

APPENDIX E-1: ENERGY CALCULATIONS – PALMDALE DITCH CONVERSION PROJECT

Palmdale Ditch Conversion IS-MND

Last Updated: 1/31/2024

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors [1]:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529
--------------	--------	----------------------	--------

Values above are expressed in gallons per horsepower-hour/BSFC.

Construction Equipment	#	CONSTRUCTION EQUIPMENT			Construction Phase	Fuel Used (gallons)
		Hours per Day	Horsepower	Load Factor		
Signal Boards	14	8	6	0.82	Grubbing and Land Clearing	615
Crawler Tractors	1	8	87	0.43	Grubbing and Land Clearing	334
Excavators	1	8	36	0.38	Grubbing and Land Clearing	122
Excavators	3	8	36	0.38	Grading and Excavation	1,659
Graders	1	8	148	0.41	Grading and Excavation	2,207
Crawler Tractors	1	8	87	0.43	Grading and Excavation	1,512
Rollers	2	8	148	0.41	Grading and Excavation	4,413
Rubber Tired Loaders	1	8	150	0.36	Grading and Excavation	1,964
Scrapers	2	8	6	0.82	Grading and Excavation	398
Signal Boards	14	8	6	0.82	Grading and Excavation	2,785
Tractors/Loaders/Backhoes	2	8	84	0.37	Grading and Excavation	2,513
Bore/Drill Rigs	1	8	83	0.5	Grading and Excavation	1,678
Signal Boards	14	8	6	0.82	Sub-Grade	1,846
Tractors/Loaders/Backhoes	0	8	97	0.37	Sub-Grade	0
Scrapers	1	6	367	0.48	Sub-Grade	3,185
Rough Terrain Forklifts	1	8	96	0.4	Sub-Grade	1,029
Plate Compactors	1	8	8	0.43	Sub-Grade	92
Pumps	1	8	11	0.74	Sub-Grade	218
Air Compressors	1	8	37	0.48	Sub-Grade	476
Graders	1	8	148	0.41	Sub-Grade	1,463
Generator Sets	1	8	14	0.74	Sub-Grade	278
Bore/Drill Rigs	1	8	83	0.5	Sub-Grade	1,112
Rollers	3	8	36	0.38	Paving Phase	560
Pavers	1	8	81	0.42	Paving Phase	464
Paving Equipment	1	8	6	0.82	Paving Phase	67
Signal Boards	14	8	6	0.82	Paving Phase	939
Tractors/Loaders/Backhoes	2	8	84	0.37	Paving Phase	847
Total Fuel Used						32,776
						(Gallons)

Construction Phase	Days of Operation
Grubbing and Land Clearing	19
Grading and Excavation	86
Sub-Grade	57
Paving Phase	29
Total Days	191

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Grubbing and Land Clearing	24.1	40	18.5	583.40
Grading and Excavation	24.1	67.5	18.5	4456.12
Sub-Grade	24.1	62.5	18.5	2734.70
Paving Phase	24.1	53	18.5	1168.72
Fuel				8,942.95

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Grubbing and Land Clearing	7.5	0	0.0	0.00
Grading and Excavation	7.5	104	20.0	277.33
Sub-Grade	7.5	0	0.0	0.00
Paving Phase	7.5	0	0.0	0.00
Fuel				277.33
VENDOR TRIPS				
Grubbing and Land Clearing	7.5	0	0.0	0.00
Grading and Excavation	7.5	1	10.2	116.96
Sub-Grade	7.5	0	0.0	0.00
Paving Phase	7.5	0	0.0	0.00
Fuel				116.96

Total Gasoline Consumption (gallons)	8,943
Total Diesel Consumption (gallons)	33,170

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2*. September. Available at: <https://www.epa.gov/system/files/documents/2021-08/420r21021.pdf>.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics*. Available at: <https://www.bts.gov/topics/national-transportation-statistics>.

APPENDIX E-2: ENERGY CALCULATIONS – GROUNDWATER WELL REPLACEMENT

PWD SWRP Update PEIR
Estimated Fuel Consumption - Well Replacement Construction

Construction Phase	MTCO2e/year (from CalEEMod)	kg CO2/year	kg CO2 / gallon	gallons - diesel	gallons - gasoline
Site preparation and mobilization	36.17	36170		3,167	350
Off-Road Equipment	17.30	17300	10.45	1,656	
Dust From Material Movement	0.00	0			
Onsite truck	0.00	0	10.45		
Worker	0.68	680	8.78		77
Vendor	2.39	2390	8.78		272
Hauling	15.80	15800	10.45	1,512	
Site grading	7.07	7070		641	42
Off-Road Equipment	6.70	6700	10.45	641	
Dust From Material Movement	0.00	0			
Onsite truck	0.00	0	10.45		
Worker	0.37	370	8.78		42
Vendor	0.00	0	8.78		
Hauling	0.00	0	10.45		
Well drilling (test, then production)	151.59	151590		14,034	562
Off-Road Equipment	141.00	141000	10.45	13,493	
Onsite truck	0.00	0	10.45		
Worker	4.93	4930	8.78		562
Vendor	0.00	0	8.78		
Hauling	5.66	5660	10.45	542	
Construction and equipping of test well, then production well, also larger treatment	243.10	243100		20,670	3,087
Off-Road Equipment	216.00	216000	10.45	20,670	
Onsite truck	0.00	0	10.45		
Worker	13.30	13300	8.78		1,515
Vendor	13.80	13800	8.78		1,572
Hauling	0.00	0	10.45		
Site restoration and paving	14.27	14270		1,248	140
Off-Road Equipment	5.66	5660	10.45	542	
Paving	0.00	0	10.45		
Onsite truck	0.00	0	10.45	-	
Worker	0.95	950	8.78		108
Vendor	0.28	280	8.78		32
Hauling	7.38	7380	10.45	706	
Architectural coating and striping	1.84	1840		99	92
Off-Road Equipment	1.03	1030	10.45	99	
Architectural Coatings	0.00	0	10.45		
Onsite truck	0.00	0	10.45		
Worker	0.81	810	8.78		92
Vendor	0.00	0	8.78		
Hauling	0.00	0	10.45		
Demolition of existing well and building	13.78	13780		1,228	108
Off-Road Equipment	11.60	11600	10.45	1,110	
Demolition	0.00	0	10.45		
Onsite truck	0.00	0	10.45		
Worker	0.95	950	8.78		108
Vendor	0.00	0	8.78		
Hauling	1.23	1230	10.45	118	
				41,087	4,380