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**SUBJECT: PERRIS DC 11 ENERGY TABLES**

The following Energy Tables were prepared for the proposed Perris DC 11 development (referred to as “Project”) which is located in the City of Perris.

**CONSTRUCTION POWER COSTS**

Based on the 2023 National Construction Estimator (1), the typical power cost per 1,000 square feet (sf) of building construction per month is estimated to be \$2.50. The Project is proposed Project would develop the 29.5-acre site, located in the City of Perris, with a new high-cube warehouse facility and related site improvements. The Project includes construction and operation of approximately 551,922 square feet (sf) of new building space, which would include 5,000 sf of office and mezzanine space. Table 1 estimates the total power cost of the on-site electricity usage during the construction of the proposed Project to be approximately \$37,960.86.

**TABLE 1: PROJECT CONSTRUCTION POWER COST**

Land Use	Power Cost (per 1,000 SF of construction per month)	Size (1,000 SF)	Construction Duration (months)	Project Construction Power Cost
TUMF Fulfillment Center	\$2.50	413.942	12	\$12,418.25
Cold Storage	\$2.50	137.981	12	\$4,139.42
Landscape	\$2.50	164.700	12	\$4,941.00
Parking	\$2.50	182.649	12	\$5,479.47
Other Asphalt Surfaces	\$2.50	366.091	12	\$10,982.73
<b>CONSTRUCTION POWER COST</b>				<b>\$37,960.86</b>

**CONSTRUCTION ELECTRICITY USAGE**

The SCE’s general service rate schedule were used to determine the Project’s electrical usage. As of May 31, 2023, SCE’s general service rate is \$0.13 per kilowatt hours (kWh) of electricity for industrial services (2), the total electricity usage from on-site Project construction related activities is estimated to be approximately 295,841 kWh.

**TABLE 2: PROJECT CONSTRUCTION ELECTRICITY USAGE**

Land Use	Cost per kWh	Project Construction Electricity Usage (kWh)
TUMF Fulfillment Center	\$0.13	96,779
Cold Storage	\$0.13	32,260
Landscape	\$0.13	38,507
Parking	\$0.13	42,703
Other Asphalt Surfaces	\$0.13	85,592
<b>CONSTRUCTION ELECTRICITY USAGE</b>		<b>295,841</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 46,924 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	20	Rubber Tired Dozers	367	3	8	0.40	3,523	3,809
		Crawler Tractors	87	4	8	0.43	1,197	1,294
Grading	45	Excavators	36	2	8	0.38	219	532
		Graders	148	1	8	0.41	485	1,181
		Rubber Tired Dozers	367	1	8	0.40	1,174	2,857
		Scrapers	423	2	8	0.48	3,249	7,902
		Crawler Tractors	87	2	8	0.43	599	1,456
Trenching	10	Dumpers/Tenders	16	2	8	0.38	97	53
		Excavators	36	4	8	0.38	438	237
		Plate Compactors	8	4	8	0.43	110	60
		Skid Steer Loaders	71	1	8	0.37	210	114
		Tractors/Loaders/Backhoes	84	2	8	0.37	497	269
Building Construction	200	Cranes	367	1	8	0.29	851	9,205
		Forklifts	82	3	8	0.20	394	4,255
		Generator Sets	14	1	8	0.74	83	896
		Tractors/Loaders/Backhoes	84	3	8	0.37	746	8,064
		Welders	46	1	8	0.45	166	1,790
Paving	35	Pavers	81	2	8	0.42	544	1,030
		Paving Equipment	89	2	8	0.36	513	970
		Rollers	36	2	8	0.38	219	414
Architectural Coating	70	Air Compressors	37	1	8	0.48	142	538
<b>CONSTRUCTION FUEL DEMAND (GALLONS DIESEL FUEL)</b>								<b>46,924</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 2022.1 model defaults utilized within the AQIA. Vehicle fuel efficiencies for LDAs, LDT1s, and LDT2s were estimated using information generated within the 2021 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 33,514 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)
2025	LDA						
	Site Preparation	20	9	18.5	3,330	32.49	102
	Grading	45	10	18.5	8,325	32.49	256
	Trenching	10	17	18.5	3,145	32.49	97
	Building Construction	142	116	18.5	304,732	32.49	9,379
	LDT1						
	Site Preparation	20	5	18.5	1,850	25.14	74
	Grading	45	5	18.5	4,163	25.14	166
	Trenching	10	9	18.5	1,665	25.14	66
	Building Construction	142	58	18.5	152,366	25.14	6,061
	LDT2						
	Site Preparation	20	5	18.5	1,850	25.29	73
	Grading	45	5	18.5	4,163	25.29	165
	Trenching	10	9	18.5	1,665	25.29	66
	Building Construction	142	58	18.5	152,366	25.29	6,025

**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)
2026	LDA						
	Building Construction	58	116	18.5	124,468	33.43	3,723
	Paving	35	8	18.5	5,180	33.43	155
	Architectural Coating	70	23	18.5	29,785	33.43	891
	LDT1						
	Building Construction	58	58	18.5	62,234	25.70	2,421
	Paving	35	4	18.5	2,590	25.70	101
	Architectural Coating	70	12	18.5	15,540	25.70	605
	LDT2						
	Building Construction	58	58	18.5	62,234	26.01	2,393
	Paving	35	4	18.5	2,590	26.01	100
	Architectural Coating	70	12	18.5	15,540	26.01	597
	<b>TOTAL CONSTRUCTION WORKER FUEL CONSUMPTION</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 HHDT. These assumptions are consistent with the CalEEMod 2022.1 defaults utilized within the within the AQIA. Vehicle fuel efficiencies for MHDTs and HHDTs were estimated using information generated within EMFAC2021.

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 56,799 gallons.

**TABLE 5: CONSTRUCTION VENDOR/HAULING FUEL CONSUMPTION ESTIMATES**

Year	Construction Activity	Duration (Days)	Vendor Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2025	MHD						
	Site Preparation	20	4	10.2	816	8.58	95
	Grading	45	8	10.2	3,672	8.58	428
	Trenching	10	2	10.2	204	8.58	24
	Building Construction	142	33	10.2	47,797	8.58	5,570
	HHD (Vendor)						
	Site Preparation	20	4	10.2	816	6.22	131
	Grading	45	8	10.2	3,672	6.22	591
	Trenching	10	2	10.2	204	6.22	33
	Building Construction	142	33	10.2	47,797	6.22	7,687
	HHD (Hauling)						
	Grading	45	255	20	229,500	6.22	36,911
2026	MHD						
	Building Construction	58	33	10.2	19,523	8.71	2,243
	HHD (Vendor)						
Building Construction	58	33	10.2	19,523	6.33	3,086	
<b>TOTAL CONSTRUCTION VENDOR/HAULING FUEL CONSUMPTION</b>							<b>56,799</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 during Project operations.

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

Vehicle Type	Average Vehicle Fuel Economy (mpg)	Annual VMT	Estimated Annual Fuel Consumption (gallons)
LDA	33.43	1,467,630	43,896
LDT1	25.70	112,455	4,375
LDT2	26.01	606,112	23,304
MDV	16.01	468,335	29,258
MCY	16.01	68,344	4,270
LHD1	16.89	378,736	22,419
LHD2	16.01	107,970	6,745
MHD	8.71	152,072	17,468
HHD	6.33	760,663	120,245
TRUs			22,390
<b>TOTAL (ALL VEHICLES)</b>		<b>4,122,316</b>	<b>294,370</b>

MDV = Medium Duty Trucks; LHD1 = Light-Duty Trucks (Vehicles under the LHD1 category have a GVWR of 8,501 to 10,000 lbs.); LHD2 = Light-Duty Trucks (Vehicles under the LHD2 category have a GVWR of 10,001 to 14,000 lbs. ); OBUS = Other Buses; UBUS = Urban Buses  
 MCY = Motorcycle; SBUS = School Bus; MH = Motorhome

**FACILITY ENERGY DEMANDS**

Project building operations activities would result in the consumption of electricity, which would be supplied to the Project by SCE. Annual electricity demands of the Project are summarized in Table 7.

Based on information provided by the Project Applicant, the Project would not use natural gas for the building envelope. As such, natural gas consumption has not been analyzed in this study.

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

Land Use	Electricity Demand (kWh/year)
TUMF Fulfillment Center	1,905,091
Cold Storage	3,017,566
Landscape	0
Parking	159,884
Other Asphalt Surfaces	0
<b>TOTAL PROJECT ENERGY DEMAND</b>	<b>5,082,541</b>

**STATIONARY SOURCE ENERGY DEMANDS**

Fuel consumption estimates from stationary sources are presented in Table 8. As previously stated, the aggregate fuel consumption rate for all equipment is estimated at 18.5 hp-hr-gal., obtained from CARB 2018 Emissions Factors Tables and cited fuel consumption rate factors presented in Table D-24 of the Moyer guidelines. For the purposes of this analysis, the calculations are based on a 150 hp diesel-fueled fire pump and 350 hp diesel-fueled emergency generator. Diesel fuel would be supplied by existing commercial fuel providers serving the City and region. As presented in Table 8, Project stationary sources would consume an estimated 3,608 gallons of diesel fuel.

**TABLE 8: STATIONARY SOURCE EQUIPMENT FUEL CONSUMPTION ESTIMATES**

<b>Equipment</b>	<b>HP Rating</b>	<b>Quantity</b>	<b>Usage Hours</b>	<b>Annual Hourly</b>	<b>Load Factor</b>	<b>HP-hrs/day</b>	<b>Total Fuel</b>
Fire Pump	150	1	0.5	50	0.73	55	1,080
Emergency Generator	350	1	0.5	50	0.73	128	2,527
<b><i>STATIONARY SOURCE FUEL DEMAND (GALLONS DIESEL FUEL)</i></b>							<b><i>3,608</i></b>



## REFERENCES

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