Appendix D: Energy Calculations

Construction Water Energy

Daily Soil Disturbance[1]	1.0	acres/day
Days of Soil Disturbance[2]	125	days
Water Concentration[3]	3,020	gallons/acre
Water Usage	0.38	million gallons
Water Energy Intensity[4]	5,306	kWh/million gallons
Water Energy	2,003	kWh
	0.0020	GWh
Annual Riverside County Electricity[5]	17,418	GWh/year
% Consumption	0.0000115%	

NOTES:

1. Total daily acres disturbed from off-road equipment per CalEEMod (3.0 Construction Emissions Detail) and maximum SCAQMD LST values for soil-disturbing equipment.
2. Number of days of construction with soil disturbing equipment per CalEEMod (5.1 Construction Schedule).
3. Water application rate per Air and Waste Management Association's Air Pollution Engineering Manual (1992).
4. Water energy intensity factor per CalEEMod User Guide, Appendix G, Tab G-32 for the supply, distribution, and treatment of water within the South Coast Hydrologic Region.
5. RiversideCounty electricity usage in 2024 (most recent data available).

Source: California Energy Commission, Electricity Consumption, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards-(

Construction Fuel

On-site Diesel[1] (off-road construction equipment)	$MTCO_2e$	Gallons of Fuel[2]
Demolition	39	3,841
Site Preparation	60	5,939
Grading	134	13,196
Battery Installation	124	12,185
Collector Substation Installation	52	5,119
Gen-Tie Line Foundation and Tower	17	1,712
Gen-Tie Line Strining and Pulling	8	756
Paving	21	2,101
Architectural Coating	3	265
Total	**457.92**	**45,114.97**

Off-site Diesel[1] (on-road construction trips)	$MTCO_2e$	Gallons of Fuel[2]
Demolition	3	334
Site Preparation	9	881
Grading	143	14,134
Battery Installation	946	93,227
Collector Substation Installation	442	43,564
Gen-Tie Line Foundation and Tower	44	4,356
Gen-Tie Line Strining and Pulling	54	5,337
Paving	0	0
Architectural Coating	0	0
Total	**1,642.61**	**161,833.50**

Off-site Gasoline[3] (worker)	$MTCO_2e$	Gallons of Fuel[2]
Demolition	2	251
Site Preparation	3	293
Grading	9	994
Battery Installation	149	16,884
Collector Substation Installation	17	1,972
Gen-Tie Line Foundation and Tower	12	1,315
Gen-Tie Line Strining and Pulling	14	1,613
Paving	3	306
Architectural Coating	0	33
Total	**208.46**	**1,952**

Fuel	$MTCO_2e$	Gallons of Fuel[2]	2026 Riverside County Fuel Use (Gallons)[4]	% Consumption
On-site Diesel (off-road construction equipment)	458	45,115	135,671,535	0.0333%
Off-site Diesel (on-road construction trips)	1,643	161,834	135,671,535	0.1193%
Total Diesel (on-site + off-site)	**2,101**	**206,948**	**135,671,535**	**0.1525%**
Gasoline	**208**	**1,952**	**508,343,229**	**0.00038%**

Construction Phase[5]	Demolition			Site Preparation			Grading		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)
2026	38.99	3.39	2.21	60.28	8.94	2.58	92.37	99.54	6.07
2027	-	-	-	-	-	-	41.57	43.91	2.68
Total	**39**	**3**	**2**	**60**	**9**	**3**	**134**	**143**	**9**

Construction Phase[5]	Battery Installation			Collector Substation Installation			Gen-Tie Line Foundation and Tower		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)
2027	123.67	946.25	148.75	51.96	442.2	17.38	19.50	44.2	11.58
2028	-	-	-	-	-	-	-	-	-
Total	**124**	**946**	**149**	**52**	**442**	**17**	**19**	**44**	**12**

Construction Phase[5]	Gen-Tie Line Strining and Pulling			Paving			Architectural Coatings		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)
2027	5.12	36.38	9.53	21.32	-	2.69	1.52	-	0.29
2028	2.56	17.79	4.68	-	-	-	-	-	-
Total	**8**	**54**	**14**	**21**	**0**	**3**	**2**	**0**	**0**

NOTES:
1. Fuel used for off-road, hauling, and vendor trips assumed to be diesel.
2. CO_2e emissions per Conversion Ratios: Climate Registry, General Reporting Protocol, Chapter 13, Page 94, 2016.
3. Fuel used for worker trips assumed to be gasoline.
4. The anticipated Riverside County fuel usage in 2026 (the first construction year).
Source: California Air Resources Board, EMFAC2021, Emissions Inventory, 2022, https://arb.ca.gov/emfac/emissions-inventory/cd60f29daaedd924a75a9316202d7f56a9b573e5.
5. $MTCO_2e$ rates per CalEEMod (3.0 Construction Emissions Details).

Operational Electricity

	Energy Usage	Annual Riverside County Energy[1]	% Consumption
Parking Lot Electricity (kWh/yr)[2]	145,003	-	-
(GWh/yr)	0.145	17,418	0.00083%
Water Energy (GWh/yr)	0.013	17,418	0.000076%
Total Electricity (GWh/yr)	**0.158**	**17,418**	0.00091%

NOTES:

1. Riverside County energy usage in 2024 (most recent data available).

Source: California Energy Commission, California Energy Consumption Dashboards, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards.

2. Electricity use per CalEEMod (5.11 Operational Energy Consumption).

Operational Water Electricity

	Indoor Water Usage	0.00	million gallons
Indoor Energy Intensity Factor[1]		6,807	kWh/MG/year
	Outdoor Water Usage	2.48	million gallons
Outdoor Energy Intensity Factor[2]		5,306	kWh/MG/year
Water Energy		13,168	kWh/year
		0.013	GWh/year
Annual Riverside County Electricity[3]		17,418	GWh/year
% Consumption		0.000076%	

Land Use	**Water Usage (gal/year)[4]**	
	Indoor	**Outdoor**
Parking Lot	0.00	1,565,452
Other Asphalt Surfaces	0.00	916,178
Total	0	2,481,630

NOTES:

1. Indoor water energy intensity factor per CalEEMod User Guide, Appendix G, Tab G-32 and includes supply, treatment, distribution, and wastewater within the South Coast Hydrologic Region.

2. Outdoor water energy intensity factor per CalEEMod User Guide, Appendix G, Tab G-32 and includes supply, treatment, and distribution within the South Coast Hydrologic Region.

3. Los Angeles County electricity usage in 2024 (most recent data available).

Source: California Energy Commission, Electricity Consumption, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards-0.

4. Operational water use values per CalEEMod (5.12 Operational Water and Wastewater Consumption).

Operational Fuel

Fuel Source	Annual Fuel Use (Gallons)	2028 Riverside County Fuel Use (Gallons)[3]	% Consumption
Diesel			
Mobile	140	134,450,219.73	0.000104%
Emergency Generator	284	134,450,219.73	0.000211%
Total	**424**	**134,450,219.73**	**0.000315%**
Gasoline Mobile	944	493,567,208.27	0.000191%

Vehicle Fuel

Vehicle Type	Percent	Annual VMT[1]	MPG[2]	Annual Fuel Use (Gallons)	Fuel Type	2028 Riverside County Fuel Use (Gallons)[3]	% Consumption
Passenger Cars	92.15%	20,383	21.6	944	**Gas**	**493,567,208.27**	**0.00019%**
Light/Medium Trucks	6.19%	1,368	17.2	80	Diesel	134,450,219.73	0.00006%
Heavy Trucks/Other	1.66%	368	6.1	60	Diesel	134,450,219.73	0.00004%
			Total Truck (Diesel)	**140**	**Diesel**	**134,450,219.73**	**0.00010%**

Land Use[5]	LDA	LDT1	LDT2	MCY	MDV	LHD1	LHD2	MHD	OBUS	UBUS	SBUS	MH	HHD	VMT/yr[4]
Condo/Townhouse	49.4962126	3.6103569	21.1994231	2.2509020	15.5928254	3.0387489	0.8699423	1.5091597	0.0583272	0.0379768	0.1327556	0.5383810	1.6649881	22119.44004

NOTES:

1. Annual VMT is based on the fleet mix and total annual VMT

2. Average fuel economy derived from Department of Transportation.

3. The anticipated Los Angeles County fuel usage in 2029 (the first operational year).

Source: California Air Resources Board, EMFAC2021, Emissions Inventory, 2022, https://arb.ca.gov/emfac/emissions-inventory/cd60f29daaedd924a75a9316202d7f56a9b573e5.

4. Total annual operational VMT based on annual VMT from CalEEMod (5.9 Operational Mobile Sources).

Emergency Generator Fuel

$MTCO_2e$[1]	Gallons of Fuel[2]	2028 Riverside County Fuel Use (Gallons)[3]	Percent Consumption
3	284	134,450,219.73	0.00021%

NOTES:

1. $MTCO_2e$ rates from Appendix A: Air Quality and Greenhouse Gas Emissions Modeling Data

2. For CO_2e emissions, The Climate Registry, June 2023, Default Emission Factors, see Table 1.1 (U.S. Default Factors for Calculating CO_2 Emissions from Combustion of Transport Fuels) https://theclimateregistry.org/wp-content/uploads/2023/06/2023-Default-Emission-Factors-Final-1.pdf; Climate Registry Conversion Ratios:

Diesel: 10.21 kg CO_2 per gallon
Conversion Factor = 1000 kg per MT

3. Total annual county fuel per EMFAC 2021 model of projected operational fuel usage in 2028– first year of operation