

## **Appendix F: Energy/Fuel Use**

**CONSTRUCTION ON-ROAD TRANSPORTATION and MOBILE SOURCE FUEL USE**

Defaults from CalEEMod

**Demolition**

Trip Type	# One way trips/day	trip length (miles/one way trip)	vehicle class	work days/phase	miles/phase	Fuel Use (1000 gal/phase)
Worker	15	11.7	LDA,LDT1,LDT2	20	3510	9.23E-02
Vendor	0	8.4	HHDT,MHDT	20	0	
Hauling	0	20	HHDT	20	0	
Onsite Truck	0	0	HHDT	20	0	

**Site Preparation**

Trip Type	# One way trips/day	trip length (miles/one way trip)	vehicle class	work days/phase	miles/phase	Fuel Use (1000 gal/phase)
Worker	10	11.7	LDA,LDT1,LDT2	10	1170	3.08E-02
Vendor	0	8.4	HHDT,MHDT	10	0	
Hauling	0	20	HHDT	10	0	
Onsite Truck	0	0	HHDT	10	0	

**Grading**

Trip Type	# One way trips/day	trip length (miles/one way trip)	vehicle class	work days/phase	miles/phase	Fuel Use (1000 gal/phase)
Worker	35	11.7	LDA,LDT1,LDT2	30	12285	3.23E-01
Vendor	0	8.4	HHDT,MHDT	30	0	
Hauling	0	20	HHDT	30	0	
Onsite Truck	0	0	HHDT	30	0	

**Building Construction**

Trip Type	# One way trips/day	trip length (miles/one way trip)	vehicle class	work days/phase	miles/phase	Fuel Use (1000 gal/phase)
Worker	249	11.7	LDA,LDT1,LDT2	300	873990	2.30E+01
Vendor	97	8.4	HHDT,MHDT	300	244440	4.09E+01
Hauling	0	20	HHDT	300	0	
Onsite Truck	0	0	HHDT	300	0	

**Paving**

Trip Type	# One way trips/day	trip length (miles/one way trip)	vehicle class	work days/phase	miles/phase	Fuel Use (1000 gal/phase)
Worker	68	11.7	LDA,LDT1,LDT2	20	15912	4.18E-01
Vendor	0	8.4	HHDT,MHDT	20	0	
Hauling	0	20	HHDT	20	0	
Onsite Truck	0	0	HHDT	20	0	

**Architectural Coating**

Trip Type	# One way trips/day	trip length (miles/one way trip)	vehicle class	work days/phase	miles/phase	Fuel Use (1000 gal/phase)
Worker	50	11.7	LDA,LDT1,LDT2	20	11700	3.08E-01
Vendor	0	8.4	HHDT,MHDT	20	0	
Hauling	0	20	HHDT	20	0	
Onsite Truck	0	0	HHDT	20	0	

Total Fuel Use (1000 gal/construction duration) = 6.51E+01

Total Fuel Use (gallons) = 65,102

**CONSTRUCTION OFF-ROAD FUELS USE**

Month-->>	H Cycle Estimated horsepower	Fuel Usage (gal/mo)		
		0	1	Fuel Usage (gal/mo)
<b>Construction Equipment &amp; Lifting Equipment</b>				
Crane 280 Ton	650			
Crane 180 Ton	489			
Crane 80 Ton	300		1	21.32196162
Crane 50 Ton	260			
Crane 20 Ton	110		1	7.818052594
Forklift ,5 Ton	84		2	11.94029851
<b>Earthmoving &amp; Concrete</b>				
Excavator , 1.5. CY (49,000	150		2	21.32196162
Loader/Backhoe (60-90 HP	75		1	5.330490405
Payloader 2 CY	125			
Bobcat Payloader	85			
Grader 12E (CAT 140/150	200			
Roller Compactor 5 T (84"	46			
Roller /Compactor 1 Ton (	14			
Concrete Pump	60		1	4.264392324
Bucket 1 CY	75			
Piledriver	335			
<b>Trucks -Heavy Duty</b>				
Truck Dump 12 CY	350			
Truck Flatbed w/ Hydraulic	350			
Truck Stakebed 5 Ton	400		1	28.42928216
Truck Water, 4000 G	330		1	23.45415778
Truck Lube and Fuel Comb	330		1	23.45415778
<b>Trucks- Light Duty /Bus</b>				
Pickup 1/2 Ton	400		3	85.28784648
SUV Medium	300		2	42.64392324
UTV 4WD DSL 4SEAT ROPS	32			
<b>Manlifts</b>				
Manlifts 45 FT	50			
Scissor Lift 45 FT	electric			
<b>Site prep equipment</b>				
330 CAT Excavator with Pu	275	0.75	14.66	
336 CAT Excavator with Pu	302	0.75	16.10	
374 CAT Excavator with Bu	485	0.75	25.85	
S330 Bobcat Skid Steer Lo	85	0.75	4.53	
Total gal/mo		61.14		275.27







Fuel Usage (gal/mo)		Fuel Usage (gal/mo)		Total Fuel Usage (gallons)
14		15		
				323
				973
1	21.3219616	1	21.3219616	1,087
				1,552
				391
2	11.9402985	2	11.9402985	251
				0
				235
				59
				98
				66
				14
				10
				19
				81
				96
				48
				0
				274
1	24.8756219			323
2	56.8585643	1	28.4292822	1,933
				281
				305
				0
3	85.2878465	3	85.2878465	1,933
1	21.3219616	1	21.3219616	597
4	9.09737029	4	9.09737029	202
				0
5	17.7683014	5	17.7683014	249
2		2		0
				0
				15
				16
				26
				5
248.47		195.17		11,462

**FUEL USE CALCULATIONS - OPERATIONS NATURAL GAS for STATIONARY SOURCES**

**Boiler NG usage**

from emission calcs spreadsheet:

Type of Fuel used:	Natural Gas and PSA Offgas	Normal Operation [Includes Natural Gas Combustion in SRM and Refining Chamber Burners]	Startup/ Shutdown
Max heat input by fuel type	Natural gas	40.00 MMBtu/hr	60.00 MMBtu/hr
	PSA Offgas	20.00 MMBtu/hr	0.00 MMBtu/hr
	Combined NG + PSA Offgas	60.00 MMBtu/hr	

Operation Schedule	Normal Operation of OMNI Unit	Startup/ Shutdown of OMNI Unit
Daily	24.0 hrs/day	24.0 hrs/day
Annual	8,200 hrs/year	272.0 hrs/year

<b>Total boiler ng usage for normal operation =</b>	<b>328000 MMBtu/yr</b>
<b>Total boiler ng usage for su/sd =</b>	<b>16320 MMBtu/yr</b>
<b>TOTAL =</b>	<b>344320 MMBtu/yr</b>

**SRM NG Combustion**

Type of Fuel used: Natural gas	Normal Operation	Startup/ Shutdown
Max Heat input for SRM burners	5.00 MMBtu/hr	14.97 MMBtu/hr
Max Heat input for refiner burners	0.00 MMBtu/hr	25.32 MMBtu/hr

Operation Schedule	Heat-up Stack SU	Heat-up Stack SD	Flare SU	Flare SD
Hours per event	48.0 hrs/event	2.0 hrs/event	10.0 hrs/event	8.0 hrs/event
SU/SD Annual	192 hrs/year	8 hrs/year	40 hrs/year	32 hrs/year
Number of SU/SD Events	4 events/year	4 events/year	4 events/year	4 events/year

ng usagefor normal operation =	41000 MMBtu/yr
ng usage for su =	9347.28 MMBtu/yr
ng usage for sd =	1611.6 MMBtu/yr
<b>TOTAL =</b>	<b>51959 MMBtu/yr</b>

**Flare Pilot NG**

Pilot fuel heat input (MMBtu/hr)	<b>0.773</b>
<b>NG usage for flare pilot =</b>	<b>6773 MMBtu/yr</b>

<b>NATURAL GAS ANNUAL USE TOTAL =</b>	<b>403,052 MMBtu/yr</b>
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**OPERATIONS TRANSPORTATION RELATED FUEL USE**

Category	Description	Classification	Fuel Type	# motor vehicle round trips/yr	round trip miles	miles/yr	Total VMT (miles/day)	Fuel Consumption (1000 gal/day)	Fuel Usage (1000 gal/yr)
MV1	Motor vehicle (truck) deliveries of feedstock	Avg T7Class8	Diesel	11096	0	0	4.92E+04	8.11E+00	0.00E+00
MV2	Motor vehicle (truck) returns of screened feedstock	Avg T7Class8	Diesel	2600	100	260000	4.92E+04	8.11E+00	4.29E+01
MV3	Motor vehicle (truck) shipments of product hydrogen	Avg T7Class8	Diesel	14600	100	1460000	4.92E+04	8.11E+00	2.41E+02
MV4	Motor vehicle (truck) shipments of outbound refuse, slag, backup oxygen, water treatment chemicals, liquid fertilizer byproduct, spare and replacement parts and other consumables or disposal materials	Avg T7Class8	Diesel	3650	100	365000	4.92E+04	8.11E+00	6.02E+01
MV6	Off-road equipment (e.g.; front end loaders)	Avg T7Class8	Diesel	18,700	0.019	355.3	4.92E+04	8.11E+00	5.86E-02
MV7	Pickup trucks-g	T7IS	Gasoline	2438	0.5	1219	6.88E+01	1.57E-02	2.78E-01
MV8	Pickup trucks-d	Avg T7Class8	Diesel	2438	0.5	1219	4.92E+04	8.11E+00	2.01E-01
MV9	Worker motor vehicle commute trips	LDA	Gasoline	25	1000	25000	1.28E+07	4.07E+02	2.76E+02
<b>2,112,793</b>								Diesel Total =	<b>344,237</b>
								Gasoline Total =	<b>276,424</b>
								Combined Total =	<b>620,661</b>