

## Energy Usage and Fuel Calculations



**Table B4-1: Proposed Project (Mitigated) Construction Energy Consumption**

Category	Year	Fuel	GHG Emissions (Metric Tons)	Fuel Consumed (Gallons)
Off-road Construction Equipment	2018	Diesel	169.79	16,711
Marine Sources / Equipment	2018	Diesel	38.63	3,802
On-road Construction Vehicles	2018	Diesel	31.04	3,055
Worker Vehicles	2018	Gasoline	44.45	5,000
Off-road Construction Equipment	2019	Diesel	382.81	37,677
Marine Sources / Equipment	2019	Diesel	453.77	44,660
On-road Construction Vehicles	2019	Diesel	171.27	16,857
Worker Vehicles	2019	Gasoline	50.17	5,643
Off-road Construction Equipment	2020	Diesel	309.39	30,451
Marine Sources / Equipment	2020	Diesel	294.40	28,975
On-road Construction Vehicles	2020	Diesel	64.98	6,396
Worker Vehicles	2020	Gasoline	29.53	3,321
Off-road Construction Equipment	2021	Diesel	207.21	20,393
Marine Sources / Equipment	2021	Diesel	219.43	21,596
On-road Construction Vehicles	2021	Diesel	142.52	14,027
Worker Vehicles	2021	Gasoline	19.97	2,246
Off-road Construction Equipment	2022	Diesel	79.20	7,795
Marine Sources / Equipment <sup>1</sup>	2022	Diesel	124.07	12,211
On-road Construction Vehicles	2022	Diesel	13.30	1,309
Worker Vehicles	2022	Gasoline	10.61	1,193
Off-road Construction Equipment	2023	Diesel	35.86	3,530
Marine Sources / Equipment	2023	Diesel	0.00	0
On-road Construction Vehicles	2023	Diesel	2.16	212
Worker Vehicles	2023	Gasoline	0.00	0
<b>Total Construction - Diesel</b>	<b>ALL</b>	<b>Diesel</b>	-	269,655
<b>Total Construction - Gasoline</b>	<b>ALL</b>	<b>Gasoline</b>	-	17,403

Notes:

- Marine sources/equipment include barges, tugboats and work boats (harbor craft).
- Emissions are calculated as far as the California state boundary.
- Figures are for the proposed Project with all construction mitigation measures.

**Table B4-2: Mitigated Operational Energy Consumption**

Operational Category	Year	Fuel Type	Fuel Consumed (gal/yr) mitigated	Terminal Throughput (bbls)	Gallons of Fuel Consumed During the Project per bbls of Throughput
Trucks Delivering Propane*	2011-2015 (Baseline)	Diesel	0	13,251,089	
Loading (VDU)*		Propane	0		
Ships – Transit and Anchorage		Diesel	829,939		
Ships – Hoteling		Diesel	245,515		
Tugs		Diesel	28,344		
Vessel Fuel Usage Total		Diesel	1,103,798		0.0832
Trucks Delivering Propane	2019	Diesel	2,555	14,343,405	0.000179
Loading (VDU)		Propane	73,961		0.0051
Ships – Transit and Anchorage		Diesel	891,360		
Ships – Hoteling		Diesel	261,542		
Tugs		Diesel	30,416		
Vessel Fuel Usage Total		Diesel	1,198,193		0.0825
Trucks Delivering Propane	2031	Diesel	2,555	18,190,906	0.000130
Loading (VDU)		Propane	73,961		0.0040
Ships – Transit and Anchorage		Diesel	1,153,017		
Ships – Hoteling		Diesel	525,243		
Tugs		Diesel	48,129		
Vessel Fuel Usage Total		Diesel	1,741,264		0.0878
Trucks Delivering Propane	2048	Diesel	2,555	25,471,660	0.00010
Loading (VDU)		Propane	73,961		0.00290
Ships – Transit and Anchorage		Diesel	1,622,041		
Ships – Hoteling		Diesel	738,901		
Tugs		Diesel	67,707		
Vessel Fuel Usage Total		Diesel	2,443,524		0.095

Notes: \* Not used in the Baseline scenario.

- Compliance with the Vessel Speed Reduction Program (VSRP) mitigation measure results in slightly less fuel usage during transit.

**Table B4-3: Operational Fuel Consumption Minus Baseline Compared with Total Fuel Use for California and USA**

Source	Project Fuel Use (MM gal/yr)	California Fuel Use (MM gal/yr)	Project Use as % of California Fuel Use	USA Fuel Use (MM gal/yr)	Project Use as % of USA Fuel Use
<b>2011-2015 Baseline</b>					
Ships Transit and Anchoring Diesel	0.83				
Ships Hoteling Diesel	0.25				
Tugs Diesel	0.03				
Loading Diesel	-				
Loading Gasoline	-				
Loading Propane	-				
<b>Total Diesel</b>	<b>1.10</b>	4,126.46	0.027%	61,247.33	0.0018%
<b>Total Gasoline</b>	<b>-</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane</b>	<b>-</b>	580.83	0.000%	37,623.02	0.0000%
<b>2019</b>					
Ships Transit and Anchoring Diesel	0.89				
Ships Hoteling Diesel	0.26				
Tugs Diesel	0.03				
Loading Diesel	0.02				
Loading Gasoline	0.00				
Loading Propane	0.07				
Total Diesel	1.20				
Total Gasoline	0.00				
Total Propane	0.07				
<b>Total Diesel Minus Baseline</b>	<b>0.10</b>	4,126.46	0.002%	61,247.33	0.0002%
<b>Total Gasoline Minus Baseline</b>	<b>0.00</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane Minus Baseline</b>	<b>0.07</b>	580.83	0.013%	37,623.02	0.0002%
<b>2019 Mitigated</b>					
Ships Transit and Anchoring Diesel	0.89				
Ships Hoteling Diesel	0.26				
Tugs Diesel	0.03				
Loading Diesel	0.02				
Loading Gasoline	0.00				
Loading Propane	0.07				
Total Diesel	1.20				
Total Gasoline	0.00				
Total Propane	0.07				
<b>Total Diesel Minus Baseline</b>	<b>0.10</b>	4,126.46	0.002%	61,247.33	0.0002%

<b>Total Gasoline Minus Baseline</b>	<b>0.00</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane Minus Baseline</b>	<b>0.07</b>	580.83	0.013%	37,623.02	0.0002%
<b>2031</b>					
Ships Transit and Anchoring Diesel	1.15				
Ships Hoteling Diesel	0.53				
Tugs Diesel	0.05				
Loading Diesel	0.02				
Loading Gasoline	0.00				
Loading Propane	0.09				
Total Diesel	1.74				
Total Gasoline	0.00				
Total Propane	0.09				
<b>Total Diesel Minus Baseline</b>	<b>0.64</b>	4,126.46	0.016%	61,247.33	0.0010%
<b>Total Gasoline Minus Baseline</b>	<b>0.00</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane Minus Baseline</b>	<b>0.07</b>	580.83	0.013%	37,623.02	0.0002%
<b>2031 Mitigated</b>					
Ships Transit and Anchoring Diesel	1.15				
Ships Hoteling Diesel	0.53				
Tugs Diesel	0.05				
Loading Diesel	0.02				
Loading Gasoline	0.00				
Loading Propane	0.09				
Total Diesel	1.74				
Total Gasoline	0.00				
Total Propane	0.09				
<b>Total Diesel Minus Baseline</b>	<b>0.64</b>	4,126.46	0.016%	61,247.33	0.0010%
<b>Total Gasoline Minus Baseline</b>	<b>0.00</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane Minus Baseline</b>	<b>0.07</b>	580.83	0.013%	37,623.02	0.0002%
<b>2048</b>					
Ships Transit and Anchoring Diesel	1.62				
Ships Hoteling Diesel	0.74				
Tugs Diesel	0.07				
Loading Diesel	0.02				
Loading Gasoline	0.00				
Loading Propane	0.13				
Total Diesel	2.45				
Total Gasoline	0.00				
Total Propane	0.13				

<b>Total Diesel Minus Baseline</b>	<b>1.34</b>	4,126.46	0.033%	61,247.33	0.0022%
<b>Total Gasoline Minus Baseline</b>	<b>0.00</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane Minus Baseline</b>	<b>0.07</b>	580.83	0.013%	37,623.02	0.0002%
<b>2048 Mitigated</b>					
Ships Transit and Anchoring Diesel	1.62				
Ships Hoteling Diesel	0.74				
Tugs Diesel	0.07				
Loading Diesel	0.02				
Loading Gasoline	0.00				
Loading Propane	0.13				
Total Diesel	2.45				
Total Gasoline	0.00				
Total Propane	0.13				
<b>Total Diesel Minus Baseline</b>	<b>1.34</b>	4,126.46	0.033%	61,247.33	0.0022%
<b>Total Gasoline Minus Baseline</b>	<b>0.00</b>	13,983.68	0.000%	131,133.79	0.0000%
<b>Total Propane Minus Baseline</b>	<b>0.07</b>	580.83	0.013%	37,623.02	0.0002%

Notes:

California and USA fuel use from US Energy Information Administration Primary Energy Consumption Estimates, 2015 ([https://www.eia.gov/state/seds/sep\\_sum/html/pdf/sum\\_btu\\_totcb.pdf](https://www.eia.gov/state/seds/sep_sum/html/pdf/sum_btu_totcb.pdf))

