

APPENDIX D

ENERGY MODELING DATA

Construction Fuel Consumption

On-Site Diesel ¹	MTCO ₂ e	Gallons of Fuel ⁴	Construction Year 2022 County Fuel	Percent
Demolition	513	50,585		
Site Preparation/Grading	887	87,372		
Building Construction	1,400	137,898		
Paving	205	20,155		
Architectural Coating	26	2,519		
Total	3,030	298,529	167,374,283	0.1784%

Off-Site Diesel ¹	MTCO ₂ e	Gallons of Fuel ⁴	Construction Year 2022 County Fuel	Percent
Demolition	0	0		
Site Preparation/Grading	0	0		
Building Construction	10,228	1,007,660		
Paving	0	0		
Architectural Coating	0	0		
Total	10,228	1,007,660	167,374,283	0.6020%

Off-Site Gasoline ²	MTCO ₂ e	Gallons of Fuel ⁴	Construction Year 2022 County Fuel	Percent
Demolition	20	2,226		
Site Preparation/Grading	32	3,631		
Building Construction	30,787	3,494,605		
Paving	11	1,272		
Architectural Coating	977	110,861		
Total	31,827	3,612,595	1,182,503,928	0.3055%

Total Diesel Fuel	13,258	1,306,189	167,374,283	0.7804%
Total Gasoline Fuel	31,827	3,612,595	1,182,503,928	0.3055%
Total Construction Fuel	45,085	4,918,785	1,349,878,211	0.3644%

Construction Phase ³	Demolition			Site Preparation			Grading		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gas (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gas (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gas (Worker)
2022	445	0	17						
2023	68	0	3	337		15	55		2
2024							495		15
Total	513	0	20	337	0	15	550	0	17

Construction Phase ³	Building Construction			Paving			Architectural Coating		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gas (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gas (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gas (Worker)
2024	96	733	2226						
2025	304	2290	6909						
2026	304	2,246.52	6750.1013						
2027	304	2,201.03	6,608.77						
2028	303	2,149.29	6,460.99						
2029	87	608.00	1,832.61	188		10.4352	24		909.2544
2030				17		0.7739	2		67.4314
Total	1,400	10,228	30,787	205	0	11	26	0	977

Notes:

¹ Fuel used for off-road, hauling, and vendor trips assumed to be diesel.

² Fuel used for worker trips assumed to be gasoline.

³ MTCO₂e rates from CalEEMod (3.0 Construction Details).

⁴ For CO₂e emissions, see Chapter 13 (page 94); Conversion Ratios: Climate Registry, General Reporting Protocol, Available at: <https://www.theclimateresistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf>, 2016.

Operational Fuel

Vehicle Type	Percent ¹	Annual VMT ²	MPG ³	Annual Fuel (Gallons)	Fuel Type	Orange County Gallons ⁴	Orange Percent	
Passenger Cars	0.94	217,896,114	21.6	10,087,783	Gas	163882259.3	6.1555%	0.0910%
Light/Medium Trucks	0.05	11,928,174	17.2	693,499	Diesel	964826395.3	0.0719%	
Heavy Trucks/Other	0.00	1,126,812	6.1	184,723	Diesel	964826395.3	0.0191%	
Total	1.00	230,951,331		10,966,005		1,128,708,655		

Land Use	LDA	LDT1	LDT2	MCY	MDV	LHD1	LHD2	MHD	OBUS	UBUS	SBUS	MH	HHD
Apartments Low Rise	0.551273	0.062673	0.182454	0.025489	0.121583	0.024089	0.00699	0.015325	0.000679	0.000362	0.000687	0.003516	0.004879

Notes:

- ¹ Percent of vehicle trip distribution based on fleet mix from CalEEMod (4.4 Fleet Mix).
- ² Total annual operational VMT based on mitigated annual VMT from CalEEMod (4.2 Trip Summary Information).
- ³ Average fuel economy derived from Department of Transportation.
- ⁴ Total annual county fuel per EMFAC 2017 model of projected operational fuel usage. (2030 Projected)

Operational Water Energy

Mitigated Indoor	362.1	million gallons	Total Water
Indoor Energy Intensity Factor ¹	13,021	kWh/MG	
Mitigated Outdoor	0	million gallons	4.714644 #DIV/0!
Outdoor Energy Intensity Factor ²	11,110	kWh/MG	
Operational Water Energy	4,714,644	kWh	
	0.0233%		

Land Use ³	Unmitigated (MG)		Mitigated (MG)	
	Indoor	Outdoor	Indoor	Outdoor
Apartments Low Rise	362	0	362	0
Total Operational Water	362	0	362	0

Notes:

¹ Indoor water energy intensity factor for county subarea per CalEEMod User Guide, Appendix D, page D-343. Factor includes supply, treatment, distribution, and wastewater.

² Outdoor water energy intensity factor for county subarea per CalEEMod User Guide, Appendix D, page D-343. Factor includes supply, treatment, and distribution.

³ Operational water use values per CalEEMod (7.2 Water by Land Use).

Electricity/Natural Gas Energy

	Mitigated Project Annual Energy	Orange County Annual Energy ³	Percentage Increase
Electricity (kWh/yr)	37,004,353	20,243,721,856	0.1828%
Natural Gas (kBTU/yr)	157,333,463	58,020,949,600	0.2712%
Natural Gas (therms/yr)	1,573,335	580,209,496	0.2712%

Land Use	Electricity ¹ (kWh/yr)		Natural Gas ² (kBTU/yr)	
	Unmitigated	Mitigated	Unmitigated	Mitigated
Apartments Low Rise	37,004,353	37,004,353	157,333,463	157,333,463
Total Energy	37,004,353	37,004,353	157,333,463	157,333,463

Notes:

¹ Electricity use per CalEEMod (5.3 Energy by Land Use).

² Natural Gas use per CalEEMod (5.2 Natural Gas by Land Use).

³ County total energy values from California Energy Commission energy reports available through ecdms.energy.ca.gov.