

## APPENDIX E: ENERGY TABLES

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**SUBJECT: PEPPER AVENUE SPECIFIC PLAN AMENDMENT AND INDUSTRIAL WAREHOUSE PROJECT ENERGY TABLES**

The following Energy Tables were prepared for the proposed Pepper Avenue Specific Plan Amendment and Industrial Warehouse development (referred to as “Project”) which is located in the City of Rialto.

**CONSTRUCTION POWER COSTS**

Based on the 2022 *National Construction Estimator* (1), the typical power cost per 1,000 square feet of building construction per month is estimated to be \$2.41. The Project is proposed to consist of a single 485,000 square foot (sf) warehouse building. Although the site plan shows 475,000 sf, the analysis will be based on 485,000 sf to allow a contingency for future changes in the site plan and therefore, the analysis overstates the Project’s impacts. Table 1 estimates the total power cost of the on-site electricity usage during the construction of the proposed Project to be approximately \$40,026.63.

**TABLE 1: PROJECT CONSTRUCTION POWER COST**

Land Use	Power Cost (per 1,000 SF)	Size (1,000 SF)	Construction Duration (months)	Project Construction Power Cost
Warehouse	\$2.41	485.000	16	\$18,701.60
Parking	\$2.41	118.620	16	\$4,573.99
Other Asphalt Surfaces	\$2.41	434.415	16	\$16,751.04
<b>CONSTRUCTION POWER COST</b>				<b>\$40,026.63</b>

**CONSTRUCTION ELECTRICITY USAGE**

The SCE’s general service rate schedule were used to determine the Project’s electrical usage. As of January 1, 2022, SCE’s general service rate is \$0.13 per kilowatt hours (kWh) of electricity for commercial uses, \$0.17 per kWh of electricity of residential uses, and \$0.13 per kWh of electricity for street and area lighting (2), the total electricity usage from on-site Project construction related activities is estimated to be approximately 303,877 kWh.

**TABLE 2: PROJECT CONSTRUCTION ELECTRICITY USAGE**

Land Use	Cost per kWh	Project Construction Electricity Usage (kWh)
Parking	\$0.13	141,980
Parking	\$0.13	34,725
Other Asphalt Surfaces	\$0.13	127,172
<b>CONSTRUCTION ELECTRICITY USAGE</b>		<b>303,877</b>

**CONSTRUCTION EQUIPMENT FUEL CONSUMPTION**

Fuel consumption estimates are presented in Table 3. The aggregate fuel consumption rate for all equipment is estimated at 18.5 hp-hr-gal., obtained from California Air Resources Board (CARB) 2018 Emissions Factors Tables and cited fuel consumption rate factors presented in Table D-24 of the Moyer guidelines (3). For the purposes of this analysis, the calculations are based on all construction equipment being diesel-powered which is standard practice consistent with industry standards. Diesel fuel would be supplied by existing commercial fuel providers serving the City and region. As presented in Table 3, Project construction activities would consume an estimated 117,375 gallons of diesel fuel.

**TABLE 3: CONSTRUCTION EQUIPMENT FUEL CONSUMPTION ESTIMATES**

Construction Activity	Duration (Days)	Equipment	HP Rating	Quantity	Usage Hours	Load Factor	HP-hrs/day	Total Fuel Consumption
Site Preparation	10	Crawler Tractors	212	4	8	0.43	2,917	1,577
		Rubber Tired Dozers	247	3	8	0.40	2,371	1,282
Grading	45	Crawler Tractors	212	2	8	0.43	1,459	3,548
		Excavators	158	2	8	0.38	961	2,337
		Graders	187	1	8	0.41	613	1,492
		Rubber Tired Dozers	247	1	8	0.40	790	1,923
		Scrapers	367	2	8	0.48	2,819	6,856
Building Construction	300	Cranes	231	2	8	0.29	1,072	17,381
		Crawler Tractors	212	4	8	0.43	2,917	47,305
		Forklifts	89	4	8	0.20	570	9,237
		Generator Sets	84	2	8	0.74	995	16,128
		Welders	46	2	8	0.45	331	5,371
Paving	20	Pavers	130	2	8	0.42	874	944
		Paving Equipment	132	2	8	0.36	760	822
		Rollers	80	2	8	0.38	486	526
Architectural Coating	40	Air Compressors	78	1	8	0.48	300	648
<b>CONSTRUCTION FUEL DEMAND (GALLONS DIESEL FUEL)</b>								<b>117,375</b>

**CONSTRUCTION WORKER FUEL ESTIMATES**

For purposes of analysis, it is assumed that 50% of all worker trips are from light-duty-auto vehicles (LDA), 25% are from light-duty-trucks with a gross vehicle weight rating (GVWR) of less than 6,000 lbs. and equivalent test weight (ETW) of less than or equal to 3,750 lbs (LDT1), and 25% are from light-duty-trucks with a GVWR of less than 6,000 lbs. and ETW between 3,751 lbs. and 5,750 lbs (LDT2). Data regarding Project related construction worker trips were based on CalEEMod 2020.4.0 model defaults utilized within the AQIA. Vehicle fuel efficiencies for LDAs, LDT1s, and LDT2s were estimated using information generated within the 2017 version of the EMFAC developed by the CARB.

Table 4 provides an estimated annual fuel consumption resulting from the Project generated by LDAs, LDT1s, and LDT2s related to construction worker trips. Based on Table 4, it is estimated that 67,882 gallons of fuel will be consumed related to construction worker trips during full construction of the proposed Project.

**TABLE 4: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES (1 OF 2)**

Year	Construction Activity	Duration (Days)	Worker Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2022	LDA						
	Site Preparation	10	9	14.7	1,323	31.93	41
	Grading	45	10	14.7	6,615	31.93	207
	Building Construction	55	218	14.7	176,253	31.93	5,520
	LDT1						
	Site Preparation	10	5	14.7	735	26.79	27
	Grading	45	5	14.7	3,308	26.79	123
	Building Construction	55	109	14.7	88,127	26.79	3,290
	LDT2						
	Site Preparation	10	5	14.7	735	25.15	29
	Grading	45	5	14.7	3,308	25.15	132
	Building Construction	55	109	14.7	88,127	25.15	3,505
2023	LDA						
	Building Construction	245	218	14.7	785,127	32.93	23,842
	Paving	20	8	14.7	2,352	32.93	71
	Architectural Coating	40	44	14.7	25,872	32.93	786

**TABLE 4: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES (2 OF 2)**

Year	Construction Activity	Duration (Days)	Worker Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2023	LDT1						
	Building Construction	245	109	14.7	392,564	27.61	14,221
	Paving	20	4	14.7	1,176	27.61	43
	Architectural Coating	40	22	14.7	12,936	27.61	469
	LDT2						
	Building Construction	245	109	14.7	392,564	26.11	15,036
	Paving	20	4	14.7	1,176	26.11	45
	Architectural Coating	40	22	14.7	12,936	26.11	495
<b>TOTAL CONSTRUCTION WORKER FUEL CONSUMPTION</b>							<b>67,882</b>

**CONSTRUCTION VENDOR/HAULING FUEL ESTIMATES**

It is assumed that 50% of all vendor trips are from Medium-Heavy-Duty-Trucks (MHDT), 50% are from Heavy-Heavy-Duty Trucks (HHDT), and 100% of hauling trips are from HHDTs. These assumptions are consistent with the CalEEMod 2020.4.0 defaults utilized within the within the AQIA. Vehicle fuel efficiencies for MHDTs and HHDTs were estimated using information generated within EMFAC2017.

Table 5 shows the estimated fuel economy of MHDTs and HHDTs accessing the Project site. Based on Table 5, fuel consumption from construction trips will total approximately 44,042 gallons.

**TABLE 5: CONSTRUCTION VENDOR/HAULING FUEL CONSUMPTION ESTIMATES (1 OF 2)**

Year	Construction Activity	Duration (Days)	Vendor/Hauling Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2022	MHDT						
	Site Preparation	10	3	6.9	207	10.04	21
	Grading	45	11	6.9	3,416	10.04	340
	Building Construction	55	72	6.9	27,324	10.04	2,720
	HHDT (Vendor)						
	Site Preparation	10	3	6.9	207	6.33	33
	Grading	45	11	6.9	3,416	6.33	540
	Building Construction	55	72	6.9	27,324	6.33	4,317

**TABLE 5: CONSTRUCTION VENDOR/HAULING FUEL CONSUMPTION ESTIMATES (2 OF 2)**

Year	Construction Activity	Duration (Days)	Vendor/Hauling Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2022	HHDT (Hauling)						
	Grading	45	44	20	39,600	6.33	6,256
2023	MHDT						
	Building Construction	245	72	6.9	121,716	10.45	11,644
	HHDT (Vendor)						
	Building Construction	245	72	6.9	121,716	6.70	18,171
<b>TOTAL CONSTRUCTION VENDOR/HAULING FUEL CONSUMPTION</b>							<b>44,042</b>

**TRANSPORTATION ENERGY DEMANDS**

Energy that would be consumed by Project-generated traffic is a function of total VMT and estimated vehicle fuel economies of vehicles accessing the Project site. Table 6 presents the estimated annual fuel consumption from project-generated traffic.

**TABLE 6: PROJECT-GENERATED TRAFFIC ANNUAL FUEL CONSUMPTION**

Vehicle Type	Average Vehicle Fuel Economy (mpg)	Annual VMT	Estimated Annual Fuel Consumption (gallons)
LDA	32.93	902,934	27,420
LDT1	27.61	93,714	3,395
LDT2	26.11	289,420	11,085
MDV	21.08	233,348	11,068
MCY	37.21	42,484	1,142
LHDT1	13.97	59,074	4,230
LHDT2	14.12	15,564	1,102
MHDT	10.45	990,814	94,788
HHDT	6.70	2,471,905	369,035
<b>TOTAL ANNUAL FUEL CONSUMPTION</b>		<b>5,099,256</b>	<b>523,265</b>

MDV = Medium Duty Trucks; LHDT1 = Light-Duty Trucks (Vehicles under the LHDT1 category have a GVWR of 8,501 to 10,000 lbs.); LHDT2 = Light-Duty Trucks (Vehicles under the LHDT2 category have a GVWR of 10,001 to 14,000 lbs.); MCY = Motorcycle

**FACILITY ENERGY DEMANDS**

Project building operations and Project site maintenance activities would result in the consumption of natural gas and electricity. Natural gas would be supplied to the Project by Southern California Gas (SoCalGas) and electricity would be supplied to the Project by SCE. Annual natural gas and electricity demands of the Project are summarized in Table 7.

**TABLE 7: PROJECT ANNUAL OPERATIONAL NATURAL GAS AND ELECTRICITY DEMAND SUMMARY**

Land Use	Natural Gas Demand (kBTU/year)	Electricity Demand (kWh/year)
Warehouse	974,850	1,125,200
Parking	0	41,517
Other Asphalt Surfaces	0	0
<b>TOTAL PROJECT ENERGY DEMAND</b>	<b>974,850</b>	<b>1,166,717</b>

**CUMULATIVE TRANSPORTATION ENERGY DEMANDS FROM BUILDOUT OF THE SPECIFIC PLAN AMENDMENT**

The proposed Project includes a Specific Plan Amendment (referred to as the Pepper Avenue Specific Plan Amendment) would split Planning Area (PA) 1 into two separate PAs – PA 1, encompassing approximately 2.86 acres, and a new PA 10, encompassing approximately 11.56 acres. The reduced PA 1 would remain as Community Commercial, and no land use designation changes would occur. The proposed Specific Plan Amendment applies the new Light Industrial land use designation to PA 2, PA 3, and the new PA 10. In addition to the proposed light industrial development project proposed in PA 2 and PA 3, buildout of the proposed Specific Plan Amendment includes 250,185 sf of warehouse use on PA 10, and a 4,600-sf convenience store/gas station, 2,400 sf of fast-food restaurant with drive-through window use, 2,400 sf of coffee shop with drive-through use, and a 3,600-sf strip retail plaza on PA 1.

It should be noted that construction-related electricity and fuel usage for the future developments within PA 1 and PA 10 are speculative and cannot be accurately determined at this stage of the planning process. Therefore, such impacts are too speculative to evaluate (see CEQA Guidelines Section 15145) and have not been quantified.

Energy that would be consumed by cumulative Project-generated traffic is a function of total VMT and estimated vehicle fuel economies of vehicles accessing the Project site. Table 8 presents the estimated annual fuel consumption from cumulative project-generated traffic.

**CUMULATIVE FACILITY ENERGY DEMANDS FROM BUILDOUT OF THE SPECIFIC PLAN AMENDMENT**

Cumulative Project building operations and cumulative Project site maintenance activities would result in the consumption of natural gas and electricity. Cumulative Annual natural gas and electricity demands of the Project are summarized in Table 9.



**TABLE 8: CUMULATIVE PROJECT-GENERATED TRAFFIC ANNUAL FUEL CONSUMPTION**

Vehicle Type	Average Vehicle Fuel Economy (mpg)	Annual VMT	Estimated Annual Fuel Consumption (gallons)
LDA	32.93	3,134,037	95,173
LDT1	27.61	325,386	11,787
LDT2	26.11	1,004,436	38,471
MDV	21.08	810,043	38,421
LHDT1	13.97	154,244	11,044
LHDT2	14.12	41,135	2,914
MHDT	10.45	468,752	44,844
HHDT	6.70	1,116,413	166,671
OBUS	6.44	2,773	431
UBUS	4.72	1,260	267
MCY	37.21	147,457	3,963
SBUS	8.15	4,733	581
MH	6.02	25,158	4,176
<b>TOTAL ANNUAL FUEL CONSUMPTION</b>		<b>7,235,828</b>	<b>418,743</b>
<i>PROPOSED PROJECT ANNUAL FUEL CONSUMPTION</i>		<i>1,961,926</i>	<i>653,634</i>
<b>CUMULATIVE ANNUAL FUEL CONSUMPTION</b>		<b>9,197,754</b>	<b>1,072,376</b>

**TABLE 9: CUMULATIVE PROJECT ANNUAL OPERATIONAL NATURAL GAS AND ELECTRICITY DEMAND SUMMARY**

Land Use	Natural Gas Demand (kBTU/year)	Electricity Demand (kWh/year)
Convenience Store/Gas Station	1,012	55,844
Fast Food Restaurant with Drive-Through Window <sup>1</sup>	1,308,770	221,568
Other Asphalt Surfaces	0	0
Strip Retail Plaza	7,920	43,704
Warehouse	502,872	580,429
<b>TOTAL PROJECT ENERGY DEMAND</b>	<b>1,820,574</b>	<b>901,545</b>
<i>PROPOSED PROJECT ENERGY DEMAND</i>	<i>974,850</i>	<i>1,166,717</i>
<b>CUMULATIVE PROJECT ENERGY DEMAND</b>	<b>2,795,424</b>	<b>2,068,262</b>

<sup>1</sup> For purposes of analysis the Fast Food Restaurant with Drive-Through includes 2.4 TSF of Fast Food Restaurant with Drive-Through Window and 2.4 TSF of Coffee Shop with Drive-Through

## REFERENCES

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