	175.14	218.19
tblVehicleEF	MCY	45.44	64.70
tblVehicleEF	MCY	1.25	1.25
tblVehicleEF	MCY	0.34	0.29
tblVehicleEF	MCY	2.1380e-003	2.0940e-003
tblVehicleEF	MCY	3.7350e-003	3.0600e-003
tblVehicleEF	MCY	1.9990e-003	1.9570e-003
tblVehicleEF	MCY	3.5160e-003	2.8790e-003
tblVehicleEF	MCY	0.21	0.21
tblVehicleEF	MCY	0.87	0.84
tblVehicleEF	MCY	0.17	0.17
tblVehicleEF	MCY	2.41	2.41
tblVehicleEF	MCY	0.68	2.48
tblVehicleEF	MCY	2.60	2.31
tblVehicleEF	MCY	2.1700e-003	2.1590e-003
tblVehicleEF	MCY	7.2300e-004	6.4000e-004
tblVehicleEF	MCY	0.21	0.21
tblVehicleEF	MCY	0.87	0.84
tblVehicleEF	MCY	0.17	0.17
tblVehicleEF	MCY	2.98	2.99
tblVehicleEF	MCY	0.68	2.48
tblVehicleEF	MCY	2.82	2.51
tblVehicleEF	MDV	8.7550e-003	3.3470e-003
tblVehicleEF	MDV	0.01	0.07
tblVehicleEF	MDV	0.96	0.75
tblVehicleEF	MDV	2.63	3.07

tblVehicleEF	MDV	441.32	375.20
tblVehicleEF	MDV	99.70	80.53
tblVehicleEF	MDV	0.12	0.07
tblVehicleEF	MDV	0.23	0.31
tblVehicleEF	MDV	1.8510e-003	1.4900e-003
tblVehicleEF	MDV	2.4720e-003	1.8540e-003
tblVehicleEF	MDV	1.7060e-003	1.3740e-003
tblVehicleEF	MDV	2.2730e-003	1.7040e-003
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.06	0.07
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	0.10	0.45
tblVehicleEF	MDV	0.20	0.37
tblVehicleEF	MDV	4.4170e-003	3.6350e-003
tblVehicleEF	MDV	1.0430e-003	7.8100e-004
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.06	0.07
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.10	0.45
tblVehicleEF	MDV	0.22	0.40
tblVehicleEF	MDV	9.7400e-003	3.7830e-003
tblVehicleEF	MDV	0.01	0.06
tblVehicleEF	MDV	1.13	0.88
tblVehicleEF	MDV	2.03	2.34
tblVehicleEF	MDV	475.38	394.67

tblVehicleEF	MDV	99.70	79.11
tblVehicleEF	MDV	0.11	0.06
tblVehicleEF	MDV	0.20	0.27
tblVehicleEF	MDV	1.8510e-003	1.4900e-003
tblVehicleEF	MDV	2.4720e-003	1.8540e-003
tblVehicleEF	MDV	1.7060e-003	1.3740e-003
tblVehicleEF	MDV	2.2730e-003	1.7040e-003
tblVehicleEF	MDV	0.14	0.15
tblVehicleEF	MDV	0.18	0.15
tblVehicleEF	MDV	0.12	0.14
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.09	0.42
tblVehicleEF	MDV	0.16	0.30
tblVehicleEF	MDV	4.7600e-003	3.8240e-003
tblVehicleEF	MDV	1.0320e-003	7.6700e-004
tblVehicleEF	MDV	0.14	0.15
tblVehicleEF	MDV	0.18	0.15
tblVehicleEF	MDV	0.12	0.14
tblVehicleEF	MDV	0.04	0.02
tblVehicleEF	MDV	0.09	0.42
tblVehicleEF	MDV	0.18	0.33
tblVehicleEF	MDV	8.5770e-003	3.2380e-003
tblVehicleEF	MDV	0.02	0.08
tblVehicleEF	MDV	0.95	0.74
tblVehicleEF	MDV	3.08	3.61
tblVehicleEF	MDV	437.91	373.26
tblVehicleEF	MDV	99.70	81.55

tblVehicleEF	MDV	0.13	0.08
tblVehicleEF	MDV	0.25	0.34
tblVehicleEF	MDV	1.8510e-003	1.4900e-003
tblVehicleEF	MDV	2.4720e-003	1.8540e-003
tblVehicleEF	MDV	1.7060e-003	1.3740e-003
tblVehicleEF	MDV	2.2730e-003	1.7040e-003
tblVehicleEF	MDV	0.02	0.03
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.22	0.41
tblVehicleEF	MDV	4.3830e-003	3.6160e-003
tblVehicleEF	MDV	1.0510e-003	7.9100e-004
tblVehicleEF	MDV	0.02	0.03
tblVehicleEF	MDV	0.17	0.14
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.12	0.54
tblVehicleEF	MDV	0.24	0.45
tblVehicleEF	MH	0.03	4.5420e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.78	0.34
tblVehicleEF	MH	5.46	0.00
tblVehicleEF	MH	1,209.12	985.92
tblVehicleEF	MH	59.04	0.00
tblVehicleEF	MH	1.21	3.71

tblVehicleEF	MH	0.81	0.00
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0960e-003	0.00
tblVehicleEF	MH	3.2140e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0080e-003	0.00
tblVehicleEF	MH	0.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.08	0.10
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.31	0.00
tblVehicleEF	MH	0.01	9.3210e-003
tblVehicleEF	MH	6.8500e-004	0.00
tblVehicleEF	MH	0.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.12	0.11
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.34	0.00
tblVehicleEF	MH	0.03	4.5420e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.87	0.34
tblVehicleEF	MH	4.91	0.00
tblVehicleEF	MH	1,209.12	985.92
tblVehicleEF	MH	59.04	0.00

tblVehicleEF	MH	1.13	3.56
tblVehicleEF	MH	0.75	0.00
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0960e-003	0.00
tblVehicleEF	MH	3.2140e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0080e-003	0.00
tblVehicleEF	MH	1.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.57	0.00
tblVehicleEF	MH	0.09	0.10
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.29	0.00
tblVehicleEF	MH	0.01	9.3210e-003
tblVehicleEF	MH	6.7600e-004	0.00
tblVehicleEF	MH	1.69	0.00
tblVehicleEF	MH	0.07	0.00
tblVehicleEF	MH	0.57	0.00
tblVehicleEF	MH	0.12	0.11
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.32	0.00
tblVehicleEF	MH	0.02	4.5420e-003
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	1.73	0.34
tblVehicleEF	MH	5.91	0.00
tblVehicleEF	MH	1,209.12	985.92

tblVehicleEF	MH	59.04	0.00
tblVehicleEF	MH	1.25	3.77
tblVehicleEF	MH	0.86	0.00
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0960e-003	0.00
tblVehicleEF	MH	3.2140e-003	4.0000e-003
tblVehicleEF	MH	0.02	0.07
tblVehicleEF	MH	1.0080e-003	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.08	0.00
tblVehicleEF	MH	0.13	0.00
tblVehicleEF	MH	0.08	0.10
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.33	0.00
tblVehicleEF	MH	0.01	9.3210e-003
tblVehicleEF	MH	6.9300e-004	0.00
tblVehicleEF	MH	0.27	0.00
tblVehicleEF	MH	0.08	0.00
tblVehicleEF	MH	0.13	0.00
tblVehicleEF	MH	0.11	0.11
tblVehicleEF	MH	0.02	0.00
tblVehicleEF	MH	0.36	0.00
tblVehicleEF	MHD	0.02	2.6790e-003
tblVehicleEF	MHD	3.4140e-003	1.3190e-003
tblVehicleEF	MHD	0.05	6.7490e-003
tblVehicleEF	MHD	0.28	0.35

tblVehicleEF	MHD	0.30	0.20
tblVehicleEF	MHD	4.19	0.78
tblVehicleEF	MHD	168.69	72.84
tblVehicleEF	MHD	1,181.03	1,042.25
tblVehicleEF	MHD	44.62	6.73
tblVehicleEF	MHD	0.47	0.41
tblVehicleEF	MHD	1.11	1.44
tblVehicleEF	MHD	13.14	1.83
tblVehicleEF	MHD	1.1400e-004	3.0900e-004
tblVehicleEF	MHD	3.0920e-003	6.8920e-003
tblVehicleEF	MHD	6.2600e-004	7.7000e-005
tblVehicleEF	MHD	1.0900e-004	2.9600e-004
tblVehicleEF	MHD	2.9540e-003	6.5900e-003
tblVehicleEF	MHD	5.7500e-004	7.1000e-005
tblVehicleEF	MHD	6.2600e-004	2.5400e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	3.7200e-004	1.5200e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.01	0.08
tblVehicleEF	MHD	0.25	0.04
tblVehicleEF	MHD	1.6180e-003	6.9000e-004
tblVehicleEF	MHD	0.01	9.9100e-003
tblVehicleEF	MHD	5.1900e-004	6.7000e-005
tblVehicleEF	MHD	6.2600e-004	2.5400e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.03	0.02

tblVehicleEF	MHD	3.7200e-004	1.5200e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.01	0.08
tblVehicleEF	MHD	0.28	0.04
tblVehicleEF	MHD	0.01	2.5350e-003
tblVehicleEF	MHD	3.4750e-003	1.3550e-003
tblVehicleEF	MHD	0.04	6.3130e-003
tblVehicleEF	MHD	0.20	0.31
tblVehicleEF	MHD	0.30	0.20
tblVehicleEF	MHD	3.81	0.71
tblVehicleEF	MHD	178.81	72.63
tblVehicleEF	MHD	1,181.03	1,042.26
tblVehicleEF	MHD	44.62	6.61
tblVehicleEF	MHD	0.48	0.40
tblVehicleEF	MHD	1.07	1.38
tblVehicleEF	MHD	13.10	1.82
tblVehicleEF	MHD	9.6000e-005	2.6400e-004
tblVehicleEF	MHD	3.0920e-003	6.8920e-003
tblVehicleEF	MHD	6.2600e-004	7.7000e-005
tblVehicleEF	MHD	9.2000e-005	2.5300e-004
tblVehicleEF	MHD	2.9540e-003	6.5900e-003
tblVehicleEF	MHD	5.7500e-004	7.1000e-005
tblVehicleEF	MHD	1.5650e-003	6.3400e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	8.2200e-004	3.3400e-004
tblVehicleEF	MHD	0.04	0.01

tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.23	0.03
tblVehicleEF	MHD	1.7140e-003	6.8800e-004
tblVehicleEF	MHD	0.01	9.9100e-003
tblVehicleEF	MHD	5.1300e-004	6.5000e-005
tblVehicleEF	MHD	1.5650e-003	6.3400e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	8.2200e-004	3.3400e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.01	0.07
tblVehicleEF	MHD	0.26	0.04
tblVehicleEF	MHD	0.02	2.8200e-003
tblVehicleEF	MHD	3.3720e-003	1.2950e-003
tblVehicleEF	MHD	0.05	7.0730e-003
tblVehicleEF	MHD	0.37	0.40
tblVehicleEF	MHD	0.30	0.19
tblVehicleEF	MHD	4.50	0.84
tblVehicleEF	MHD	154.98	73.22
tblVehicleEF	MHD	1,181.03	1,042.25
tblVehicleEF	MHD	44.62	6.83
tblVehicleEF	MHD	0.44	0.43
tblVehicleEF	MHD	1.13	1.46
tblVehicleEF	MHD	13.18	1.83
tblVehicleEF	MHD	1.3900e-004	3.7100e-004
tblVehicleEF	MHD	3.0920e-003	6.8920e-003
tblVehicleEF	MHD	6.2600e-004	7.7000e-005

tblVehicleEF	MHD	1.3300e-004	3.5500e-004
tblVehicleEF	MHD	2.9540e-003	6.5900e-003
tblVehicleEF	MHD	5.7500e-004	7.1000e-005
tblVehicleEF	MHD	2.6200e-004	1.0700e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	1.7800e-004	7.3000e-005
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.01	0.09
tblVehicleEF	MHD	0.27	0.04
tblVehicleEF	MHD	1.4890e-003	6.9400e-004
tblVehicleEF	MHD	0.01	9.9100e-003
tblVehicleEF	MHD	5.2500e-004	6.8000e-005
tblVehicleEF	MHD	2.6200e-004	1.0700e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.7800e-004	7.3000e-005
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.01	0.09
tblVehicleEF	MHD	0.29	0.04
tblVehicleEF	OBUS	0.01	8.4040e-003
tblVehicleEF	OBUS	7.3300e-003	6.4160e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.58
tblVehicleEF	OBUS	0.50	0.72
tblVehicleEF	OBUS	5.48	2.46
tblVehicleEF	OBUS	109.46	84.59

tblVehicleEF	OBUS	1,291.14	1,439.19
tblVehicleEF	OBUS	66.03	19.38
tblVehicleEF	OBUS	0.24	0.33
tblVehicleEF	OBUS	0.92	1.26
tblVehicleEF	OBUS	3.02	0.82
tblVehicleEF	OBUS	2.2000e-005	1.1000e-004
tblVehicleEF	OBUS	2.7560e-003	7.2320e-003
tblVehicleEF	OBUS	8.6800e-004	1.9300e-004
tblVehicleEF	OBUS	2.1000e-005	1.0500e-004
tblVehicleEF	OBUS	2.6160e-003	6.9010e-003
tblVehicleEF	OBUS	7.9800e-004	1.7700e-004
tblVehicleEF	OBUS	1.1740e-003	1.4530e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	5.5600e-004	6.9000e-004
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.27
tblVehicleEF	OBUS	0.34	0.12
tblVehicleEF	OBUS	1.0560e-003	8.0500e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.5600e-004	1.9200e-004
tblVehicleEF	OBUS	1.1740e-003	1.4530e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	5.5600e-004	6.9000e-004
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	0.04	0.27

tblVehicleEF	OBUS	0.37	0.13
tblVehicleEF	OBUS	0.01	8.4980e-003
tblVehicleEF	OBUS	7.5590e-003	6.6620e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.24	0.58
tblVehicleEF	OBUS	0.52	0.74
tblVehicleEF	OBUS	4.95	2.22
tblVehicleEF	OBUS	115.00	83.64
tblVehicleEF	OBUS	1,291.14	1,439.24
tblVehicleEF	OBUS	66.03	18.97
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tblVehicleEF	OBUS	0.88	1.19
tblVehicleEF	OBUS	2.95	0.81
tblVehicleEF	OBUS	1.8000e-005	9.8000e-005
tblVehicleEF	OBUS	2.7560e-003	7.2320e-003
tblVehicleEF	OBUS	8.6800e-004	1.9300e-004
tblVehicleEF	OBUS	1.7000e-005	9.3000e-005
tblVehicleEF	OBUS	2.6160e-003	6.9010e-003
tblVehicleEF	OBUS	7.9800e-004	1.7700e-004
tblVehicleEF	OBUS	2.8210e-003	3.4560e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.2010e-003	1.4620e-003
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.03	0.26
tblVehicleEF	OBUS	0.31	0.11
tblVehicleEF	OBUS	1.1090e-003	7.9600e-004

tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.4700e-004	1.8800e-004
tblVehicleEF	OBUS	2.8210e-003	3.4560e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.2010e-003	1.4620e-003
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	0.03	0.26
tblVehicleEF	OBUS	0.34	0.12
tblVehicleEF	OBUS	0.01	8.2950e-003
tblVehicleEF	OBUS	7.1730e-003	6.2490e-003
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.25	0.59
tblVehicleEF	OBUS	0.50	0.70
tblVehicleEF	OBUS	5.90	2.65
tblVehicleEF	OBUS	101.81	85.91
tblVehicleEF	OBUS	1,291.14	1,439.16
tblVehicleEF	OBUS	66.03	19.69
tblVehicleEF	OBUS	0.23	0.35
tblVehicleEF	OBUS	0.94	1.29
tblVehicleEF	OBUS	3.08	0.84
tblVehicleEF	OBUS	2.6000e-005	1.2700e-004
tblVehicleEF	OBUS	2.7560e-003	7.2320e-003
tblVehicleEF	OBUS	8.6800e-004	1.9300e-004
tblVehicleEF	OBUS	2.5000e-005	1.2100e-004
tblVehicleEF	OBUS	2.6160e-003	6.9010e-003
tblVehicleEF	OBUS	7.9800e-004	1.7700e-004

tblVehicleEF	OBUS	5.5100e-004	6.8700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	2.8900e-004	3.6000e-004
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.04	0.30
tblVehicleEF	OBUS	0.35	0.12
tblVehicleEF	OBUS	9.8300e-004	8.1800e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.6300e-004	1.9500e-004
tblVehicleEF	OBUS	5.5100e-004	6.8700e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	2.8900e-004	3.6000e-004
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	0.04	0.30
tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	SBUS	0.84	0.07
tblVehicleEF	SBUS	0.02	4.2520e-003
tblVehicleEF	SBUS	0.06	6.2910e-003
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tblVehicleEF	SBUS	10.87	0.91
tblVehicleEF	SBUS	958.21	343.38
tblVehicleEF	SBUS	923.62	980.93
tblVehicleEF	SBUS	74.39	5.28
tblVehicleEF	SBUS	5.73	2.78

tblVehicleEF	SBUS	2.43	3.34
tblVehicleEF	SBUS	8.88	1.14
tblVehicleEF	SBUS	5.0660e-003	2.7620e-003
tblVehicleEF	SBUS	9.7390e-003	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.3330e-003	7.7000e-005
tblVehicleEF	SBUS	4.8470e-003	2.6430e-003
tblVehicleEF	SBUS	2.4350e-003	2.6270e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.2260e-003	7.0000e-005
tblVehicleEF	SBUS	2.9520e-003	3.7600e-004
tblVehicleEF	SBUS	0.03	3.6840e-003
tblVehicleEF	SBUS	1.29	0.33
tblVehicleEF	SBUS	1.4370e-003	1.8000e-004
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tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.53	0.03
tblVehicleEF	SBUS	9.5230e-003	3.2760e-003
tblVehicleEF	SBUS	8.9860e-003	9.4020e-003
tblVehicleEF	SBUS	9.3100e-004	5.2000e-005
tblVehicleEF	SBUS	2.9520e-003	3.7600e-004
tblVehicleEF	SBUS	0.03	3.6840e-003
tblVehicleEF	SBUS	1.87	0.48
tblVehicleEF	SBUS	1.4370e-003	1.8000e-004
tblVehicleEF	SBUS	0.11	0.07
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.59	0.04

tblVehicleEF	SBUS	0.84	0.07
tblVehicleEF	SBUS	0.02	4.3310e-003
tblVehicleEF	SBUS	0.05	5.2000e-003
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tblVehicleEF	SBUS	923.62	980.94
tblVehicleEF	SBUS	74.39	4.84
tblVehicleEF	SBUS	5.91	2.82
tblVehicleEF	SBUS	2.32	3.20
tblVehicleEF	SBUS	8.81	1.13
tblVehicleEF	SBUS	4.2710e-003	2.3370e-003
tblVehicleEF	SBUS	9.7390e-003	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.3330e-003	7.7000e-005
tblVehicleEF	SBUS	4.0860e-003	2.2360e-003
tblVehicleEF	SBUS	2.4350e-003	2.6270e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.2260e-003	7.0000e-005
tblVehicleEF	SBUS	7.0680e-003	9.2700e-004
tblVehicleEF	SBUS	0.03	3.8710e-003
tblVehicleEF	SBUS	1.29	0.33
tblVehicleEF	SBUS	3.1150e-003	4.1000e-004
tblVehicleEF	SBUS	0.08	0.06
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.44	0.03

tblVehicleEF	SBUS	9.8580e-003	3.3250e-003
tblVehicleEF	SBUS	8.9870e-003	9.4020e-003
tblVehicleEF	SBUS	8.7900e-004	4.8000e-005
tblVehicleEF	SBUS	7.0680e-003	9.2700e-004
tblVehicleEF	SBUS	0.03	3.8710e-003
tblVehicleEF	SBUS	1.87	0.48
tblVehicleEF	SBUS	3.1150e-003	4.1000e-004
tblVehicleEF	SBUS	0.11	0.07
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.48	0.03
tblVehicleEF	SBUS	0.84	0.07
tblVehicleEF	SBUS	0.02	4.1970e-003
tblVehicleEF	SBUS	0.07	7.1210e-003
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tblVehicleEF	SBUS	0.89	0.33
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tblVehicleEF	SBUS	74.39	5.65
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tblVehicleEF	SBUS	6.1650e-003	3.3490e-003
tblVehicleEF	SBUS	9.7390e-003	0.01
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.3330e-003	7.7000e-005
tblVehicleEF	SBUS	5.8980e-003	3.2040e-003

tblVehicleEF	SBUS	2.4350e-003	2.6270e-003
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	1.2260e-003	7.0000e-005
tblVehicleEF	SBUS	1.4220e-003	1.7200e-004
tblVehicleEF	SBUS	0.03	3.7650e-003
tblVehicleEF	SBUS	1.29	0.33
tblVehicleEF	SBUS	7.5100e-004	9.1000e-005
tblVehicleEF	SBUS	0.08	0.06
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	0.61	0.04
tblVehicleEF	SBUS	9.0600e-003	3.2080e-003
tblVehicleEF	SBUS	8.9860e-003	9.4020e-003
tblVehicleEF	SBUS	9.7500e-004	5.6000e-005
tblVehicleEF	SBUS	1.4220e-003	1.7200e-004
tblVehicleEF	SBUS	0.03	3.7650e-003
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tblVehicleEF	SBUS	0.66	0.04
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tblVehicleEF	UBUS	7.57	0.07
tblVehicleEF	UBUS	2,189.07	1,618.25
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tblVehicleEF	UBUS	14.47	0.71

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tblVehicleEF	UBUS	0.65	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.30	5.1750e-003
tblVehicleEF	UBUS	9.3300e-004	6.0000e-006
tblVehicleEF	UBUS	0.28	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9020e-003
tblVehicleEF	UBUS	0.28	4.9510e-003
tblVehicleEF	UBUS	8.5800e-004	6.0000e-006
tblVehicleEF	UBUS	2.3250e-003	1.4400e-004
tblVehicleEF	UBUS	0.05	8.4600e-004
tblVehicleEF	UBUS	1.1670e-003	3.8000e-005
tblVehicleEF	UBUS	0.74	0.02
tblVehicleEF	UBUS	0.01	5.1720e-003
tblVehicleEF	UBUS	0.57	4.7200e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3400e-004	8.0000e-006
tblVehicleEF	UBUS	2.3250e-003	1.4400e-004
tblVehicleEF	UBUS	0.05	8.4600e-004
tblVehicleEF	UBUS	1.1670e-003	3.8000e-005
tblVehicleEF	UBUS	1.07	1.15
tblVehicleEF	UBUS	0.01	5.1720e-003
tblVehicleEF	UBUS	0.63	5.1680e-003
tblVehicleEF	UBUS	0.27	1.12
tblVehicleEF	UBUS	0.04	9.5100e-004
tblVehicleEF	UBUS	6.37	8.27
tblVehicleEF	UBUS	5.93	0.06

tblVehicleEF	UBUS	2,189.07	1,618.25
tblVehicleEF	UBUS	79.76	0.81
tblVehicleEF	UBUS	13.87	0.71
tblVehicleEF	UBUS	16.25	8.4230e-003
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tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.30	5.1750e-003
tblVehicleEF	UBUS	9.3300e-004	6.0000e-006
tblVehicleEF	UBUS	0.28	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9020e-003
tblVehicleEF	UBUS	0.28	4.9510e-003
tblVehicleEF	UBUS	8.5800e-004	6.0000e-006
tblVehicleEF	UBUS	5.8850e-003	3.4400e-004
tblVehicleEF	UBUS	0.06	9.3100e-004
tblVehicleEF	UBUS	2.5520e-003	7.9000e-005
tblVehicleEF	UBUS	0.75	0.02
tblVehicleEF	UBUS	0.01	4.6590e-003
tblVehicleEF	UBUS	0.49	4.1230e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.0500e-004	8.0000e-006
tblVehicleEF	UBUS	5.8850e-003	3.4400e-004
tblVehicleEF	UBUS	0.06	9.3100e-004
tblVehicleEF	UBUS	2.5520e-003	7.9000e-005
tblVehicleEF	UBUS	1.08	1.15
tblVehicleEF	UBUS	0.01	4.6590e-003
tblVehicleEF	UBUS	0.54	4.5140e-003
tblVehicleEF	UBUS	0.26	1.12

tblVehicleEF	UBUS	0.05	1.1780e-003
tblVehicleEF	UBUS	6.28	8.27
tblVehicleEF	UBUS	8.97	0.08
tblVehicleEF	UBUS	2,189.07	1,618.25
tblVehicleEF	UBUS	79.76	0.86
tblVehicleEF	UBUS	14.70	0.71
tblVehicleEF	UBUS	16.39	9.6430e-003
tblVehicleEF	UBUS	0.65	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.30	5.1750e-003
tblVehicleEF	UBUS	9.3300e-004	6.0000e-006
tblVehicleEF	UBUS	0.28	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9020e-003
tblVehicleEF	UBUS	0.28	4.9510e-003
tblVehicleEF	UBUS	8.5800e-004	6.0000e-006
tblVehicleEF	UBUS	9.1900e-004	7.3000e-005
tblVehicleEF	UBUS	0.06	8.7300e-004
tblVehicleEF	UBUS	5.6100e-004	2.0000e-005
tblVehicleEF	UBUS	0.74	0.02
tblVehicleEF	UBUS	0.02	6.4740e-003
tblVehicleEF	UBUS	0.63	5.1740e-003
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.5800e-004	9.0000e-006
tblVehicleEF	UBUS	9.1900e-004	7.3000e-005
tblVehicleEF	UBUS	0.06	8.7300e-004
tblVehicleEF	UBUS	5.6100e-004	2.0000e-005
tblVehicleEF	UBUS	1.07	1.15

tblVehicleEF	UBUS	0.02	6.4740e-003
tblVehicleEF	UBUS	0.69	5.6640e-003
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	HO_TL	5.70	0.00
tblVehicleTrips	HO_TTP	54.00	0.00
tblVehicleTrips	HS_TL	4.80	0.00
tblVehicleTrips	HS_TTP	15.00	0.00
tblVehicleTrips	HW_TL	10.80	3.37
tblVehicleTrips	HW_TTP	31.00	100.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	ST_TR	4.98	3.14
tblVehicleTrips	ST_TR	6.39	0.00
tblVehicleTrips	ST_TR	42.04	0.00
tblVehicleTrips	SU_TR	3.65	3.14
tblVehicleTrips	SU_TR	5.86	0.00
tblVehicleTrips	SU_TR	20.43	0.00
tblVehicleTrips	WD_TR	4.20	3.14
tblVehicleTrips	WD_TR	6.65	0.00
tblVehicleTrips	WD_TR	44.32	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	10,815,568.25	26,558,130.00
tblWater	IndoorWaterUseRate	7,232,096.84	0.00
tblWater	IndoorWaterUseRate	296,290.09	0.00
tblWater	OutdoorWaterUseRate	6,818,510.42	1,045,652.00
tblWater	OutdoorWaterUseRate	4,559,365.40	0.00

tblWater	OutdoorWaterUseRate	181,597.15	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

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	2.7549	0.0384	2.9360	1.8600e-003		0.1372	0.1372		0.1372	0.1372	12.6284	8.5469	21.1752	0.0235	8.3000e-004	22.0100
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	0.1714	0.0919	1.0031	1.9500e-003	0.2337	1.4400e-003	0.2352	0.0621	1.3300e-003	0.0635	0.0000	182.9839	182.9839	0.0130	0.0000	183.3091
Waste						0.0000	0.0000		0.0000	0.0000	19.4465	0.0000	19.4465	1.1493	0.0000	48.1780
Water						0.0000	0.0000		0.0000	0.0000	9.3963	0.0000	9.3963	0.0323	0.0204	16.2941
Total	**2.9263**	**0.1303**	**3.9391**	**3.8100e-003**	**0.2337**	**0.1387**	**0.3724**	**0.0621**	**0.1386**	**0.2007**	**41.4712**	**191.5308**	**233.0019**	**1.2181**	**0.0213**	**269.7912**

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	2.7549	0.0384	2.9360	1.8600e-003		0.1372	0.1372		0.1372	0.1372	12.6284	8.5469	21.1752	0.0235	8.3000e-004	22.0100
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	0.1714	0.0919	1.0031	1.9500e-003	0.2337	1.4400e-003	0.2352	0.0621	1.3300e-003	0.0635	0.0000	182.9839	182.9839	0.0130	0.0000	183.3091
Waste						0.0000	0.0000		0.0000	0.0000	19.4465	0.0000	19.4465	1.1493	0.0000	48.1780
Water						0.0000	0.0000		0.0000	0.0000	9.3963	0.0000	9.3963	0.0323	0.0204	16.2941
Total	**2.9263**	**0.1303**	**3.9391**	**3.8100e-003**	**0.2337**	**0.1387**	**0.3724**	**0.0621**	**0.1386**	**0.2007**	**41.4712**	**191.5308**	**233.0019**	**1.2181**	**0.0213**	**269.7912**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	0.1714	0.0919	1.0031	1.9500e-003	0.2337	1.4400e-003	0.2352	0.0621	1.3300e-003	0.0635	0.0000	182.9839	182.9839	0.0130	0.0000	183.3091
Unmitigated	0.1714	0.0919	1.0031	1.9500e-003	0.2337	1.4400e-003	0.2352	0.0621	1.3300e-003	0.0635	0.0000	182.9839	182.9839	0.0130	0.0000	183.3091

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	520.97	520.97	520.97	639,183	639,183
Apartments Mid Rise	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Strip Mall	0.00	0.00	0.00		
Total	520.97	520.97	520.97	639,183	639,183

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	3.37	0.00	0.00	100.00	0.00	0.00	100	0	0
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.702804	0.047547	0.237784	0.000000	0.000000	0.000000	0.000000	0.005044	0.000000	0.000000	0.006822	0.000000	0.000000
Apartments Mid Rise	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
Other Non-Asphalt Surfaces	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
Parking Lot	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690
Strip Mall	0.562515	0.038056	0.190319	0.106285	0.014814	0.005157	0.024895	0.046887	0.002221	0.002358	0.005460	0.000343	0.000690

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	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	0.0000

5.2 Energy by Land Use - NaturalGas

<u>Unmitigated</u>

	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					
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	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
Other Non-Asphalt Surfaces	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
Parking Lot	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
Strip Mall	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**

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					
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	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
Other Non-Asphalt Surfaces	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
Parking Lot	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
Strip Mall	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			
Apartments High Rise	1.11049e+006	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	742558	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	1155	0.0000	0.0000	0.0000	0.0000
Strip Mall	65600	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	1.11049e+006	0.0000	0.0000	0.0000	0.0000
Apartments Mid Rise	742558	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	1155	0.0000	0.0000	0.0000	0.0000
Strip Mall	65600	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	2.7549	0.0384	2.9360	1.8600e-003		0.1372	0.1372		0.1372	0.1372	12.6284	8.5469	21.1752	0.0235	8.3000e-004	22.0100
Unmitigated	2.7549	0.0384	2.9360	1.8600e-003		0.1372	0.1372		0.1372	0.1372	12.6284	8.5469	21.1752	0.0235	8.3000e-004	22.0100

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	0.3131					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7409					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.6391	0.0147	0.8801	1.7500e-003		0.1258	0.1258		0.1258	0.1258	12.6284	5.1871	17.8154	0.0203	8.3000e-004	18.5696
Landscaping	0.0618	0.0237	2.0560	1.1000e-004		0.0114	0.0114		0.0114	0.0114	0.0000	3.3598	3.3598	3.2200e-003	0.0000	3.4404
Total	**2.7549**	**0.0384**	**2.9360**	**1.8600e-003**		**0.1372**	**0.1372**		**0.1372**	**0.1372**	**12.6284**	**8.5469**	**21.1752**	**0.0235**	**8.3000e-004**	**22.0100**

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	0.3131					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7409					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.6391	0.0147	0.8801	1.7500e-003		0.1258	0.1258		0.1258	0.1258	12.6284	5.1871	17.8154	0.0203	8.3000e-004	18.5696
Landscaping	0.0618	0.0237	2.0560	1.1000e-004		0.0114	0.0114		0.0114	0.0114	0.0000	3.3598	3.3598	3.2200e-003	0.0000	3.4404
Total	**2.7549**	**0.0384**	**2.9360**	**1.8600e-003**		**0.1372**	**0.1372**		**0.1372**	**0.1372**	**12.6284**	**8.5469**	**21.1752**	**0.0235**	**8.3000e-004**	**22.0100**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	9.3963	0.0323	0.0204	16.2941
Unmitigated	9.3963	0.0323	0.0204	16.2941

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	26.5581 / 1.04565	9.3963	0.0323	0.0204	16.2941
Apartments Mid Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.3963**	**0.0323**	**0.0204**	**16.2941**

Mitigated

Land Use	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
	Mgal	MT/yr			
Apartments High Rise	26.5581 / 1.04565	9.3963	0.0323	0.0204	16.2941
Apartments Mid Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.3963**	**0.0323**	**0.0204**	**16.2941**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	19.4465	1.1493	0.0000	48.1780
Unmitigated	19.4465	1.1493	0.0000	48.1780

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	95.8	19.4465	1.1493	0.0000	48.1780
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0	0.0000	0.0000	0.0000	0.0000
Total		**19.4465**	**1.1493**	**0.0000**	**48.1780**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	95.8	19.4465	1.1493	0.0000	48.1780
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0	0.0000	0.0000	0.0000	0.0000
Total		**19.4465**	**1.1493**	**0.0000**	**48.1780**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Operation_Housing Project #2

Alameda County, Mitigation Report

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation Selected	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	-0.01	0.14		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			

No	Land Use	Integrate Below Market Rate Housing	0.00				
	Land Use	Land Use SubTotal	0.00				
No	Neighborhood Enhancements	Improve Pedestrian Network					
No	Neighborhood Enhancements	Provide Traffic Calming Measures					
No	Neighborhood Enhancements	Implement NEV Network	0.00				
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00				
No	Parking Policy Pricing	Limit Parking Supply	0.00				
No	Parking Policy Pricing	Unbundle Parking Costs	0.00				
No	Parking Policy Pricing	On-street Market Pricing	0.00				
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00				
No	Transit Improvements	Provide BRT System	0.00				
No	Transit Improvements	Expand Transit Network	0.00				
No	Transit Improvements	Increase Transit Frequency	0.00				
	Transit Improvements	Transit Improvements Subtotal	0.00				
		Land Use and Site Enhancement Subtotal	0.00				
No	Commute	Implement Trip Reduction Program					
No	Commute	Transit Subsidy					
No	Commute	Implement Employee Parking "Cash Out"					
No	Commute	Workplace Parking Charge					
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00				
No	Commute	Market Commute Trip Reduction Option	0.00				
No	Commute	Employee Vanpool/Shuttle	0.00			2.00	
No	Commute	Provide Ride Sharing Program					
	Commute	Commute Subtotal	0.00				
No	School Trip	Implement School Bus Program	0.00				
		Total VMT Reduction	0.00				

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy	0.00	0.00
No	Use Reclaimed Water	0.00	0.00
No	Use Grey Water	0.00	
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction	0.00	
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape	0.00	0.00

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	