

**Appendix F:
Energy Analysis Supporting Information**

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Barton Road Logistics Center Project—Construction Vehicle Fuel Calculations

California Air Resource Board (ARB). 2020. EMFAC2014 Web Database. Website: <https://www.arb.ca.gov/emfac/2014/>. Accessed September 8, 2020.

EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: Sub-Area

Region: San Bernardino (SC)

Calendar Year: 2021

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled

FE = Fuel Economy

Calculations

VehClass	MdlYr	Speed	Fuel	Population	VMT (mi/day)	Fuel Consumption (1000)	FE (mi/gallon)	VMT*FE
LDA	Aggregated	Aggregated	GAS	532030.0575	20874160.6	704.7545235	29.61905165	618272842
LDA	Aggregated	Aggregated	DSL	4926.592687	213090.136	5.311144111	40.12132435	8549458.442
LDT1	Aggregated	Aggregated	GAS	43154.69332	1486505.9	60.32288362	24.64248733	36631202.69
LDT1	Aggregated	Aggregated	DSL	56.42254309	1457.48743	0.05073299	28.72859316	41871.56347
LDT2	Aggregated	Aggregated	GAS	181337.9022	7187480.2	323.8308674	22.19516705	159527323.7
LDT2	Aggregated	Aggregated	DSL	298.38211	13205.2109	0.431746973	30.58553217	403888.4035
MDV	Aggregated	Aggregated	GAS	138621.9014	4881787.77	303.3245526	16.09427173	78568818.93
MDV	Aggregated	Aggregated	DSL	1855.394742	84093.0013	3.566013519	23.58179544	1983063.956
LHDT1	Aggregated	Aggregated	GAS	11544.54686	315247.197	28.91972892	10.90076597	3436435.918
LHDT1	Aggregated	Aggregated	DSL	10162.4222	325881.704	16.13035217	20.20301236	6583792.096
LHDT2	Aggregated	Aggregated	GAS	2118.420894	69554.9381	6.829454194	10.18455298	708385.9522
LHDT2	Aggregated	Aggregated	DSL	3621.112418	130900.702	7.014740907	18.66080353	2442712.281
MHDT	Aggregated	Aggregated	GAS	1227.037953	62224.4268	8.648116874	7.195141752	447713.5713
MHDT	Aggregated	Aggregated	DSL	15253.53292	890403.344	100.6867507	8.843301999	7874105.671
HHDT	Aggregated	Aggregated	GAS	85.01556029	9869.4278	2.121119972	4.65293238	45921.78017
HHDT	Aggregated	Aggregated	DSL	12810.01456	1830803.57	310.9366324	5.888027926	10779822.57

Worker	
Weighted Average FE	26.02
Vendor	
Weighted Average FE	8.89
Haul	
Weighted Average FE	5.88

Barton Road Logistics Center Project—Construction Parameters

Construction

Source: AQ/GHG Appendix, CalEEMod Output

Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Num Days	
				Week	Num Days
Demolition	Demolition	2/15/2021	7/2/2021	5	100
Site Preparation	Site Preparation	7/3/2021	7/30/2021	5	20
Grading	Grading	7/31/2021	9/10/2021	5	30
Building Construction	Building Construction	9/11/2021	3/4/2022	5	125
Paving	Paving	3/5/2022	4/8/2022	5	25
Architectural Coating	Architectural Coating	4/9/2022	5/13/2022	5	25
Off-Site Improvements	Site Preparation	9/25/2021	10/4/2021	5	6
Off-Site Improvements	Grading	10/5/2021	10/21/2021	5	13
Off-Site Improvements	Paving	10/22/2021	12/3/2021	5	31

Construction Trips and VMT

Phase Name	Trips per Day			Construction Trip Length in Miles			Number of Days per Phase	Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length		Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
Demolition	15	0	11,934	14.7	6.9	20	100	1,500	0	11,934	22,050	0	238,680	847.43	0.00	2,029.11
Site Preparation	18	0	0	14.7	6.9	20	20	360	0	0	5,292	0	0	203.38	0.00	0.00
Grading	20	0	155	14.7	6.9	20	30	600	0	155	8,820	0	3,100	338.97	0.00	26.35
Building Construction	869	340	0	14.7	6.9	20	125	108,625	42,500	0	1,596,788	293,250	0	61,367.88	32,981.64	0.00
Paving	15	0	0	14.7	6.9	20	25	375	0	0	5,513	0	0	211.86	0.00	0.00
Architectural Coating	174	0	0	14.7	6.9	20	25	4,350	0	0	63,945	0	0	2,457.54	0.00	0.00
Off-Site Improvements	5	0	0	14.7	6.9	20	6	30	0	0	441	0	0	16.95	0.00	0.00
Off-Site Improvements	10	0	0	14.7	6.9	20	13	130	0	0	1,911	0	0	73.44	0.00	0.00
Off-Site Improvements	18	0	0	14.7	6.9	20	31	558	0	0	8,203	0	0	315.24	0.00	0.00

Total Project Construction VMT (miles)
2,247,992

Total Project Fuel Consumption (gallons)
100,870

Construction Equipment Fuel Calculation

Barton Road Logistics Center Project

Source: AQ/GHG Appendix, CalEEMod Output

Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Num Days	
				Week	Num Days
Demolition	Demolition	2/15/2021	7/2/2021	5	100
Site Preparation	Site Preparation	7/3/2021	7/30/2021	5	20
Grading	Grading	7/31/2021	9/10/2021	5	30
Building Construction	Building Construction	9/11/2021	3/4/2022	5	125
Paving	Paving	3/5/2022	4/8/2022	5	25
Architectural Coating	Architectural Coating	4/9/2022	5/13/2022	5	25
Off-Site Improvements	Site Preparation	9/25/2021	10/4/2021	5	6
Off-Site Improvements	Grading	10/5/2021	10/21/2021	5	13
Off-Site Improvements	Paving	10/22/2021	12/3/2021	5	31

Construction Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Fuel	Diesel Fuel
								(gallons/HP-hour)	Usage
Demolition	Concrete/Industrial Saws	1	8	81	0.73	100	47,304.00	0.042	1,988.76
Demolition	Excavators	3	8	158	0.38	100	144,096.00	0.020	2,847.93
Demolition	Rubber Tired Dozers	2	8	247	0.40	100	158,080.00	0.020	3,230.19
Site Preparation	Rubber Tired Dozers	3	8	247	0.40	20	47,424.00	0.020	969.06
Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37	20	22,969.60	0.019	436.97
Grading	Excavators	2	8	158	0.38	30	28,819.20	0.020	569.59
Grading	Graders	1	8	187	0.41	30	18,400.80	0.021	389.55
Grading	Rubber Tired Dozers	1	8	247	0.40	30	23,712.00	0.020	484.53
Grading	Scrapers	2	8	367	0.48	30	84,556.80	0.019	1,608.58
Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	30	17,227.20	0.019	327.72
Building Construction	Cranes	1	7	231	0.29	125	58,616.25	0.015	873.14
Building Construction	Forklifts	3	8	89	0.2	125	53,400.00	0.021	1,111.47
Building Construction	Generator Sets	1	8	84	0.74	125	62,160.00	0.042	2,635.38
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	125	94,211.25	0.019	1,792.25
Building Construction	Welders	1	8	46	0.45	125	20,700.00	0.026	535.70
Paving	Pavers	2	8	130	0.42	25	21,840.00	0.032	700.18
Paving	Paving Equipment	2	8	132	0.36	25	19,008.00	0.022	409.15
Paving	Rollers	2	8	80	0.38	25	12,160.00	0.018	222.94
Architectural Coating	Air Compressors	1	6	78	0.48	25	5,616.00	0.028	155.20
Off-Site Improvements	Graders	1	8	187	0.41	6	3,680.16	0.021	77.91
Off-Site Improvements	Tractors/Loaders/Backhoes	1	8	97	0.37	6	1,722.72	0.019	32.77
Off-Site Improvements	Concrete/Industrial Saws	1	8	81	0.73	13	6,149.52	0.042	258.54
Off-Site Improvements	Rubber Tired Dozers	1	1	247	0.4	13	1,284.40	0.020	26.25
Off-Site Improvements	Tractors/Loaders/Backhoes	2	6	97	0.37	13	5,598.84	0.019	106.51
Off-Site Improvements	Cement and Mortar Mixers	4	6	9	0.56	31	3,749.76	0.022	80.71
Off-Site Improvements	Pavers	1	7	130	0.42	31	11,848.20	0.022	255.03
Off-Site Improvements	Rollers	1	7	80	0.38	31	6,596.80	0.018	120.94
Off-Site Improvements	Tractors/Loaders/Backhoes	1	7	97	0.37	31	7,788.13	0.019	148.16

Total Construction Equipment Fuel Consumption (gallons)

22,395.09

Notes:

Equipment assumptions are provided in the CalEEMod output files.

Source of usage estimates: California Air Resource Board (ARB). 2020. OFFROAD2017 (v1.0.1) Emissions Inventory

Website: <https://www.arb.ca.gov/orion/>. Accessed July 7, 2020.

Construction Office Electricity Calculation

Energy Appendix: CalEEMod Typical Construction Trailer
 Typical Construction Trailer - San Bernardino-South Coast County, Annual

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	6854.4	1.8602	9.0000e-005	2.0000e-005	1.8680
Total		1.8602	9.0000e-005	2.0000e-005	1.8680

kWh/yr = kilowatt hours per year

Energy by Land Use - Electricity

Annual 6,854 kWh/yr
Total Over Construction 8,826 kWh

Total Construction Schedule

Start 2/15/2021
 End 5/31/2022
 Total Calendar Days 470
 Years 1.29

2018 POWER CONTENT LABEL		
CITY OF COLTON		
www.coltonca.gov		
ENERGY RESOURCES	Power Mix	2018 CA Power Mix**
Eligible Renewable	31%	31%
Biomass & Biowaste	16%	2%
Geothermal	0%	5%
Eligible Hydroelectric	3%	2%
Solar	10%	11%
Wind	2%	11%
Coal	0%	3%
Large Hydroelectric	1%	11%
Natural Gas	19%	35%
Nuclear	5%	9%
Other	0%	<1%
Unspecified sources of power*	44%	11%
TOTAL	100%	100%
<p>* "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources.</p> <p>** Percentages are estimated annually by the California Energy Commission based on the electricity generated in California and net imports as reported to the Quarterly Fuel and Energy Report database and the Power Source Disclosure program.</p>		
For specific information about this electricity product, contact:	CITY OF COLTON/ELECTRIC DEPARTMENT	
	909-370-6132	
For general information about the Power Content Label, please visit:	http://www.energy.ca.gov/pcl/	
For additional questions, please contact the California Energy Commission at:	Toll-free in California: 844-454-2906 Outside California: 916-653-0237	

Typical Construction Trailer - San Bernardino-South Coast County, Annual

**Typical Construction Trailer
San Bernardino-South Coast County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.72	1000sqft	0.02	720.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	32
Climate Zone	10	Operational Year	2021		
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	598.29	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Colton Electric Utility not included as option in CalEEMod - CO2 intensity updated for Colton Electric Utility and accounts for compliance with RPS.

Land Use - Upper range of typical single-wide mobile office trailer = 720 square feet.

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	CO2IntensityFactor	702.44	598.29

5.0 Energy Detail

5.3 Energy by Land Use - Electricity

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	6854.4	1.8602	9.0000e-005	2.0000e-005	1.8680
Total		1.8602	9.0000e-005	2.0000e-005	1.8680

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