

Appendix B

Air Quality and Greenhouse Gases Supporting Information

Appendix B – Air Quality and Greenhouse Gases Supporting Information

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Appendix B.1

Operational and Construction Emissions Calculations

ExxonMobil Interium Trucking for SYU Phased Restart

Table B-1 Combined Mobile, Stationary, and Indirect Source Summary

	Scenario 1: Phillips 66 Santa Maria Truck Rack	Scenario 2: Plains Pentland Truck Rack
NOx: Daily Significance Threshold Exceeded? (Threshold - 55 lb NOx/day)	No	No
NOx: Daily Mobile Significance Threshold Exceeded? (Threshold - 25 lb NOx/day)	No	Yes
NOx: Daily Stationary Source Emissions (NOx lb/day)	0	0
NOx: Daily Mobile Source Emissions (NOx lb/day)	21.23	51.16
NOx: Daily Stationary + Mobile Source Emissions (NOx lb/day)	21.23	51.16
ROC: Daily Significance Threshold Exceeded? (Threshold - 55 lb ROC/day)	No	No
ROC: Daily Stationary Source Emissions (ROC lb/day)	43.36	43.36
ROC: Daily Mobile Source Emissions (ROC lb/day)	0.53	1.15
ROC: Daily Stationary + Mobile Source Emissions (ROC lb/day)	43.89	44.51
PM: Daily Significance Threshold Exceeded? (Threshold - 80 lb PM/day)	No	No
PM: Daily Stationary Source Emissions (PM lb/day)	0.00	0.00
PM: Daily Mobile Source Emissions (PM lb/day)	13.88	46.22
PM: Daily Stationary + Mobile Source Emissions (PM lb/day)	13.88	46.22
GHG: Annual GHG Significance Threshold Exceeded? (Threshold 1,000 MT CO ₂ e/year)	Yes	Yes
GHG: Annual Stationary Source Emissions (MT CO₂e/year)	69	69
GHG: Annual Indirect Source Emissions (MT CO₂e/year)	347	347
GHG: Annual Mobile Source Emissions (MT CO₂e/year)	3,537	8,875
GHG: Annual Stationary, Mobile Source, and Indirect Emissions (MT CO₂e/year)	3,953	9,291

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-2 Mobile Source to Santa Maria

Daily Emissions - Scenario 1															
Destination	Road Type	Number of Vehicles	Round Trips per Day	Trip Length Round Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	25	70	98.8	6,916	0.30	17.23	9.79	1.61	3.26	0.18	18,845.57	0.01	2.96	19,729
Travel Within Santa Barbara County - Collector Road	Collector	25	70	8.00	560	0.12	2.52	1.56	0.25	1.67	0.02	1,753.00	0.01	0.28	1,835
Travel Within Santa Barbara County - Local Road	Local	25	70	1.6	112	0.11	1.48	2.52	0.38	1.56	0.01	548.24	0.00	0.09	574
Total			70	108.4	7,588										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.5	21.2	13.9	2.2	6.5	0.2	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination	Road Type	Number of Vehicles	Round Trips per Day	Trip Length Round Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons/Yr)						GHG Emissions (Metric Tons/Yr)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	25	25,550	98.8	2,524,340	0.04	2.92	1.79	0.29	0.32	0.03	3,079.29	0.00	0.48	3,224
Travel Within Santa Barbara County - Collector road	Collector	25	25,550	8	204,400	0.00	0.24	0.29	0.04	0.03	0.00	249.44	0.00	0.04	261.1
Travel Within Santa Barbara County - Local Road	Local	25	25,550	1.6	40,880	0.00	0.05	0.46	0.07	0.01	0.00	49.98	0.00	0.01	52.3
Total			25,550	108.4	2,769,620	0.04	3.21	2.53	0.41	0.35	0.04	3,379	0	1	3,537
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									3,537.0
Significance Threshold:						(Not Applicable)									
SB County Planning												1,000			
SBC APCD												10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
				Truck Capacity (bbl/truck)	Crude Transported (bbl/year)										
Potential Maximum Volume Crude Transported to Markets:				160	4,088,000										

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-2 Mobile Source to Santa Maria

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).														
Emission Factors														
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	
Running Exhaust	Freeway			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust	Major			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust	Collector			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust	Local			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):										
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}	
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt			
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile	
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04	
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04	
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04	
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03	
Average vehicle weight				CalTrans WIM Data	W	27	tons			
Paved Road Dust Entrainment										$Ef = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 54.3 miles from the ExxonMobil Las Flores Canyon facility to the Phillips 66 Santa Maria truck rack located at 1580 East Battles Road in Santa Maria.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM₁₀ and PM_{2.5} factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size of 25 is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound)
 - 1,000 kilograms/metric ton

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-3 Mobile Source to Pentland

Daily Emissions - Scenario 2																	
Destination	Road Type	Number of Vehicles	Round Trips per Day	Trip Length Round Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)					
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e		
Plains Pentland Truck Rack:																	
Travel Within Santa Barbara County - Freeway	Freeway	29	68	108.8	7,398	0.33	18.54	10.47	1.73	3.63	0.19	20,182	0.02	3.17	21,128		
Travel Within Santa Barbara County - Collector Road	Collector	29	68	7.4	503	0.13	2.58	1.41	0.22	1.90	0.02	1,640	0.01	0.26	1,717		
Travel Within Santa Barbara County - Local Road	Local	29	68	1.6	109	0.12	1.67	2.45	0.37	1.80	0.01	579	0.01	0.09	606		
Travel Outside Santa Barbara County - Major road	Major	29	68	161.4	10,975	0.44	26.82	30.66	4.83	4.52	0.28	29,801	0.02	4.68	31,198		
Travel Outside Santa Barbara County - Local Road	Local	29	68	0.8	54	0.12	1.55	1.23	0.19	1.79	0.00	433	0.01	0.07	453		
Total			68	280	19,040												
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties (Max - Worst Case)						1.15	51.16	46.22	7.34	13.65	0.50	(Not Applicable)					
Significance Thresholds:																	
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)					
SBC APCD						25	25	N/A	N/A	N/A	N/A						
Significant?						No	Yes	No	N/A	N/A	N/A	(Not Applicable)					
Annual Emissions																	
Destination		Number of Vehicles	Round Trips per Day	Trip Length Round Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons)						GHG Emissions (Metric Tons)					
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e		
Plains Pentland Truck Rack:																	
Travel Within Santa Barbara County - Freeway	Freeway	29	24,820	108.8	2,700,416	0.04	3.12	1.91	0.32	0.34	0.03	3,294.09	0.00	0.52	3,448.4		
Travel Within Santa Barbara County - Local Road	Collector	29	24,820	7.4	183,668	0.00	0.21	0.26	0.04	0.02	0.00	224.17	0.00	0.04	234.7		
Travel Within Santa Barbara County - Collector road	Local	29	24,820	1.6	39,712	0.00	0.05	0.45	0.07	0.01	0.00	48.57	0.00	0.01	50.8		
Travel Outside Santa Barbara County - Major road	Major	29	24,820	161.4	4,005,948	0.06	4.64	5.60	0.88	0.50	0.05	4,886.57	0.00	0.77	5,115.5		
Travel Outside Santa Barbara County - Local Road	Local	29	24,820	0.8	19,856	0.00	0.02	0.22	0.03	0.00	0.00	24.35	0.00	0.00	25.5		
Total			24,820	280	6,949,600	0.10	8.04	8.43	1.34	0.87	0.09	8,477.74	0.00	1.33	8,874.96		
Greenhouse Gas Impacts - Total Travel Distance (Max - Worst Case)												(Not Applicable)					8,875.0
Significance Threshold:						(Not Applicable)											
SB County Planning												1,000					
SBC APCD												10,000					
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes		
			Truck Capacity (bbl/truck)	Crude Transported (bbl/year)													
Potential Maximum Volume Crude Transported to Markets:					160	3,971,200											

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-3 Mobile Source to Pentland

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
					Emission Factors								
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O
Running Exhaust	Freeway			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Major			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Collector			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Local			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):									
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight				CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment									

Notes:

- Trip distances assume:
 - 140 total miles (within Santa Barbara, San Luis Obispo, and Kern Counties) from the ExxonMobil Las Flores Canyon facility to the Plains Pentland truck rack located at 2311 Basic School Road in Maricopa.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size of 29 is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound
 - 1,000 kilograms/metric ton

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-4 Mobile Source to Pentland by County

Daily Emissions - Scenario 2																
Destination	Road Type	Number of Vehicles	Round Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)				
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e	DPM
Plains Pentland Truck Rack:																
Santa Barbara County-Hwy 101	Freeway	29	68	108.8	7,398	0.33	18.54	10.47	1.73	3.63	0.19	20,182.37	0.02	3.17	21,128.1	0.19
Santa Barbara County-Hwy 166	Major	0	68	60.2	4,094	0.12	9.47	11.44	1.80	1.03	0.10	11,008.52	0.01	1.73	11,524.3	0.11
Santa Barbara County-Calle Real	Local	29	68	1.6	109	0.12	1.67	2.45	0.37	1.80	0.01	579.16	0.01	0.09	606.4	0.00
Santa Barbara County-SYU Rds	Collector	29	68	7.4	503	0.13	2.58	1.41	0.22	1.90	0.02	1,639.78	0.01	0.26	1,716.7	0.01
SLO County-Hwy 166	Major	15	68	77.4	5,263	0.21	12.89	14.70	2.32	2.21	0.14	14,297.10	0.01	2.25	14,967.0	0.14
Kern County-Hwy 166	Major	15	68	23.8	1,618	0.11	4.45	4.52	0.71	1.29	0.04	4,495.49	0.00	0.71	4,706.2	0.04
Kern County-Access to Pentland	Local	29	68	0.8	54	0.12	1.55	1.23	0.19	1.79	0.00	432.87	0.01	0.07	453.3	0.00
Total Travel Distance		29	68	280	19,040											
San Luis Obispo DPM																0.14
Kern County Totals						0.23	6.00	5.75	0.90	3.08	0.05					
Santa Barbara County Totals						0.71	32.27	25.76	4.12	8.36	0.32					
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						1.15	51.16	46.22	7.34	13.65	0.50	(Not Applicable)				

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-5 Stationary and Indirect Sources

Emission Source	Reactive Organic Compounds			
	lb/hr	lb/day	TPQ	Total Emissions (Tons/Yr)
SUMMARY				
Fugitive Hydrocarbon Components	0.334	8.014	0.366	1.462
Crude Loading Activity - VRU	4.039	35.343	1.613	6.450
Total Increase:	4.373	43.357	1.978	7.913

GHG - CO ₂ e			
lb/hr	lb/day	TPQ	Total Emissions (Metric Tons/Yr)
12.593	302.222	12.509	50.036
13.122	114.815	4.752	19.009
25.714	417.037	17.261	69.045

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

Emission Source	lb/hr					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		0.33				
Crude Loading Activity		4.04				
Total Increase:	0.00	4.37	0.00	0.00	0.00	0.00

lb/hr
GHG - CO ₂ e
12.59
13.12
0.00
25.71

Emission Source	lb/day					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		8.01				
Crude Loading Activity		35.34				
Total Increase:	0.00	43.36	0.00	0.00	0.00	0.00

lb/day
GHG - CO ₂ e
302.22
114.81
0.00
417.04

Emission Source	TPQ					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		0.37				
Crude Loading Activity		1.61				
Total Increase:	0.00	1.98	0.00	0.00	0.00	0.00

TPQ
GHG - CO ₂ e
12.51
4.75
0.00
17.26

Emission Source	Total Tons/Yr					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		1.46				
Crude Loading Activity - VRU		6.45				
Total Increase:	0.00	7.91	0.00	0.00	0.00	0.00

Total Tons/Yr
GHG - CO ₂ e
50.04
19.01
0.00
69.04

Emission Offset Evaluation	TPQ					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Total Emissions to Offset:	0.000	1.98				
Total ERCs Required at a 1.3:1 ratio (TPQ):	0.000	2.57				

ROC- TPY
10.29

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

⁴ Source of Emission Reduction Credits will be determined during the course of the permit application review and approval. Offset ratio per APCD Rule 804 Section D.8.

Indirect GHG Emissions from Electrical Use

Loading Rack Electrical Use (MW-hr/day)
Electric Power CO₂e factor(CO₂e lb/MWH)
Tons per Year CO₂e

³ Data from ExxonMobil
704.6 CalEEMod Value for SCE Power
347.17

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-6 Loading Rack Emissions

Product Loading Activity Emission Calculations					
	Scenario 1 and 2 ExxonMobil Production Exxon - SYU, Las Flores Canyon	Reference:	Loading Rack		
		Rack Type:	Enter X as Appropriate	S Factor	
			Submerged loading of a clean cargo tank		0.50
			Submerged loading: Dedicated normal service	X	0.60
			Submerged loading: Dedicated vapor balance service		1.00
			Splash loading of a clean cargo tank		1.45
			Splash loading: Dedicated normal service		1.45
			Splash loading: Dedicated vapor balance service		1.00
Input data			Reference		
S = Saturation Factor	0.60	See AP-42 Table 4.4-1			2
M = Molecular Weight	50	Crude Oil: Default = 50 lb/lb-mole			3
P = True Vapor Pressure (psia)	2.680	See AP-42 Table 12.3-5			1
T = Liquid Temperature °R	590	130 °F + 460 = °R			5
C = Storage Capacity (bbl)	4,088,000	171,696,000 gallons (42 gallons = 1 bbl)			1
A = Annual Production (bbl)	4,088,000	171,696,000 gallons (42 gallons = 1 bbl)			1
R = Max Loading Rate (bbl/hr)	1280.00	53,760 gallons (42 gallons = 1 bbl)			1
D = Max Daily Production (bbl)	11,200	470,400 gallons (42 gallons = 1 bbl)			
D2 = Average Daily Production (bbl)	11,200	470,400 gallons (42 gallons = 1 bbl)			
eff = Vapor Recovery Efficiency	0.95	Default = 0.95 (SBC APCD)			1
ROC/THC = Reactivity	0.885	Crude Oil: Default = 0.885			
$L_{LTHC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M)/T =$ 1.6979 lbTHC/1000 gal $L_{LROC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M) \cdot \text{React}/T =$ 1.5027 lb ROC/1000 gal					
Total Uncontrolled Hydrocarbon Losses:					
		ROC		THC	Estimated CH ₄ , GHG
Hourly					
THL _H = (R)(42 gal/bbl)(L _{LROC} /1000) =		80.78	lbs/hr	91.28	10.50
Max Daily					
THL _D = (D)(42 gal/bbl)(L _{LROC} /1000) =		706.86	lbs/day	798.71	91.85
Quarterly					
THL _Q = THL _D (91)(1/2000) =		32.25	TPQ	36.44	4.19
Total Emissions					
THL _A = (A)(42 gal/bbl)(L _{LROC} /1000)(1/2000) =		129.00	TPY	145.76	16.76
Total Controlled Hydrocarbon Losses:					
Hourly					
THL _{HC} = (THL _H)(1-eff) =		4.04	lbs/hr	4.56	0.52
Max Daily					
THL _{DC} = (THL _D)(1-eff) =		35.34	lbs/day	39.94	4.59
Quarterly					
THL _{QC} = (THL _Q)(1-eff) =		1.61	TPQ	1.82	0.21
Total Emissions					
THL _{AC} = (THL _A)(1-eff) =		6.45	TPY	7.29	0.84

Notes:

1. Data provided by the applicant
- C = Annual Transport Volume.
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. Vapor pressure as measured from LFC Crude.
5. R is calculated by adding 460 to °F.
6. A maximum of 70 trucks will be loaded per day; up to 8 per hour. Actual number of trucks/day may be less.
7. The maximum daily rate of 70 trucks was used to determine the maximum quarterly and annual emissions.
8. GHG emissions from loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.
9. Applied SBC APCD determined truck loading efficiency of 95%;
10. Average Daily Production is assumed to be the same as the maximum daily potential production for purposes of defining a reasonable worst case scenario.

Controlled CH4 Emission (tts/day)	Controlled CH4 Emission (Tons/Yr)
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.04	0.01
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.06	0.01
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.10	0.02
12.09	2.21

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-8 Mobile Source to Pentland Mitigated with CNG Trucks

Daily Emissions - Scenario 2															
		Number of Vehicles	Round Trips	Trip Length	Round Trip	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
Destination	Road Type		per Day	Round Trip	Miles/Day	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	29	68	108.8	7,398	1.38	3.51	11.46	2.73	1,840.04	0.23	24,115	0.16	0.13	24,157
Travel Within Santa Barbara County - Collector Road	Collector	29	68	7.4	503	0.10	1.29	1.47	0.29	126.47	0.02	1,865	0.08	0.05	1,883
Travel Within Santa Barbara County - Local Road	Local	29	68	1.6	109	0.02	1.17	2.47	0.38	28.46	0.00	592	0.08	0.05	609
Travel Outside Santa Barbara County - Major road	Major	29	68	161.4	10,975	2.05	4.65	32.13	6.32	2,728.94	0.34	35,658	0.20	0.17	35,712
Travel Outside Santa Barbara County - Local Road	Local	29	68	0.8	54	0.01	1.15	1.23	0.19	14.94	0.00	416	0.07	0.05	433
Total			68	280	19,040										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties (Max - Worst Case)						3.56	11.77	48.77	9.91	4,738.85	0.59	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
		Number of Vehicles	Round Trips	Trip Length	Total Round	Criteria Pollutant Emissions (Tons)						GHG Emissions (Metric Tons)			
Destination			per Day	Round Trip	Trip Miles	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	29	24,820	108.8	2,700,416	0.25	0.43	2.09	0.50	335.55	0.04	3,952.79	0.01	0.01	3,957.0
Travel Within Santa Barbara County - Local Road	Collector	29	24,820	7.4	183,668	0.02	0.03	0.27	0.05	22.82	0.00	268.95	0.00	0.00	269.2
Travel Within Santa Barbara County - Collector road	Local	29	24,820	1.6	39,712	0.00	0.01	0.45	0.07	4.94	0.00	58.24	0.00	0.00	58.3
Travel Outside Santa Barbara County - Major road	Major	29	24,820	161.4	4,005,948	0.37	0.64	5.86	1.15	497.77	0.06	5,863.74	0.02	0.02	5,870.0
Travel Outside Santa Barbara County - Local Road	Local	29	24,820	0.8	19,856	0.00	0.00	0.22	0.04	2.47	0.00	29.17	0.00	0.00	29.2
Total			24,820	280	6,949,600	0.65	1.12	8.90	1.81	863.55	0.11	10,172.90	0.04	0.03	10,183.76
Greenhouse Gas Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)						10,183.8			
Significance Threshold: SB County Planning SBC APCD						(Not Applicable)						1,000 10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)						Yes			

			Truck Capacity (bbl/truck)	Crude Transported (bbl/year)
Potential Maximum Volume Crude Transported to Markets:			160	3,971,200

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-8 Mobile Source to Pentland Mitigated with CNG Trucks

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).															
					Emission Factors										
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O		
Running Exhaust	aggregated			g/mile	0.0848	0.1455	0.0727	0.0727	112.7273	0.014	1463.7641	0.0051	0.0048		
Running Exhaust	Freeway			lb/mile	1.9E-04	3.2E-04	1.6E-04	1.6E-04	2.5E-01	3.1E-05	3.2E+00	1.1E-05	1.1E-05		
Running Exhaust	Major			lb/mile	1.9E-04	3.2E-04	1.6E-04	1.6E-04	2.5E-01	3.1E-05	3.2E+00	1.1E-05	1.1E-05		
Running Exhaust	Collector			lb/mile	1.9E-04	3.2E-04	1.6E-04	1.6E-04	2.5E-01	3.1E-05	3.2E+00	1.1E-05	1.1E-05		
Running Exhaust	Local			lb/mile	1.9E-04	3.2E-04	1.6E-04	1.6E-04	2.5E-01	3.1E-05	3.2E+00	1.1E-05	1.1E-05		
Idle Exhaust	aggregated			g/vehicle/day	0.01650	17.72000	0.00638	0.00610	22.16000	0.00000	3768.00000	1.15800	0.76800		
Idle Exhaust	Freeway			lb/vehicle/day	0.00004	0.03907	0.00001	0.00001	0.04885	0.00000	8.30688	0.00255	0.00169		
Idle Exhaust	Major			lb/vehicle/day	0.00004	0.03907	0.00001	0.00001	0.04885	0.00000	8.30688	0.00255	0.00169		
Idle Exhaust	Collector			lb/vehicle/day	0.00004	0.03907	0.00001	0.00001	0.04885	0.00000	8.30688	0.00255	0.00169		
Idle Exhaust	Local			lb/vehicle/day	0.00004	0.03907	0.00001	0.00001	0.04885	0.00000	8.30688	0.00255	0.00169		

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):

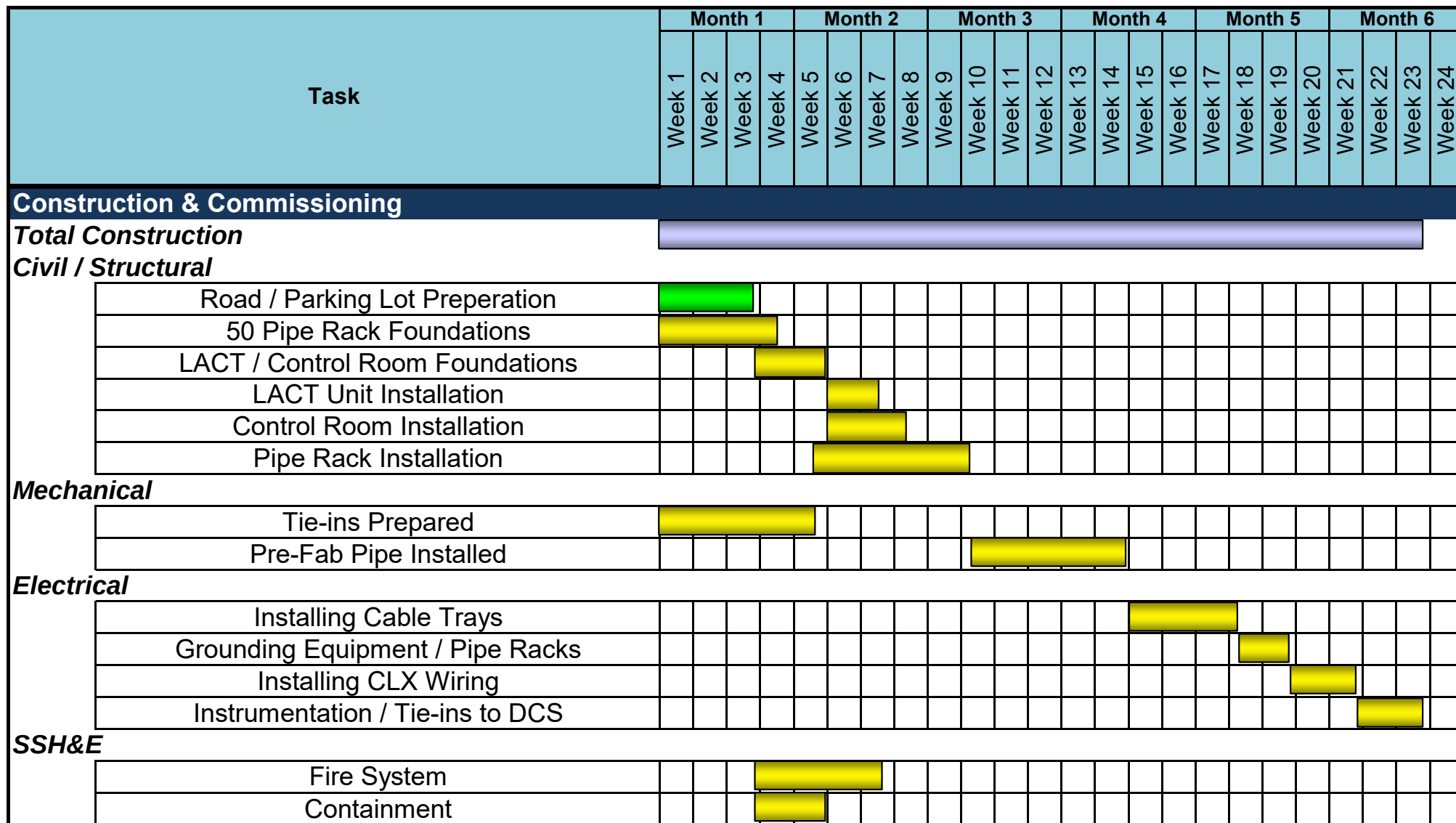
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight				CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment									

$Ef = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 140 total miles (within Santa Barbara, San Luis Obispo, and Kern Counties) from the ExxonMobil Las Flores Canyon facility to the Plains Pentland truck rack located at 2311 Basic School Road in Maricopa.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- Emissions factor running based on Cummins CNG engine, as per AERA project EIR air appendices. Idle rates based on EMFAC2017 cng T6 solid waster trucks (the only cng category)
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
- Fleet size of 29 is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42)*, Section 13.2.1 Paved Roads, Equation 1.
Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018).
https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound)
 - 1,000 kilograms/metric ton

Estimated Construcion Schedule



ExxonMobil Interium Trucking for SYU Phased Restart
Table B-10 Annual Construction Emissions Summary

Total Construction Emissions.

Project Task	Project Component	Criteria Pollutant Emissions (Tons)						GHG Emissions (Metric Tons/Year)			
		NOx	ROG	CO	SOx	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	CO ₂ e
Road / Parking Lot Preparation	Off-road Diesel Construction Equipment	0.015	0.002	0.014	0.000	0.001	0.001	2	0.00	0.00	2
Road / Parking Lot Preparation	On-road Motor Vehicles	0.016	0.002	0.076	0.000	0.286	0.043	22	0.00	0.00	22
50 Pipe Rack Foundations	Off-road Diesel Construction Equipment	0.023	0.002	0.024	0.000	0.001	0.001	3	0.00	0.00	3
50 Pipe Rack Foundations	On-road Motor Vehicles	0.025	0.005	0.252	0.001	0.944	0.142	68	0.00	0.00	69
LACT / Control Room Foundations	Off-road Diesel Construction Equipment	0.012	0.001	0.012	0.000	0.001	0.001	2	0.00	0.00	2
LACT / Control Room Foundations	On-road Motor Vehicles	0.009	0.002	0.071	0.000	0.269	0.041	20	0.00	0.00	20
LACT Unit Installation	Off-road Diesel Construction Equipment	0.014	0.001	0.012	0.000	0.001	0.001	2	0.00	0.00	2
LACT Unit Installation	On-road Motor Vehicles	0.008	0.002	0.071	0.000	0.269	0.041	20	0.00	0.00	20
Control Room Installation	Off-road Diesel Construction Equipment	0.009	0.001	0.005	0.000	0.000	0.000	2	0.00	0.00	2
Control Room Installation	On-road Motor Vehicles	0.018	0.004	0.189	0.001	0.708	0.106	51	0.00	0.00	52
Pipe Rack Installation	Off-road Diesel Construction Equipment	0.059	0.007	0.033	0.000	0.003	0.003	6	0.00	0.00	6
Pipe Rack Installation	On-road Motor Vehicles	0.025	0.005	0.241	0.001	0.908	0.137	66	0.00	0.00	66
Tie-ins Prepared	Off-road Diesel Construction Equipment	0.056	0.007	0.042	0.000	0.003	0.003	6	0.00	0.00	6
Tie-ins Prepared	On-road Motor Vehicles	0.017	0.004	0.177	0.001	0.671	0.101	48	0.00	0.00	49
Pre-Fab Pipe Installed	Off-road Diesel Construction Equipment	0.048	0.004	0.022	0.000	0.002	0.002	4	0.00	0.00	4
Pre-Fab Pipe Installed	On-road Motor Vehicles	0.012	0.002	0.080	0.000	0.311	0.047	23	0.00	0.00	23
Installing Cable Trays	Off-road Diesel Construction Equipment	0.043	0.004	0.019	0.000	0.002	0.002	4	0.00	0.00	4
Installing Cable Trays	On-road Motor Vehicles	0.011	0.002	0.099	0.000	0.378	0.057	28	0.00	0.00	28
Grounding Equipment / Pipe Racks	Off-road Diesel Construction Equipment	0.009	0.001	0.009	0.000	0.001	0.001	1	0.00	0.00	1
Grounding Equipment / Pipe Racks	On-road Motor Vehicles	0.002	0.000	0.018	0.000	0.073	0.011	5	0.00	0.00	5
Installing CLX Wiring	Off-road Diesel Construction Equipment	0.002	0.000	0.001	0.000	0.000	0.000	0	0.00	0.00	0
Installing CLX Wiring	On-road Motor Vehicles	0.004	0.001	0.027	0.000	0.109	0.016	8	0.00	0.00	8
Instrumentation / Tie-ins to DCS	Off-road Diesel Construction Equipment	0.002	0.000	0.001	0.000	0.000	0.000	0	0.00	0.00	0
Instrumentation / Tie-ins to DCS	On-road Motor Vehicles	0.004	0.001	0.027	0.000	0.109	0.016	8	0.00	0.00	8
Fire System	Off-road Diesel Construction Equipment	0.018	0.002	0.019	0.000	0.001	0.001	2	0.00	0.00	2
Fire System	On-road Motor Vehicles	0.036	0.008	0.393	0.001	1.466	0.220	106	0.00	0.00	106
Containment	Off-road Diesel Construction Equipment	0.019	0.002	0.018	0.000	0.001	0.001	2	0.00	0.00	2
Containment	On-road Motor Vehicles	0.011	0.002	0.097	0.000	0.364	0.055	27	0.00	0.00	27
	Fugitive PM from Material Movement	-	-	-	-	0.099	0.054				
	Asphalt Paving Offgassing	-	0.001	-	-	-	-				
	Architectural Coating Offgassing	-	0.015	-	-	-	-				
	Total Construction Emissions	0.529	0.087	2.052	0.006	6.982	1.103	534	0.018	0.016	540
	Significance Threshold:	25.00	25.00	25.00	25.00	25.00	25.00				

Notes:

1. All construction emissions are conservatively assumed to occur within the same calendar year.
2. Project construction is expected to take between 3 and 6 months. A reasonable worst case construction period is expected to be 4.5 months.
3. Santa Barbara County has not developed significance thresholds for Construction related emissions. (p. 19 SBC Environmental Thresholds and Guidelines Manual, 2008).
4. Conversion factors:
Global warming potential for methane: 25
Global warming potential for nitrous oxide: 298

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-11 Annual Construction Onsite

Task	Category	Representative Equipment Model	Horsepower	Load Factor	Number of Units	Number of Days	Hours/Day	Emissions (Ton/Year)						Emissions (MT/year)			
								ROG	NOx	PM ₁₀	PM _{2.5}	CO	SOx	CO ₂	CH ₄	N ₂ O	CO ₂ e
Road / Parking Lot Preparation	Rollers	Smooth Drum Roller	63	0.38	1	5	10	0.00	0.01	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.59
Road / Parking Lot Preparation	Tractors/Loaders/Backhoes	Cat 950H Loader	196	0.37	1	2	10	0.00	0.01	0.00	0.00	0.01	0.00	0.70	0.00	0.00	0.72
Road / Parking Lot Preparation	Tractors/Loaders/Backhoes	Case 570 NXT	63	0.37	1	4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.46
Road / Parking Lot Preparation Phase Total:								0.00	0.02	0.00	0.00	0.01	0.00	1.74	0.00	0.00	1.77
50 Pipe Rack Foundations	Excavators	CAT 325 Excavator	153	0.38	1	7	10	0.00	0.01	0.00	0.00	0.01	0.00	1.96	0.00	0.00	2.00
50 Pipe Rack Foundations	Rubber Tired Loaders	Cat Skid Steer	83	0.36	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.15
50 Pipe Rack Foundations	Tractors/Loaders/Backhoes	Cat 950H Loader	196	0.37	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.36
50 Pipe Rack Foundations	Tractors/Loaders/Backhoes	Case 570 NXT	63	0.37	1	4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.46
50 Pipe Rack Foundations	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.40
50 Pipe Rack Foundations Phase Total:								0.00	0.02	0.00	0.00	0.02	0.00	3.31	0.00	0.00	3.36
LACT / Control Room Foundations	Air Compressors	Sullair 185 Air Comp	61	0.48	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.17
LACT / Control Room Foundations	Tractors/Loaders/Backhoes	Cat 950H Loader	196	0.37	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.36
LACT / Control Room Foundations	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	5	10	0.00	0.01	0.00	0.00	0.01	0.00	0.99	0.00	0.00	1.01
LACT / Control Room Foundations Phase Total:								0.00	0.01	0.00	0.00	0.01	0.00	1.51	0.00	0.00	1.53
LACT Unit Installation	Cranes	Cranes	240	0.29	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.34
LACT Unit Installation	Tractors/Loaders/Backhoes	Case 570 NXT	63	0.37	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.23
LACT Unit Installation	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	5	10	0.00	0.01	0.00	0.00	0.01	0.00	0.99	0.00	0.00	1.01
LACT Unit Installation Phase Total:								0.00	0.01	0.00	0.00	0.01	0.00	1.55	0.00	0.00	1.58
Control Room Installation	Air Compressors	Sullair 185 Air Comp	61	0.48	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.34
Control Room Installation	Cranes	Cranes	240	0.29	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.34
Control Room Installation	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.39
Control Room Installation	Rubber Tired Loaders	Cat Skid Steer	83	0.36	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.29
Control Room Installation	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.40
Control Room Installation Phase Total:								0.00	0.01	0.00	0.00	0.01	0.00	1.74	0.00	0.00	1.76
Pipe Rack Installation	Cranes	Cranes	240	0.29	1	10	10	0.00	0.04	0.00	0.00	0.01	0.00	3.36	0.00	0.00	3.42
Pipe Rack Installation	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	10	10	0.00	0.01	0.00	0.00	0.01	0.00	0.96	0.00	0.00	0.98
Pipe Rack Installation	Welders	Welders	46	0.45	2	5	10	0.00	0.01	0.00	0.00	0.01	0.00	1.18	0.00	0.00	1.19
Pipe Rack Installation Phase Total:								0.01	0.06	0.00	0.00	0.03	0.00	5.51	0.00	0.00	5.59
Tie-ins Prepared	Cranes	Cranes	240	0.29	1	5	10	0.00	0.02	0.00	0.00	0.01	0.00	1.68	0.00	0.00	1.71
Tie-ins Prepared	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	10	10	0.00	0.01	0.00	0.00	0.01	0.00	0.96	0.00	0.00	0.98
Tie-ins Prepared	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	10	10	0.00	0.02	0.00	0.00	0.02	0.00	1.98	0.00	0.00	2.01
Tie-ins Prepared	Welders	Welders	46	0.45	2	5	10	0.00	0.01	0.00	0.00	0.01	0.00	1.18	0.00	0.00	1.19
Tie-ins Prepared Phase Total:								0.01	0.06	0.00	0.00	0.04	0.00	5.80	0.00	0.00	5.89
Pre-Fab Pipe Installed	Cranes	Cranes	240	0.29	1	10	10	0.00	0.04	0.00	0.00	0.01	0.00	3.36	0.00	0.00	3.42
Pre-Fab Pipe Installed	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	10	10	0.00	0.01	0.00	0.00	0.01	0.00	0.96	0.00	0.00	0.98
Pre-Fab Pipe Installed Phase Total:								0.00	0.05	0.00	0.00	0.02	0.00	4.33	0.00	0.00	4.40
Installing Cable Trays	Cranes	Cranes	240	0.29	1	10	10	0.00	0.04	0.00	0.00	0.01	0.00	3.36	0.00	0.00	3.42
Installing Cable Trays	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	5	10	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.49
Installing Cable Trays Phase Total:								0.00	0.04	0.00	0.00	0.02	0.00	3.85	0.00	0.00	3.91
Grounding Equipment / Pipe Racks	Air Compressors	Sullair 185 Air Comp	61	0.48	1	1	10	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.17
Grounding Equipment / Pipe Racks	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	5	10	0.00	0.01	0.00	0.00	0.01	0.00	0.99	0.00	0.00	1.01
Grounding Equipment / Pipe Racks Phase Total:								0.00	0.01	0.00	0.00	0.01	0.00	1.16	0.00	0.00	1.17
Installing CLX Wiring	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.20
Installing CLX Wiring Phase Total:								0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.20
Instrumentation / Tie-ins to DCS	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.20
Instrumentation / Tie-ins to DCS Phase Total:								0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.20
Fire System	Air Compressors	Sullair 185 Air Comp	61	0.48	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.34
Fire System	Excavators	CAT 325 Excavator	153	0.38	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.57
Fire System	Forklifts	CAT TH360B Variable Reach Forklift	99.9	0.2	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.20
Fire System	Rubber Tired Dozers	CASE 650L DOZER	80	0.4	1	--	--	--	--	--	--	--	--	--	--	--	--
Fire System	Rubber Tired Loaders	Cat Skid Steer	83	0.36	1	--	--	--	--	--	--	--	--	--	--	--	--
Fire System	Tractors/Loaders/Backhoes	Cat 950H Loader	196	0.37	1	--	--	--	--	--	--	--	--	--	--	--	--
Fire System	Tractors/Loaders/Backhoes	Case 570 NXT	63	0.37	1	3	10	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.35
Fire System	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	5	10	0.00	0.01	0.00	0.00	0.01	0.00	0.99	0.00	0.00	1.01
Fire System Phase Total:								0.00	0.02	0.00	0.00	0.02	0.00	2.42	0.00	0.00	2.45

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-11 Annual Construction Onsite

Task	Category	Representative Equipment Model	Horsepower	Load Factor	Number of Units	Number of Days	Hours/Day	Emissions (Ton/Year)						Emissions (MT/year)			
								ROG	NOx	PM ₁₀	PM _{2.5}	CO	SOx	CO ₂	CH ₄	N ₂ O	CO ₂ e
Containment	Rubber Tired Loaders	Cat Skid Steer	83	0.36	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.29
Containment	Tractors/Loaders/Backhoes	Cat 950H Loader	196	0.37	1	4	10	0.00	0.01	0.00	0.00	0.01	0.00	1.41	0.00	0.00	1.43
Containment	Tractors/Loaders/Backhoes	Case 570 NXT	63	0.37	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.23
Containment	Tractors/Loaders/Backhoes	CAT 430 Backhoe	110	0.37	1	2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.40
Containment Phase Total:								0.00	0.02	0.00	0.00	0.02	0.00	2.32	0.00	0.00	2.36
Total Construction Emissions								0.03	0.33	0.02	0.02	0.23	0.00	35.60	0.01	0.00	36.17

Notes:

1. Total emissions for the construction
2. Source for equipment horsepower per
3. Source for equipment Load Factors: Load
4. Source for emission factors: CalEEMod, Appendix D, Default Data Tables, October 2017. Based on Year: 2019
5. Conversion factors:
Global warming potential for methane: 25
Global warming potential for nitrous oxide: 298
2,000 pounds/ton
0.45359 kilograms/pound)
1,000 kilograms/metric ton
5 construction work days/week

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-1 Annual Construction OnRoad

Task	Category	Representative Equipment Model	Fuel	EMFAC 2011	Number of Vehicles	Total Project Trips	Trip Length One-Way	Round Trip Miles/Project	Emissions (Ton/Project)						Emissions (MT/year)			
									ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Road / Parking Lot Preparation	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	10	300	23.5	7,050	0.00	0.01	0.27	0.04	0.07	0.00	19.50	0.00	0.00	19.66
Road / Parking Lot Preparation	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	60	23.5	1,410	0.00	0.00	0.01	0.00	0.00	0.00	0.82	0.00	0.00	0.86
Road / Parking Lot Preparation	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	23.5	--	--	--	--	--	--	--	--	--	--	0.00
Road / Parking Lot Preparation	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	20	23.5	470	0.00	0.01	0.00	0.00	0.00	0.00	0.87	0.00	0.00	0.91
Road / Parking Lot Preparation	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Road / Parking Lot Preparation	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Road / Parking Lot Preparation	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	15	23.5	353	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.68
Road / Parking Lot Preparation Phase Total:									0.00	0.02	0.29	0.04	0.08	0.00	21.84	0.00	0.00	22.10
50 Pipe Rack Foundations	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	16	640	23.5	15,040	0.00	0.02	0.93	0.14	0.25	0.00	66.56	0.00	0.00	67.09
50 Pipe Rack Foundations	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	80	23.5	1,880	0.00	0.00	0.01	0.00	0.00	0.00	1.09	0.00	0.00	1.14
50 Pipe Rack Foundations	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	8	0	--	0.00	0.00	0.00	0.00	0.00	0.00	0.03	--	--	0.03
50 Pipe Rack Foundations	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
50 Pipe Rack Foundations	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	10	23.5	235	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.28
50 Pipe Rack Foundations	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
50 Pipe Rack Foundations	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	20	5	100	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.26
50 Pipe Rack Foundations Phase Total:									0.01	0.02	0.94	0.14	0.25	0.00	68.19	0.00	0.00	68.80
LACT / Control Room Foundations	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	12	240	23.5	5,640	0.00	0.01	0.26	0.04	0.07	0.00	18.72	0.00	0.00	18.87
LACT / Control Room Foundations	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	40	23.5	940	0.00	0.00	0.01	0.00	0.00	0.00	0.55	0.00	0.00	0.57
LACT / Control Room Foundations	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	8	0	--	0.00	0.00	0.00	0.00	0.00	0.00	0.03	--	--	0.03
LACT / Control Room Foundations	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
LACT / Control Room Foundations	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	10	23.5	235	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.28
LACT / Control Room Foundations	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
LACT / Control Room Foundations	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	10	5	50	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.13
LACT / Control Room Foundations Phase Total:									0.00	0.01	0.27	0.04	0.07	0.00	19.69	0.00	0.00	19.88
LACT Unit Installation	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	12	240	23.5	5,640	0.00	0.01	0.26	0.04	0.07	0.00	18.72	0.00	0.00	18.87
LACT Unit Installation	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	40	23.5	940	0.00	0.00	0.01	0.00	0.00	0.00	0.55	0.00	0.00	0.57
LACT Unit Installation	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	8	0	--	0.00	0.00	0.00	0.00	0.00	0.00	0.03	--	--	0.03
LACT Unit Installation	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
LACT Unit Installation	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	8	23.5	188	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.22
LACT Unit Installation	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
LACT Unit Installation	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	10	5	50	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.13
LACT Unit Installation Phase Total:									0.00	0.01	0.27	0.04	0.07	0.00	19.63	0.00	0.00	19.82
Control Room Installation	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	16	480	23.5	11,280	0.00	0.02	0.70	0.10	0.19	0.00	49.92	0.00	0.00	50.32
Control Room Installation	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	60	23.5	1,410	0.00	0.00	0.01	0.00	0.00	0.00	0.82	0.00	0.00	0.86
Control Room Installation	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	8	0	--	0.00	0.00	0.00	0.00	0.00	0.00	0.03	--	--	0.03
Control Room Installation	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Control Room Installation	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	4	23.5	94	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11
Control Room Installation	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Control Room Installation	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	15	5	75	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.19
Control Room Installation Phase Total:									0.00	0.02	0.71	0.11	0.19	0.00	51.06	0.00	0.00	51.51
Pipe Rack Installation	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	14	700	23.5	16,450	0.00	0.02	0.89	0.13	0.24	0.00	63.70	0.00	0.00	64.21
Pipe Rack Installation	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	100	23.5	2,350	0.00	0.00	0.02	0.00	0.00	0.00	1.36	0.00	0.00	1.43
Pipe Rack Installation	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Pipe Rack Installation	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Pipe Rack Installation	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	8	23.5	188	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.22
Pipe Rack Installation	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	1	4	23.5	94	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.13
Pipe Rack Installation	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	25	5	125	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.32
Pipe Rack Installation Phase Total:									0.01	0.02	0.91	0.14	0.24	0.00	65.71	0.00	0.00	66.31
Tie-ins Prepared	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	12	600	23.5	14,100	0.00	0.01	0.65	0.10	0.18	0.00	46.80	0.00	0.00	47.17
Tie-ins Prepared	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	100	23.5	2,350	0.00	0.00	0.02	0.00	0.00	0.00	1.36	0.00	0.00	1.43
Tie-ins Prepared	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Tie-ins Prepared	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Tie-ins Prepared	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Tie-ins Prepared	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Tie-ins Prepared	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	25	5	125	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.32
Tie-ins Prepared Phase Total:									0.00	0.02	0.67	0.10	0.18	0.00	48.47	0.00	0.00	48.92

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-1 Annual Construction OnRoad

Task	Category	Representative Equipment Model	Fuel	EMFAC 2011	Number of Vehicles	Total Project Trips	Trip Length One-Way	Round Trip Miles/Project	Emissions (Ton/Project)						Emissions (MT/year)			
									ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO _x	CO ₂	CH ₄	N ₂ O	CO _{2e}
Pre-Fab Pipe Installed	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	8	400	23.5	9,400	0.00	0.01	0.29	0.04	0.08	0.00	20.80	0.00	0.00	20.97
Pre-Fab Pipe Installed	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	100	23.5	2,350	0.00	0.00	0.02	0.00	0.00	0.00	1.36	0.00	0.00	1.43
Pre-Fab Pipe Installed	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Pre-Fab Pipe Installed	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Pre-Fab Pipe Installed	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	20	23.5	470	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.56
Pre-Fab Pipe Installed	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	4	23.5	94	--	--	--	--	--	--	--	--	--	0.00
Pre-Fab Pipe Installed	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	25	5	125	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.32
Pre-Fab Pipe Installed Phase Total:									0.00	0.01	0.31	0.05	0.08	0.00	23.01	0.00	0.00	23.27
Installing Cable Trays	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	10	400	23.5	9,400	0.00	0.01	0.36	0.05	0.10	0.00	26.00	0.00	0.00	26.21
Installing Cable Trays	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	80	23.5	1,880	0.00	0.00	0.01	0.00	0.00	0.00	1.09	0.00	0.00	1.14
Installing Cable Trays	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Installing Cable Trays	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Installing Cable Trays	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	8	23.5	188	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.22
Installing Cable Trays	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	1	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Installing Cable Trays	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	20	5	100	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.26
Installing Cable Trays Phase Total:									0.00	0.01	0.38	0.06	0.10	0.00	27.55	0.00	0.00	27.83
Grounding Equipment / Pipe Racks	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	6	120	23.5	2,820	0.00	0.00	0.07	0.01	0.02	0.00	4.68	0.00	0.00	4.72
Grounding Equipment / Pipe Racks	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	40	23.5	940	0.00	0.00	0.01	0.00	0.00	0.00	0.55	0.00	0.00	0.57
Grounding Equipment / Pipe Racks	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Grounding Equipment / Pipe Racks	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Grounding Equipment / Pipe Racks	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Grounding Equipment / Pipe Racks	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Grounding Equipment / Pipe Racks	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	10	5	50	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.13
Grounding Equipment / Pipe Racks Phase Total:									0.00	0.00	0.07	0.01	0.02	0.00	5.35	0.00	0.00	5.42
Installing CLX Wiring	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	6	180	23.5	4,230	0.00	0.00	0.10	0.01	0.03	0.00	7.02	0.00	0.00	7.08
Installing CLX Wiring	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	60	23.5	1,410	0.00	0.00	0.01	0.00	0.00	0.00	0.82	0.00	0.00	0.86
Installing CLX Wiring	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Installing CLX Wiring	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Installing CLX Wiring	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	4	23.5	94	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11
Installing CLX Wiring	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Installing CLX Wiring	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	15	5	75	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.19
Installing CLX Wiring Phase Total:									0.00	0.00	0.11	0.02	0.03	0.00	8.13	0.00	0.00	8.24
Instrumentation / Tie-ins to DCS	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	6	180	23.5	4,230	0.00	0.00	0.10	0.01	0.03	0.00	7.02	0.00	0.00	7.08
Instrumentation / Tie-ins to DCS	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	60	23.5	1,410	0.00	0.00	0.01	0.00	0.00	0.00	0.82	0.00	0.00	0.86
Instrumentation / Tie-ins to DCS	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Instrumentation / Tie-ins to DCS	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Instrumentation / Tie-ins to DCS	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	4	23.5	94	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11
Instrumentation / Tie-ins to DCS	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Instrumentation / Tie-ins to DCS	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	15	5	75	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.19
Instrumentation / Tie-ins to DCS Phase Total:									0.00	0.00	0.11	0.02	0.03	0.00	8.13	0.00	0.00	8.24
Fire System	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	20	800	23.5	18,800	0.01	0.03	1.45	0.22	0.39	0.00	104.00	0.00	0.00	104.83
Fire System	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	80	23.5	1,880	0.00	0.00	0.01	0.00	0.00	0.00	1.09	0.00	0.00	1.14
Fire System	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Fire System	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Fire System	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	8	23.5	188	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.22
Fire System	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Fire System	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	20	5	100	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.26
Fire System Phase Total:									0.01	0.04	1.47	0.22	0.39	0.00	105.55	0.00	0.00	106.45
Containment	Passenger Car	Class 1 Light Duty Vehicle (< 8,500 lbs GVWR)	Gasoline	LDA - Gas	14	280	23.5	6,580	0.00	0.01	0.36	0.05	0.10	0.00	25.48	0.00	0.00	25.68
Containment	Pickup Truck	Class 1 Light Duty Trucks (< 6,000 lbs GVWR)	Diesel	LDT2 - DSL	2	40	23.5	940	0.00	0.00	0.01	0.00	0.00	0.00	0.55	0.00	0.00	0.57
Containment	Cement Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Containment	Dump Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Containment	Flatbed Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 IH	1	4	23.5	94	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11
Containment	Welder Truck	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	Diesel	T6 ICH	--	0	0	--	--	--	--	--	--	--	--	--	--	0.00
Containment	Water Truck	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	Diesel	T7 Single - DSL	1	10	23.5	235	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.45
Containment Phase Total:									0.00	0.01	0.36	0.05	0.10	0.00	26.57	0.00	0.00	26.82
Total Construction Emissions									0.04	0.20	6.87	1.03	1.82	0.01	498.88	0.01	0.02	503.61

Notes:

1. Total emissions for the construction period are calculated by multiplying the total number of trips per project by the miles per trip and the associated emission factor, and divided by the appropriate conversion factors to convert pounds into tons (criteria pollutants) or metric tons (greenhouse gas emissions).
2. Source for engine emission factors: CARB EMFAC2014 Database - EMFAC2011 vehicle category, emission rate data.
3. Estimated number of trips, and miles per trip as noted in Table A-9 - On Road Project Phase Details.
4. Conversion factors:
Global warming potential for methane: 25
Global warming potential for nitrous oxide: 198
2,000 pounds/ton
0.45359 kilograms/pound
1,000 kilograms/metric ton
20 week construction period

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-13 Construction Offgassing

Asphalt Paving

Reactive Organic Gases from Asphalt Pavement Offgassing.

	Paved	ROG Emission	ROG Emissions
Component	Acres	Factor	(Tons)
Access Road			
Total Emissions (Tons)	0.41 acres	2.62 lb/acre	0.001
Average Daily Emissions (Pounds/Day)			0.009

Notes:

1. It is assumed that this project will not include any paving activities.
2. Source for the ROG emission factor: CalEEMod User's Guide, Appendix A, Section 4.8 (Asphalt Paving Off-Gassing Emissions).
3. Average daily emissions are calculated by assuming a 24 week construction period, 5 construction days per week.
4. Conversion factors:
2,000 pounds/ton
43,560 square feet/acre
5,280 feet/mile
18,000 square feet
24 week construction period
5 construction work days/week

Architectural Coating Offgassing Emissions

Reactive Organic Gases from Architectural Coating Offgassing.

	Volume Coating	VOC	ROG Emission	ROG Emissions
Component	Applied	Coating Limit	Factor	(Tons)
Industrial Surfaces				
Total Emissions (Tons)	10 gallons	350 grams/liter	2920.59 lb/gallon	0.01
Average Daily Emissions (Pounds/Day)				0.24

Notes:

1. It is assumed that approximately 10 gallons of paint will be required to coats various surfaces installed during the project.
2. Source for VOC coating limit: Santa Barbara APCD Rule 323, assuming the use of a Fire Resistive Coating per Table 1 of Rule 323.
3. ROG emission factor calculated per CalEEMod User's Guide, Appendix A, Section 4.7 (Architectural Coatings):

$$E_{FAC} = \text{Coating VOC Limit (grams/liter)} \times 1/453.59 \text{ grams/pound} \times 3.785 \text{ liters/gallon} \times 1 \text{ gallon/180 sq. ft.}$$

$$E_{FAC}$$
 is multiplied by 1,000 to produce an emission factor in pounds per 1,000 square feet.
4. Average daily emissions are calculated by assuming a 24 week construction period, 5 construction days per week per week.
5. Conversion factors:
2,000 pounds/ton
24 week construction period
5 construction work days/week

ExxonMobil Interium Trucking for SYU Phased Restart Table

B-14 Construction Material Movement Fugitive Dust

Fugitive Particulate Matter Emissions from Material Movement.

Material Movement	Emission Factor		Activity	Emissions (Tons)	
Component	PM ₁₀	PM _{2.5}	Indicator	PM ₁₀	PM _{2.5}
Grading	1.543 lb/mile	0.167 lb/mile	0.3 miles	0.00	0.00
Bulldozing	0.753 lb/hour	0.414 lb/hour	262 hours	0.10	0.05
Material Handling	1.17E-04 lb/ton	1.76E-05 lb/ton	874 tons	0.00	0.00
Demolition Debris Handling	1.12E-03 lb/ton	1.70E-04 lb/ton	0 tons	0.00	0.00
Total Emissions (Tons)				0.10	0.05
Average Daily Emissions (Pounds/Day)				1.65	0.90

Notes:

1. Total emissions for the construction period are calculated by multiplying the sum of the rail and non-rail activity data for each component by the applicable emission factor, and divided by the appropriate conversion factor to convert pounds into tons of fugitive particulate matter.
2. Average daily emissions are calculated by assuming a 24 week construction period, 5 construction days per week.
3. Conversion factors:
2,000 pounds/ton
24 week construction period
5 construction work days/week

Material Movement Activity Indicators.

Activity/Construction Phase	Phase Description	Activity Indicator		
		Initial	Target	Notes
Grading	Road / Parking Lot Preparation	0.39 acres	0.27 miles	Assumed square footage for each pad to be graded for the parking lot, pipe rack, and LACT.
	50 Pipe Rack Foundations	0.02 acres	0.016 miles	
	LACT / Control Room Foundations	0.02 acres	0.016 miles	
	Total Grading:	0.44 acres	0.30 miles	
Bulldozing	Road / Parking Lot Preparation		60 hours	Hours estimated based on construction schedule hours for dozers, loaders, and excavators
	50 Pipe Rack Foundations		142 hours	
	LACT / Control Room Foundations		60 hours	
	Total Bulldozing:		262 hours	
Material Handling	Road / Parking Lot Preparation	782 tons earth	782 tons	Assumed square footage for each pad to be graded for the parking lot, pipe rack, and LACT.
	50 Pipe Rack Foundations	46 tons earth	46 tons	
	LACT / Control Room Foundations	46 tons earth	46 tons	
	Total Material Handling:	874 tons	874 tons	
Demolition Debris Handling	Mechanical Dismemberment	0 square feet	0 tons	No demolition activities
	Demolition Debris Loading	0 square feet	0 tons	No demolition activities
	Total Demolition Debris:	0 square feet	0 tons	

Notes:

1. Grading for the project is assumed to occur during the first three phases of the project. The area to be graded includes the parking lot, pipe rack, and LACT/Control Room.
2. Miles traveled for site grading is based on the analytical approach suggested in *California Emissions Estimator Model User's Guide* (Version 2011.1) (CalEEMod User's Guide), ENVIRON International Corporation (for South Coast Air Quality Management District), February 2011, Appendix A (Calculation Details for CalEEMod), Section 4.3 (Dust from Material Movement). Grading miles are calculated as $As/Wb \times 43,560 \text{ square feet/acre} \div 5,280 \text{ ft/mile}$, where As = acres to be graded and Wb = blade width (feet), assumed in the CalEEMod Version 2011.1.1 program to be 12 feet (based on a Caterpillar 140 motor grader).
3. Bulldozer hours are estimated from the Interim Trucking Construction Schedule - includes excavators, dozers, and loaders. See the Table A-5 - Project Phases Off-Road.
5. Construction material handling is estimated based on the square footage to be disturbed as part of the grading activities, applying the 0.046 ton of construction debris per square foot, as defined by CalEEMod User's Guide, Appendix A.
6. Demolition Activities: This project does not involve the demolition of any structures or equipment. As such material movement associated with demolition is assumed to be zero.
7. Conversion factors:
43,560 square feet/acre
5,280 feet/mile
12 feet grader blade width
0.046 ton of construction debris per square foot (CalEEMod User's Guide, Appendix A)

ExxonMobil Interium Trucking for SYU Phased Restart

Table B-14 Construction Material Movement Fugitive Dust

Grading Emission Factors.

Variable	Reference	Symbol	Value	Unit
PM ₁₀ particle size multiplier	EPA AP-42 Table 11.9-1	k	0.6	--
PM _{2.5} particle size multiplier	EPA AP-42 Table 11.9-1	k	0.031	--
Mean vehicle speed	EPA AP-42 Table 11.9-1	S	7.1	miles/hour
Grading		PM ₁₀ :	1.543	lb/mile
		PM _{2.5} :	0.167	lb/mile

$$Ef_{PM_{10}} = k \times 0.051 \times (S)^{2.0}$$

$$Ef_{PM_{2.5}} = k \times 0.040 \times (S)^{2.5}$$

Source: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors* (AP-42), Section 11.9 Western Surface Coal Mining, Table 11.9-1. Per the CalEEMod User's Guide, Appendix A, Section 4.3, AP-42 default values are used for k and S.

Bulldozing Emission Factors

Variable	Reference	Symbol	Value	Unit
PM ₁₀ particle size multiplier	EPA AP-42 Table 11.9-1	k	0.75	--
PM _{2.5} particle size multiplier	EPA AP-42 Table 11.9-1	k	0.105	--
Silt content (overburden)	EPA AP-42 Table 11.9-1	s	6.9	%
Moisture content (overburden)	EPA AP-42 Table 11.9-1	M	7.9	%
Bulldozing		PM ₁₀ :	0.753	lb/hour
		PM _{2.5} :	0.414	lb/hour

$$Ef_{PM_{10}} = k \times \frac{1.0 \times (s)^{1.5}}{(M)^{1.4}}$$

$$Ef_{PM_{2.5}} = k \times \frac{5.7 \times (s)^{1.2}}{(M)^{1.3}}$$

Source: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors* (AP-42), Section 11.9 Western Surface Coal Mining, Table 11.9-1. Per the CalEEMod User's Guide, Appendix A, Section 4.3, AP-42 default values are used for k and the AP-42 default values for overburden are used for s and M.

Material Handling (Truck Loading/Unloading) Emission Factors.

Variable	Reference	Symbol	Value	Unit
PM ₁₀ particle size multiplier	EPA AP-42 Table 13.2.4-1	k	0.35	--
PM _{2.5} particle size multiplier	EPA AP-42 Table 13.2.4-1	k	0.053	--
Mean wind speed	CalEEMod 2011.1.1 default	U	6.04	miles/hour
Moisture content (cover)	EPA AP-42 Table 13.2.4-1	M	12	%
Material Handling		PM ₁₀ :	1.17E-04	lb/ton
		PM _{2.5} :	1.76E-05	lb/ton

$$Ef = k \times 0.0032 \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Source: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors* (AP-42), Section 13.2.4 Aggregate Handling And Storage Piles, Equation 1. Per the CalEEMod User's Guide, Appendix A, Section 4.3, AP-42 values are used for k and the AP-42 default value for municipal solid waste landfill cover is used for M. Per CalEEMod User's Guide, Appendix D (Default Data Tables), Table 1.1 (Weather Data), a mean wind speed of 2.7 meters/second (m/s) is used for Kern County. Conversion factors to convert 2.7 m/s to miles/hour:

1,609.3 meters/mile
60 seconds/minute
60 minutes/hour

Demolition Debris Handling (Mechanical Dismemberment/Truck Loading) Emission Factors.

Variable	Reference	Symbol	Value	Unit
PM ₁₀ particle size multiplier	EPA AP-42 Table 13.2.4-1	k	0.35	--
PM _{2.5} particle size multiplier	EPA AP-42 Table 13.2.4-1	k	0.053	--
Mean wind speed	CalEEMod 2011.1.1 default	U	5.00	miles/hour
Moisture content	EPA AP-42 Table 13.2.4-1	M	2	%
Demolition Debris Handling		PM ₁₀ :	1.12E-03	lb/ton
		PM _{2.5} :	1.70E-04	lb/ton

$$Ef = k \times 0.0032 \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Source: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors* (AP-42), Section 13.2.4 Aggregate Handling And Storage Piles, Equation 1. The CalEEMod User's Guide, Appendix A, Section 4.4 recommends the AP-42 equation be used for mechanical dismemberment, using the default wind speed of 5 miles/hour and a moisture content of 2 percent. AP-42 Section 13.2.3 (Heavy Construction Operations) Table 13.2.3-1 (Recommended Emission Factors for Construction Operations) also recommends the emission equation from AP-42 Section 13.2.4 be used for loading of construction debris into trucks.

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-15 Construction On-road Emission Factors

		EMFAC2011				Emission Factors									
	Vehicle Class	Categories		Units	Fuel	TOG	ROG	NOx	CO	PM10	PM2_5	SOx	CO2	CH4	N2O
Running	Class 5 Medium Duty Vehicles (16,001 - 19,500 LBS GVWR)	LHD2 - DSL		g/mile	Diesel	0.2050	0.1801	2.5646	0.8114	0.0315	0.0302	0.0062	652.4308	0.0084	0.1026
Idle	Class 5 Medium Duty Vehicles (16,001 - 19,500 LBS GVWR)	LHD2 - DSL		g/vehicle/day	Diesel	0.1250	0.1098	2.4766	0.9097	0.0282	0.0270	0.0021	224.284		
Running	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 IH		g/mile	Diesel	0.3803	0.3341	5.4098	0.8720	0.1491	0.1427	0.0104	1104.4851	0.0155	0.1736
Idle	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 IH		g/vehicle/day	Diesel	0.1885	0.1656	7.6603	2.0489	0.0484	0.0463	0.0064	675.7635		
Running	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 ICH		g/mile	Diesel	0.7396	0.6496	6.3953	1.2559	0.2027	0.1939	0.0121	1283.7124	0.0302	0.2018
Idle	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 ICH		g/vehicle/day	Diesel	0.2594	0.2279	7.5890	2.3911	0.0679	0.0650	0.0064	673.2631		
Running	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	T7 Single - DSL		g/mile	Diesel	0.5024	0.4413	8.7581	1.4204	0.1968	0.1883	0.0159	1681.252	0.020	0.264
Idle	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	T7 Single - DSL		g/vehicle/day	Diesel	2.5729	2.2601	29.7930	20.0165	0.1731	0.1656	0.0378	3999.769		
Running	Light Duty Trucks	LDT2 - DSL		g/mile	Diesel	0.0188	0.0165	0.0764	0.1273	0.0079	0.0076	0.0027	290.161	0.001	0.046
Idle	Light Duty Trucks	LDT2 - DSL		g/vehicle/day	Diesel	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000		
Running	Light Duty Vehicles	LDA - Gas		g/mile	Gasoline	0.0271	0.0186	0.0795	0.9439	0.0015	0.0014	0.0027	276.5841	0.0044	0.0071
Idle	Light Duty Vehicles	LDA - Gas		g/vehicle/day	Gasoline	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		

		EMFAC2011				Emission Factors									
	Vehicle Class	Categories			Fuel	TOG	ROG	NOx	CO	PM10	PM2.5	SOx	CO2	CH4	N2O
Running	Class 5 Medium Duty Vehicles (16,001 - 19,500 LBS GVWR)	LHD2 - DSL	LHD2 - DSLRunning	lb/mile	Diesel	0.0005	0.0004	0.0057	0.0018	0.0078	0.0012	0.0000	1.4384	0.0000	0.0002
Idle	Class 5 Medium Duty Vehicles (16,001 - 19,500 LBS GVWR)	LHD2 - DSL	LHD2 - DSLIdle	lb/vehicle/day	Diesel	0.0003	0.0002	0.0055	0.0020	0.0001	0.0001	0.0000	0.4945	0.0000	0.0000
Running	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 IH	T6 IHRunning	lb/mile	Diesel	0.0008	0.0007	0.0119	0.0019	0.0080	0.0015	0.0000	2.4350	0.0000	0.0004
Idle	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 IH	T6 IHIdle	lb/vehicle/day	Diesel	0.0004	0.0004	0.0169	0.0045	0.0001	0.0001	0.0000	1.4898	0.0000	0.0000
Running	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 ICH	T6 ICHRunning	lb/mile	Diesel	0.0016	0.0014	0.0141	0.0028	0.0082	0.0016	0.0000	2.8301	0.0001	0.0004
Idle	Class 6 Medium-Heavy Duty Vehicles (>26,000 lbs. GVWR)	T6 ICH	T6 ICHIdle	lb/vehicle/day	Diesel	0.0006	0.0005	0.0167	0.0053	0.0001	0.0001	0.0000	1.4843	0.0000	0.0000
Running	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	T7 Single - DSL	T7 Single - DSLRunning	lb/mile	Diesel	0.0011	0.0010	0.0193	0.0031	0.0081	0.0016	0.0000	3.7065	0.0000	0.0006
Idle	Class 8a and 8b Heavy-Duty Vehicles (>33,000 lbs. GVWR)	T7 Single - DSL	T7 Single - DSLIdle	lb/vehicle/day	Diesel	0.0057	0.0050	0.0657	0.0441	0.0004	0.0004	0.0001	8.8180	0.0000	0.0000
Running	Light Duty Trucks	LDT2 - DSL	LDT2 - DSLRunning	lb/mile	Diesel	0.0000	0.0000	0.0002	0.0003	0.0077	0.0012	0.0000	0.6397	0.0000	0.0001
Idle	Light Duty Trucks	LDT2 - DSL	LDT2 - DSLIdle	lb/vehicle/day	Diesel	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Running	Light Duty Vehicles	LDA - Gas	LDA - GasRunning	lb/mile	Gasoline	0.0001	0.0000	0.0002	0.0021	0.0077	0.0012	0.0000	0.6098	0.0000	0.0000
Idle	Light Duty Vehicles	LDA - Gas	LDA - GasIdle	lb/vehicle/day	Gasoline	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes:

- EMFAC2017 criteria pollutant and CO₂ emission factors for on-road vehicles are derived from the California Air Resources Board's EMFAC2017 2019 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.7) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed Feb 20, 2019). Data reflects the use specific vehicle model years (2015 - 2019) and aggregated vehicle speeds)
- California's Greenhouse Gas Inventory (10th Edition, last modified June 6, 2017), data for 2015, 1A3bii (Light-duty Trucks and SUVs), 1A3biii (Heavy-Duty Trucks and Buses) available at www.arb.ca.gov/cc/inventory/doc/doc_index.php (accessed June 28, 2018).
 - Light Duty Trucks and SUVs - Diesel:
0.0291 grams methane/gallon
0.332 grams nitrous oxide/gallon
 - Heavy Duty Trucks - Diesel:
0.0900 grams methane/gallon
0.332 grams nitrous oxide/gallon
- Criteria pollutant emission factors include total emissions for each pollutant. In addition to exhaust emissions, ROG emission factors include emissions from diurnal, hot soak, running losses, and resting losses. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
Conversion factors:
2000 pounds/ton
453.59 grams/pound

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):						
Variable	Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier	CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier	CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	CARB - 2018 EI	sL	0.015	g/m ²	4.76E-04	7.14E-05
Road silt loading - Major	CARB - 2018 EI	sL	0.032	g/m ²	9.49E-04	1.42E-04
Road silt loading - Collector	CARB - 2018 EI	sL	0.032	g/m ²	9.49E-04	1.42E-04
Road silt loading - Local	CARB - 2018 EI	sL	0.320	g/m ²	7.71E-03	1.16E-03
Average vehicle weight	Average Project Vehicle Weight		W	9.45	tons	
Paved Road Dust Entrainment	$E_f = k(sL)^{0.91} \times W^{1.02}$					

Notes:

- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*.
Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018).
https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based estimated based on anticipated vehicle types to be used by project.
- Road silt loading factor assumed to be for "local" roads only, since construction activities will be within the LFC property boundary only.

ExxonMobil Interium Trucking for SYU Phased Restart

Table B-1 Construction Off-road Equipment Specifications and Emission Factors

	Horse-	Load	Emission Factors (grams/Horsepower-Hour)								
Category	power	Factor	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
Air Compressors	78	0.48	0.538	3.718	3.706	0.006	0.260	0.260	568.299	0.048	0.014
Cement and Mortar Mixers	9	0.56	0.661	3.469	4.142	0.008	0.162	0.162	568.299	0.059	0.014
Concrete/Industrial Saws	81	0.73	0.443	3.550	3.441	0.006	0.220	0.220	568.300	0.040	0.014
Cranes	231	0.29	0.427	1.941	5.084	0.005	0.216	0.198	483.462	0.153	0.014
Excavators	157	0.38	0.246	3.082	2.533	0.005	0.122	0.112	482.684	0.153	0.014
Forklifts	149	0.20	0.382	3.288	3.885	0.005	0.210	0.193	482.598	0.153	0.014
Generator Sets	84	0.74	0.405	3.396	3.446	0.006	0.206	0.206	568.299	0.036	0.014
Graders	187	0.41	0.360	1.359	4.887	0.005	0.156	0.144	486.329	0.154	0.014
Off-Highway Trucks (Haul)	381	0.38	0.263	1.483	2.669	0.005	0.097	0.089	485.383	0.154	0.014
Off-Highway Trucks (Water)	381	0.20	0.263	1.483	2.669	0.005	0.097	0.089	485.383	0.154	0.014
Pavers	130	0.42	0.299	3.013	3.245	0.005	0.159	0.146	483.394	0.153	0.014
Paving Equipment	132	0.36	0.254	3.011	2.692	0.005	0.134	0.123	481.225	0.152	0.014
Rollers	80	0.38	0.423	3.557	4.179	0.005	0.275	0.253	484.336	0.153	0.014
Rubber Tired Dozers	247	0.40	0.651	2.459	6.929	0.005	0.338	0.311	485.172	0.154	0.014
Rubber Tired Loaders	203	0.36	0.309	1.302	3.745	0.005	0.126	0.116	480.100	0.152	0.014
Scrapers	367	0.48	0.343	2.595	4.156	0.005	0.163	0.150	482.732	0.153	0.014
Tractors/Loaders/Backhoes	97	0.37	0.368	3.638	3.693	0.005	0.247	0.227	485.855	0.154	0.014
Welders	46	0.45	1.055	4.950	4.950	0.007	0.273	0.273	568.299	0.095	0.014

	Horse-	Load	Emission Factors (lb/Horsepower-Hour)								
Category	power	Factor	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O
Air Compressors	78	0.48	0.001	0.008	0.008	0.000	0.001	0.001	1.253	0.000	0.000
Cement and Mortar Mixers	9	0.56	0.001	0.008	0.009	0.000	0.000	0.000	1.253	0.000	0.000
Concrete/Industrial Saws	81	0.73	0.001	0.008	0.008	0.000	0.000	0.000	1.253	0.000	0.000
Cranes	231	0.29	0.001	0.004	0.011	0.000	0.000	0.000	1.066	0.000	0.000
Excavators	157	0.38	0.001	0.007	0.006	0.000	0.000	0.000	1.064	0.000	0.000
Forklifts	149	0.20	0.001	0.007	0.009	0.000	0.000	0.000	1.064	0.000	0.000
Generator Sets	84	0.74	0.001	0.007	0.008	0.000	0.000	0.000	1.253	0.000	0.000
Graders	187	0.41	0.001	0.003	0.011	0.000	0.000	0.000	1.072	0.000	0.000
Off-Highway Trucks (Haul)	381	0.38	0.001	0.003	0.006	0.000	0.000	0.000	1.070	0.000	0.000
Off-Highway Trucks (Water)	381	0.20	0.001	0.003	0.006	0.000	0.000	0.000	1.070	0.000	0.000
Pavers	130	0.42	0.001	0.007	0.007	0.000	0.000	0.000	1.066	0.000	0.000
Paving Equipment	132	0.36	0.001	0.007	0.006	0.000	0.000	0.000	1.061	0.000	0.000
Rollers	80	0.38	0.001	0.008	0.009	0.000	0.001	0.001	1.068	0.000	0.000
Rubber Tired Dozers	247	0.40	0.001	0.005	0.015	0.000	0.001	0.001	1.070	0.000	0.000
Rubber Tired Loaders	203	0.36	0.001	0.003	0.008	0.000	0.000	0.000	1.058	0.000	0.000
Scrapers	367	0.48	0.001	0.006	0.009	0.000	0.000	0.000	1.064	0.000	0.000
Tractors/Loaders/Backhoes	97	0.37	0.001	0.008	0.008	0.000	0.001	0.001	1.071	0.000	0.000
Welders	46	0.45	0.002	0.011	0.011	0.000	0.001	0.001	1.253	0.000	0.000

Notes:

1. Source for emission factors: CalEEMod, Appendix D, Default Data Tables, October 2017. Based on Year: 2019

ExxonMobil Interium Trucking for SYU Phased Restart

Reduced Trucking Alternative

Table B-1 Combined Mobile, Stationary, and Indirect Source Summary

	Scenario 1: Phillips 66 Santa Maria Truck Rack	Scenario 2: Plains Pentland Truck Rack
NOx: Daily Significance Threshold Exceeded? (Threshold - 55 lb NOx/day)	No	No
NOx: Daily Mobile Significance Threshold Exceeded? (Threshold - 25 lb NOx/day)	No	Yes
NOx: Daily Stationary Source Emissions (NOx lb/day)	0.00	0.00
NOx: Daily Mobile Source Emissions (NOx lb/day)	15.19	37.78
NOx: Daily Stationary + Mobile Source Emissions (NOx lb/day)	15.19	37.78
ROC: Daily Significance Threshold Exceeded? (Threshold - 55 lb ROC/day)	No	No
ROC: Daily Stationary Source Emissions (ROC lb/day)	33.26	33.26
ROC: Daily Mobile Source Emissions (ROC lb/day)	0.38	0.86
ROC: Daily Stationary + Mobile Source Emissions (ROC lb/day)	33.64	34.12
PM: Daily Significance Threshold Exceeded? (Threshold - 80 lb PM/day)	No	No
PM: Daily Stationary Source Emissions (PM lb/day)	0.00	0.00
PM: Daily Mobile Source Emissions (PM lb/day)	9.91	33.98
PM: Daily Stationary + Mobile Source Emissions (PM lb/day)	9.91	33.98
GHG: Annual GHG Significance Threshold Exceeded? (Threshold 1,000 MT CO ₂ e/year)	Yes	Yes
GHG: Annual Stationary Source Emissions (MT CO ₂ e/year)	64	64
GHG: Annual Indirect Source Emissions (MT CO ₂ e/year)	248	248
GHG: Annual Mobile Source Emissions (MT CO ₂ e/year)	2,526	6,526
GHG: Annual Stationary, Mobile Source, and Indirect Emissions (MT CO₂e/year)	2,838	6,837

Reduced Trucking Alternative
Table B-18 Mobile Source to Santa Maria

Daily Emissions - Scenario 1															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	18	50	98.8	4,940	0.22	12.31	6.99	1.15	2.34	0.13	13,462.54	0.01	2.12	14,093
Travel Within Santa Barbara County - Collector Road	Collector	18	50	8.00	400	0.09	1.81	1.12	0.18	1.20	0.01	1,253.56	0.00	0.20	1,312
Travel Within Santa Barbara County - Local Road	Local	18	50	1.6	80	0.08	1.07	1.80	0.27	1.12	0.00	393.01	0.00	0.06	412
Total Travel Distance		18	50	108.4	5,420										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.4	15.2	9.9	1.6	4.7	0.1	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination	Road Type	Number of Vehicles	Trips per Year	Trip Length Round-Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons/Yr)						GHG Emissions (Metric Tons/Yr)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	18	18,250	98.8	1,803,100	0.03	2.09	1.28	0.21	0.23	0.02	2,199.49	0.00	0.35	2,303
Travel Within Santa Barbara County - Collector road	Collector	18	18,250	8	146,000	0.00	0.17	0.20	0.03	0.02	0.00	178.17	0.00	0.03	186.5
Travel Within Santa Barbara County - Local Road	Local	18	18,250	1.6	29,200	0.00	0.03	0.33	0.05	0.00	0.00	35.70	0.00	0.01	37.4
Total Travel Distance		18	18,250	108.4	1,978,300	0.03	2.29	1.81	0.29	0.25	0.03	2,413	0	0	2,526
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									2,526.4
Significance Threshold: SB County Planning SBC APCD						(Not Applicable)						1,000 10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
				Truck Capacity (bbl/truck)	Crude Transported (bbl/year)										
Potential Maximum Volume Crude Transported to Markets:				160	2,920,000										

Reduced Trucking Alternative

Table B-18 Mobile Source to Santa Maria

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
Emission Factors													
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O
Running Exhaust	Freeway			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Major			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Collector			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Local			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):

Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight				CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment								$Ef = k(sL)^{0.91} \times W^{1.02}$	

Notes:

- Trip distances assume:
 - 54.3 miles from the ExxonMobil Las Flores Canyon facility to the Phillips 66 Santa Maria truck rack located at 1580 East Battles Road in Santa Maria.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound
 - 1,000 kilograms/metric ton

Reduced Trucking Alternative Table
B-19 Mobile Source to Pentland

Daily Emissions - Scenario 2															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	22	50	108.8	5,440	0.25	13.66	7.70	1.27	2.71	0.14	14,847	0.01	2.33	15,542
Travel Within Santa Barbara County - Collector Road	Collector	22	50	7.4	370	0.10	1.93	1.03	0.16	1.44	0.01	1,212	0.00	0.19	1,269
Travel Within Santa Barbara County - Local Road	Local	22	50	1.6	80	0.09	1.26	1.80	0.27	1.37	0.00	433	0.00	0.07	453
Travel Outside Santa Barbara County - Major road	Major	22	50	161.4	8,070	0.32	19.75	22.55	3.55	3.37	0.21	21,919	0.02	3.45	22,946
Travel Outside Santa Barbara County - Local Road	Local	22	50	0.8	40	0.09	1.17	0.90	0.14	1.36	0.00	325	0.00	0.05	340
Total Travel Distance		22	50	280	14,000										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties (Max - Worst Case)						0.86	37.78	33.98	5.40	10.24	0.37	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	Yes	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination		Number of Vehicles	Trips per Year	Trip Length Round-Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons)						GHG Emissions (Metric Tons)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	22	18,250	108.8	1,985,600	0.03	2.30	1.40	0.23	0.25	0.03	2,422.12	0.00	0.38	2,535.6
Travel Within Santa Barbara County - Local Road	Collector	22	18,250	7.4	135,050	0.00	0.16	0.19	0.03	0.02	0.00	164.83	0.00	0.03	172.6
Travel Within Santa Barbara County - Collector road	Local	22	18,250	1.6	29,200	0.00	0.03	0.33	0.05	0.00	0.00	35.72	0.00	0.01	37.4
Travel Outside Santa Barbara County - Major road	Major	22	18,250	161.4	2,945,550	0.04	3.41	4.11	0.65	0.37	0.04	3,593.07	0.00	0.56	3,761.4
Travel Outside Santa Barbara County - Local Road	Local	22	18,250	0.8	14,600	0.00	0.02	0.16	0.02	0.00	0.00	17.91	0.00	0.00	18.7
Total Travel Distance		22	18,250	280	5,110,000	0.07	5.91	6.20	0.98	0.64	0.06	6,233.65	0.00	0.98	6,525.72
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									6,525.7
Significance Threshold:						(Not Applicable)									
SB County Planning												1,000			
SBC APCD												10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
			Truck Capacity (bbl/truck)	Crude Transported (bbl/year)											
Potential Maximum Volume Crude Transported to Markets:				160	2,920,000										

**Reduced Trucking Alternative Table
B-19 Mobile Source to Pentland**

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
					Emission Factors								
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O
Running Exhaust	Freeway			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Major			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Collector			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Local			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):									
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight				CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment									$Ef = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 140 total miles (within Santa Barbara, San Luis Obispo, and Kern Counties) from the ExxonMobil Las Flores Canyon facility to the Plains Pentland truck rack located at 2311 Basic School Road in Maricopa.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fulpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound)
 - 1,000 kilograms/metric ton

Reduced Trucking Alternative

Table B-20 Mobile Source to Pentland by County

Daily Emissions - Scenario 2																
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)				
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e	DPM
Plains Pentland Truck Rack:																
Santa Barbara County-Hwy 101	Freeway	22	50	108.8	5,440	0.25	13.66	7.70	1.27	2.71	0.14	14,846.67	0.01	2.33	15,542.4	0.14
Santa Barbara County-Hwy 166	Major	0	50	60.2	3,010	0.09	6.96	8.41	1.33	0.75	0.08	8,094.50	0.00	1.27	8,473.8	0.08
Santa Barbara County-Calle Real	Local	22	50	1.6	80	0.09	1.26	1.80	0.27	1.37	0.00	432.54	0.00	0.07	452.9	0.00
Santa Barbara County-SYU Rds	Collector	22	50	7.4	370	0.10	1.93	1.03	0.16	1.44	0.01	1,212.41	0.00	0.19	1,269.3	0.01
SLO County-Hwy 166	Major	11	50	77.4	3,870	0.16	9.49	10.81	1.70	1.64	0.10	10,515.92	0.01	1.65	11,008.7	0.10
Kern County-Hwy 166	Major	11	50	23.8	1,190	0.08	3.29	3.32	0.52	0.97	0.03	3,308.85	0.00	0.52	3,463.9	0.03
Kern County-Access to Pentland	Local	22	50	0.8	40	0.09	1.17	0.90	0.14	1.36	0.00	324.97	0.00	0.05	340.3	0.00
Total Travel Distance		22	50	280	14,000											
San Luis Obispo DPM																0.10
Kern County Totals						0.17	4.46	4.23	0.66	2.33	0.03					
Santa Barbara County Totals						0.53	23.83	18.94	3.03	6.27	0.23					
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.86	37.78	33.98	5.40	10.24	0.37	(Not Applicable)				

ExxonMobil Interium Trucking for SYU Phased Restart
Reduced Trucking Alternative
Table B-21 Stationary and Indirect Sources

Emission Source	Reactive Organic Compounds			
SUMMARY	lb/hr	lb/day	TPQ	Total Emissions (Tons/Yr)
Fugitive Hydrocarbon Components	0.334	8.014	0.366	1.462
Crude Loading Activity - VRU	4.039	25.245	1.152	4.607
Total Increase:	4.373	33.259	1.517	6.070

GHG - CO ₂ e			
lb/hr	lb/day	TPQ	Total Emissions (Metric Tons/Yr)
12.593	302.222	12.509	50.036
13.122	82.010	3.394	13.578
25.714	384.233	15.903	63.614

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

Emission Source	lb/hr					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		0.33				
Crude Loading Activity		4.04				
Total Increase:	0.00	4.37	0.00	0.00	0.00	0.00

lb/hr
GHG - CO ₂ e
12.59
13.12
25.71

Emission Source	lb/day					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		8.01				
Crude Loading Activity		25.24				
Total Increase:	0.00	33.26	0.00	0.00	0.00	0.00

lb/day
GHG - CO ₂ e
302.22
82.01
384.23

Emission Source	TPQ					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		0.37				
Crude Loading Activity		1.15				
Total Increase:	0.00	1.52	0.00	0.00	0.00	0.00

TPQ
GHG - CO ₂ e
12.51
3.39
15.90

Emission Source	Total Tons/Yr					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		1.46				
Crude Loading Activity - VRU		4.61				
Total Increase:	0.00	6.07	0.00	0.00	0.00	0.00

Total Tons/Yr
GHG - CO ₂ e
50.04
13.58
63.61

Emission Offset Evaluation	TPQ					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Total Emissions to Offset:	0.000	1.52				
Total ERCs Required at a 1.3:1 ratio (TPQ):	0.000	1.97				

ROC- TPY
7.89

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

⁴ Source of Emission Reduction Credits will be determined during the course of the permit application review and approval. Offset ratio per APCD Rule 804 Section D.8.

Indirect GHG Emissions from Electrical Use

Loading Rack Electrical Use (MW-hr/day)	2.14 Data from ExxonMobil
Electric Power CO ₂ e factor(CO ₂ e lb/MWH)	704.6 CalEEMod Value for SCE Power
Tons per Year CO ₂ e	247.98

Reduced Trucking Alternative
Table B-2 Loading Rack Emissions

Product Loading Activity Emission Calculations					
Scenario 1 and 2 ExxonMobil Production Exxon - SYU, Las Flores Canyon		Reference: Loading Rack Rack Type: Enter X as Appropriate	S Factor		
		Submerged loading of a clean cargo tank		0.50	
		Submerged loading: Dedicated normal service	X	0.60	
		Submerged loading: Dedicated vapor balance service		1.00	
		Splash loading of a clean cargo tank		1.45	
		Splash loading: Dedicated normal service		1.45	
		Splash loading: Dedicated vapor balance service		1.00	
Input data		Reference			
S = Saturation Factor	0.60	See AP-42 Table 4.4-1		2	
M = Molecular Weight	50	Crude Oil: Default = 50 lb/lb-mole		3	
P = True Vapor Pressure (psia)	2.680	See AP-42 Table 12.3-5		1	
T = Liquid Temperature °R	590	130 °F + 460 = °R		5	
C = Storage Capacity (bbl)	2,920,000	122,640,000 gallons (42 gallons = 1 bbl)		1	
A = Annual Production (bbl)	2,920,000	122,640,000 gallons (42 gallons = 1 bbl)		1	
R = Max Loading Rate (bbl/hr)	1280.00	53,760 gallons (42 gallons = 1 bbl)		1	
D = Max Daily Production (bbl)	8,000	336,000 gallons (42 gallons = 1 bbl)			
D2 = Average Daily Production (bbl)	8,000	336,000 gallons (42 gallons = 1 bbl)			
eff = Vapor Recovery Efficiency	0.95	Default = 0.95 (SBC APCD)		1	
ROC/THC = Reactivity	0.885	Crude Oil: Default = 0.885			
$L_{LTHC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M)/T =$ $L_{LROC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M) \cdot \text{React}/T =$		1.6979 lbTHC/1000 gal 1.5027 lb ROC/1000 gal			
Total Uncontrolled Hydrocarbon Losses:					
		ROC	THC	Estimated CH ₄ , GHG	
Hourly					
THL _H = (R)(42 gal/bbl)(L _{LROC} /1000) =		80.78 lbs/hr	91.28	10.50	
Max Daily					
THL _D = (D)(42 gal/bbl)(L _{LROC} /1000) =		504.90 lbs/day	570.51	65.61	
Quarterly					
THL _Q = THL _D (91)(1/2000) =		23.04 TPQ	26.03	2.99	
Total Emissions					
THL _A = (A)(42 gal/bbl)(L _{LROC} /1000)(1/2000) =		92.14 TPY	104.12	11.97	
Total Controlled Hydrocarbon Losses:					
Hourly					
THL _{HC} = (THL _H)(1-eff) =		4.04 lbs/hr	4.56	0.52	
Max Daily					
THL _{DC} = (THL _D)(1-eff) =		25.24 lbs/day	28.53	3.28	
Quarterly					
THL _{QC} = (THL _Q)(1-eff) =		1.15 TPQ	1.30	0.15	
Total Emissions					
THL _{AC} = (THL _A)(1-eff) =		4.61 TPY	5.21	0.60	

Notes:

- Data provided by the applicant
C = Annual Transport Volume.
- AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
- If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
- Vapor pressure as measured from LFC Crude.
- R is calculated by adding 460 to °F.
- A maximum of 70 trucks will be loaded per day; up to 8 per hour. Actual number of trucks/day may be less.
- The maximum daily rate of 70 trucks was used to determine the maximum quarterly and annual emissions.
- GHG emissions from loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.
- Applied SBC APCD determined truck loading efficiency of 95%;
- Average Daily Production is assumed to be the same as the maximum daily potential production for purposes of defining a reasonable worst case scenario.

No Trucking During Rainy Day Periods

Table B-23 Combined Mobile, Stationary, and Indirect Source Summary

	Scenario 1: Phillips 66 Santa Maria Truck Rack	Scenario 2: Plains Pentland Truck Rack
NOx: Daily Significance Threshold Exceeded? (Threshold - 55 lb NOx/day)	No	Yes
NOx: Daily Mobile Significance Threshold Exceeded? (Threshold - 25 lb NOx/day)	No	Yes
NOx: Daily Stationary Source Emissions (NOx lb/day)	0	0
NOx: Daily Mobile Source Emissions (NOx lb/day)	23.68	58.86
NOx: Daily Stationary + Mobile Source Emissions (NOx lb/day)	23.68	58.86
ROC: Daily Significance Threshold Exceeded? (Threshold - 55 lb ROC/day)	No	No
ROC: Daily Stationary Source Emissions (ROC lb/day)	47.40	47.40
ROC: Daily Mobile Source Emissions (ROC lb/day)	0.59	1.34
ROC: Daily Stationary + Mobile Source Emissions (ROC lb/day)	47.99	48.73
PM: Daily Significance Threshold Exceeded? (Threshold - 80 lb PM/day)	No	No
PM: Daily Stationary Source Emissions (PM lb/day)	0.00	0.00
PM: Daily Mobile Source Emissions (PM lb/day)	15.46	53.01
PM: Daily Stationary + Mobile Source Emissions (PM lb/day)	15.46	53.01
GHG: Annual GHG Significance Threshold Exceeded? (Threshold 1,000 MT CO ₂ e/year)	Yes	Yes
GHG: Annual Stationary Source Emissions (MT CO₂e/year)	69	69
GHG: Annual Indirect Source Emissions (MT CO₂e/year)	347	347
GHG: Annual Mobile Source Emissions (MT CO₂e/year)	3,537	8,875
GHG: Annual Stationary + Mobile Source Emissions (MT CO₂e/year)	3,953	9,291

No Trucking During Rainy Day Periods
Table B-24 Mobile Source to Santa Maria

Daily Emissions - Scenario 1															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	28	78	98.8	7,706	0.34	19.20	10.91	1.80	3.64	0.20	21,000.77	0.02	3.30	21,985
Travel Within Santa Barbara County - Collector Road	Collector	28	78	8.00	624	0.13	2.81	1.74	0.28	1.87	0.02	1,954.76	0.01	0.31	2,046
Travel Within Santa Barbara County - Local Road	Local	28	78	1.6	125	0.12	1.66	2.81	0.42	1.75	0.01	612.31	0.01	0.10	641
Total			78	108.4	8,455										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.6	23.7	15.5	2.5	7.3	0.2	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination	Road Type	Number of Vehicles	Trips per Year	Trip Length Round-Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons/Yr)						GHG Emissions (Metric Tons/Yr)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	28	25,550	98.8	2,524,340	0.04	2.92	1.79	0.29	0.32	0.03	3,079.30	0.00	0.48	3,224
Travel Within Santa Barbara County - Collector road	Collector	28	25,550	8	204,400	0.00	0.24	0.29	0.04	0.03	0.00	249.45	0.00	0.04	261.1
Travel Within Santa Barbara County - Local Road	Local	28	25,550	1.6	40,880	0.00	0.05	0.46	0.07	0.01	0.00	49.99	0.00	0.01	52.3
Total			25,550	108.4	2,769,620	0.04	3.21	2.53	0.41	0.35	0.04	3,379	0	1	3,537
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									3,537.1
Significance Threshold: SB County Planning SBC APCD						(Not Applicable)						1,000 10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
				Truck Capacity (bbl/truck)	Crude Transported (bbl/year)										
Potential Maximum Volume Crude Transported to Markets:				160	4,088,000										

No Trucking During Rainy Day Periods
Table B-24 Mobile Source to Santa Maria

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
Emission Factors													
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O
Running Exhaust	Freeway			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Major			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Collector			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Local			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):										
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}	
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt			
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile	
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04	
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04	
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04	
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03	
Average vehicle weight				CalTrans WIM Data	W	27	tons			
Paved Road Dust Entrainment										$E_f = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 54.3 miles from the ExxonMobil Las Flores Canyon facility to the Phillips 66 Santa Maria truck rack located at 1580 East Battles Road in Santa Maria.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound
 - 1,000 kilograms/metric ton

No Trucking During Rainy Day Periods
Table B-25 Mobile Source to Pentland

Daily Emissions - Scenario 2															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	34	78	108.8	8,486	0.39	21.30	12.01	1.98	4.21	0.22	23,158	0.02	3.64	24,243
Travel Within Santa Barbara County - Collector Road	Collector	34	78	7.4	577	0.16	3.00	1.61	0.25	2.23	0.02	1,888	0.01	0.30	1,977
Travel Within Santa Barbara County - Local Road	Local	34	78	1.6	125	0.14	1.95	2.81	0.42	2.11	0.01	672	0.01	0.11	703
Travel Outside Santa Barbara County - Major road	Major	34	78	161.4	12,589	0.51	30.79	35.17	5.54	5.23	0.32	34,191	0.02	5.37	35,793
Travel Outside Santa Barbara County - Local Road	Local	34	78	0.8	62	0.14	1.81	1.41	0.21	2.10	0.00	504	0.01	0.08	528
Total Travel Distance			78	280	21,840										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties (Max - Worst Case)						1.34	58.86	53.01	8.42	15.88	0.57	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	Yes	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination		Number of Vehicles	Trips per Year	Trip Length Round-Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons)						GHG Emissions (Metric Tons)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	34	24,820	108.8	2,700,416	0.04	3.13	1.91	0.32	0.34	0.03	3,294.11	0.00	0.52	3,448.4
Travel Within Santa Barbara County - Local Road	Collector	34	24,820	7.4	183,668	0.00	0.21	0.26	0.04	0.02	0.00	224.19	0.00	0.04	234.7
Travel Within Santa Barbara County - Collector road	Local	34	24,820	1.6	39,712	0.00	0.05	0.45	0.07	0.01	0.00	48.59	0.00	0.01	50.9
Travel Outside Santa Barbara County - Major road	Major	34	24,820	161.4	4,005,948	0.06	4.64	5.60	0.88	0.50	0.05	4,886.59	0.00	0.77	5,115.5
Travel Outside Santa Barbara County - Local Road	Local	34	24,820	0.8	19,856	0.00	0.02	0.22	0.03	0.00	0.00	24.37	0.00	0.00	25.5
Total Travel Distance			24,820	280	6,949,600	0.10	8.04	8.43	1.34	0.88	0.09	8,477.85	0.00	1.33	8,875.07
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									8,875.1
Significance Threshold: SB County Planning SBC APCD						(Not Applicable)						1,000 10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
			Truck Capacity (bbl/truck)	Crude Transported (bbl/year)											
Potential Maximum Volume Crude Transported to Markets:				160	3,971,200										

No Trucking During Rainy Day Periods
Table B-25 Mobile Source to Pentland

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
					Emission Factors								
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O
Running Exhaust	Freeway			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Major			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Collector			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Local			lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):									
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight				CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment									$Ef = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 140 total miles (within Santa Barbara, San Luis Obispo, and Kern Counties) from the ExxonMobil Las Flores Canyon facility to the Plains Pentland truck rack located at 2311 Basic School Road in Maricopa.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fulpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound)
 - 1,000 kilograms/metric ton

No Trucking During Rainy Day Periods

Table B-2 Mobile Source to Pentland by County

Daily Emissions - Scenario 2															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Santa Barbara County-Hwy 101	Freeway	34	78	108.8	8,486	0.39	21.30	12.01	1.98	4.21	0.22	23,157.64	0.02	3.64	24,242.8
Santa Barbara County-Hwy 166	Major	0	78	60.2	4,696	0.14	10.87	13.12	2.07	1.18	0.12	12,627.42	0.01	1.98	13,219.1
Santa Barbara County-Calle Real	Local	34	78	1.6	125	0.14	1.95	2.81	0.42	2.11	0.01	671.60	0.01	0.11	703.2
Santa Barbara County-SYU Rds	Collector	34	78	7.4	577	0.16	3.00	1.61	0.25	2.23	0.02	1,888.19	0.01	0.30	1,976.8
SLO County-Hwy 166	Major	17	78	77.4	6,037	0.25	14.80	16.87	2.66	2.55	0.15	16,403.25	0.01	2.58	17,171.9
Kern County-Hwy 166	Major	17	78	23.8	1,856	0.12	5.13	5.19	0.82	1.51	0.05	5,160.23	0.01	0.81	5,402.1
Kern County-Access to Pentland	Local	34	78	0.8	62	0.14	1.81	1.41	0.21	2.10	0.00	503.79	0.01	0.08	527.6
Total Travel Distance		34	78	280	21,840										
San Luis Obispo DPM															0.16
Kern County Totals						0.27	6.94	6.59	1.03	3.60	0.05				
Santa Barbara County Totals						0.82	37.12	29.55	4.73	9.72	0.36				
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						1.34	58.86	53.01	8.42	15.88	0.57	(Not Applicable)			

ExxonMobil Interium Trucking for SYU Phased Restart
No Trucking During Rainy Day Periods
Table B-2 Stationary and Indirect Sources

Emission Source	Reactive Organic Compounds			
SUMMARY	lb/hr	lb/day	TPQ	Total Emissions (Tons/Yr)
Fugitive Hydrocarbon Components	0.334	8.014	0.366	1.462
Crude Loading Activity - VRU	4.039	39.382	1.613	6.450
Total Increase:	4.373	47.396	1.978	7.913

GHG - CO ₂ e			
lb/hr	lb/day	TPQ	Total Emissions (Metric Tons/Yr)
12.593	302.222	12.509	50.036
13.122	127.936	3.992	19.009
25.714	430.159	16.501	69.045

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

Emission Source	lb/hr					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		0.33				
Crude Loading Activity		4.04				
Total Increase:	0.00	4.37	0.00	0.00	0.00	0.00

lb/hr
GHG - CO ₂ e
12.59
13.12
25.71

Emission Source	lb/day					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		8.01				
Crude Loading Activity		39.38				
Total Increase:	0.00	47.40	0.00	0.00	0.00	0.00

lb/day
GHG - CO ₂ e
302.22
127.94
430.16

Emission Source	TPQ					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		0.37				
Crude Loading Activity		1.61				
Total Increase:	0.00	1.98	0.00	0.00	0.00	0.00

TPQ
GHG - CO ₂ e
12.51
3.99
16.50

Emission Source	Total Tons/Yr					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Fugitive Hydrocarbon Components		1.46				
Crude Loading Activity - VRU		6.45				
Total Increase:	0.00	7.91	0.00	0.00	0.00	0.00

Total Tons/Yr
GHG - CO ₂ e
50.04
19.01
69.04

Emission Offset Evaluation	TPQ					
	NO _x	ROC	CO	SO _x	PM	PM ₁₀
Total Emissions to Offset:	0.000	1.98				
Total ERCs Required at a 1.3:1 ratio (TPQ):	0.000	2.57				

ROC- TPY
10.29

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

⁴ Source of Emission Reduction Credits will be determined during the course of the permit application review and approval. Offset ratio per APCD Rule 804 Section D.8.

Indirect GHG Emissions from Electrical Use

Loading Rack Electrical Use (MW-hr/day)
Electric Power CO₂e factor(CO₂e lb/MWH)
Tons per Year CO₂e

³ Data from ExxonMobil
704.6 CalEEMod Value for SCE Power
347.17

No Trucking During Rainy Day Periods
Table B- 8 Loading Rack Emissions

Product Loading Activity Emission Calculations					
Scenario 1 and 2 ExxonMobil Production Exxon - SYU, Las Flores Canyon		Reference: Loading Rack Rack Type: Enter X as Appropriate	S Factor		
		Submerged loading of a clean cargo tank		0.50	
		Submerged loading: Dedicated normal service	X	0.60	
		Submerged loading: Dedicated vapor balance service		1.00	
		Splash loading of a clean cargo tank		1.45	
		Splash loading: Dedicated normal service		1.45	
		Splash loading: Dedicated vapor balance service		1.00	
Input data		Reference			
S = Saturation Factor	0.60	See AP-42 Table 4.4-1		2	
M = Molecular Weight	50	Crude Oil: Default = 50 lb/lb-mole		3	
P = True Vapor Pressure (psia)	2.680	See AP-42 Table 12.3-5		1	
T = Liquid Temperature °R	590	130 °F + 460 = °R		5	
C = Storage Capacity (bbl)	4,088,000	171,696,000 gallons (42 gallons = 1 bbl)		1	
A = Annual Production (bbl)	4,088,000	171,696,000 gallons (42 gallons = 1 bbl)		1	
R = Max Loading Rate (bbl/hr)	1280.00	53,760 gallons (42 gallons = 1 bbl)		1	
D = Max Daily Production (bbl)	12,480	524,160 gallons (42 gallons = 1 bbl)			
D2 = Average Daily Production (bbl)	11,200	470,400 gallons (42 gallons = 1 bbl)			
eff = Vapor Recovery Efficiency	0.95	Default = 0.95 (SBC APCD)		1	
ROC/THC = Reactivity	0.885	Crude Oil: Default = 0.885			
$L_{LTHC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M)/T =$ $L_{LROC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M) \cdot \text{React}/T =$		1.6979 1.5027	lbTHC/1000 gal lb ROC/1000 gal		
Total Uncontrolled Hydrocarbon Losses:					
		ROC		THC	Estimated CH4, GHG
Hourly					
THL _H = (R)(42 gal/bbl)(L _{LROC} /1000) =		80.78	lbs/hr	91.28	10.50
Max Daily					
THL _D = (D)(42 gal/bbl)(L _{LROC} /1000) =		787.64	lbs/day	889.99	102.35
Quarterly					
THL _Q = THLD(91)(1/2000) =		32.25	TPQ	36.44	4.19
Total Emissions					
THL _A = (A)(42 gal/bbl)(L _{LROC} /1000)(1/2000) =		129.00	TPY	145.76	16.76
Total Controlled Hydrocarbon Losses:					
Hourly					
THL _{HC} = (THL _H)(1-eff) =		4.04	lbs/hr	4.56	0.52
Max Daily					
THL _{DC} = (THL _D)(1-eff) =		39.38	lbs/day	44.50	5.12
Quarterly					
THL _{QC} = (THL _Q)(1-eff) =		1.61	TPQ	1.82	0.21
Total Emissions					
THL _{AC} = (THL _A)(1-eff) =		6.45	TPY	7.29	0.84

Notes:

1. Data provided by the applicant
C = Annual Transport Volume.
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. Vapor pressure as measured from LFC Crude.
5. R is calculated by adding 460 to °F.
6. A maximum of 70 trucks will be loaded per day; up to 8 per hour. Actual number of trucks/day may be less.
7. The maximum daily rate of 70 trucks was used to determine the maximum quarterly and annual emissions.
8. GHG emissions from loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.
9. Applied SBC APCD determined truck loading efficiency of 95%;
10. Average Daily Production is assumed to be the same as the maximum daily potential production for purposes of defining a reasonable worst case scenario.

ExxonMobil Interium Trucking for SYU Phased Restart
SMPS Only Alterantive Summary
Table B- 9 Combined Mobile, Stationary, and Indirect Source Summary

	Scenario 1 - All Trucks to SMPS ¹	Scenario 2 - 20 Days of Trucking to Plains Pentland Terminal ²
NOx: Daily Significance Threshold Exceeded? (Threshold - 55 lb NOx/day)	No	No
NOx: Daily Mobile Significance Threshold Exceeded? (Threshold - 25 lb NOx/day)	No	No
NOx: Daily Stationary Source Emissions (NOx lb/day)	0	0
NOx: Daily Mobile Source Emissions (NOx lb/day)	23.68	24.48
NOx: Daily Stationary + Mobile Source Emissions (NOx lb/day)	23.68	24.48
ROC: Daily Significance Threshold Exceeded? (Threshold - 55 lb ROC/day)	No	No
ROC: Daily Stationary Source Emissions (ROC lb/day)	47.40	25.18
ROC: Daily Mobile Source Emissions (ROC lb/day)	0.59	0.48
ROC: Daily Stationary + Mobile Source Emissions (ROC lb/day)	47.99	25.66
PM: Daily Significance Threshold Exceeded? (Threshold - 80 lb PM/day)	No	No
PM: Daily Stationary Source Emissions (PM lb/day)	0.00	0.00
PM: Daily Mobile Source Emissions (PM lb/day)	15.46	23.11
PM: Daily Stationary + Mobile Source Emissions (PM lb/day)	15.46	23.11
GHG: Annual GHG Significance Threshold Exceeded? (Threshold 1,000 MT CO ₂ e/year)	Yes	Yes
GHG: Annual Stationary Source Emissions (MT CO ₂ e/year)	69	69
GHG: Annual Indirect Source Emissions (MT CO ₂ e/year)	347	347
GHG: Annual Mobile Source Emissions (MT CO ₂ e/year)	3,537	3,686
Combined GHG: Annual Stationary + Mobile Source Emissions (MT CO ₂ e/year)	3,953	4,103

1. Assumes 70 trucks per day.

2. Assumes 34 trucks per day to Plains Pentland Terminal for 20 days and a peak of 78 trucks per day to SMPS.

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-30 SMPS Only Alternative - Mobile Source to Santa Maria

Daily Emissions - Scenario 1															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	28	78.0	98.8	7,706	0.34	19.20	10.91	1.80	3.64	0.20	21,000.77	0.02	3.30	21,985
Travel Within Santa Barbara County - Collector Road	Collector	28	78.0	8.00	624	0.13	2.81	1.74	0.28	1.87	0.02	1,954.76	0.01	0.31	2,046
Travel Within Santa Barbara County - Local Road	Local	28	78.0	1.6	125	0.12	1.66	2.81	0.42	1.75	0.01	612.31	0.01	0.10	641
Total			78.0	108.4	8,455										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.6	23.7	15.5	2.5	7.3	0.2	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination	Road Type	Number of Vehicles	Trips per Year	Trip Length Round-Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons/Yr)						GHG Emissions (Metric Tons/Yr)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	28	24,870	98.8	2,457,156	0.04	2.84	1.74	0.29	0.31	0.03	2,997.35	0.00	0.47	3,138
Travel Within Santa Barbara County - Collector road	Collector	28	24,870	8	198,960	0.00	0.23	0.28	0.04	0.03	0.00	242.82	0.00	0.04	254.2
Travel Within Santa Barbara County - Local Road	Local	28	24,870	1.6	39,792	0.00	0.05	0.45	0.07	0.01	0.00	48.66	0.00	0.01	50.9
Total			24,870	108.4	2,695,908	0.04	3.12	2.46	0.40	0.34	0.03	3,289	0	1	3,443
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									3,442.9
Significance Threshold: SB County Planning SBC APCD						(Not Applicable)						1,000 10,000			
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
				Truck Capacity (bbl/truck)	Crude Transported (bbl/year)										
Potential Maximum Volume Crude Transported to Markets:				160	3,979,200										

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-30 SMPS Only Alternative - Mobile Source to Santa Maria

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
Exhaust Source		Road Type	Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	
Running Exhaust		Freeway	lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust		Major	lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust		Collector	lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust		Local	lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004	
Idle Exhaust		Freeway	lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust		Major	lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust		Collector	lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust		Local	lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):										
Variable	Road Type				Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier					CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier					CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway				CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major				CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector				CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local				CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight					CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment										
$Ef = k(sL)^{0.91} \times W^{1.02}$										

Notes:

- Trip distances assume:
 - 54.3 miles from the ExxonMobil Las Flores Canyon facility to the Phillips 66 Santa Maria truck rack located at 1580 East Battles Road in Santa Maria.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound
 - 1,000 kilograms/metric ton

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-31 SMPS Only Alternative - Emissions During Pentland Period - Mobile Source to Pentland

Daily Emissions - Scenario 2															
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length Round-Trip	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	10	34	108.8	3,699	0.15	9.05	5.23	0.86	1.54	0.09	10,047	0.01	1.58	10,517
Travel Within Santa Barbara County - Collector Road	Collector	10	34	7.4	252	0.05	1.07	0.70	0.11	0.68	0.01	775	0.00	0.12	812
Travel Within Santa Barbara County - Local Road	Local	10	34	1.6	54	0.04	0.62	1.23	0.19	0.63	0.00	245	0.00	0.04	257
Travel Outside Santa Barbara County - Major road	Major	10	34	161.4	5,488	0.20	13.19	15.33	2.42	1.99	0.14	14,856	0.01	2.34	15,552
Travel Outside Santa Barbara County - Local Road	Local	10	34	0.8	27	0.04	0.55	0.61	0.09	0.62	0.00	172	0.00	0.03	180
Total			34	280	9,520										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties (Max - Worst Case)						0.48	24.48	23.11	3.67	5.45	0.25	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination		Number of Vehicles	Trips per Year	Trip Length Round-Trip	Total Round Trip Miles	Criteria Pollutant Emissions (Tons)						GHG Emissions (Metric Tons)			
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Plains Pentland Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	10	680	108.8	73,984	0.00	0.09	0.05	0.01	0.01	0.00	90.29	0.00	0.01	94.5
Travel Within Santa Barbara County - Local Road	Collector	10	680	7.4	5,032	0.00	0.01	0.01	0.00	0.00	0.00	6.18	0.00	0.00	6.5
Travel Within Santa Barbara County - Collector road	Local	10	680	1.6	1,088	0.00	0.00	0.01	0.00	0.00	0.00	1.37	0.00	0.00	1.4
Travel Outside Santa Barbara County - Major road	Major	10	680	161.4	109,752	0.00	0.13	0.15	0.02	0.01	0.00	133.92	0.00	0.02	140.2
Travel Outside Santa Barbara County - Local Road	Local	10	680	0.8	544	0.00	0.00	0.01	0.00	0.00	0.00	0.71	0.00	0.00	0.7
Total			680	280	190,400	0.00	0.22	0.23	0.04	0.03	0.00	232.47	0.00	0.04	243.37
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									243.4
Significance Threshold:						(Not Applicable)									
SB County Planning															
SBC APCD															
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									No
			Truck Capacity (bbl/truck)	Crude Transported (bbl/year)											
Potential Maximum Volume Crude Transported to Markets:				160	108,800										

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-31 SMPS Only Alternative - Emissions During Pentland Period - Mobile Source to Pentland

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
				Emission Factors									
Exhaust Source	Road Type		Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	
Running Exhaust	Freeway		lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust	Major		lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust	Collector		lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004	
Running Exhaust	Local		lb/mile	2.9E-05	0.0023	2.6E-05	2.5E-05	0.0003	0.0000	2.6892	0.0000	0.0004	
Idle Exhaust	Freeway		lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust	Major		lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust	Collector		lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	
Idle Exhaust	Local		lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016	

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):									
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt		
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03
Average vehicle weight				CalTrans WIM Data	W	27	tons		
Paved Road Dust Entrainment									$Ef = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 140 total miles (within Santa Barbara, San Luis Obispo, and Kern Counties) from the ExxonMobil Las Flores Canyon facility to the Plains Pentland truck rack located at 2311 Basic School Road in Maricopa.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM10 and PM2.5 factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fulpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound)
 - 1,000 kilograms/metric ton
- Assumed maximum trips to Pentland, days 20

ExxonMobil Interium Trucking for SYU Phased Restart

Table B-32 SMPS Only Alternative - Emissions During Pentland Period - Mobile Source to Pentland by County

Daily Emissions - Scenario 2																
Destination	Road Type	Number of Vehicles	Trips per Day	Trip Length	Round Trip Miles/Day	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)				
						ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}	DPM
Plains Pentland Truck Rack:																
Santa Barbara County-Hwy 101	Freeway	10	34	108.8	3,699	0.15	9.05	5.23	0.86	1.54	0.09	10,046.72	0.01	1.58	10,517.5	0.10
Santa Barbara County-Hwy 166	Major	0	34	60.2	2,047	0.06	4.74	5.72	0.90	0.51	0.05	5,504.26	0.00	0.87	5,762.2	0.05
Santa Barbara County-Calle Real	Local	10	34	1.6	54	0.04	0.62	1.23	0.19	0.63	0.00	245.11	0.00	0.04	256.6	0.00
Santa Barbara County-SYU Rds	Collector	10	34	7.4	252	0.05	1.07	0.70	0.11	0.68	0.01	775.42	0.00	0.12	811.8	0.01
SLO County-Hwy 166	Major	5	34	77.4	2,632	0.10	6.33	7.35	1.16	0.97	0.07	7,126.32	0.00	1.12	7,460.2	0.07
Kern County-Hwy 166	Major	5	34	23.8	809	0.04	2.12	2.26	0.36	0.51	0.02	2,225.51	0.00	0.35	2,329.8	0.02
Kern County-Access to Pentland	Local	10	34	0.8	27	0.04	0.55	0.61	0.09	0.62	0.00	171.97	0.00	0.03	180.1	0.00
Total Travel Distance			34	280	9,520											
San Luis Obispo DPM																0.07
Kern County Totals						0.09	2.67	2.87	0.45	1.13	0.02					
Santa Barbara County Totals						0.30	15.47	12.88	2.06	3.35	0.16					
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.48	24.48	23.11	3.67	5.45	0.25	(Not Applicable)				

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-33 SMPS Only Alternative - Mobile Source to Santa Maria

Daily Emissions - Scenario 1															
Destination	Road Type	Number of Vehicles	Trips per	Trip Length	Round Trip	Criteria Pollutant Emissions (Pounds/Day)						GHG Emissions (Pounds/Day)			
			Day	Round-Trip	Miles/Day	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	25	70.0	98.8	6,916	0.30	17.23	9.79	1.61	3.26	0.18	18,845.57	0.01	2.96	19,729
Travel Within Santa Barbara County - Collector Road	Collector	25	70.0	8.00	560	0.12	2.52	1.56	0.25	1.67	0.02	1,753.00	0.01	0.28	1,835
Travel Within Santa Barbara County - Local Road	Local	25	70.0	1.6	112	0.11	1.48	2.52	0.38	1.56	0.01	548.24	0.00	0.09	574
Total			70.0	108.4	7,588										
Criteria Pollutant Impacts - Total Travel Within SBC/SLO/Kern Counties						0.5	21.2	13.9	2.2	6.5	0.2	(Not Applicable)			
Significance Thresholds:															
SB County Planning						25	25	80	N/A	N/A	N/A	(Not Applicable)			
SBC APCD						25	25	N/A	N/A	N/A	N/A				
Significant?						No	No	No	N/A	N/A	N/A	(Not Applicable)			
Annual Emissions															
Destination	Road Type	Number of Vehicles	Trips per	Trip Length	Total Round	Criteria Pollutant Emissions (Tons/Yr)						GHG Emissions (Metric Tons/Yr)			
			Year	Round-Trip	Trip Miles	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Phillips 66 Santa Maria Truck Rack:															
Travel Within Santa Barbara County - Freeway	Freeway	25	25,550	98.8	2,524,340	0.04	2.92	1.79	0.29	0.32	0.03	3,079.29	0.00	0.48	3,224
Travel Within Santa Barbara County - Collector road	Collector	25	25,550	8	204,400	0.00	0.24	0.29	0.04	0.03	0.00	249.44	0.00	0.04	261.1
Travel Within Santa Barbara County - Local Road	Local	25	25,550	1.6	40,880	0.00	0.05	0.46	0.07	0.01	0.00	49.98	0.00	0.01	52.3
Total			25,550	108.4	2,769,620	0.04	3.21	2.53	0.41	0.35	0.04	3,379	0	1	3,537
Greenhouse Gase Impacts - Total Travel Distance (Max - Worst Case)						(Not Applicable)									3,537.0
Significance Threshold:						(Not Applicable)									
SB County Planning															1,000
SBC APCD															10,000
Significant? (SBC P&D or SBC APCD)						(Not Applicable)									Yes
			Truck Capacity (bbl/truck)	Crude Transported (bbl/year)											
Potential Maximum Volume Crude Transported to Markets:				160	4,088,000										

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-33 SMPS Only Alternative - Mobile Source to Santa Maria

T7 Tractor Diesel Truck Emission Factors (EMFAC2017).													
Emission Factors													
Exhaust Source	Road Type			Units	ROG	NOx	PM ₁₀	PM _{2.5}	CO	SO ₂	CO ₂	CH ₄	N ₂ O
Running Exhaust	Freeway			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Major			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Collector			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Running Exhaust	Local			lb/mile	0.0000	0.0023	0.0000	0.0000	0.0003	0.0000	2.6892	0.0000	0.0004
Idle Exhaust	Freeway			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Major			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Collector			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016
Idle Exhaust	Local			lb/vehicle/day	0.0041	0.0490	0.0000	0.0000	0.0612	0.0001	9.8819	0.0002	0.0016

On-road Vehicle Paved Road Dust Entrainment Emission Factors (pounds/mile):										
Variable	Road Type			Reference	Symbol	Value	Unit	PM ₁₀	PM _{2.5}	
PM ₁₀ particle size multiplier				CARB - 2018 EI	k	0.0022	lb/vmt			
PM _{2.5} particle size multiplier				CARB - 2018 EI	k	0.00033	lb/vmt	lb/mile	lb/mile	
Road silt loading - Freeway	Freeway			CARB - 2018 EI	sL	0.015	g/m ²	1.39E-03	2.08E-04	
Road silt loading - Major	Major			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04	
Road silt loading - Collector	Collector			CARB - 2018 EI	sL	0.032	g/m ²	2.77E-03	4.15E-04	
Road silt loading - Local	Local			CARB - 2018 EI	sL	0.320	g/m ²	2.25E-02	3.37E-03	
Average vehicle weight				CalTrans WIM Data	W	27	tons			
Paved Road Dust Entrainment										$Ef = k(sL)^{0.91} \times W^{1.02}$

Notes:

- Trip distances assume:
 - 54.3 miles from the ExxonMobil Las Flores Canyon facility to the Phillips 66 Santa Maria truck rack located at 1580 East Battles Road in Santa Maria.
- Duration (days) is based on the total crude to be transported and the estimated number of truck trips per day, assuming each truck can carry up to: 160 bbl
- Truck transportation is expected to occur from 2019 - 2022.
- EMFAC2017 criteria pollutant and GHG emission factors for T7 Tractor engines are derived from the California Air Resources Board's EMFAC2017 2018 emission estimates for Santa Barbara County. Source: California Air Resources Board, EMFAC2017 Web Database (v1.0.2) (undated), emissions data option, available at www.arb.ca.gov/emfac/2017/ (accessed September 10, 2018). Data reflects the use specific vehicle model years (2017, 2018, 2019) and aggregated vehicle speeds, grouped by Road Type)
 - Vehicle Category based on EMFAC2011 vehicle definitions, applied the T7 Tractor vehicle type as directed by the SBC APCD.
 - Criteria pollutant emission factors include total emissions for each pollutant. In addition to running exhaust emissions, emission factors include idle exhaust emissions. PM₁₀ and PM_{2.5} factors also include emissions from brake wear and tire wear.
 - PM₁₀ and PM_{2.5} from on-road vehicle paved road dust entrainment emission factors are included in the total emissions for the each trip segmented as documented above.
 - Vehicle emissions based on the reported "emission rate" data for the specified vehicle category. This data is reported in terms of g/mile (running exhaust) and g/vehicle/day (idle exhaust). Note that emissions data for running exhaust is based on individual vehicle speeds, grouped by "Road Type". Idle Exhaust data is only reported by CARB for aggregated vehicle speeds, so each Road Type/Vehicle speed is assumed to have the same idle exhaust value.
- Fleet size is based on maximum number of daily trips, and estimated number of trucks to accommodate these trips. The Fleet size is applied in determining the idle exhaust portion of the total emissions.
- Equation for calculating on-road vehicle paved road dust entrainment emissions: U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.1 Paved Roads, Equation 1*. Silt loading factors, particle size multipliers, and average vehicle weight as defined by CARB in Section 7.9 of the Emissions Inventory Guidance Document - Entrained Road Travel, Paved Road Dust (March 2018). https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf
- Average vehicle weight based on weight in motion (WIM) monitoring stations installed by CalTrans throughout the state of California. Reviewed data from 2016 - 2018 to establish a reasonable average vehicle weight representative of major roadway sections. See PeMS System.
- Conversion factors:
 - Global warming potential for methane: 25
 - Global warming potential for nitrous oxide: 298
 - 2,000 pounds/ton
 - 0.45359 kilograms/pound)
 - 1,000 kilograms/metric ton

ExxonMobil Interium Trucking for SYU Phased Restart
SMPS Only Alternative
Table B-34 Stationary and Indirect Sources

Emission Source	Reactive Organic Compounds			
SUMMARY	lb/hr	lb/day	TPQ	Total Emissions (Tons/Yr)
Fugitive Hydrocarbon Components	0.33	8.01	0.37	1.46
Crude Loading - 34 trips to Pentland	4.04	17.17	0.17	0.17
Crude Loading - 78 trips to SMPS	4.04	39.38	1.57	6.28
Crude Loading - 70 trips to SMPS	4.04	35.34	1.61	6.45
Total 34 Trips to Pentland:	4.37	25.18	-	-
Total 78 Trips to SMPS or Total:	4.37	47.40	-	-
Total Annual with 20 days to Pentland:	-	-	2.11	7.91
Total 70 Trips to SMPS	4.37	43.36	1.98	7.91

GHG - CO ₂ e			
lb/hr	lb/day	TPQ	Total Emissions (Metric Tons/Yr)
12.59	302.22	12.51	50.04
13.12	55.77	0.51	0.51
13.12	127.94	4.63	18.50
13.12	114.81	4.75	19.01
25.71	357.99	-	-
25.71	430.16	-	-
-	-	17.64	69.04
		17.26	69.04

Notes:

¹ Hourly and daily emissions assume the maximum loading rate proposed, 8 trucks/hour and 70 trucks/day.

² Fugitive Hydrocarbon components include piping components associated with crude loading activity and the LACT units.

³ GHG emissions from fugitive components and crude loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.

Indirect GHG Emissions from Electrical Use

Loading Rack Electrical Use (MW-hr/day)

Electric Power CO₂e factor(CO₂e lb/MWH)

Tons per Year CO₂e

³ Data from ExxonMobil

704.6 CalEEMod Value for SCE Power

347.17

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-35 Loading Rack Emissions: SMPS Only Alternative - Emissions During SMPS Period

Product Loading Activity Emission Calculations			
Scenario 1 and 2 ExxonMobil Production Exxon - SYU, Las Flores Canyon	Reference:	Loading Rack	
	Rack Type:	Enter X as Appropriate	S Factor
	Submerged loading of a clean cargo tank		0.50
	Submerged loading: Dedicated normal service	X	0.60
	Submerged loading: Dedicated vapor balance service		1.00
	Splash loading of a clean cargo tank		1.45
	Splash loading: Dedicated normal service		1.45
	Splash loading: Dedicated vapor balance service		1.00
	Input data	Reference	
	S = Saturation Factor	0.60	See AP-42 Table 4.4-1 2
M = Molecular Weight			
P = True Vapor Pressure (psia)			
T = Liquid Temperature °R			
C = Storage Capacity (bbl)			
A = Annual Production (bbl)			
R = Max Loading Rate (bbl/hr)			
D = Max Daily Production (bbl)			
D2 = Average Daily Production (bbl)			
eff = Vapor Recovery Efficiency			
ROC/THC = Reactivity			
L _{THC} = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)/T =			
L _{ROC} = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)*React/T =			
Total Uncontrolled Hydrocarbon Losses:			
	ROC	THC	Estimated CH ₄ , GHG
Hourly			
THL _{HH} = (R)(42 gal/bbl)(L _{ROC} /1000) =	80.78 lbs/hr	91.28	10.50
Max Daily			
THL _D = (D)(42 gal/bbl)(L _{ROC} /1000) =	787.64 lbs/day	889.99	102.35
Quarterly			
THL _Q = THLD(91)(1/2000) =	31.39 TPQ	35.47	4.08
Total Emissions			
THL _A = (A)(42 gal/bbl)(L _{ROC} /1000)(1/2000) =	125.57 TPY	141.89	16.32
Total Controlled Hydrocarbon Losses:			
Hourly			
THL _{HC} = (THL _{HH})(1-eff) =	4.04 lbs/hr	4.56	0.52
Max Daily			
THL _{DC} = (THL _D)(1-eff) =	39.38 lbs/day	44.50	5.12
Quarterly			
THL _{QC} = (THL _Q)(1-eff) =	1.57 TPQ	1.77	0.20
Total Emissions			
THL _{AC} = (THL _A)(1-eff) =	6.28 TPY	7.09	0.82

Notes:

1. Data provided by the applicant
C = Annual Transport Volume.
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. Vapor pressure as measured from LFC Crude.
5. R is calculated by adding 460 to °F.
6. A maximum of 70 trucks will be loaded per day; up to 8 per hour. Actual number of trucks/day may be less.
7. The maximum daily rate of 70 trucks was used to determine the maximum quarterly and annual emissions.
8. GHG emissions from loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.
9. Applied SBC APCD determined truck loading efficiency of 95%;
10. Average Daily Production is assumed to be the same as the maximum daily potential production for purposes of defining a reasonable worst case scenario.

Product Loading Activity Emission Calculations									
Scenario 1 and 2 ExxonMobil Production Exxon - SYU, Las Flores Canyon			Reference: Loading Rack Rack Type: Enter X as Appropriate		S Factor				
			Submerged loading of a clean cargo tank		_____ 0.50				
			Submerged loading: Dedicated normal service		_____ X 0.60				
			Submerged loading: Dedicated vapor balance service		_____ 1.00				
			Splash loading of a clean cargo tank		_____ 1.45				
			Splash loading: Dedicated normal service		_____ 1.45				
			Splash loading: Dedicated vapor balance service		_____ 1.00				
Input data			Reference						
S = Saturation Factor			0.60		See AP-42 Table 4.4-1		2		
M = Molecular Weight			50		Crude Oil: Default = 50 lb/lb-mole		3		
P = True Vapor Pressure (psia)			2.680		See AP-42 Table 12.3-5		1		
T = Liquid Temperature °R			590		130 °F + 460 = °R		5		
C = Storage Capacity (bbl)			4,088,000		171,696,000 gallons (42 gallons = 1 bbl)		1		
A = Annual Production (bbl)			4,088,000		171,696,000 gallons (42 gallons = 1 bbl)		1		
R = Max Loading Rate (bbl/hr)			1280.00		53,760 gallons (42 gallons = 1 bbl)		1		
D = Max Daily Production (bbl)			11,200		470,400 gallons (42 gallons = 1 bbl)				
D2 = Average Daily Production (bbl)			11,200		470,400 gallons (42 gallons = 1 bbl)				
eff = Vapor Recovery Efficiency			0.95		Default = 0.95 (SBC APCD)		1		
ROC/THC = Reactivity			0.885		Crude Oil: Default = 0.885				
L _{LTHC} = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)/T =			1.6979		lbTHC/1000 gal				
L _{LROC} = Loading loss (lb/1000 gal) = 12.46 (S)(P)(M)*React/T =			1.5027		lb ROC/1000 gal				
Total Uncontrolled Hydrocarbon Losses:									
					ROC		THC		Estimated CH₄, GHG
Hourly									
THL _H = (R)(42 gal/bbl)(L _{LROC} /1000) =					80.78 lbs/hr		91.28		10.50
Max Daily									
THL _D = (D)(42 gal/bbl)(L _{LROC} /1000) =					706.86 lbs/day		798.71		91.85
Quarterly									
THL _Q = THLD(91)(1/2000) =					32.25 TPQ		36.44		4.19
Total Emissions									
THL _A = (A)(42 gal/bbl)(L _{LROC} /1000)(1/2000) =					129.00 TPY		145.76		16.76
Total Controlled Hydrocarbon Losses:									
Hourly									
THL _{HC} = (THL _H)(1-eff) =					4.04 lbs/hr		4.56		0.52
Max Daily									
THL _{DC} = (THL _D)(1-eff) =					35.34 lbs/day		39.94		4.59
Quarterly									
THL _{QC} = (THL _Q)(1-eff) =					1.61 TPQ		1.82		0.21
Total Emissions									
THL _{AC} = (THL _A)(1-eff) =					6.45 TPY		7.29		0.84

Notes:

1. Data provided by the applicant
C = Annual Transport Volume.
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. Vapor pressure as measured from LFC Crude.
5. R is calculated by adding 460 to $^{\circ}\text{F}$.
6. A maximum of 70 trucks will be loaded per day; up to 8 per hour. Actual number of trucks/day may be less.
7. The maximum daily rate of 70 trucks was used to determine the maximum quarterly and annual emissions.
8. GHG emissions from loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.
9. Applied SBC APCD determined truck loading efficiency of 95%;
10. Average Daily Production is assumed to be the same as the maximum daily potential production for purposes of defining a reasonable worst case scenario.

ExxonMobil Interium Trucking for SYU Phased Restart
Table B-37 Loading Rack Emissions: SMPS Only Alternative - Emissions During Pentland Period

Product Loading Activity Emission Calculations			
	Scenario 1 and 2 ExxonMobil Production Exxon - SYU, Las Flores Canyon	Reference: Loading Rack	
		Rack Type: Enter X as Appropriate	S Factor
		Submerged loading of a clean cargo tank	0.50
		Submerged loading: Dedicated normal service	X 0.60
		Submerged loading: Dedicated vapor balance service	1.00
		Splash loading of a clean cargo tank	1.45
		Splash loading: Dedicated normal service	1.45
		Splash loading: Dedicated vapor balance service	1.00
Input data		Reference	
S = Saturation Factor	0.60	See AP-42 Table 4.4-1	2
M = Molecular Weight	50	Crude Oil: Default = 50 lb/lb-mole	3
P = True Vapor Pressure (psia)	2.680	See AP-42 Table 12.3-5	1
T = Liquid Temperature °R	590	130 °F + 460 = °R	5
C = Storage Capacity (bbl)	108,800	4,569,600 gallons (42 gallons = 1 bbl)	1
A = Annual Production (bbl)	108,800	4,569,600 gallons (42 gallons = 1 bbl)	1
R = Max Loading Rate (bbl/hr)	1280.00	53,760 gallons (42 gallons = 1 bbl)	1
D = Max Daily Production (bbl)	5,440	228,480 gallons (42 gallons = 1 bbl)	
D2 = Average Daily Production (bbl)	5,440	228,480 gallons (42 gallons = 1 bbl)	
eff = Vapor Recovery Efficiency	0.95	Default = 0.95 (SBC APCD)	1
ROC/THC = Reactivity	0.885	Crude Oil: Default = 0.885	
$L_{LTHC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M)/T = \underline{1.6979} \text{ lbTHC/1000 gal}$ $L_{LROC} = \text{Loading loss (lb/1000 gal)} = 12.46 (S)(P)(M) \cdot \text{React}/T = \underline{1.5027} \text{ lb ROC/1000 gal}$			
Total Uncontrolled Hydrocarbon Losses:			
	ROC	THC	Estimated CH4, GHG
Hourly			
$THL_{HH} = (R)(42 \text{ gal/bbl})(L_{LROC}/1000) =$	80.78 lbs/hr	91.28	10.50
Max Daily			
$THL_D = (D)(42 \text{ gal/bbl})(L_{LROC}/1000) =$	343.33 lbs/day	387.95	44.61
Quarterly			
$THL_Q = THL_D(91)(1/2000) =$	3.43 TPQ	3.88	0.45
Total Emissions			
$THL_A = (A)(42 \text{ gal/bbl})(L_{LROC}/1000)(1/2000) =$	3.43 TPY	3.88	0.45
Total Controlled Hydrocarbon Losses:			
Hourly			
$THL_{LHC} = (THL_{HH})(1 - \text{eff}) =$	4.04 lbs/hr	4.56	0.52
Max Daily			
$THL_{DC} = (THL_D)(1 - \text{eff}) =$	17.17 lbs/day	19.40	2.23
Quarterly			
$THL_{QC} = (THL_Q)(1 - \text{eff}) =$	0.17 TPQ	0.19	0.02
Total Emissions			
$THL_{AC} = (THL_A)(1 - \text{eff}) =$	0.17 TPY	0.19	0.02

Notes:

1. Data provided by the applicant
C = Annual Transport Volume.
2. AP-42, (Chapter 5, 5th Edition, January 1995), Table 5.2-1
3. If not otherwise provided, crude oil is assumed to be 50 lb/lb-mole.
4. Vapor pressure as measured from LFC Crude.
5. R is calculated by adding 460 to °F.
6. A maximum of 70 trucks will be loaded per day; up to 8 per hour. Actual number of trucks/day may be less.
7. The maximum daily rate of 70 trucks was used to determine the maximum quarterly and annual emissions.
8. GHG emissions from loading operations conservatively assume that the difference between the THC and ROC emissions represents methane emissions.
9. Applied SBC APCD determined truck loading efficiency of 95%;
10. Average Daily Production is assumed to be the same as the maximum daily potential production for purposes of defining a reasonable worst case scenario.

Table B-38 LFC Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)					
	NOx	ROC	CO	SOx	PM	PM10
Combustion - IC Engines						
Stang Pump	0.00	0.00	0.00	0.00	0.00	0.00
Firewater Pump A	0.29	0.02	0.06	0.02	0.02	0.02
Firewater Pump B	0.14	0.01	0.03	0.01	0.01	0.01
Cogeneration Power Plant (CPP)						
CPP-Normal Ops. Modes (GTG and GTG/HRSG Ops.)	28.36	11.46	17.91	1.64	32.93	26.26
CPP-HRSG Only Mode	0.53	0.34	0.28	0.02	0.18	0.14
CPP-Planned Start-up/Shutdown Mode	0.02	0.08	0.04	0.00	0.02	0.02
CPP-Unplanned Start-up/Shutdown Mode	0.04	0.11	0.23	0.00	0.03	0.03
SGTP - Incinerator						
TGCU Incinerator - Fuel Gas	0.82	0.11	2.58	3.33	2.19	1.75
TGCU Incinerator - Offgas	incl. above	0.00	0.11	incl. above	0.09	0.07
TGCU Incinerator - Merox Vent	0.00	0.00	0.00	0.00	0.00	0.00
Planned Startup/Shutdown/Maintenance	0.00	0.00	0.00	0.00	0.00	0.00
Unplanned Startup/Shutdown	0.00	0.00	0.01	0.01	0.00	0.00
Fugitive Components - Gas						
Valves - Accessible		0.28				
Valves - Inaccessible		0.41				
Valves - Unsafe		3.52				
Valves - Bellows / Background ppmv		0.00				
Valves - Category A		0.59				
Valves - Category B		2.06				
Valves - Category C		0.73				
Valves - Category E		4.99				
Valves - Category F		0.10				
Valves - Category H		3.90				
Valves - Category H (Inaccessible)		0.27				
Valves - Category I		2.55				
Flanges/Connections - Accessible/Inaccessible		8.82				
Flanges/Connections - Unsafe		2.10				
Flanges/Connections - Category B		7.50				
Flanges/Connections - Category C		0.11				
Flanges/Connections - Category E		0.93				
Flanges/Connections - Category F		0.03				
Compressor Seals - To VRS		0.00				
Exempt		0.00				
Fugitive Components - Oil						
Valves - Accessible		0.10				
Valves - Inaccessible		0.00				
Valves - Bellows / Background ppmv		0.00				
Valves - Category B		0.01				
Valves - Category H		1.24				
Valves - Category H (Inaccessible)		0.05				
Flanges/Connections - Accessible/Inaccessible		1.00				
Flanges/Connections - Unsafe		0.00				
Flanges/Connections - Category B		0.01				
Flanges/Connections - Category F		0.00				
Pump Seals - Single		0.14				
Pump Seals - Dual/Tandem		0.23				
Exempt		0.00				
Compressor Vent						
SOV Distance Piece Vent		1.31				
VRU Distance Piece Vent		0.88				
Crew Boat - NEI (3 Mi.)						
Main Engines - DPV	1.91	0.10	0.46	0.04	0.19	0.18
Main Engines - DPV Broadbill	1.09	0.09	0.40	0.03	0.03	0.03
Main Engines - Spot Charter	0.00	0.00	0.00	0.00	0.00	0.00
Auxiliary Engines - DPV	0.60	0.05	0.13	0.01	0.04	0.04

Table B-38 LFC Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)					
	NOx	ROC	CO	SOx	PM	PM10
Auxiliary Engines - DPV Broadbill	0.19	0.04	0.11	0.00	0.00	0.00
Supply Boat - NEI (3 Mi.)						
Main Engines - DPV	0.85	0.04	0.20	0.02	0.08	0.08
Main Engines - Spot Charter	0.07	0.00	0.01	0.00	0.00	0.00
Bow Thruster	incl. below	incl. below	incl. below	incl. below	incl. below	incl. below
Auxiliary Engines	0.28	0.02	0.06	0.00	0.02	0.02
Combustion - Thermal Oxidizer						
Purge and Pilot	1.28	0.06	1.08	0.01	0.09	0.09
Planned - Continuous LP	0.47	0.03	0.40	0.03	0.04	0.04
Planned - Continuous AG	0.00	0.00	0.00	0.07	0.00	0.00
Planned - Other	0.13	0.00	0.05	0.04	0.00	0.00
Unplanned - Other	1.15	0.02	0.38	5.36	0.04	0.04
Pigging Equipment		0.01				
Tanks/Sumps/Separators						
Oil Storage Tank A (vrs1)		0.85				
Oil Storage Tank B (vrs1)		1.22				
Area Drain Oil/Water Separator (cc)		0.02				
Area Drain Sump		0.17				
Rerun Tank A (vrs)		0.00				
Rerun Tank B (vrs)		0.00				
Equalization Tank 1424 (vent scbr/cc)		1.02				
Demulsifier Tank (totes)		0.00				
Oily Sludge Thickener (vrs)		0.10				
Backwash Sump (vrs)		0.02				
Backwash Collection Tank (vrs)		0.01				
Open Drain Sump (cc)		0.02				
Area Drain Sump		1.12				
Area Drain Oil/Water Separator (cc)		0.03				
Area Drain Sump		0.11				
Area Drain Oil/Water Separator (cc)		0.02				
Open Drain Sump (cc)		0.00				
Chemical Storage Tote Tanks		0.05				
Solvent Usage		0.04				
Total Reported Emissions (TPY)	38.23	61.24	24.52	10.65	36.02	28.83
Actual Total from PDF of CVR	38.04	59.62	24.66	10.63	36.16	28.93
Exempt Engine Emissions (CVR)	13.86	1.37	7.26	0.08	2.22	2.22
Permitted Engines Omitted from Total	0.43	0.03	0.09	0.03	0.03	0.03
New Total:	52.33	61.03	32.02	10.75	38.41	31.18

Table B-39 POPCO Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)					
	NOx	ROC	CO	SOx	PM	PM10
IC Engines						
Firewater Pump A	0.48	0.04	0.10	0.01	0.04	0.04
Firewater Pump B	0.48	0.14	0.37	0.02	0.12	0.12
Emergency Electrical Generator	0.02	0.00	0.01	--	0.00	0.00
Emergency Instrument Air Compressor	0.02	0.02	0.04	--	0.01	0.01
Boiler B-801A	1.84	0.06	4.14	--	0.51	0.49
Boiler B-801B	1.66	0.04	3.45	--	0.42	0.40
Stretford Tailgas Incineration	--	--	0.25	5.88	0.05	0.05
Stretford Oxidizer Tank	--	0.44	--	--	--	--
John Zink Thermal Oxidizer (ZTOF):						
Pilot	0.16	1.16	0.11	0.00	--	--
Purge	0.02	0.12	0.01	0.00	--	--
Planned Continuous: AG	0.03	0.03	0.01	0.00	--	--
Planned Continuous: HC/AG	0.12	0.13	0.01	0.01	--	--
Planned Other	0.04	0.03	0.07	--	--	--
Unplanned Other: Miscellaneous	0.04	0.02	0.07	0.01	--	--
Unplanned Other: SRU Failure	--	--	--	--	--	--
Fugitive Components - Gas Service						
Valves - Bellows/Background						
Valves - Category B		20.95				
Valves - Category C		4.14				
Valves - Category F		1.88				
Valves - Category J		8.07				
Valves - Unsafe		2.35				
Flanges/Connections - Accessible/Inaccessible		6.52				
Flanges/Connections - Category B		2.95				
Flanges/Connections - Category C		1.10				
Flanges/Connections - Unsafe		2.79				
PSV to Atm/Flare		3.90				
Compressor Seals - To VRS		--				
Pump Seals - Dual/Tandem		0.04				
Pump Seals - Single		0.07				
Fugitive Components - Oil Service		--				
Valves - Accessible/Inaccessible		--				
Flanges/Connections - Accessible/Inaccessible		--				
Tanks		0.00				
Solvent Usage		--				
Total Reported Emissions (TPY)	4.90	56.97	8.64	5.94	1.15	1.11

Table B-39 POPCO Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)					
	NOx	ROC	CO	SOx	PM	PM10
Totals per PDF of CVR	4.54	63.83	8.25	5.92	1.02	0.97
Corrections to Include Permitted Engines	2.72	0.22	0.59	0.04	0.19	0.19
Corrections for Tank		-6.98				
Permit Exempt Engines	1.03	0.29	0.70	--	0.24	0.24
New Total:	8.28	57.36	9.54	5.96	1.45	1.40

B-40 Exxon SYU Mobile Emissions Baseline

Offsite Baseline Emissions

	Average Daily (pounds)										Annual (tons)									CO2e, MT
Emissions	NOx	ROC	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	NOx	ROG	CO	SOx	PM10	PM2.5	CO2	CH4	N2O		
Employee (LDA)	4.02	1.08	41.11	0.07	0.04	0.04	7198.95	0.31	1.14	0.73	0.20	7.50	0.01	0.01	0.01	1313.81	0.06	0.21	1,239	
Delivery (MD)	0.11	0.01	0.16	0.00	0.01	0.01	291.46	0.01	0.03	0.02	0.00	0.03	0.00	0.00	0.00	53.19	0.00	0.01	50	
Truck (T7)	8.79	0.47	1.62	0.01	0.26	0.25	1557.78	0.01	0.05	1.60	0.09	0.30	0.00	0.05	0.04	284.30	0.00	0.01	258	
Totals	12.92	1.56	42.89	0.09	0.31	0.29	9048.20	0.33	1.22	2.36	0.29	7.83	0.02	0.06	0.05	1651.30	0.06	0.22	1,547	

Maximum Daily Offsite Baseline Emissions

Emissions	Maximum Daily (pounds)					
	NOx	ROG	CO	SOx	PM10	PM2.5
Employee (LDA)	4.02	1.08	41.11	0.07	0.04	0.04
Delivery (MD)	0.11	0.01	0.16	0.00	0.01	0.01
Truck (T7)	12.42	0.66	2.29	0.02	0.36	0.35
Totals	16.55	1.76	43.56	0.09	0.41	0.39

Emission Factors

EMFAC Emission Factor (pounds/r)	NOx	ROG	CO	SOx	PM10	PM2.5	CO2	CH4	N2O
Employee (LDA) Gas	0.000372155	0.0001004	0.003806864	6.59625E-06	3.95137E-06	3.639E-06	0.6665698	2.85164E-05	0.000105194
Delivery (MDV) Diesel	0.000341261	3.99E-05	0.00047931	8.50422E-06	2.33459E-05	2.234E-05	0.8995755	2.85164E-05	0.000105194
Truck (T7) Diesel	0.019159617	0.0010185	0.00352931	3.20635E-05	0.000558363	0.0005342	3.3938632	2.85164E-05	0.000105194

Note CH4 and N2O ef based on SYU Emission Calcs 2018 ef for T7, T7 used for LDA and MD also

Emission factors based on EMFAC2017 for year 2015

Trips

Trips	Daily Trips	Total Daily Miles	Max Daily Trips	Max Daily Miles
Employee trips	100	10800	100	10800
Delivery truck trips	3	324	3	324
T7 Truck trips	4.25	459	6	648

Trip length round trip, miles

108

Propane and sulfur trucks data from monthly production reports submitted to County Energy

	2014												Daily	Daily
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	Max
Propane Sales (trucks/day):	4	3	3	3	3	3	5	3	3	3	3	3	3.25	5
NGL from POPCO (trucks/day):														
Butane Sales (trucks/day):														
Sulfur (trucks/day):	1	1	1	1	1	1	1	1	1	1	1	1	1	1
													4.25	6

Data Estimated based on:

Employees and trucks based in Phillips 66 Truck Rack Santa Maria - 108 miles round trip

50 employees

3 delivery trucks

EMFAC 2017 Options

SBCAPCD

2015

Annual

EMFAC 2011 categories all

Model aggregated

Speed aggregated

Fuel all

Conversion Factors

grams to pounds

0.0022046

Table B-41 Hondo Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)						
	NOx	ROC	CO	SOx	PM	PM10	GHG
Combustion - Engines							
East Crane	1.26	0.16	0.49	0.00	0.16	0.16	84.72
West Crane	0.65	0.08	0.25	0.00	0.08	0.08	43.94
Emergency Production Generator	0.58	0.05	0.12	0.00	0.04	0.04	3.01
Emergency Firewater Pump A	0.20	0.02	0.04	0.00	0.02	0.02	8.17
Emergency Firewater Pump B	0.15	0.01	0.04	0.00	0.01	0.01	4.55
BJ Cement Skid "B" Engine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BJ Cement Skid "C" Engine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker Cuttings Reinjection Skid	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - Flare							
Purge and Pilot	0.15	0.27	0.82	0.02	0.04	0.03	259.24
Planned - cont.	0.43	0.75	2.31	5.41	0.13	0.13	1678.77
Planned - other	0.01	0.03	0.07	0.24	0.00	0.00	52.76
Unplanned - other	0.72	1.28	3.94	9.41	0.21	0.21	2860.57
Fugitive Components							
Oil - Valve/Conn. - Accessible		2.14					
Oil - Valve/Conn. - Category B		0.00					
Oil - Valve/Conn. - Category F		0.00					
Oil - Valve/Conn. - Unsafe		0.03					
Gas - Valve/Conn. - Accessible		30.03					
Gas - Valve/Conn. - Category B		18.54					
Gas - Valve/Conn. - Category F		0.30					
Gas - Valve/Conn. - Unsafe		1.13					
Boats							
Supply Boat - Main Engines	15.19	0.76	3.53	0.01	1.49	1.43	903.82
Supply Boat - Main Engines - SC	0.77	0.03	0.11	0.00	0.05	0.04	2.75
Supply Boat - Auxiliary Engines	4.87	0.40	1.05	0.00	0.34	0.33	160.00
Crew Boat - Main Engines	5.13	0.26	1.23	0.00	0.50	0.48	281.41
Crew Boat - Main Engines - SC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crew Boat - Auxiliary Engines	1.61	0.13	0.35	0.00	0.11	0.11	49.19
Broadbill - Main Engines	2.94	0.23	1.09	0.00	0.08	0.08	368.32
Broadbill - Auxiliary Engines	0.52	0.12	0.31	0.00	0.01	0.01	65.00
Emerg. Resp. - Main Engines	0.05	0.00	0.01	0.00	0.00	0.00	2.66
Emerg. Resp. - Aux. Engines	0.01	0.00	0.00	0.00	0.00	0.00	0.31
Survival Capsules							
Survival Capsule #1	0.00	0.00	0.00	0.00	0.00	0.00	0.11
Survival Capsule #2	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Pigging Equipment							
Emulsion Pig Launcher		0.00					
Gas Pig Launcher		0.00					
Gas Pig Receiver		0.00					

Table B-41 Hondo Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)						
	NOx	ROC	CO	SOx	PM	PM10	GHG
Sumps/Tanks/Separator							
HP Drain Sump		0.00					
LP Drain Sump		0.01					
Settling Tank		0.02					
Diesel/Misc Tanks		0.10					
Solvent Usage - Cleaning/Degreasing		0.05					
Total Emissions	35.23	56.91	15.76	15.09	3.28	3.17	6829.40

Total Emissions (Per CVR Document)	34.20	56.79	15.42	15.11	3.17	3.07
Corrections to Include East Crane	1.15	0.15	0.45	0.00	0.15	0.15
Permit Exempt Equipment (CVR)	1.16	2.95	1.11	0	12.37	12.37
New Total:	36.51	59.89	16.98	15.11	15.69	15.58

Table B-42 Harmony Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)						
	NOx	ROC	CO	SOx	PM	PM10	GHG
Combustion - Engines							
East Crane	6.65	0.74	2.34	0.00	0.76	0.76	403.53
Emergency Production Generator	0.86	0.07	0.19	0.00	0.06	0.06	27.51
Emer. Firewater Pump PBE-357	0.74	0.06	0.16	0.00	0.05	0.05	18.19
Emer. Firewater Pump PBE-367	0.37	0.03	0.08	0.00	0.03	0.03	9.00
Emergency Drilling Generator	1.01	0.08	0.22	0.00	0.07	0.07	28.93
BJ Cement Skid "B" Pump	1.66	0.12	1.55	0.00	0.09	0.09	59.97
BJ Cement Skid "C" Pump	1.24	0.09	1.15	0.00	0.07	0.07	42.79
Baker Cuttings Reinjection Pump	4.96	0.45	4.43	0.01	0.28	0.28	107.66
Combustion - External							
Cent. Proc. Heater (PG)	0.79	0.12	6.50	0.02	0.16	0.16	2561.76
Cent. Proc. Heater (PR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - Flare							
Purge and Pilot	0.14	0.25	0.57	0.00	0.04	0.04	220.42
Planned - cont.	0.18	0.32	1.00	2.15	0.06	0.06	302.37
Planned - other	0.00	0.00	0.01	0.02	0.00	0.00	6.73
Unplanned - other	0.59	1.04	3.20	6.89	0.17	0.17	873.88
Fugitive Components							
Oil - Valve/Conn. - Acc.		1.37					
Oil - Valve/Conn. - Category B		0.01					
Oil - Valve/Conn. - Category F		0.00					
Oil - Pump Seals - Tandem		0.00					
Gas - Valve/Conn. - Acc.		22.17					
Gas - Valve/Conn. - Category B		12.71					
Gas - Valve/Conn. - Category F		1.61					
Gas - Valve/Conn. - Unsafe		1.18					
Gas - PSV - To Flare/VRS		0.01					
Boats							
Supply Boat - Main Engines	14.46	0.72	3.36	0.01	1.42	1.36	859.97
Supply Boat - Main Engines - SC	2.21	0.07	0.31	0.00	0.13	0.13	2.60
Supply Boat - Auxiliary Engines	4.82	0.39	1.04	0.00	0.34	0.32	152.22
Crew Boat - Main Engines	4.88	0.25	1.17	0.00	0.48	0.46	267.29
Crew Boat - Main Engines - SC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crew Boat - Auxiliary Engines	1.53	0.12	0.33	0.00	0.11	0.10	47.16
Broadbill - Main Engines	2.81	0.22	1.04	0.00	0.08	0.08	351.96
Broadbill - Auxiliary Engines	0.49	0.11	0.29	0.00	0.01	0.01	62.10
Emerg. Resp. - Main Engines	0.17	0.00	0.01	0.00	0.01	0.01	9.59
Emerg. Resp. - Aux. Engines	0.06	0.01	0.01	0.00	0.00	0.00	1.84
Survival Capsules							
Survival Capsule #1	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Survival Capsule #2	0.00	0.00	0.00	0.00	0.00	0.00	0.08

Table B-42 Harmony Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)						
	NOx	ROC	CO	SOx	PM	PM10	GHG
Survival Capsule #3	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Pigging Equipment							
Emulsion Pig Launcher		0.02					
HO Emulsion Pig Receiver		0.00					
HE Emulsion Pig Receiver		0.01					
Gas Pig Launcher		0.00					
Gas Pig Receiver		0.01					
Sumps/Tanks/Separator							
Closed Drain Sump		0.01					
Open Drain Sump		0.02					
Wellbay Drain Sump		0.01					
Amine Sump		0.00					
Skim Pile		0.00					
Drilling Settling Tank		0.06					
Diesel/Misc Tanks		0.08					
Solvent Usage - Cleaning/Degreasing		0.05					
Total Emissions	50.64	44.60	28.97	9.10	4.42	4.32	6417.72

Total Emissions (Per CVR Document)	49.87	44.58	28.86	9.11	4.38	4.28
Permit Exempt Equipment (CVR)	4.76	1.96	5.29	0.02	0.27	0.27
New Total:	54.63	46.54	34.14	9.13	4.65	4.55

Table B-43 Heritage Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)						
	NOx	ROC	CO	SOx	PM	PM10	GHG
Combustion - Engines							
East Crane	5.65	0.63	1.99	0.00	0.65	0.65	343.02
Emergency Production Generator	2.14	0.17	0.46	0.00	0.15	0.15	34.49
Emergency Firewater Pump 357	0.38	0.03	0.08	0.00	0.03	0.03	12.09
Emergency Firewater Pump 367	0.13	0.01	0.03	0.00	0.01	0.01	3.36
Emergency Drilling Generator	3.36	0.27	0.73	0.00	0.24	0.24	46.00
BJ Cement Skid "B" Engine	0.31	0.02	0.29	0.00	0.02	0.02	33.79
BJ Cement Skid "C" Engine	0.17	0.01	0.16	0.00	0.01	0.01	10.84
Baker Cuttings Reinjection Skid	2.30	0.85	0.68	0.00	0.26	0.26	148.86
Combustion - External							
Cent. Proc. Heater (PG)	0.76	0.12	6.24	0.00	0.16	0.16	2457.61
Cent. Proc. Heater (PR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - Flare							
Purge and Pilot	0.15	0.26	0.80	0.00	0.04	0.04	227.93
Planned - cont.	0.18	0.32	1.00	2.20	0.06	0.06	316.59
Planned - other	0.02	0.04	0.12	0.27	0.01	0.01	19.29
Unplanned - other	0.70	1.23	3.80	8.48	0.21	0.21	984.11
Fugitive Components - Gas							
Valve/Connection - Accessible		20.23					
Valve/Connection - Category B		12.26					
Valve/Connection - Category C		0.85					
Valve/Connection - Category F		4.25					
Valve/Connection - Unsafe		1.09					
Exempt		0.00					
Fugitive Components - Oil							
Valve/Connection - Accessible		1.89					
Valve/Connection - Category B		0.01					
Valve/Connection - Category F		0.10					
Valve/Connection - Unsafe		0.00					
Pump Seal - Dual/Tandem		0.00					
Exempt		0.00					
Boats							
Supply Boat - Main Engines	13.68	0.68	3.18	0.01	1.34	1.29	813.46
Supply Boat - Main Engines - SC	0.65	0.02	0.09	0.00	0.04	0.04	2.46
Supply Boat - Auxiliary Engines	4.38	0.36	0.94	0.00	0.31	0.29	143.99
Crew Boat - Main Engines	4.62	0.23	1.11	0.00	0.45	0.43	253.26
Crew Boat - Main Engines - SC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crew Boat - Auxiliary Engines	1.45	0.12	0.31	0.00	0.10	0.10	44.69
Broadbill - Main Engines	2.65	0.21	0.98	0.00	0.07	0.07	331.48
Broadbill - Auxiliary Engines	0.50	0.11	0.30	0.00	0.02	0.02	62.57
Emerg. Resp. - Main Engines	0.16	0.00	0.01	0.00	0.01	0.01	12.95
Emerg. Resp. - Aux. Engines	0.05	0.00	0.01	0.00	0.01	0.01	2.28
Survival Capsules							
Survival Capsule #1	0.00	0.00	0.00	0.00	0.00	0.00	0.29
Survival Capsule #2	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Survival Capsule #3	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Pigging Equipment							
Emulsion Pig Launcher		0.02					
Gas Pig Launcher		0.00					

Table B-43 Heritage Baseline Emissions from CVRs
Three-Year Average (2012-2014)

Equipment	Emissions (Tons/yr)						
	NOx	ROC	CO	SOx	PM	PM10	GHG
Sumps/Tanks/Separator							
Closed Drain Sump		0.01					
Open Drain Sump		0.03					
Wellbay Drain Sump		0.03					
Amine Sump		0.00					
Skim Pile		0.00					
Drilling Settling Tank		0.07					
Diesel/Misc Tanks		0.10					
Solvent Usage - Cleaning/Degreasing		0.03					
Total Emissions	44.40	46.65	23.31	10.96	4.18	4.08	6305.68

Total Emissions (Per CVR Document)	44.17	46.65	23.28	10.97	4.15	4.06	
Permit Exempt Equipment (CVR)	2.90	3.12	3.34	0.02	1.12	1.12	
New Total:	47.07	49.77	26.62	10.99	5.27	5.18	

Table B-44 LFC Estimated Cumulative Restart Emissions

Equipment	Emissions (lb/day)					
	NOx	ROC	CO	SOx	PM	PM10
Combustion - IC Engines						
Floodwater Pump (Replaced Stang Pump)	0.0075	0.0036	0.0658	0.0001	0.0004	0.0004
Firewater Pump A	0.2890	0.0230	0.0623	0.0001	0.0206	0.0206
Firewater Pump B	0.3702	0.0295	0.0798	0.0001	0.0263	0.0263
Emergency Backup Generator (New)	0.0081	0.0038	0.0706	0.0001	0.0004	0.0004
Emergency Backup Generator (New)	0.0162	0.0076	0.1401	0.0003	0.0008	0.0008
Permit Exempt Engine Emissions	9.42	1.07	10.25	0.02	0.22	0.22
Cogeneration Power Plant (CPP)						
CPP-Normal Ops. Modes (GTG and GTG/HRSG Ops.)	123.51	53.47	85.10	6.84	153.59	122.48
CPP-HRSG Only Mode	2.59	1.70	1.06	0.10	0.90	0.72
CPP-Planned Start-up/Shutdown Mode	0.05	0.16	0.05	0.00	0.06	0.05
CPP-Unplanned Start-up/Shutdown Mode	0.16	0.80	0.16	0.01	0.23	0.19
SGTP - Incinerator						
TGCU Incinerator - Fuel Gas	4.55	0.57	13.89	21.59	11.77	9.42
TGCU Incinerator - Offgas	incl. above	0.08	1.83	incl. above	1.55	1.24
TGCU Incinerator - Merox Vent	0.00	0.00	0.00	0.00	0.00	0.00
Planned Startup/Shutdown/Maintenance	0.00	0.00	0.00	0.00	0.00	0.00
Unplanned Startup/Shutdown	0.01	0.00	0.02	0.07	0.02	0.01
Fugitive Components - Gas						
Valves - Accessible		1.53				
Valves - Inaccessible		2.33				
Valves - Unsafe		19.30				
Valves - Bellows / Background ppmv		0.00				
Valves - Category A		3.22				
Valves - Category B		11.28				
Valves - Category C		4.03				
Valves - Category E		27.33				
Valves - Category F		0.52				
Valves - Category H		21.39				
Valves - Category H (Inaccessible)		1.49				
Valves - Category I		14.01				
Flanges/Connections - Accessible/Inaccessible		48.39				
Flanges/Connections - Unsafe		11.53				
Flanges/Connections - Category B		41.07				
Flanges/Connections - Category C		0.59				
Flanges/Connections - Category E		5.16				
Flanges/Connections - Category F		0.14				
Compressor Seals - To VRS		0.00				
Exempt		0.00				
Fugitive Components - Oil						
Valves - Accessible		0.60				
Valves - Inaccessible		0.01				
Valves - Bellows / Background ppmv		0.00				
Valves - Category B		0.04				
Valves - Category H		6.79				
Valves - Category H (Inaccessible)		0.26				
Flanges/Connections - Accessible/Inaccessible		5.53				
Flanges/Connections - Unsafe		0.00				
Flanges/Connections - Category B		0.06				
Flanges/Connections - Category F		0.00				

Table B-44 LFC Estimated Cumulative Restart Emissions

Equipment	Emissions (lb/day)					
	NOx	ROC	CO	SOx	PM	PM10
Pump Seals - Single		0.74				
Pump Seals - Dual/Tandem		1.26				
Exempt		0.00				
Compressor Vent						
SOV Distance Piece Vent		7.20				
VRU Distance Piece Vent		4.80				
Crew Boat - NEI (3 Mi.)						
Main Engines - DPV	10.44	0.53	2.51	0.22	1.02	0.98
Main Engines - DPV Broadbill	6.07	0.47	2.24	0.19	0.16	0.16
Main Engines - Spot Charter	0.00	0.00	0.00	0.00	0.00	0.00
Auxiliary Engines - DPV	3.28	0.27	0.71	0.04	0.23	0.22
Auxiliary Engines - DPV Broadbill	1.06	0.24	0.63	0.03	0.03	0.03
Supply Boat - NEI (3 Mi.)						
Main Engines - DPV	4.49	0.22	1.03	0.09	0.44	0.42
Main Engines - Spot Charter	0.04	0.00	0.01	0.00	0.00	0.00
Bow Thruster	incl. below	incl. below	incl. below	incl. below	incl. below	incl. below
Auxiliary Engines	1.44	0.12	0.31	0.02	0.10	0.10
Combustion - Thermal Oxidizer						
Purge and Pilot	8.05	0.44	6.73	0.06	0.61	0.61
Planned - Continuous LP	3.88	0.21	3.26	0.38	0.30	0.30
Planned - Continuous AG	0.00	0.00	0.00	1.00	0.00	0.00
Planned - Other	0.41	0.01	0.13	0.17	0.01	0.01
Unplanned - Other	9.25	0.19	2.94	44.44	0.27	0.27
Pigging Equipment		0.14				
Tanks/Sumps/Separators						
Oil Storage Tank A (vrs1)		3.66				
Oil Storage Tank B (vrs1)		0.00				
Area Drain Oil/Water Separator (cc)		0.07				
Area Drain Sump		0.94				
Rerun Tank A (vrs)		0.78				
Rerun Tank B (vrs)		0.78				
Equalization Tank 1424 (vent scbr/cc)		5.58				
Demulsifier Tank (totes)		1.04				
Oily Sludge Thickener (vrs)		0.54				
Backwash Sump (vrs)		0.09				
Backwash Collection Tank (vrs)		0.03				
Open Drain Sump (cc)		0.09				
Area Drain Sump		6.12				
Area Drain Oil/Water Separator (cc)		0.17				
Area Drain Sump		0.59				
Area Drain Oil/Water Separator (cc)		0.10				
Open Drain Sump (cc)		0.01				
Chemical Storage Tote Tanks		0.22				
Diesel Tanks		0.01				

Table B-44 LFC Estimated Cumulative Restart Emissions

Equipment	Emissions (lb/day)					
	NOx	ROC	CO	SOx	PM	PM10
Solvent Usage		0.21				
TOTAL EMISSIONS	189.40	322.36	133.28	75.27	171.56	137.47

Table B-45 POPCO Estimated Cumulative Restart Emissions

Equipment	Emissions (lb/day)					
	NOx	ROC	CO	SOx	PM	PM10
IC Engines						
Firewater Pump A	0.5903	0.0470	0.1272	0.0002	0.0420	0.0420
Firewater Pump B	0.4976	0.0396	0.1072	0.0002	0.0354	0.0354
Emergency Electrical Generator	0.0015	0.0007	0.0129	0.0000	0.0001	0.0001
Emergency Instrument Air Compressor	0.0673	0.0054	0.0145	0.0000	0.0048	0.0048
Exempt Engine Emissions	0.238	0.026	0.288	0.000	0.006	0.006
Boiler B-801A	9.04	0.27	19.56		2.41	2.30
Boiler B-801B	10.74	0.27	21.81		2.68	2.58
Stretford Tailgas Incineration		--	2.63	34.52	0.33	0.33
Stretford Oxidizer Tank		0.79				
John Zink Thermal Oxidizer (ZTOF):						
Pilot	0.88	6.36	0.60	0.05	--	--
Purge	0.11	0.82	0.05	--	--	--
Planned Continuous: AG	0.11	0.11	--	--	--	--
Planned Continuous: HC/AG	0.82	0.88	0.11	0.05	--	--
Planned Other	0.33	0.22	0.55	--	--	--
Unplanned Other: Miscellaneous	0.16	0.11	0.33	0.11	--	--
Unplanned Other: SRU Failure	--	--	--	--	--	--
Fugitive Components - Gas Service						
Valves - Bellows/Background		--				
Valves - Category B		114.85				
Valves - Category C		22.68				
Valves - Category F		10.79				
Valves - Category J		44.22				
Valves - Unsafe		12.88				
Flanges/Connections - Accessible/Inaccessible		35.73				
Flanges/Connections - Category B		16.16				
Flanges/Connections - Category C		6.03				
Flanges/Connections - Unsafe		15.29				
PSV to Atm/Flare		21.32				
Compressor Seals - To VRS		--				
Pump Seals - Dual/Tandem		0.22				
Pump Seals - Single		0.38				
Fugitive Components - Oil Service						
Valves - Accessible/Inaccessible		--				
Flanges/Connections - Accessible/Inaccessible		--				
Tanks						
Methanol Tank		0.31				
Diesel Tanks		0.00				
Solvent Usage		0.10				
TOTAL EMISSIONS	23.59	310.91	46.19	34.74	5.51	5.29

Table B-46 LFC and POPCO Cumulative Restart GHG Emissions

2013 Cogen GHG Emissions

		1	2	3	4	5	6		
	Entire Cogen Fuel Gas	CO2 Mol Fraction	Methane Mol Fraction	Ethane Mol Fraction	Propane Mol Fraction	Butanes Mol Fraction	Pentanes Mol Fraction	Hexanes+ Mol Fraction	HHV dry
	scf								MMBtu/scf
Annual Total/Avg 2013	3,605,610,750	0.0000000	0.8445028	0.0774743	0.0614127	0.0093997	0.0018627	0.0006272	0.0011827

	CO ₂	CH ₄	N ₂ O	Total CO2e
	MT	MT	MT	MT
Annual Total/Avg 2013	234,104	292	0	
CO2e	234,104	7,308	127	241,539

EFs	Value	Units
CH4	0.003	kg CH4/MMBtu
N2O	0.0001	kg N2O/MMBtu

Emissions calculated according to equations 32 and 36 of Section 95153 (v) of CARB MRR.

Proposed Cogen Restart GHG Emissions:

		1	2	3	4	5	6		
	Entire Cogen Fuel Gas	CO2 Mol Fraction	Methane Mol Fraction	Ethane Mol Fraction	Propane Mol Fraction	Butanes Mol Fraction	Pentanes Mol Fraction	Hexanes+ Mol Fraction	HHV dry
	scf								MMBtu/scf
Proposed Annual Total	3,041,717,808	0.0000000	0.8445028	0.0774743	0.0614127	0.0093997	0.0018627	0.0006272	0.0011827

	CO ₂	CH ₄	N ₂ O	Total CO2e
	MT	MT	MT	MT
Proposed Annual Total	197,491	247	0	
CO2e	197,491	6,165	107	203,764

LFC Restart GHG Emissions:

LFC	280,337	241,539	203,764	242,562
POPCO	44,663	--	--	44,663

Table B-47 Hondo Estimated Cumulative Restart Emissions

Equipment	Daily Emissions (lbs/day)						GHGs (tones/yr)
	NOx	ROC	CO	SOx	PM	PM10	
Combustion - Engines							
East Crane	6.89	0.86	2.70	0.00	0.88	0.88	84.72
West Crane	3.58	0.44	1.39	0.00	0.46	0.46	43.94
Emergency Production Generator	2.36	0.16	0.49	0.00	0.16	0.16	2.26
Emergency Firewater Pump A	1.10	0.09	0.22	0.00	0.09	0.09	8.17
Emergency Firewater Pump B	0.84	0.07	0.20	0.00	0.07	0.07	4.55
BJ Cement Skid "B" Engine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BJ Cement Skid "C" Engine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker Cuttings Reinjection Skid	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - Flare							
Purge and Pilot	0.82	1.42	4.38	0.11	0.22	0.11	252.64
Planned - cont.	2.19	3.84	11.84	27.07	0.66	0.66	1,548.31
Planned - other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unplanned - other	3.51	6.19	19.07	40.11	1.04	1.04	2,593.88
Fugitive Components							
Oil - Valve/Conn. - Accessible		11.67					0.00
Oil - Valve/Conn. - Category B		0.00					0.00
Oil - Valve/Conn. - Category F		0.00					0.00
Oil - Valve/Conn. - Unsafe		0.16					0.00
Gas - Valve/Conn. - Accessible		164.16					0.00
Gas - Valve/Conn. - Category B		101.59					0.00
Gas - Valve/Conn. - Category F		1.64					0.00
Gas - Valve/Conn. - Unsafe		6.19					0.00
Boats							
Supply Boat - Main Engines	83.25	4.16	19.34	0.05	8.15	7.82	903.82
Supply Boat - Main Engines - SC	4.19	0.14	0.58	0.00	0.25	0.22	2.75
Supply Boat - Auxiliary Engines	26.68	2.19	5.75	0.00	1.88	1.79	160.00
Crew Boat - Main Engines	28.11	1.42	6.76	0.00	2.74	2.65	281.41
Crew Boat - Main Engines - SC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crew Boat - Auxiliary Engines	8.80	0.73	1.90	0.00	0.60	0.60	49.19
Broadbill - Main Engines	16.11	1.26	5.95	0.00	0.44	0.44	368.32
Broadbill - Auxiliary Engines	2.83	0.66	1.68	0.00	0.07	0.07	65.00
Emerg. Resp. - Main Engines	0.26	0.00	0.04	0.00	0.00	0.00	2.66
Emerg. Resp. - Aux. Engines	0.03	0.00	0.00	0.00	0.00	0.00	0.31
Survival Capsules							
Survival Capsule #1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Survival Capsule #2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigging Equipment							
Emulsion Pig Launcher		0.01					0.00
Gas Pig Launcher		0.01					0.00
Gas Pig Receiver		0.00					0.00
Sumps/Tanks/Separator							
HP Drain Sump		0.02					0.00
LP Drain Sump		0.04					0.00
Settling Tank		0.09					0.00
Diesel/Misc Tanks		0.55					0.00

Table B-47 Hondo Estimated Cumulative Restart Emissions

Equipment	Daily Emissions (lbs/day)						GHGs (tones/yr)
	NOx	ROC	CO	SOx	PM	PM10	
Solvent Usage - Cleaning/Degreasing		0.16					0.00
Permit Exempt Equipment	3.73	12.18	3.82	0.00	22.68	22.68	85.19
Estimated Total Daily Emissions (lbs/day)	195.27	322.13	86.11	67.34	40.39	39.74	6,457.13

Platform emission estimates developed from past historical operating emissions.

Used average emissions for cranes, vessels, firewater pumps and permit-exempt equip. Used minimum for all other sources.

Table B-48 Harmony Estimated Cumulative Restart Emissions

Equipment	Daily Emissions (lbs/day)						GHGs (tones/yr)
	NOx	ROC	CO	SOx	PM	PM10	
Combustion - Engines							
East Crane	21.37	2.36	7.51	0.00	2.47	2.47	236.41
Emergency Production Generator	3.56	0.27	0.77	0.00	0.27	0.27	13.03
Emer. Firewater Pump PBE-357	4.07	0.33	0.88	0.00	0.29	0.29	18.19
Emer. Firewater Pump PBE-367	2.03	0.16	0.42	0.00	0.15	0.15	9.00
Emergency Drilling Generator	3.12	0.27	0.66	0.00	0.22	0.22	22.50
BJ Cement Skid "B" Pump	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BJ Cement Skid "C" Pump	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker Cuttings Reinjection Pump	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - External							
Cent. Proc. Heater (PG)	3.78	0.55	31.07	0.05	0.77	0.77	2,234.29
Cent. Proc. Heater (PR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - Flare							
Purge and Pilot	0.71	1.32	1.04	0.00	0.22	0.22	217.98
Planned - cont.	0.93	1.64	5.10	9.97	0.27	0.27	299.02
Planned - other	0.00	0.00	0.00	0.00	0.00	0.00	6.65
Unplanned - other	2.74	4.82	14.79	29.10	0.82	0.82	864.21
Fugitive Components							
Oil - Valve/Conn. - Acc.		7.45					0.00
Oil - Valve/Conn. - Category B		0.05					0.00
Oil - Valve/Conn. - Category F		0.00					0.00
Oil - Pump Seals - Tandem		0.00					0.00
Gas - Valve/Conn. - Acc.		121.42					0.00
Gas - Valve/Conn. - Category B		69.48					0.00
Gas - Valve/Conn. - Category F		8.82					0.00
Gas - Valve/Conn. - Unsafe		6.47					0.00
Gas - PSV - To Flare/VRS		0.05					0.00
Boats							
Supply Boat - Main Engines	79.25	3.96	18.43	0.05	7.76	7.45	859.97
Supply Boat - Main Engines - SC	12.08	0.38	1.70	0.00	0.71	0.68	2.60
Supply Boat - Auxiliary Engines	26.43	2.16	5.68	0.00	1.86	1.77	152.22
Crew Boat - Main Engines	26.74	1.35	6.43	0.00	2.61	2.50	267.29
Crew Boat - Main Engines - SC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crew Boat - Auxiliary Engines	8.40	0.68	1.83	0.00	0.60	0.57	47.16
Broadbill - Main Engines	15.40	1.19	5.70	0.00	0.42	0.42	351.96
Broadbill - Auxiliary Engines	2.70	0.60	1.61	0.00	0.07	0.07	62.10
Emerg. Resp. - Main Engines	0.93	0.02	0.07	0.00	0.05	0.05	9.59
Emerg. Resp. - Aux. Engines	0.33	0.05	0.05	0.00	0.00	0.00	1.84
Survival Capsules							
Survival Capsule #1	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Survival Capsule #2	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Survival Capsule #3	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Pigging Equipment							0.00
Emulsion Pig Launcher		0.11					0.00
HO Emulsion Pig Receiver		0.00					0.00
HE Emulsion Pig Receiver		0.00					0.00
Gas Pig Launcher		0.00					0.00

Table B-48 Harmony Estimated Cumulative Restart Emissions

Equipment	Daily Emissions (lbs/day)						GHGs (tones/yr)
	NOx	ROC	CO	SOx	PM	PM10	
Gas Pig Receiver		0.00					0.00
Sumps/Tanks/Separator							
Closed Drain Sump		0.05					0.00
Open Drain Sump		0.11					0.00
Wellbay Drain Sump		0.00					0.00
AMINE Sump		0.00					0.00
Skim Pile		0.00					0.00
Drilling Settling Tank		0.27					0.00
Diesel/Misc Tanks		0.38					0.00
Solvent Usage - Cleaning/Degreasing		0.11					0.00
Permit Exempt Equipment	26.08	10.74	28.97	0.09	1.48	1.46	596.20
Total Daily Emissions (lbs/day)	240.67	247.65	132.69	39.27	21.06	20.47	6,272.46

Platform emission estimates developed from past historical operating emissions.

Used average emissions for vessels, firewater pumps and permit-exempt equip. Used minimum for all other sources.

Table B-49 Heritage Estimated Cumulative Restart Emissions

Equipment	Daily Emissions (lbs/day)						GHGs (tones/yr)
	NOx	ROC	CO	SOx	PM	PM10	
Combustion - Engines							
East Crane	21.64	2.41	7.62	0.00	2.47	2.47	239.44
Emergency Production Generator	4.44	0.33	0.99	0.00	0.33	0.33	10.39
Emergency Firewater Pump 357	2.10	0.16	0.46	0.00	0.15	0.15	12.09
Emergency Firewater Pump 367	0.69	0.05	0.15	0.00	0.05	0.05	3.36
Emergency Drilling Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BJ Cement Skid "B" Engine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BJ Cement Skid "C" Engine	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker Cuttings Reinjection Skid	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - External							
Cent. Proc. Heater (PG)	3.62	0.55	29.92	0.00	0.77	0.77	2,148.97
Cent. Proc. Heater (PR)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Combustion - Flare							
Purge and Pilot	0.82	1.42	4.38	0.00	0.22	0.22	225.80
Planned - cont.	0.93	1.64	5.10	10.74	0.27	0.27	313.62
Planned - other	0.00	0.05	0.16	0.33	0.00	0.00	19.11
Unplanned - other	2.90	5.15	15.89	33.26	0.88	0.88	974.90
Fugitive Components - Gas							
Valve/Connection - Accessible		106.74					0.00
Valve/Connection - Category B		67.07					0.00
Valve/Connection - Category C		4.60					0.00
Valve/Connection - Category F		23.23					0.00
Valve/Connection - Unsafe		5.92					0.00
Exempt		0.00					0.00
Fugitive Components - Oil							
Valve/Connection - Accessible		10.30					0.00
Valve/Connection - Category B		0.05					0.00
Valve/Connection - Category F		0.49					0.00
Valve/Connection - Unsafe		0.00					0.00
Pump Seal - Dual/Tandem		0.00					0.00
Exempt		0.00					0.00
Boats							
Supply Boat - Main Engines	74.98	3.74	17.42	0.05	7.34	7.05	813.46
Supply Boat - Main Engines - SC	3.56	0.11	0.49	0.00	0.22	0.19	2.46
Supply Boat - Auxiliary Engines	23.98	1.95	5.17	0.00	1.68	1.61	143.99
Crew Boat - Main Engines	25.32	1.26	6.06	0.00	2.48	2.37	253.26
Crew Boat - Main Engines - SC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crew Boat - Auxiliary Engines	7.95	0.66	1.70	0.00	0.57	0.53	44.69
Broadbill - Main Engines	14.50	1.13	5.37	0.00	0.37	0.40	331.48
Broadbill - Auxiliary Engines	2.76	0.62	1.64	0.00	0.09	0.09	62.57
Emerg. Resp. - Main Engines	0.89	0.02	0.07	0.00	0.05	0.05	12.95
Emerg. Resp. - Aux. Engines	0.25	0.00	0.03	0.00	0.03	0.03	2.28
Survival Capsules							
Survival Capsule #1	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Survival Capsule #2	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Survival Capsule #3	0.00	0.00	0.00	0.00	0.00	0.00	0.10

Table B-49 Heritage Estimated Cumulative Restart Emissions

Equipment	Daily Emissions (lbs/day)						GHGs (tones/yr)
	NOx	ROC	CO	SOx	PM	PM10	
Pigging Equipment							
Emulsion Pig Launcher		0.09					0.00
Gas Pig Launcher		0.01					0.00
Sumps/Tanks/Separator							
Closed Drain Sump		0.04					0.00
Open Drain Sump		0.15					0.00
Wellbay Drain Sump		0.15					0.00
Amine Sump		0.02					0.00
Skim Pile		0.02					0.00
Drilling Settling Tank		0.37					0.00
Diesel/Misc Tanks		0.55					0.00
Solvent Usage - Cleaning/Degreasing		0.11					0.00
Permit Exempt Equipment	15.91	17.11	18.30	0.11	6.14	6.12	95.52
Total Daily Emissions (lbs/day)	207.24	258.33	120.92	44.49	24.10	23.58	5,710.64

Platform emission estimates developed from past historical operating emissions.

Used average emissions for vessels, firewater pumps and permit-exempt equip. Used minimum for all other sources.



Patrice A. Surmeier
ExxonMobil - Goleta
12000 Calle Real
Goleta, CA 93117

16 December 2014

RE: Santa Ynez Unit - LFC

Work Order: 1400629

Dear Client:

Enclosed is an analytical report for the above referenced project. The samples included in this report were received on 10-Feb-14 07:00 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in cursive script, reading "Marissa Censullo".

Marissa L. Censullo

Project Manager



Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Las Flores Canyon
Project Manager: Patrice A. Surmeier

Reported:
16-Dec-14 14:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Annual LFC Produced Oil	1400629-01	Oil	09-Feb-14 15:27	10-Feb-14 07:00
Annual LFC Produced Oil	1400629-02	Oil	09-Feb-14 15:29	10-Feb-14 07:00

Oilfield Environmental and Compliance

307 Roemer Way, Suite 300, Santa Maria, CA 93454

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Las Flores Canyon
Project Manager: Patrice A. Surmeier

Reported:
16-Dec-14 14:41

Annual LFC Produced Oil
1400629-01 (Oil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Oilfield Environmental and Compliance

ASTM/GPA/UOP/CARB Method

API gravity	18.8	0.1	°API	1	A402330	11-Feb-14	11-Feb-14	ASTM D-287/1298	
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Vapor Pressure

HOST (C1-C10) Vapor pressure	1.20 @ 99°F	0.005	psi	1	B4L0528	12-Feb-14	12-Feb-14	LBNL HOST Modified	Est
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Annual LFC Produced Oil
1400629-02 (Oil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Oilfield Environmental and Compliance

ASTM/GPA/UOP/CARB Method

API gravity	19.0	0.1	°API	1	A402330	11-Feb-14	11-Feb-14	ASTM D-287/1298	
-------------	------	-----	------	---	---------	-----------	-----------	--------------------	--

Vapor Pressure

HOST (C1-C10) Vapor pressure	1.34 @ 99°F	0.005	psi	1	B4L0528	12-Feb-14	12-Feb-14	LBNL HOST Modified	Est
------------------------------	-------------	-------	-----	---	---------	-----------	-----------	-----------------------	-----

Oilfield Environmental and Compliance

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

307 Roemer Way, Suite 300, Santa Maria, CA 93454

www.oecusa.com

TEL: (805) 922-4772
FAX: (805) 925-3376



Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Las Flores Canyon
Project Manager: Patrice A. Surmeier

Reported:
16-Dec-14 14:41

Notes and Definitions

HOSTa 1.34 @ 99°F
HOST 1.20 @ 99°F
Est The result is an estimated value.
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Oilfield Environmental and Compliance

307 Roemer Way, Suite 300, Santa Maria, CA 93454

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Patrice A. Surmeier
ExxonMobil - Goleta
12000 Calle Real
Goleta, CA 93117

06 February 2015

RE: Santa Ynez Unit - LFC

Work Order: 1500463

Dear Client:

Enclosed is an analytical report for the above referenced project. The samples included in this report were received on 03-Feb-15 13:15 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in blue ink that reads "Marissa Censullo". The signature is written in a cursive, flowing style.

Marissa L. Censullo

Project Manager



Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Annual LFC Produced Crude Oil
Project Manager: Patrice A. Surmeier

Reported:
06-Feb-15 11:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Annual LFC Produced Crude Oil	1500463-01	Product	03-Feb-15 10:35	03-Feb-15 13:15
Annual LFC Produced Crude Oil (Duplicate)	1500463-02	Product	03-Feb-15 10:45	03-Feb-15 13:15

Oilfield Environmental and Compliance

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Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Annual LFC Produced Crude Oil
Project Manager: Patrice A. Surmeier

Reported:
06-Feb-15 11:14

Annual LFC Produced Crude Oil
1500463-01 (Product)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Oilfield Environmental and Compliance

ASTM/GPA/UOP/CARB Method

API gravity	18.6	0.1	°API	1	B5B0142	05-Feb-15	05-Feb-15	ASTM D-287	
-------------	------	-----	------	---	---------	-----------	-----------	------------	--

Vapor Pressure

HOST (C1-C10) Vapor Pressure	1.10 @ 124°F	0.005	psi	1	B5B0188	05-Feb-15	06-Feb-15	LBNL HOST Modified	Est
------------------------------	--------------	-------	-----	---	---------	-----------	-----------	--------------------	-----

Annual LFC Produced Crude Oil (Duplicate)
1500463-02 (Product)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

Oilfield Environmental and Compliance

ASTM/GPA/UOP/CARB Method

API gravity	18.7	0.1	°API	1	B5B0142	05-Feb-15	05-Feb-15	ASTM D-287	
-------------	------	-----	------	---	---------	-----------	-----------	------------	--

Vapor Pressure

HOST (C1-C10) Vapor Pressure	0.965 @ 124°F	0.005	psi	1	B5B0188	05-Feb-15	06-Feb-15	LBNL HOST Modified	Est
------------------------------	---------------	-------	-----	---	---------	-----------	-----------	--------------------	-----

Oilfield Environmental and Compliance

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Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Annual LFC Produced Crude Oil
Project Manager: Patrice A. Surmeier

Reported:
06-Feb-15 11:14

ASTM/GPA/UOP/CARB Method - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch B5B0142 - ASTM Method Prep by volume

Duplicate (B5B0142-DUP1)

Source: 1500463-01

Prepared & Analyzed: 05-Feb-15

API gravity	18.7	0.1	°API		18.6			0.536	0.7	
-------------	------	-----	------	--	------	--	--	-------	-----	--

Oilfield Environmental and Compliance

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Oilfield Environmental and Compliance, INC.

ExxonMobil - Goleta
12000 Calle Real
Goleta CA, 93117

Project: Santa Ynez Unit - LFC
Project Number: Annual LFC Produced Crude Oil
Project Manager: Patrice A. Surmeier

Reported:
06-Feb-15 11:14

Notes and Definitions

HOSTa 1.10 @ 124°F
HOST 0.965 @ 124°F
Est The result is an estimated value.
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Oilfield Environmental and Compliance

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Appendix B.2

Trucking Cancer Risk Assessment

Truck Use on the Highways Cancer Risk Assessment

In order to satisfy the CEQA requirements for full disclosure, the EIR has included a screening analysis to address the potential for elevated cancer risks along the truck routes that would be used by the crude oil trucks in the project. The screening analysis is meant to estimate the cancer risks from truck travel along highways and follows the CAPCOA Guidance document on Health Risk Assessment for Proposed Land Use Documents (CAPCOA 2009). The guidance document related to screening allows for the use of screening tools, such as SCREEN3 or various spreadsheets.

The screening approach used in this analysis utilizes the AERMOD modeling program with 5 years of meteorological data from the Santa Maria area to estimate the average exposure to DPM along the roadways from the trucks associated with the project. The screening approach then utilizes the unit risk factor for DPM as detailed in OEHHA 2000 as a simple screening approach to estimating the cancer risks. The unit risk factor involves multiplying the long-term exposure concentration by the unit risk factor to arrive at the cancer risk per million. The unit risk factor is calculated as follows:

Item	Value
Breathing rate, L/kg-day	393
Inhale absorb rate factor	1
Exposure frequency, days/year	350
Exposure duration, years	70
Averaging time, days	25,550
Slope Factor for Diesel	1.1
Cancer risk x ug/m3	414.5

OEHHA 2000, Air Toxics Hot Spots Program Risk Assessment Guidelines Part IV Technical Support Document for Exposure Assessment and Stochastic Analysis, September 2000

The unit risk factor uses the 95% confidence level for the simulated lifetime as detailed by OEHHA 2000 table 3.21 in order to be conservative on the cancer risk levels. Although OEHHA has recently updated their cancer risk approach as incorporated into the HARP2 model, this approach in using the cancer unit risk factor allows for a screening of the potential cancer risks.

The AERMOD program was used to estimate the DPM concentrations at different distances from the highway using a 50m grid with a 3000 meter line source configured with a width equal to the roadway lane width, following the guidance in EPA 2015 (*EPA Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas, Appendix J*) for release height and the initial vertical dimensions for trucks. The attachments shows the AERMOD input values. AERMOD was run for a location in Santa Maria and with flat terrain as a setup that would allow for application to a range of roadways.

Cancer risk curves as a function of the truck speed and the distance from the roadway were then generated based on the emission factors for a model year 2017 truck (as per the project proposal) at different speeds as generated from EMFAC2017. The trips are based on the project 70 round trips per day. The cancer risk as a function of distance is based on the DPM concentration at the midpoint of the 3000 meter line source in combination with the unit risk factor.

```

**AERMOD INPUT FILE CREATED BY HARP VERSION 17320
**DATE CREATED: 12/7/2018 2:25:48 PM
**
CO STARTING
  TITLEONE   Roadway Calcs
  TITLETWO
  MODELOPT   BETA CONC FLAT LOWWIND1
  AVERTIME   1 PERIOD
  POLLUTID   OTHER
  RUNORNOT   RUN
  ERRORFIL   "C:\HARP2\Projects\Roadway\ROADWAY\ROADWAY_AERMOD.ERR"
  LOW_WIND   1 1
CO FINISHED
**
**SOURCES
SO STARTING
**SOURCES LOCATIONS
  LOCATION 1 LINE 720000 3879750 720000 3882750 0
**SOURCES PARAMETERS
  SRCPARAM 1 0.00009 3.4 3.7 3.2
  SRCGROUP 1 1
SO FINISHED
**
**RECEPTORS
RE STARTING
**GRID RECEPTORS
  GRIDCART 1 STA
                XYINC 718050 40 100 3879350 40 100
  GRIDCART 1 END
**
RE FINISHED
**
**MET PATHWAY
ME STARTING
ME SURFFILE "C:\HARP2\MET\SM_Airport.SFC"
ME PROFFILE "C:\HARP2\MET\SM_Airport.PFL"
ME SURFDATA 23273 2010
ME UAIRDATA 93214 2010
ME SITEDATA 0 2010
ME PROFBASE 79.6
ME FINISHED
**
**OUTPUT PATHWAY
OU STARTING
  RECTABLE ALLAVE 1ST
  RECTABLE 1 1ST
  PLOTFILE 1 1 1ST "C:\HARP2\Projects\Roadway\ROADWAY\plt\MAX1HR1.PLT" 31
  PLOTFILE PERIOD 1 "C:\HARP2\Projects\Roadway\ROADWAY\plt\PERIOD1.PLT" 32
OU FINISHED

```

*** Message Summary For AERMOD Model Setup ***

----- Summary of Total Messages -----

```

A Total of          0 Fatal Error Message(s)
A Total of          6 Warning Message(s)
A Total of          0 Informational Message(s)

```

***** FATAL ERROR MESSAGES *****
 *** NONE ***

***** WARNING MESSAGES *****

CO W200	6	TITLES: Missing Parameter(s). No Options Specified For	TITLE TWO
CO W121	7	MODEPT: LowWind1 Beta Option specified on MODELOPT Keyword	Non-DEFAULT
CO W112	12	LOW_WND: User-specified minimum Sigma-V on LOW_WIND Keyword	1.0000
CO W113	12	LOW_WND: User-specified minimum WindSpeed on LOW_WIND Keywd	1.0000
SO W390	20	LPARM: Aspect ratio (L/W) of LINE source greater than 100	1
ME W186	41	MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used	0.50

 *** SETUP Finishes Successfully ***

• *** AERMOD - VERSION 16216r ***	*** Roadway Calcs	***	12/07/18
*** AERMET - VERSION 14134 ***	***	***	14:26:04
			PAGE 1

*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

**NO GAS DEPOSITION Data Provided.

**NO PARTICLE DEPOSITION Data Provided.

**Model Uses NO DRY DEPLETION. DRYDPLT = F

**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Allows User-Specified Options:

1. Stack-tip Downwash.
2. Model Assumes Receptors on FLAT Terrain.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:

LOWWIND1 - Use LowWind1 BETA option
 with user-specified parameters
 CCVR_Sub - Meteorological data includes CCVR substitutions
 TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: OTHER

**Model Calculates 1 Short Term Average(s) of: 1-HR
 and Calculates PERIOD Averages

**This Run Includes: 1 Source(s); 1 Source Group(s); and 1600 Receptor(s)

with: 0 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 0 VOLUME source(s)
and: 0 AREA type source(s)
and: 1 LINE source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with 0 line(s)

**Model Set To Continue RUNNING After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 14134

**Output Options Selected:

Model Outputs Tables of PERIOD Averages by Receptor
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 79.60 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.7 MB of RAM.

**Detailed Error/Message File: C:\HARP2\Projects\Roadway\ROADWAY\ROADWAY_AERMOD.ERR

• *** AERMOD - VERSION 16216r *** *** Roadway Calcs *** 12/07/18
*** AERMET - VERSION 14134 *** *** 14:26:04
PAGE 2

*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** LINE SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	FIRST COORD X (METERS)	Y (METERS)	SECOND COORD X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	WIDTH OF LINE (METERS)	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
1	0	0.90000E-04	720000.0	3879750.0	720000.0	3882750.0	79.6	3.40	3.70	3.20	NO	
• *** AERMOD - VERSION 16216r ***	***	***	***	***	***	***	***	***	***	***	***	12/07/18
*** AERMET - VERSION 14134 ***	***	***	***	***	***	***	***	***	***	***	***	14:26:04
*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods												PAGE 3

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID

SOURCE IDs

1 1
• *** AERMOD - VERSION 16216r *** *** Roadway Calcs *** 12/07/18
*** AERMET - VERSION 14134 *** *** 14:26:04

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

718050.0,	718150.0,	718250.0,	718350.0,	718450.0,	718550.0,	718650.0,	718750.0,	718850.0,	718950.0,
719050.0,	719150.0,	719250.0,	719350.0,	719450.0,	719550.0,	719650.0,	719750.0,	719850.0,	719950.0,
720050.0,	720150.0,	720250.0,	720350.0,	720450.0,	720550.0,	720650.0,	720750.0,	720850.0,	720950.0,
721050.0,	721150.0,	721250.0,	721350.0,	721450.0,	721550.0,	721650.0,	721750.0,	721850.0,	721950.0,

3879350.0,	3879450.0,	3879550.0,	3879650.0,	3879750.0,	3879850.0,	3879950.0,	3880050.0,	3880150.0,	3880250.0,
3880350.0,	3880450.0,	3880550.0,	3880650.0,	3880750.0,	3880850.0,	3880950.0,	3881050.0,	3881150.0,	3881250.0,
3881350.0,	3881450.0,	3881550.0,	3881650.0,	3881750.0,	3881850.0,	3881950.0,	3882050.0,	3882150.0,	3882250.0,
3882350.0,	3882450.0,	3882550.0,	3882650.0,	3882750.0,	3882850.0,	3882950.0,	3883050.0,	3883150.0,	3883250.0,

*** 12/07/18
*** 14:26:04
PAGE 5

```
*** MODELOPTs:      NonDEFAULT  CONC  FLAT  BETA  RURAL  LW1w/Mods
```

[illegible]

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

```

• *** AERMOD - VERSION 16216r ***      ***      1.54,      3.09,      5.14,      8.23,      10.80,
  *** AERMET - VERSION 14134 ***      ***      Roadway Calcs

```

*** 12/07/18
*** 14:26:04
PAGE 6

```
*** MODELOPTs:      NonDEFAULT  CONC  FLAT  BETA  RURAL  LW1w/Mods
```

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\HARP2\MET\SM_Airport.SFC
Profile file: C:\HARP2\MET\SM_Airport.PFL

Met Version: 14134

Surface format: FREE
 Profile format: FREE
 Surface station no.: 23273
 Name: UNKNOWN
 Year: 2010

Upper air station no.: 93214
 Name: UNKNOWN
 Year: 2010

First 24 hours of scalar data																				
YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.94	1.00	0.00	0.	10.0	278.8	2.0	
10	01	01	1	02	-4.6	0.066	-9.000	-9.000	-999.	41.	5.7	0.05	0.94	1.00	1.76	178.	10.0	278.1	2.0	
10	01	01	1	03	-3.9	0.061	-9.000	-9.000	-999.	36.	5.3	0.05	0.94	1.00	1.60	323.	10.0	278.8	2.0	
10	01	01	1	04	-5.5	0.073	-9.000	-9.000	-999.	47.	6.4	0.06	0.94	1.00	1.89	99.	10.0	278.8	2.0	
10	01	01	1	05	-6.2	0.077	-9.000	-9.000	-999.	51.	6.6	0.05	0.94	1.00	2.06	154.	10.0	279.2	2.0	
10	01	01	1	06	-3.2	0.056	-9.000	-9.000	-999.	32.	4.9	0.06	0.94	1.00	1.45	100.	10.0	279.2	2.0	
10	01	01	1	07	-3.9	0.062	-9.000	-9.000	-999.	37.	5.4	0.06	0.94	1.00	1.59	133.	10.0	278.8	2.0	
10	01	01	1	08	-2.3	0.052	-9.000	-9.000	-999.	29.	5.6	0.06	0.94	0.64	1.35	124.	10.0	279.9	2.0	
10	01	01	1	09	7.7	0.096	0.196	0.019	35.	72.	-10.5	0.05	0.94	0.36	1.03	171.	10.0	282.5	2.0	
10	01	01	1	10	44.3	0.196	0.481	0.016	91.	209.	-15.5	0.06	0.94	0.26	2.06	69.	10.0	283.8	2.0	
10	01	01	1	11	47.2	0.125	0.565	0.017	138.	107.	-3.7	0.06	0.94	0.23	1.11	136.	10.0	285.4	2.0	
10	01	01	1	12	56.3	0.159	0.663	0.017	188.	152.	-6.5	0.02	0.94	0.22	1.89	247.	10.0	286.4	2.0	
10	01	01	1	13	57.2	0.240	0.711	0.012	227.	282.	-21.9	0.05	0.94	0.22	2.71	323.	10.0	287.0	2.0	
10	01	01	1	14	22.4	0.184	0.531	0.015	241.	190.	-25.0	0.05	0.94	0.22	2.10	302.	10.0	287.5	2.0	
10	01	01	1	15	34.9	0.125	0.632	0.014	261.	107.	-5.0	0.05	0.94	0.25	1.19	329.	10.0	287.5	2.0	
10	01	01	1	16	20.6	0.345	0.537	0.009	272.	485.	-179.7	0.05	0.94	0.33	4.38	304.	10.0	287.5	2.0	
10	01	01	1	17	-5.2	0.080	-9.000	-9.000	-999.	186.	8.9	0.05	0.94	0.56	2.11	303.	10.0	285.9	2.0	
10	01	01	1	18	-9.2	0.095	-9.000	-9.000	-999.	73.	8.3	0.05	0.94	1.00	2.49	305.	10.0	284.9	2.0	
10	01	01	1	19	-11.5	0.104	-9.000	-9.000	-999.	81.	8.9	0.04	0.94	1.00	2.88	294.	10.0	284.2	2.0	
10	01	01	1	20	-6.9	0.082	-9.000	-9.000	-999.	56.	7.1	0.05	0.94	1.00	2.15	321.	10.0	283.8	2.0	
10	01	01	1	21	-10.3	0.100	-9.000	-9.000	-999.	76.	8.8	0.05	0.94	1.00	2.61	334.	10.0	283.1	2.0	
10	01	01	1	22	-5.7	0.073	-9.000	-9.000	-999.	48.	6.3	0.04	0.94	1.00	2.03	294.	10.0	283.8	2.0	
10	01	01	1	23	-2.7	0.050	-9.000	-9.000	-999.	27.	4.2	0.04	0.94	1.00	1.38	272.	10.0	280.9	2.0	
10	01	01	1	24	-8.6	0.091	-9.000	-9.000	-999.	66.	8.0	0.05	0.94	1.00	2.40	300.	10.0	283.1	2.0	

First hour of profile data
 YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV
 10 01 01 01 10.0 1 -999. -99.00 278.8 99.0 -99.00 -99.00

F indicates top of profile (=1) or below (=0)

• *** AERMOD - VERSION 16216r *** *** Roadway Calcs
 *** AERMET - VERSION 14134 *** ***

*** 12/07/18
 *** 14:26:04
 *** PAGE 7

*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LWlw/Mods

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1 ***
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	718050.00	718150.00	718250.00	718350.00	718450.00	718550.00	718650.00	718750.00	718850.00
3883250.00	2.21550	2.34521	2.48348	2.63303	2.79268	2.96344	3.14672	3.34231	3.54877
3883150.00	2.23842	2.37510	2.52217	2.68065	2.85300	3.03840	3.23817	3.45520	3.68936

3883050.00	2.25386	2.39639	2.55067	2.71787	2.90095	3.10001	3.31685	3.55341	3.81238
3882950.00	2.26124	2.40892	2.56927	2.74394	2.93552	3.14613	3.37699	3.63137	3.91271
3882850.00	2.26093	2.41235	2.57784	2.75895	2.95704	3.17659	3.41914	3.68771	3.98686
3882750.00	2.25251	2.40713	2.57643	2.76251	2.96678	3.19270	3.44373	3.72308	4.03613
3882650.00	2.23692	2.39397	2.56629	2.75587	2.96436	3.19561	3.45279	3.74037	4.06379
3882550.00	2.21462	2.37312	2.54742	2.73973	2.95146	3.18664	3.44852	3.74190	4.07286
3882450.00	2.18559	2.34531	2.52084	2.71450	2.92857	3.16648	3.43195	3.72913	4.06587
3882350.00	2.15088	2.31047	2.48714	2.68140	2.89694	3.13652	3.40414	3.70459	4.04432
3882250.00	2.11031	2.26997	2.44627	2.64118	2.85713	3.09768	3.36696	3.66959	4.01182
3882150.00	2.06368	2.22321	2.39924	2.59368	2.80980	3.05110	3.32117	3.62482	3.96869
3882050.00	2.01267	2.17138	2.34597	2.54035	2.75612	2.99726	3.26725	3.57128	3.91561
3881950.00	1.95727	2.11366	2.28742	2.48065	2.69570	2.93549	3.20518	3.50921	3.85351
3881850.00	1.89644	2.05157	2.22352	2.41412	2.62713	2.86575	3.13416	3.43811	3.78295
3881750.00	1.83227	1.98382	2.15291	2.34196	2.55302	2.78982	3.05644	3.35861	3.70328
3881650.00	1.76301	1.91203	2.07772	2.26284	2.47109	2.70510	2.97007	3.27124	3.61462
3881550.00	1.69083	1.83487	1.99696	2.17882	2.38361	2.61482	2.87672	3.17496	3.51746
3881450.00	1.61502	1.75431	1.91122	2.08854	2.28915	2.51627	2.77470	3.07036	3.41032
3881350.00	1.53611	1.67032	1.82147	1.99324	2.18849	2.41078	2.66494	2.95725	3.29309
3881250.00	1.45532	1.58354	1.72846	1.89384	2.08262	2.29874	2.54690	2.83409	3.16488
3881150.00	1.37295	1.49454	1.63234	1.79039	1.97171	2.18038	2.42121	2.70095	3.02577
3881050.00	1.28988	1.40423	1.53433	1.68422	1.85659	2.05618	2.28798	2.55810	2.87546
3880950.00	1.20672	1.31312	1.43513	1.57562	1.73776	1.92658	2.14756	2.40682	2.71239
3880850.00	1.12380	1.22228	1.33539	1.46565	1.61713	1.79396	2.00175	2.24713	2.53936
3880750.00	1.04204	1.13236	1.23594	1.35592	1.49515	1.65877	1.85169	2.08099	2.35583
3880650.00	0.96208	1.04396	1.13811	1.24698	1.37401	1.52301	1.69953	1.91053	2.16482
3880550.00	0.88457	0.95811	1.04258	1.14026	1.25437	1.38827	1.54745	1.73814	1.96916
3880450.00	0.81016	0.87548	0.95041	1.03699	1.13800	1.25658	1.39762	1.56672	1.77241
3880350.00	0.73948	0.79686	0.86256	0.93826	1.02629	1.12971	1.25217	1.39934	1.57829
3880250.00	0.67346	0.72332	0.78016	0.84547	0.92104	1.00947	1.11410	1.23917	1.39124
3880150.00	0.61267	0.65551	0.70421	0.75975	0.82377	0.89823	0.98567	1.08988	1.21560
3880050.00	0.55754	0.59426	0.63553	0.68230	0.73578	0.79752	0.86950	0.95442	1.05598
3879950.00	0.50843	0.53963	0.57454	0.61370	0.65815	0.70892	0.76747	0.83563	0.91604
3879850.00	0.46499	0.49164	0.52114	0.55404	0.59101	0.63277	0.68034	0.73486	0.79789
3879750.00	0.42688	0.44975	0.47489	0.50273	0.53371	0.56828	0.60726	0.65126	0.70122
3879650.00	0.39358	0.41342	0.43500	0.45885	0.48510	0.51427	0.54676	0.58292	0.62329
3879550.00	0.36442	0.38183	0.40068	0.42137	0.44408	0.46913	0.49673	0.52718	0.56079
3879450.00	0.33906	0.35449	0.37119	0.38946	0.40947	0.43137	0.45544	0.48171	0.51050
3879350.00	0.31699	0.33083	0.34587	0.36228	0.38025	0.39962	0.42089	0.44408	0.46920

• *** AERMOD - VERSION 16216r *** *** Roadway Calcs
 *** AERMET - VERSION 14134 *** ***

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	718950.00	719050.00	719150.00	719250.00	719350.00	719450.00	719550.00	719650.00	719750.00
3883250.00	3.76487	3.99084	4.21781	4.43871	4.63823	4.79239	4.86621	4.81062	4.57367
3883150.00	3.94152	4.20987	4.49204	4.78703	5.07892	5.34982	5.55619	5.62977	5.47294
3883050.00	4.09661	4.40668	4.74647	5.11253	5.50596	5.91422	6.31077	6.60920	6.67078
3882950.00	4.22468	4.57230	4.96116	5.39745	5.88870	6.43752	7.04605	7.67851	8.19423

3882850.00	4.32211	4.70037	5.13034	5.62278	6.19467	6.86692	7.66833	8.64779	9.81177
3882750.00	4.38968	4.79145	5.25103	5.72266	6.41042	7.16950	8.10589	9.29890	10.96729
3882650.00	4.43036	4.84721	5.32790	5.88623	6.54809	7.35124	8.35681	9.64616	11.48436
3882550.00	4.44773	4.87511	5.36914	5.94391	6.62603	7.45344	8.48918	9.81650	11.70001
3882450.00	4.44666	4.88081	5.38394	5.97050	6.66393	7.50801	8.56108	9.91289	11.83281
3882350.00	4.43000	4.87063	5.37991	5.97497	6.67747	7.53230	8.59827	9.97100	11.92099
3882250.00	4.40108	4.84517	5.35927	5.96080	6.67210	7.53516	8.61492	10.01603	11.98159
3882150.00	4.35993	4.80753	5.32569	5.93243	6.65303	7.52462	8.61761	10.03987	12.01310
3882050.00	4.30891	4.75819	5.28075	5.89272	6.62102	7.50174	8.60805	10.04376	12.02717
3881950.00	4.24782	4.69944	5.22575	5.84307	6.57929	7.47111	8.58459	10.03219	12.02234
3881850.00	4.17690	4.63185	5.16171	5.78400	6.52584	7.42633	8.54971	10.00792	11.99729
3881750.00	4.09786	4.55504	5.08744	5.71397	6.46150	7.37070	8.50361	9.96928	11.95279
3881650.00	4.00992	4.46669	5.00096	5.63207	6.38650	7.30419	8.44345	9.91829	11.91055
3881550.00	3.91102	4.36925	4.90541	5.53859	6.29811	7.22265	8.37010	9.85333	11.85716
3881450.00	3.80289	4.26000	4.79637	5.43306	6.19537	7.12610	8.28269	9.77256	11.80062
3881350.00	3.68350	4.13869	4.67492	5.31176	6.07922	7.01463	8.17933	9.67741	11.71939
3881250.00	3.55163	4.00383	4.53823	5.17480	5.94389	6.88418	8.05842	9.56442	11.61909
3881150.00	3.40671	3.85484	4.38552	5.02157	5.79006	6.73486	7.91501	9.43221	11.50038
3881050.00	3.24828	3.68914	4.21525	4.84757	5.61503	6.56190	7.74827	9.27681	11.35849
3880950.00	3.07488	3.50661	4.02481	4.65043	5.41533	6.36175	7.55407	9.09858	11.19430
3880850.00	2.88756	3.30653	3.81294	4.42956	5.18802	6.13089	7.32695	8.88393	10.99786
3880750.00	2.68681	3.08845	3.57814	4.18059	4.92739	5.86444	7.06055	8.62782	10.76448
3880650.00	2.47371	2.85248	3.32016	3.90157	4.63056	5.55523	6.74755	8.32293	10.48633
3880550.00	2.25212	2.60217	3.03936	3.59086	4.29275	5.19559	6.37656	7.95512	10.14616
3880450.00	2.02564	2.34132	2.74013	3.25059	3.91150	4.77948	5.93526	7.50714	9.72309
3880350.00	1.79925	2.07611	2.42875	2.88598	3.49015	4.30119	5.40950	6.95620	9.18459
3880250.00	1.57867	1.81350	2.11413	2.50743	3.03555	3.76198	4.78876	6.27412	8.48561
3880150.00	1.36981	1.56228	1.80801	2.13007	2.56602	3.17892	4.07348	5.43095	7.56912
3880050.00	1.17904	1.33079	1.52275	1.77209	2.10854	2.58378	3.29425	4.42442	6.34864
3879950.00	1.01167	1.12761	1.27110	1.45361	1.69415	2.02791	2.52376	3.32809	4.80123
3879850.00	0.87152	0.95843	1.06261	1.19032	1.35175	1.56565	1.86533	2.32619	3.15300
3879750.00	0.75817	0.82368	0.89960	0.98859	1.09561	1.22836	1.39736	1.62544	1.96574
3879650.00	0.66848	0.71929	0.77638	0.84160	0.91679	1.00501	1.11076	1.24234	1.42126
3879550.00	0.59788	0.63890	0.68440	0.73536	0.79249	0.85785	0.93583	1.03312	1.16297
3879450.00	0.54190	0.57625	0.61412	0.65549	0.70226	0.75585	0.81970	0.89700	0.99185
3879350.00	0.49660	0.52626	0.55827	0.59438	0.63428	0.68035	0.73358	0.79369	0.85945

*** AERMOD - VERSION 16216r *** *** Roadway Calcs ***
 *** AERMET - VERSION 14134 *** ***
 *** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods
 *** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1 ***
 INCLUDING SOURCE(S): 1 ,
 *** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***
 ** CONC OF OTHER IN MICROGRAMS/M**3 **
 Y-COORD (METERS) 719850.00 719950.00 720050.00 720150.00 720250.00 720350.00 720450.00 720550.00 720650.00
 X-COORD (METERS)
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3883250.00	4.14541	3.60302	3.09287	2.70678	2.42576	2.20452	2.01911	1.86353	1.72872
3883150.00	4.99702	4.27517	3.56433	3.05054	2.69338	2.41957	2.19848	2.01494	1.86107
3883050.00	6.24242	5.26873	4.20123	3.47887	3.01589	2.67349	2.40866	2.19642	2.01922
3882950.00	8.15943	6.92166	5.11514	4.03836	3.42100	2.99125	2.67448	2.42281	2.21549
3882850.00	10.99304	10.37838	6.53057	4.85554	3.98518	3.43640	3.03492	2.71786	2.46012
3882750.00	13.46114	18.15290	10.55676	6.49816	4.99428	4.12859	3.54491	3.11124	2.77188

3882650.00	14.28838	20.03633	21.09330	10.14694	6.76276	5.18654	4.25885	3.62987	3.16911
3882550.00	14.60530	20.60394	22.96185	12.75129	8.65486	6.45346	5.13265	4.26254	3.64599
3882450.00	14.79096	20.94801	23.60318	13.87106	9.90574	7.54179	5.99356	4.92969	4.16554
3882350.00	14.91658	21.15049	23.97979	14.41939	10.61637	8.29917	6.69330	5.53175	4.66832
3882250.00	14.99890	21.26726	24.18138	14.72655	11.03651	8.79128	7.20419	6.01788	5.10678
3882150.00	15.04845	21.46267	24.34540	14.91697	11.30071	9.11280	7.56271	6.38651	5.46345
3882050.00	15.07498	21.64456	24.44154	15.04250	11.47156	9.32750	7.81186	6.65754	5.74124
3881950.00	15.08578	21.70184	24.53655	15.12490	11.58980	9.47471	7.98723	6.85442	5.95196
3881850.00	15.07872	21.93453	24.60532	15.17214	11.66167	9.57655	8.10903	6.99583	6.10822
3881750.00	15.05717	22.11893	24.60760	15.18802	11.70973	9.64439	8.19380	7.09689	6.22320
3881650.00	15.02542	22.26955	24.61544	15.18992	11.73811	9.68723	8.25121	7.16730	6.30556
3881550.00	14.97856	22.41818	24.63988	15.19640	11.74659	9.70875	8.28648	7.21322	6.36227
3881450.00	14.92189	22.19956	24.63692	15.18003	11.74050	9.71167	8.30353	7.24006	6.39802
3881350.00	14.85353	21.68746	24.60931	15.15024	11.71985	9.70151	8.30450	7.25051	6.41731
3881250.00	14.76247	21.54516	24.58991	15.09691	11.68507	9.67924	8.29165	7.24566	6.42135
3881150.00	14.66386	21.41761	24.49151	15.03409	11.63577	9.64355	8.26377	7.22939	6.41343
3881050.00	14.52584	21.30754	24.54948	14.96043	11.56824	9.59473	8.22443	7.19969	6.39308
3880950.00	14.33578	21.17323	24.32061	14.87020	11.49339	9.53349	8.17368	7.15923	6.36295
3880850.00	14.16896	20.99390	24.09373	14.76780	11.40423	9.45832	8.10963	7.10701	6.32258
3880750.00	13.98875	20.80945	23.83141	14.64527	11.31421	9.36813	8.03355	7.04267	6.27117
3880650.00	13.74970	20.61080	23.63713	14.50358	11.19959	9.26292	7.94336	6.96820	6.20950
3880550.00	13.45106	20.29333	23.42972	14.33623	11.05121	9.13995	7.84062	6.88114	6.13651
3880450.00	13.07915	19.98077	23.19780	14.13625	10.88558	8.99614	7.72120	6.77998	6.04970
3880350.00	12.60382	19.59461	22.87010	13.90102	10.68350	8.82924	7.58398	6.66413	5.95032
3880250.00	11.97427	19.09382	22.44461	13.61596	10.45415	8.63326	7.42576	6.53033	5.83611
3880150.00	11.10219	18.31069	21.93749	13.26005	10.17347	8.41201	7.24143	6.37519	5.70195
3880050.00	9.83004	17.34012	21.32323	12.81769	9.83772	8.14734	7.02164	6.18754	5.53896
3879950.00	7.88823	15.68054	20.39669	12.24280	9.42177	7.81671	6.74473	5.95266	5.33861
3879850.00	5.07384	12.15935	18.88363	11.43955	8.83286	7.35552	6.37296	5.64787	5.08486
3879750.00	2.55774	4.18402	14.76601	9.75670	7.80866	6.64806	5.84782	5.24250	4.76168
3879650.00	1.69861	2.23996	4.27164	6.07172	6.01821	5.57567	5.11537	4.70745	4.35230
3879550.00	1.33857	1.64362	2.39040	3.43184	4.10166	4.28867	4.22415	4.05757	3.85975
3879450.00	1.10564	1.30014	1.71406	2.28499	2.81988	3.17713	3.34353	3.37276	3.32224
3879350.00	0.93677	1.07618	1.34623	1.70873	2.07696	2.39422	2.61962	2.74856	2.79938

• *** AERMOD - VERSION 16216r *** Roadway Calcs
 *** AERMET - VERSION 14134 ***

*** MODELPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	720750.00	720850.00	720950.00	721050.00	721150.00	721250.00	721350.00	721450.00	721550.00
3883250.00	1.61128	1.50766	1.41583	1.33319	1.25832	1.18980	1.12674	1.06865	1.01528
3883150.00	1.72901	1.61320	1.51149	1.41970	1.33643	1.26012	1.19063	1.12714	1.06889
3883050.00	1.86866	1.73792	1.62202	1.51869	1.42479	1.33981	1.26239	1.19193	1.12795
3882950.00	2.03877	1.88546	1.75096	1.63187	1.52501	1.42906	1.34229	1.26375	1.19276
3882850.00	2.24472	2.06047	1.90183	1.76234	1.63925	1.52954	1.43130	1.34339	1.26440
3882750.00	2.49842	2.27194	2.08006	1.91447	1.77018	1.64357	1.53183	1.43247	1.34415
3882650.00	2.81208	2.52648	2.29022	2.09128	1.92077	1.77351	1.64493	1.53231	1.43288
3882550.00	3.18461	2.82437	2.53349	2.29391	2.09211	1.92013	1.77206	1.64367	1.53132

3882450.00	3.59599	3.15573	2.80506	2.51959	2.28231	2.08230	1.91230	1.76603	1.63890
3882350.00	4.01206	3.50002	3.09190	2.76052	2.48639	2.25711	2.06353	1.89809	1.75511
3882250.00	4.39616	3.83148	3.37631	3.00463	2.69671	2.43952	2.22230	2.03723	1.87783
3882150.00	4.72663	4.13027	3.64245	3.23976	2.90380	2.62226	2.38363	2.17998	2.00447
3882050.00	4.99747	4.38580	3.87884	3.45557	3.09953	2.79850	2.54186	2.32191	2.13164
3881950.00	5.21186	4.59699	4.08130	3.64609	3.27689	2.96197	2.69194	2.45881	2.25609
3881850.00	5.37846	4.76715	4.24959	3.80925	3.43313	3.10945	2.82969	2.58661	2.37398
3881750.00	5.50440	4.90018	4.38654	3.94615	3.56734	3.23888	2.95323	2.70334	2.48324
3881650.00	5.59763	5.00177	4.49440	4.05780	3.67997	3.35035	3.06151	2.80719	2.58205
3881550.00	5.66391	5.07812	4.57836	4.14741	3.77240	3.44396	3.15414	2.89753	2.66938
3881450.00	5.70995	5.13302	4.64166	4.21729	3.84671	3.52053	3.23182	2.97503	2.74557
3881350.00	5.73786	5.17013	4.68698	4.26952	3.90416	3.58207	3.29515	3.03944	2.81034
3881250.00	5.75090	5.19187	4.71695	4.30668	3.94674	3.62897	3.34547	3.09196	2.86445
3881150.00	5.75155	5.20127	4.73390	4.33005	3.97597	3.66302	3.38339	3.13349	2.90840
3881050.00	5.74072	5.19831	4.73880	4.34159	3.99338	3.68530	3.41087	3.16474	2.94316
3880950.00	5.71929	5.18546	4.73266	4.34158	3.99998	3.69755	3.42830	3.18688	2.96899
3880850.00	5.68853	5.16216	4.71633	4.33224	3.99693	3.70070	3.43681	3.20009	2.98624
3880750.00	5.64726	5.12926	4.69101	4.31371	3.98513	3.69503	3.43714	3.20526	2.99550
3880650.00	5.59567	5.08671	4.65606	4.28660	3.96512	3.68158	3.42899	3.20178	2.99606
3880550.00	5.53356	5.03409	4.61273	4.25178	3.93693	3.65975	3.41253	3.19007	2.98861
3880450.00	5.46055	4.97243	4.56088	4.20789	3.89988	3.62858	3.38673	3.16931	2.97224
3880350.00	5.37614	4.90018	4.49831	4.15336	3.85249	3.58748	3.35150	3.13967	2.94780
3880250.00	5.27804	4.81455	4.42283	4.08692	3.79399	3.53595	3.30677	3.10113	2.91541
3880150.00	5.16104	4.71171	4.33187	4.00630	3.72289	3.47344	3.25217	3.05391	2.87458
3880050.00	5.01867	4.58736	4.22248	3.91038	3.63861	3.39941	3.18738	2.99727	2.82516
3879950.00	4.84516	4.43754	4.09251	3.79713	3.53940	3.31287	3.11149	2.93076	2.76738
3879850.00	4.63204	4.25701	3.93814	3.66374	3.42378	3.21225	3.02365	2.85395	2.70008
3879750.00	4.36817	4.03788	3.75395	3.50697	3.28897	3.09579	2.92231	2.76535	2.62267
3879650.00	4.04319	3.77324	3.53498	3.32261	3.13274	2.96135	2.80593	2.66405	2.53394
3879550.00	3.65785	3.46312	3.28030	3.11038	2.95344	2.80816	2.67380	2.54947	2.43396
3879450.00	3.22922	3.11682	2.99549	2.87307	2.75283	2.63698	2.52666	2.42193	2.32274
3879350.00	2.79531	2.75479	2.69314	2.61813	2.53594	2.45099	2.36622	2.28265	2.20117

• *** AERMOD - VERSION 16216r *** Roadway Calcs
 *** AERMET - VERSION 14134 ***

*** MODELPTS: NonDEFAULT CONC FLAT BETA RURAL LWlw/Mods

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	721650.00	721750.00	721850.00	721950.00
3883250.00	0.96630	0.92089	0.87975	0.84179
3883150.00	1.01546	0.96659	0.92215	0.88109
3883050.00	1.06938	1.01625	0.96796	0.92352
3882950.00	1.12852	1.07049	1.01759	0.96921
3882850.00	1.19347	1.12965	1.07162	1.01873
3882750.00	1.26532	1.19453	1.13055	1.07244
3882650.00	1.34473	1.26600	1.19519	1.13102
3882550.00	1.43215	1.34428	1.26563	1.19457
3882450.00	1.52774	1.42932	1.34183	1.26308
3882350.00	1.63038	1.52076	1.42339	1.33629

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3882250.00	1.73910	1.61742	1.50963	1.41377
3882150.00	1.85176	1.71803	1.59962	1.49451
3882050.00	1.96590	1.82037	1.69181	1.57751
3881950.00	2.07866	1.92244	1.78423	1.66139
3881850.00	2.18702	2.02186	1.87509	1.74446
3881750.00	2.28885	2.11615	1.96257	1.82546
3881650.00	2.38206	2.20418	2.04500	1.90259
3881550.00	2.46619	2.28424	2.12124	1.97498
3881450.00	2.54032	2.35600	2.19069	2.04164
3881350.00	2.60451	2.41943	2.25285	2.10202
3881250.00	2.65942	2.47458	2.30772	2.15610
3881150.00	2.70521	2.52142	2.35520	2.20344
3881050.00	2.74260	2.56057	2.39510	2.24411
3880950.00	2.77154	2.59182	2.42753	2.27751
3880850.00	2.79200	2.61499	2.45272	2.30358
3880750.00	2.80458	2.62989	2.46992	2.32287
3880650.00	2.80857	2.63727	2.47978	2.33479
3880550.00	2.80480	2.63660	2.48225	2.34032
3880450.00	2.79283	2.62871	2.47810	2.33888
3880350.00	2.77327	2.61371	2.46671	2.33120
3880250.00	2.74611	2.59118	2.44879	2.31752
3880150.00	2.71124	2.56187	2.42418	2.29732
3880050.00	2.66869	2.52529	2.39335	2.27113
3879950.00	2.61835	2.48162	2.35566	2.23895
3879850.00	2.55966	2.43042	2.31113	2.20011
3879750.00	2.49183	2.37091	2.25916	2.15492
3879650.00	2.41410	2.30285	2.19936	2.10237
3879550.00	2.32631	2.22585	2.13152	2.04257
3879450.00	2.22863	2.13992	2.05567	1.97581
3879350.00	2.12178	2.04587	1.97265	1.90222

• *** AERMOD - VERSION 16216r *** *** Roadway Calcs
 *** AERMET - VERSION 14134 *** ***

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LWlw/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1 ***
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	718050.00	718150.00	718250.00	718350.00	718450.00
3883250.0	57.16215 (13111622)	58.06164 (13111622)	61.30955 (14013106)	64.48137 (14013106)	66.27555 (14013106)
3883150.0	57.20106 (13111622)	58.06245 (13111622)	60.03700 (14013106)	63.44199 (14013106)	66.27059 (14013106)
3883050.0	56.99614 (13111622)	58.08299 (13111622)	58.71851 (13111622)	62.38882 (14013106)	65.58377 (14013106)
3882950.0	56.96691 (13111622)	57.93542 (13111622)	58.66964 (13111622)	60.76362 (14013106)	64.41047 (14013106)
3882850.0	56.68910 (13111622)	57.94346 (13111622)	58.56634 (13111622)	59.56179 (13111622)	63.31083 (14013106)
3882750.0	56.51169 (13111622)	57.53578 (13111622)	58.56709 (13111622)	59.51057 (13111622)	61.64336 (14013106)
3882650.0	56.10573 (13111622)	57.27809 (13111622)	58.65010 (13111622)	59.55722 (13111622)	60.39003 (13111622)
3882550.0	54.94332 (13111622)	56.63266 (13111622)	58.01719 (13111622)	59.59577 (13111622)	60.51218 (13111622)
3882450.0	53.54897 (13111622)	56.13467 (13111622)	57.80889 (13111622)	59.07697 (13111622)	60.46256 (13111622)
3882350.0	51.67252 (13111622)	54.62375 (13111622)	56.97505 (13111622)	58.69793 (13111622)	60.13863 (13111622)
3882250.0	50.02763 (13040205)	52.68539 (13111622)	55.84436 (13111622)	57.95295 (13111622)	59.64304 (13111622)
3882150.0	49.98650 (13040205)	50.69611 (13040205)	54.10354 (13111622)	57.16035 (13111622)	59.70787 (13111622)

3882050.0	49.55475 (13040205)	50.44430 (13040205)	51.52347 (13111622)	55.51191 (13111622)	58.49235 (13111622)
3881950.0	48.93596 (13040205)	50.05813 (13040205)	51.20828 (13040205)	52.86267 (13111622)	56.75477 (13111622)
3881850.0	48.52436 (14020201)	49.58102 (13040205)	50.81633 (13040205)	51.80024 (13040205)	54.55880 (13111622)
3881750.0	48.52959 (14020201)	49.22653 (14020201)	50.23523 (13040205)	51.37811 (13040205)	52.57662 (13040205)
3881650.0	48.23526 (14020201)	48.96228 (14020201)	49.68680 (14020201)	50.57817 (13040205)	52.15197 (13040205)
3881550.0	47.86625 (14020201)	48.75541 (14020201)	49.41387 (14020201)	50.24701 (14020201)	51.29427 (13040205)
3881450.0	47.18315 (12120507)	48.24902 (14020201)	49.19438 (14020201)	50.09832 (14020201)	50.70217 (14020201)
3881350.0	47.30229 (12120507)	47.59906 (12120507)	48.54821 (14020201)	49.68488 (14020201)	50.52192 (14020201)
3881250.0	47.16291 (12120507)	47.72516 (12120507)	48.02998 (12120507)	49.02308 (14020201)	50.22845 (14020201)
3881150.0	46.89723 (12120507)	47.43303 (12120507)	48.07667 (12120507)	48.38009 (12120507)	49.16283 (14020201)
3881050.0	46.04514 (12120507)	47.01836 (12120507)	47.81718 (12120507)	48.34908 (12120507)	48.72710 (12120507)
3880950.0	44.92729 (14031422)	45.88643 (12120507)	47.04373 (12120507)	47.98167 (12120507)	48.59936 (12120507)
3880850.0	44.71152 (14031422)	45.23602 (14031422)	45.74716 (14031422)	46.86033 (12120507)	48.07193 (12120507)
3880750.0	43.84548 (14031422)	44.71138 (14031422)	45.41515 (14031422)	46.01479 (14031422)	47.42202 (14042801)
3880650.0	43.41000 (10020206)	43.78969 (10020206)	44.45686 (14031422)	46.24191 (14042801)	48.36416 (14042801)
3880550.0	43.28410 (10020206)	43.73982 (10020206)	45.33368 (14042801)	46.93307 (14042801)	49.10443 (10021822)
3880450.0	42.85710 (10020206)	44.24461 (14042801)	45.93561 (14042801)	47.65564 (14042801)	50.13749 (10021822)
3880350.0	43.12579 (14042801)	45.08505 (14042801)	46.30373 (14042801)	48.82180 (10021822)	50.57141 (10021822)
3880250.0	43.88406 (14042801)	45.62204 (14042801)	47.56217 (10021822)	49.52605 (10021822)	52.61100 (13020303)
3880150.0	44.46964 (14042801)	46.18367 (10021822)	48.43745 (10021822)	50.01576 (10021822)	55.53041 (13020303)
3880050.0	44.99338 (10021822)	47.05146 (10021822)	48.68401 (10021822)	53.16704 (13020303)	57.72915 (13020303)
3879950.0	45.84948 (10021822)	47.96346 (10021822)	50.69309 (13020303)	55.43534 (13020303)	59.21416 (13020303)
3879850.0	46.35744 (10021822)	48.17186 (10021822)	53.05713 (13020303)	57.11716 (13020303)	60.22567 (13020303)
3879750.0	47.11344 (10021822)	50.72942 (13020303)	55.15765 (13020303)	58.69008 (13020303)	61.25230 (13020303)
3879650.0	48.92476 (13020303)	53.47991 (13020303)	56.90553 (13020303)	59.52984 (13020303)	61.93447 (13020303)
3879550.0	51.27001 (13020303)	55.06744 (13020303)	57.82731 (13020303)	60.16340 (13020303)	61.86318 (13020303)
3879450.0	53.08603 (13020303)	56.18872 (13020303)	58.33258 (13020303)	60.48684 (13020303)	62.30219 (13020303)
3879350.0	54.44985 (13020303)	56.78840 (13020303)	59.45651 (13020303)	60.81015 (13020303)	62.30879 (13020303)

• *** AERMOD - VERSION 16216r ***
 *** AERMET - VERSION 14134 ***

Roadway Calcs

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	718550.00	718650.00	X-COORD (METERS) 718750.00	718850.00	718950.00
3883250.0	68.67957 (14013106)	74.86672 (12121301)	83.93047 (12121301)	91.17948 (12121301)	96.08786 (12121301)
3883150.0	68.27254 (14013106)	71.49576 (12121301)	80.69285 (12121301)	89.37682 (12121301)	95.20520 (12121301)
3883050.0	67.94909 (14013106)	69.91835 (14013106)	78.24553 (12121301)	86.50495 (12121301)	94.20353 (12121301)
3882950.0	67.56796 (14013106)	69.75402 (14013106)	73.93448 (12121301)	84.58307 (12121301)	92.28201 (12121301)
3882850.0	66.65780 (14013106)	69.26439 (14013106)	70.78777 (14013106)	81.37560 (12121301)	89.88841 (12121301)
3882750.0	65.73655 (14013106)	68.95535 (14013106)	70.97133 (14013106)	77.22605 (12121301)	88.05066 (12121301)
3882650.0	64.10547 (14013106)	67.76035 (14013106)	70.70961 (14013106)	72.88123 (12121301)	84.54390 (12121301)
3882550.0	62.64615 (14013106)	66.79787 (14013106)	70.08098 (14013106)	72.08701 (14013106)	80.99208 (12121301)
3882450.0	61.30472 (13111622)	65.29843 (14013106)	68.85903 (14013106)	72.00062 (14013106)	75.94181 (12121301)
3882350.0	61.23025 (13111622)	63.08063 (14013106)	68.09149 (14013106)	70.99427 (14013106)	74.25221 (14013106)
3882250.0	61.04033 (13111622)	62.27567 (13111622)	66.00586 (14013106)	70.24177 (14013106)	73.51712 (14013106)
3882150.0	60.85528 (13111622)	61.84687 (13111622)	64.00565 (10082323)	68.94945 (14013106)	72.24816 (14013106)
3882050.0	60.64081 (13111622)	61.67965 (13111622)	63.04857 (13111622)	67.19791 (14013106)	71.61163 (14013106)
3881950.0	59.77267 (13111622)	61.68018 (13111622)	62.63920 (13111622)	64.63746 (10082323)	69.94477 (14013106)

3881850.0	58.15475 (13111622)	61.06227 (13111622)	62.40750 (13111622)	63.74268 (13111622)	68.19411 (14013106)
3881750.0	55.95858 (13111622)	59.51164 (13111622)	61.90914 (13111622)	63.41985 (13111622)	65.86159 (10082323)
3881650.0	53.28905 (13040205)	57.51909 (13111622)	60.94348 (13111622)	63.14300 (13111622)	64.80019 (13111622)
3881550.0	52.93797 (13040205)	54.06989 (13111622)	59.02704 (13111622)	62.07968 (13111622)	64.03777 (13111622)
3881450.0	51.99546 (13040205)	53.62346 (13040205)	55.99754 (13111622)	60.50155 (13111622)	63.49451 (13111622)
3881350.0	51.21192 (14020201)	52.82321 (13040205)	54.25473 (13040205)	57.62910 (13111622)	62.14951 (13111622)
3881250.0	51.02940 (14020201)	51.67413 (14020201)	53.55360 (13040205)	55.06357 (13040205)	59.43467 (13111622)
3881150.0	50.40442 (14020201)	51.46893 (14020201)	52.14049 (14020201)	54.30770 (13040205)	55.80596 (11020322)
3881050.0	49.41310 (14020201)	50.80687 (14020201)	51.97749 (14020201)	53.98509 (10021822)	56.95890 (10021822)
3880950.0	49.03604 (12120507)	49.92829 (14042801)	52.20337 (10021822)	55.13580 (10021822)	60.70006 (13020303)
3880850.0	48.81151 (12120507)	50.68241 (10021822)	53.47871 (10021822)	57.47123 (13020303)	63.86561 (13020303)
3880750.0	49.29595 (14042801)	52.08495 (10021822)	54.71482 (10021822)	60.64024 (13020303)	65.70189 (13020303)
3880650.0	50.57737 (10021822)	53.18671 (10021822)	57.77698 (13020303)	63.44890 (13020303)	66.96837 (13020303)
3880550.0	51.57887 (10021822)	54.76291 (13020303)	60.58895 (13020303)	65.28344 (13020303)	68.06487 (13020303)
3880450.0	52.25373 (10021822)	58.07668 (13020303)	62.61034 (13020303)	65.86536 (13020303)	68.37588 (13020303)
3880350.0	55.46303 (13020303)	60.39749 (13020303)	63.88827 (13020303)	66.73689 (13020303)	68.94140 (13020303)
3880250.0	58.05671 (13020303)	61.98116 (13020303)	64.98136 (13020303)	67.11884 (13020303)	68.78709 (13020303)
3880150.0	59.90212 (13020303)	63.02933 (13020303)	65.67046 (13020303)	67.54152 (13020303)	69.18335 (13020303)
3880050.0	61.20252 (13020303)	63.97624 (13020303)	65.79903 (13020303)	67.41466 (13020303)	69.26665 (12121620)
3879950.0	62.29373 (13020303)	64.69184 (13020303)	66.07699 (13020303)	67.51596 (13020303)	69.63586 (13020303)
3879850.0	62.73936 (13020303)	64.59818 (13020303)	66.46535 (13020303)	67.32977 (13020303)	71.93652 (13070302)
3879750.0	63.07698 (13020303)	64.69938 (13020303)	66.09110 (13020303)	67.71392 (13020303)	74.17590 (13070302)
3879650.0	63.40110 (13020303)	65.00920 (13020303)	66.58946 (13020303)	68.19195 (13020303)	76.51272 (13070302)
3879550.0	63.44321 (13020303)	64.75093 (13020303)	65.94164 (13020303)	70.71200 (13070302)	78.62687 (13070302)
3879450.0	63.77917 (13020303)	65.23365 (13020303)	66.40304 (13020303)	72.94790 (13070302)	80.42372 (13070302)
3879350.0	63.48143 (13020303)	65.51815 (13020303)	67.25777 (13070302)	75.29189 (13070302)	81.83711 (13070302)

• *** AERMOD - VERSION 16216r ***

*** AERMET - VERSION 14134 ***

Roadway Calcs

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3

**

Y-COORD (METERS)	719050.00	719150.00	X-COORD (METERS) 719250.00	719350.00	719450.00
3883250.0	99.64034 (12121301)	105.08407 (10021205)	114.78291 (10021205)	124.07358 (10050301)	140.29846 (12050705)
3883150.0	99.24399 (12121301)	103.05826 (10021205)	112.82827 (10021205)	122.44848 (10050301)	137.54484 (12050705)
3883050.0	98.67639 (12121301)	102.40141 (12121301)	111.15389 (10021205)	120.72073 (10050301)	135.86595 (12050705)
3882950.0	97.63557 (12121301)	101.95609 (12121301)	110.05568 (10021205)	118.90068 (10021205)	132.61604 (12050705)
3882850.0	97.29036 (12121301)	101.57097 (12121301)	107.54290 (10021205)	117.37689 (10021205)	129.91086 (10050301)
3882750.0	95.58332 (12121301)	100.45750 (12121301)	105.10529 (10021205)	115.84434 (10021205)	127.68311 (10050301)
3882650.0	93.01522 (12121301)	99.19905 (12121301)	103.04235 (12121301)	114.82449 (10021205)	125.28897 (10050301)
3882550.0	91.59705 (12121301)	98.47243 (12121301)	103.51252 (12121301)	112.48192 (10021205)	123.05825 (10021205)
3882450.0	87.80741 (12121301)	96.37199 (12121301)	102.47231 (12121301)	109.47640 (10021205)	121.89694 (10021205)
3882350.0	84.44376 (12121301)	95.18690 (12121301)	100.74457 (12121301)	106.31186 (10021205)	120.07445 (10021205)
3882250.0	79.24557 (12121301)	91.46566 (12121301)	99.56989 (12121301)	104.44632 (12121301)	117.43168 (10021205)
3882150.0	75.57834 (14013106)	88.04397 (12121301)	97.33019 (12121301)	103.96247 (12121301)	114.87616 (10021205)
3882050.0	74.54175 (14013106)	83.39015 (12121301)	95.35610 (12121301)	102.90467 (12121301)	111.06764 (10021205)
3881950.0	74.01080 (14013106)	77.83530 (12121301)	92.48880 (12121301)	101.55285 (12121301)	107.34596 (10021205)
3881850.0	72.86053 (14013106)	76.23668 (14013106)	87.54413 (12121301)	99.12872 (12121301)	106.64352 (12121301)
3881750.0	71.31356 (14013106)	75.77117 (14013106)	81.76048 (12121301)	95.81740 (12121301)	103.97385 (12121301)

3881650.0	68.39123 (14013106)	74.28089 (14013106)	78.38356 (14013106)	91.22567 (12121301)	102.87353 (12121301)
3881550.0	66.51604 (10082323)	72.21958 (14013106)	77.09384 (14013106)	86.14943 (12121301)	100.78114 (12121301)
3881450.0	65.31408 (13111622)	68.85972 (10082323)	75.95407 (14013106)	80.08883 (10060306)	96.85799 (12121301)
3881350.0	65.05984 (13111622)	66.72192 (10082323)	72.95901 (14013106)	78.28533 (14013106)	91.53123 (12121301)
3881250.0	63.77161 (13111622)	65.88256 (13111622)	69.93543 (13020303)	77.21215 (14013106)	84.01819 (12121301)
3881150.0	61.32980 (13111622)	67.08828 (13020303)	71.80361 (13020303)	74.94413 (12121620)	83.10793 (13070302)
3881050.0	63.90877 (13020303)	69.28590 (13020303)	72.56637 (13020303)	76.20690 (12121620)	87.85054 (13070302)
3880950.0	66.68066 (13020303)	70.64983 (13020303)	73.06122 (12121620)	77.51315 (13070302)	91.61505 (13070302)
3880850.0	68.36534 (13020303)	71.09022 (13020303)	74.13575 (12121620)	82.52900 (13070302)	94.73611 (13070302)
3880750.0	69.46806 (13020303)	71.61061 (13020303)	74.69735 (12121620)	86.18029 (13070302)	98.52405 (11022807)
3880650.0	69.68534 (13020303)	71.98238 (12121620)	77.16088 (13070302)	88.89151 (13070302)	100.45767 (11022807)
3880550.0	70.14419 (13020303)	72.25951 (12121620)	80.87001 (13070302)	91.55054 (11022807)	103.33509 (11051201)
3880450.0	70.75217 (13020303)	73.16081 (12121620)	84.70237 (13070302)	94.19361 (11022807)	105.88958 (11051201)
3880350.0	70.70680 (12121620)	76.35652 (13070302)	86.51682 (13070302)	96.89002 (11022807)	107.50182 (11051201)
3880250.0	70.57493 (12121620)	79.86217 (13070302)	88.78728 (11022807)	99.26277 (11022807)	108.50391 (11051201)
3880150.0	71.76696 (13070302)	82.59052 (13070302)	91.20208 (11022807)	101.17099 (11051201)	109.96045 (11051201)
3880050.0	75.69089 (13070302)	84.20133 (13070302)	93.68536 (11022807)	102.59310 (11051201)	111.16746 (11051201)
3879950.0	78.39651 (13070302)	86.54316 (11022807)	95.91556 (11022807)	104.27905 (11051201)	111.29677 (11051201)
3879850.0	80.33821 (13070302)	89.06791 (11022807)	97.19887 (11022807)	105.62562 (11051201)	112.31118 (11051201)
3879750.0	82.23845 (13070302)	90.41005 (11022807)	99.05302 (11051201)	106.38342 (11051201)	113.66302 (11051201)
3879650.0	84.11247 (13070302)	91.95270 (11022807)	100.55110 (11051201)	107.11371 (11051201)	113.46607 (11051201)
3879550.0	86.16515 (11022807)	93.51034 (11051201)	102.07590 (11051201)	108.80564 (11051201)	113.34124 (11051201)
3879450.0	88.36180 (11022807)	95.76706 (11051201)	102.31359 (11051201)	108.72113 (11051201)	114.02526 (11051201)
3879350.0	89.97923 (11022807)	96.98940 (11051201)	102.94643 (11051201)	109.20864 (11051201)	113.20514 (11051201)

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Roadway Calcs

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LWlw/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	719550.00	719650.00	X-COORD (METERS) 719750.00	719850.00	719950.00
3883250.0	155.35799 (12050705)	173.79450 (13091123)	216.07394 (11100222)	284.76448 (11121303)	294.19306 (13013020)
3883150.0	153.91288 (12050705)	173.93817 (13091123)	212.21116 (11100222)	287.38109 (11121303)	314.70105 (11121303)
3883050.0	153.24472 (12050705)	169.50926 (13091123)	209.50513 (11100222)	285.75200 (11121303)	345.36886 (11121303)
3882950.0	150.57462 (12050705)	166.83541 (13091123)	205.64393 (11100222)	280.44410 (11121303)	376.03482 (11121303)
3882850.0	148.58001 (12050705)	164.70650 (12050705)	201.22259 (11100222)	275.41536 (11121303)	397.47217 (11121303)
3882750.0	146.45637 (12050705)	163.09443 (12050705)	197.32863 (12101623)	269.15099 (11121303)	406.19341 (11121303)
3882650.0	143.22305 (12050705)	161.80036 (12050705)	191.63609 (11100222)	262.51016 (11121303)	402.54142 (11121303)
3882550.0	141.55488 (12050705)	160.01846 (12050705)	189.92963 (12101623)	257.68252 (11121303)	396.48414 (11121303)
3882450.0	137.68433 (12050705)	158.85657 (12050705)	184.21263 (12101623)	249.45723 (11121303)	391.29004 (11121303)
3882350.0	134.56844 (10050301)	155.53863 (12050705)	183.29195 (13091123)	242.76736 (11121303)	385.04292 (11121303)
3882250.0	131.41355 (10050301)	152.52281 (12050705)	177.46749 (13091123)	236.13952 (11121303)	379.00594 (11121303)
3882150.0	128.12965 (10050301)	150.88577 (12050705)	175.01944 (13091123)	231.17898 (11100222)	374.37949 (11121303)
3882050.0	124.80512 (13111720)	147.00352 (12050705)	169.88072 (13091123)	226.06109 (11100222)	367.24031 (11121303)
3881950.0	123.13288 (10021205)	142.87465 (12050705)	166.47479 (12050705)	220.62712 (11100222)	360.27182 (11121303)
3881850.0	120.63021 (10021205)	138.31106 (12050705)	162.87971 (14042704)	214.35993 (11100222)	352.10712 (11121303)
3881750.0	116.91331 (10021205)	133.99850 (10050301)	160.40843 (12050705)	208.25838 (11100222)	344.73516 (11121303)
3881650.0	113.29527 (10021205)	130.06382 (10050301)	157.35645 (12050705)	201.08687 (11100222)	337.34041 (11121303)
3881550.0	108.06667 (10021205)	126.26996 (10021205)	153.32035 (12050705)	194.29087 (12101623)	327.15742 (11121303)

3881450.0	106.65158	(12121301)	122.60548	(10021205)	148.43766	(12050705)	188.40662	(13091123)	318.95302	(11121303)
3881350.0	104.91880	(12121301)	118.77854	(10021205)	142.55364	(12050705)	181.81837	(13091123)	309.00860	(11121303)
3881250.0	101.29845	(12121301)	114.31037	(10021205)	136.46782	(10050301)	174.83682	(13091123)	298.25984	(11121303)
3881150.0	97.74094	(11022807)	112.30514	(11051201)	131.41456	(10050301)	167.88977	(13090204)	286.84880	(11121303)
3881050.0	100.88654	(11022807)	114.39137	(11051201)	130.18969	(12021803)	166.97367	(11090702)	279.20681	(11090702)
3880950.0	104.98691	(11022807)	117.50638	(11051201)	132.44458	(11072004)	174.84615	(11090702)	286.32756	(11090702)
3880850.0	107.00129	(11051201)	119.35849	(11051201)	135.55628	(12020519)	181.98577	(11090702)	291.36469	(11090702)
3880750.0	110.82804	(11051201)	119.91135	(11051201)	141.40178	(12020519)	188.50548	(11090702)	296.32717	(11090702)
3880650.0	112.49260	(11051201)	119.94860	(11051201)	144.96799	(12020519)	195.78196	(11090702)	301.65915	(11090702)
3880550.0	113.73211	(11051201)	121.17424	(12021803)	148.98407	(12020519)	201.02736	(11090702)	307.04330	(11090702)
3880450.0	114.10014	(11051201)	123.12374	(12021803)	152.90193	(12020519)	207.26530	(11090702)	311.20514	(14010407)
3880350.0	115.09095	(11051201)	126.39008	(12020519)	156.06543	(12020519)	211.14741	(11090702)	315.75245	(14010407)
3880250.0	116.03934	(11051201)	131.30419	(12020519)	158.98933	(12020519)	217.94145	(11090702)	321.12198	(14010407)
3880150.0	116.65733	(11051201)	133.25273	(12020519)	162.38178	(12020519)	220.59922	(11090702)	326.47482	(14010407)
3880050.0	117.49948	(11051201)	138.08508	(12020519)	163.58916	(12020519)	224.86777	(11090702)	330.38936	(14010407)
3879950.0	117.55411	(11051201)	139.54280	(12020519)	166.95057	(12020519)	230.44504	(11090702)	333.75559	(14010407)
3879850.0	119.10212	(12020519)	144.07908	(12020519)	167.50609	(12020519)	231.67146	(11090702)	338.39861	(14010407)
3879750.0	121.32029	(12020519)	145.35453	(12020519)	172.30645	(11090702)	237.64209	(11090702)	343.04691	(14010407)
3879650.0	125.69241	(12020519)	149.15006	(12020519)	175.41200	(11090702)	240.89922	(11090702)	333.45323	(14010407)
3879550.0	127.54868	(12020519)	149.92625	(12020519)	178.98218	(11090702)	243.77742	(11090702)	317.53266	(14052706)
3879450.0	131.44221	(12020519)	153.17682	(12020519)	183.27159	(11090702)	244.77987	(11090702)	299.36710	(14052706)
3879350.0	134.26124	(12020519)	155.95511	(12020519)	186.48547	(11090702)	240.65817	(11090702)	281.60941	(14052706)

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	720050.00	720150.00	X-COORD (METERS) 720250.00	720350.00	720450.00					
3883250.0	311.09403	(14082106)	283.68163	(12010206)	242.82873	(14012603)	191.89501	(14012603)	167.98683	(12121222)
3883150.0	329.81355	(14082106)	291.44020	(12010206)	239.50372	(14012603)	185.70974	(14012603)	167.14507	(12121222)
3883050.0	348.38255	(14082106)	291.19476	(12010206)	235.92314	(14012603)	180.22049	(14012603)	164.12404	(12121222)
3882950.0	375.92039	(10020805)	287.99094	(12010206)	230.83111	(14012603)	176.54008	(13111820)	163.52696	(12121222)
3882850.0	394.89229	(10020805)	284.52744	(12010206)	224.34411	(14012603)	175.23895	(12121222)	161.63948	(12121222)
3882750.0	401.11801	(10020805)	280.06459	(12010206)	220.80193	(14012603)	172.51352	(12121222)	158.51047	(12121222)
3882650.0	397.47844	(10020805)	275.45364	(12010206)	213.62781	(14012603)	172.45645	(12121222)	155.45624	(12121222)
3882550.0	391.50706	(10020805)	271.50200	(14012603)	209.55961	(14012603)	170.44696	(12121222)	153.54129	(12121222)
3882450.0	384.71591	(10020805)	266.22699	(14012603)	200.91668	(14012603)	168.37871	(12121222)	150.24463	(12121222)
3882350.0	379.66038	(10020805)	262.31035	(14012603)	195.52172	(14012603)	165.71724	(12121222)	145.42874	(12121222)
3882250.0	372.26287	(10020805)	257.35718	(14012603)	187.54713	(14012603)	163.62735	(12121222)	140.45237	(12121222)
3882150.0	364.83823	(10020805)	251.75464	(14012603)	181.74207	(13111820)	160.24260	(12121222)	135.29482	(12121222)
3882050.0	359.13936	(10020805)	245.43246	(14012603)	177.27084	(13111820)	157.12709	(12121222)	129.46993	(12121222)
3881950.0	351.66069	(10020805)	238.88524	(14012603)	174.64324	(12121222)	152.91521	(12121222)	125.38211	(12050624)
3881850.0	343.15854	(10020805)	232.35921	(14012603)	171.41331	(12121222)	147.95285	(12121222)	123.78421	(12050624)
3881750.0	335.23077	(10020805)	223.79694	(14012603)	168.68315	(12121222)	142.02238	(12121222)	121.57263	(12050624)
3881650.0	326.45133	(10020805)	217.87090	(14012603)	165.41962	(12121222)	135.76900	(12121222)	117.51770	(12050624)
3881550.0	318.87494	(12010206)	207.88939	(14012603)	161.46639	(12121222)	128.52347	(12031207)	114.52928	(12050624)
3881450.0	310.82385	(12010206)	198.32633	(14012603)	156.30586	(12121222)	124.93936	(12050624)	109.30247	(12050624)
3881350.0	301.97102	(12010206)	187.99527	(14012603)	150.50164	(12121222)	121.95339	(12050624)	103.23204	(14012422)

3881250.0	295.42238	(12010206)	180.61435	(12082305)	144.01004	(12121222)	118.47072	(12050624)	98.31986	(11121101)
3881150.0	284.94405	(11070203)	186.55793	(12082305)	136.48960	(14022407)	112.66719	(12050624)	94.70334	(12092402)
3881050.0	293.08162	(11070203)	192.20369	(12082305)	142.27355	(12082305)	114.99638	(12090424)	97.28659	(12092402)
3880950.0	302.29498	(12092723)	195.67789	(12082305)	149.78440	(12082305)	119.64549	(12090424)	99.27731	(12092402)
3880850.0	310.61444	(12092723)	200.21012	(12082305)	156.73043	(12082305)	123.51201	(12090424)	103.16837	(11090805)
3880750.0	317.98680	(12092723)	204.13173	(10071924)	162.00214	(12082305)	127.03491	(12090424)	106.91324	(11090805)
3880650.0	325.13332	(12092723)	209.93264	(10071924)	168.00561	(12082305)	129.59299	(14022407)	110.09265	(11090805)
3880550.0	332.51474	(12092723)	215.91992	(10071924)	172.36061	(12082305)	132.26088	(14022407)	113.48343	(12090424)
3880450.0	338.72801	(12092723)	221.08819	(10071924)	176.61927	(12082305)	137.00435	(12082305)	116.84565	(12090424)
3880350.0	344.58017	(12092723)	225.92929	(10071924)	180.49180	(12082305)	142.80600	(12082305)	119.47289	(12090424)
3880250.0	350.62281	(12092723)	230.61946	(10071924)	183.89543	(12082305)	148.20224	(12082305)	122.72762	(14022407)
3880150.0	355.55796	(12092723)	235.15874	(10071924)	186.88574	(12082305)	153.00988	(12082305)	124.75842	(14022407)
3880050.0	361.66221	(12092723)	238.84433	(10071924)	190.03262	(12082305)	156.98542	(12082305)	126.38384	(14022407)
3879950.0	367.08661	(12092723)	242.44184	(10071924)	191.31373	(12082305)	161.26836	(12082305)	127.96227	(14022407)
3879850.0	378.24339	(10071924)	245.64574	(10071924)	194.96647	(12082305)	165.24632	(12082305)	132.23700	(12082305)
3879750.0	384.59303	(10071924)	249.71307	(10071924)	195.68818	(12082305)	167.68007	(12082305)	136.62588	(12082305)
3879650.0	368.26108	(12092723)	251.48479	(10071924)	198.72517	(12082305)	171.22097	(12082305)	141.80364	(12082305)
3879550.0	349.35559	(13092102)	255.48670	(10071924)	198.68438	(12082305)	173.40873	(12082305)	145.27850	(12082305)
3879450.0	327.31138	(13092102)	256.87249	(10071924)	201.79643	(10071924)	176.58890	(12082305)	148.20343	(12082305)
3879350.0	305.35344	(13092102)	253.45567	(11070203)	204.29778	(10071924)	178.04822	(12082305)	151.93662	(12082305)

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*** AERMET - VERSION 14134 ***

*** Roadway Calcs

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3

**

Y-COORD (METERS)	720550.00	720650.00	X-COORD (METERS) 720750.00	720850.00	720950.00					
3883250.0	154.99313	(12121222)	136.42372	(12121222)	119.61734	(12050624)	113.73996	(12050624)	105.84108	(12050624)
3883150.0	152.76161	(12121222)	133.47504	(12121222)	118.29575	(12050624)	111.95535	(12050624)	103.25691	(12050624)
3883050.0	149.41741	(12121222)	128.96271	(12121222)	117.57042	(12050624)	109.98455	(12050624)	100.78272	(12050624)
3882950.0	145.69267	(12121222)	124.40271	(12121222)	116.77946	(12050624)	107.76953	(12050624)	96.68512	(12050624)
3882850.0	142.65828	(12121222)	121.43634	(12050624)	114.84655	(12050624)	105.55570	(12050624)	93.42773	(14012422)
3882750.0	139.66191	(12121222)	120.63159	(12050624)	113.05487	(12050624)	102.23454	(12050624)	91.48633	(14012422)
3882650.0	134.33869	(12121222)	119.83392	(12050624)	111.23350	(12050624)	98.76559	(12050624)	89.10266	(11121101)
3882550.0	129.05267	(12121222)	118.77410	(12050624)	108.77331	(12050624)	95.45582	(14012422)	86.22592	(11121101)
3882450.0	124.11883	(12050624)	117.00787	(12050624)	105.04530	(12050624)	92.74224	(14012422)	84.42658	(13083002)
3882350.0	122.62522	(12050624)	114.39021	(12050624)	101.25794	(12050624)	90.00288	(13050201)	81.35090	(11121302)
3882250.0	121.54723	(12050624)	111.40742	(12050624)	97.66127	(14012422)	87.77594	(13083002)	79.89608	(11020103)
3882150.0	119.67130	(12050624)	107.64663	(12050624)	93.89728	(11121101)	84.43410	(13083002)	79.73921	(11020103)
3882050.0	117.59010	(12050624)	103.39465	(12050624)	91.55629	(11121101)	82.49984	(11121302)	79.06631	(11020103)
3881950.0	114.37741	(12050624)	99.33253	(14012422)	88.16879	(13083002)	80.89114	(11020103)	77.96491	(11020103)
3881850.0	111.22696	(12050624)	95.41804	(14012422)	84.84313	(11121302)	79.94777	(11020103)	76.22072	(11020103)
3881750.0	105.81028	(12050624)	92.98250	(11121101)	82.69407	(11020103)	79.38716	(11020103)	73.65797	(14013101)
3881650.0	101.53284	(14012422)	89.33107	(13083002)	81.79419	(11020103)	77.50268	(11020103)	72.55643	(14013101)
3881550.0	96.85445	(14012422)	85.01584	(13083002)	80.15654	(11020103)	74.39867	(11020103)	71.17396	(14013101)
3881450.0	93.16943	(11121101)	83.17296	(11020103)	78.55133	(11020103)	73.30335	(14013101)	68.49830	(13031005)
3881350.0	88.98989	(13083002)	81.52945	(11020103)	75.02070	(11020103)	71.01590	(14013101)	67.26176	(13031005)
3881250.0	85.14911	(11121302)	79.79602	(11020103)	73.58902	(14013101)	68.25866	(13031005)	65.59236	(10121522)
3881150.0	85.61602	(10091024)	81.51983	(10091024)	74.22106	(14081104)	69.02635	(14081104)	65.29114	(10121522)

3881050.0	86.17182	(10091024)	83.36816	(10091024)	77.83941	(10091024)	71.32926	(14081104)	66.48166	(10072822)
3880950.0	88.94437	(12092402)	84.01349	(10091024)	79.82128	(10091024)	73.47060	(14081104)	68.37259	(14081104)
3880850.0	91.66321	(12092402)	84.69068	(10091024)	81.73544	(10091024)	76.64974	(10091024)	70.79549	(14081104)
3880750.0	94.03663	(12092402)	84.83236	(10091024)	82.43459	(10091024)	78.35737	(10091024)	72.23379	(14081104)
3880650.0	94.77960	(12092402)	86.42174	(12092402)	83.09508	(10091024)	79.85389	(10091024)	75.04431	(10091024)
3880550.0	96.56355	(11090805)	88.01013	(12092402)	83.93428	(10091024)	81.39853	(10091024)	77.30328	(10091024)
3880450.0	99.98878	(11090805)	90.23356	(12092402)	84.02266	(10091024)	81.39813	(10091024)	78.92608	(10091024)
3880350.0	102.85614	(11090805)	91.72846	(12092402)	84.26495	(12092402)	81.64848	(10091024)	79.23863	(10091024)
3880250.0	105.82978	(12090424)	92.16685	(12092402)	85.16828	(12092402)	82.58691	(10091024)	80.42960	(10091024)
3880150.0	108.96339	(12090424)	94.20421	(11090805)	86.89570	(12092402)	82.47987	(10091024)	80.74117	(10091024)
3880050.0	111.28416	(12090424)	97.01729	(11090805)	88.56246	(12092402)	82.84730	(10091024)	81.28986	(10091024)
3879950.0	113.60151	(12090424)	99.28805	(11090805)	89.61399	(12092402)	83.08373	(10091024)	80.99123	(10091024)
3879850.0	116.08424	(12090424)	101.47584	(11090805)	89.80909	(12092402)	84.08042	(12092402)	81.35292	(10091024)
3879750.0	118.23157	(12090424)	103.59612	(12090424)	91.16604	(11090805)	85.19697	(12092402)	81.26300	(10091024)
3879650.0	119.03018	(14022407)	107.02808	(12090424)	93.35103	(11090805)	85.81813	(12092402)	81.41335	(10091024)
3879550.0	120.72619	(14022407)	108.51417	(12090424)	95.67183	(11090805)	86.63195	(12092402)	81.53875	(10091024)
3879450.0	122.25019	(14022407)	110.12129	(12090424)	97.16945	(11090805)	87.15606	(11090805)	81.93265	(12092402)
3879350.0	123.84794	(14022407)	112.36834	(12090424)	99.91841	(12090424)	88.85319	(11090805)	82.75127	(12092402)

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 *** AERMET - VERSION 14134 ***

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LWlw/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	721050.00	721150.00	X-COORD (METERS) 721250.00	721350.00	721450.00					
3883250.0	94.61010	(12050624)	86.25428	(13050201)	78.95533	(13083002)	75.32636	(11020103)	73.85618	(11020103)
3883150.0	91.91819	(14012422)	84.16638	(13050201)	77.40526	(13083002)	75.26528	(11020103)	73.58096	(11020103)
3883050.0	89.52493	(14012422)	82.15352	(11121101)	76.63545	(11020103)	75.31060	(11020103)	73.03477	(11020103)
3882950.0	87.25110	(13050201)	80.09315	(13083002)	76.30312	(11020103)	74.41436	(11020103)	72.24038	(11020103)
3882850.0	85.62454	(11121101)	77.78844	(11121302)	75.77382	(11020103)	73.85459	(11020103)	70.79379	(11020103)
3882750.0	82.57621	(13083002)	77.84210	(11020103)	75.80764	(11020103)	73.59809	(11020103)	69.58402	(14013101)
3882650.0	80.28633	(11121302)	77.42020	(11020103)	75.01057	(11020103)	71.80273	(11020103)	69.29111	(14013101)
3882550.0	78.77232	(11020103)	76.92419	(11020103)	74.75088	(11020103)	70.40057	(14013101)	68.54148	(14013101)
3882450.0	79.00280	(11020103)	76.21303	(11020103)	72.97182	(11020103)	70.25028	(14013101)	67.57377	(14013101)
3882350.0	78.18810	(11020103)	75.62273	(11020103)	71.20829	(14013101)	69.57272	(14013101)	66.22580	(14013101)
3882250.0	78.00334	(11020103)	73.97139	(11020103)	70.62076	(14013101)	67.97073	(14013101)	64.84570	(13031005)
3882150.0	76.51835	(11020103)	72.50247	(14013101)	69.65983	(14013101)	66.28445	(14013101)	64.50659	(10121522)
3882050.0	75.29879	(11020103)	71.49802	(14013101)	68.89946	(14013101)	65.70340	(13031005)	64.50916	(10121522)
3881950.0	73.15005	(14013101)	70.25270	(14013101)	66.79726	(13031005)	65.00125	(10121522)	64.35340	(10121522)
3881850.0	71.81777	(14013101)	68.67803	(14013101)	65.86094	(13031005)	64.79771	(10121522)	63.85720	(10121522)
3881750.0	71.04528	(14013101)	66.79843	(13031005)	65.22691	(10121522)	64.68504	(10121522)	62.67156	(10121522)
3881650.0	68.78531	(14013101)	65.86757	(13031005)	65.08754	(10121522)	63.43595	(10121522)	61.11889	(10121522)
3881550.0	67.20761	(13031005)	65.31222	(10121522)	64.39213	(10121522)	61.71123	(10121522)	57.75948	(10121522)
3881450.0	65.93071	(10121522)	64.78408	(10121522)	62.74910	(10121522)	58.86110	(10121522)	56.36099	(10022003)
3881350.0	65.19833	(10121522)	63.56551	(10121522)	59.90979	(10121522)	57.29087	(10022003)	54.40616	(10022003)
3881250.0	64.39382	(10121522)	60.91281	(10121522)	57.40326	(10022003)	54.83267	(10022003)	52.57198	(13022023)
3881150.0	61.67782	(10121522)	57.93642	(10022003)	56.10453	(10031821)	54.18154	(10031821)	52.57198	(13022023)
3881050.0	63.71434	(10072822)	59.46946	(10072822)	57.13382	(10092620)	55.05043	(10031821)	53.55167	(10031821)
3880950.0	65.37676	(10072822)	62.24493	(10072822)	57.87750	(10092620)	56.05225	(10092620)	54.50379	(10031821)

3880850.0	65.94014	(10072822)	63.98196	(10072822)	60.63759	(10072822)	56.89929	(10092620)	54.90244	(10092620)
3880750.0	67.97589	(14081104)	64.70853	(10072822)	62.62625	(10072822)	58.96659	(10072822)	56.27963	(10092620)
3880650.0	69.44221	(14081104)	65.41431	(10072822)	63.81788	(10072822)	61.24599	(10072822)	57.41375	(10072822)
3880550.0	71.02313	(10091024)	67.42839	(14081104)	64.38783	(10072822)	62.62350	(10072822)	59.68407	(10072822)
3880450.0	73.62066	(10091024)	69.04749	(14081104)	64.76669	(14081104)	63.56661	(10072822)	61.26741	(10072822)
3880350.0	75.58634	(10091024)	70.14096	(10091024)	66.49730	(14081104)	64.22920	(10072822)	62.34028	(10072822)
3880250.0	77.11304	(10091024)	72.36689	(10091024)	67.85674	(14081104)	64.39065	(14081104)	63.17817	(10072822)
3880150.0	78.46965	(10091024)	74.16900	(10091024)	68.86354	(10091024)	65.98731	(14081104)	63.31410	(10072822)
3880050.0	78.39246	(10091024)	75.68547	(10091024)	71.29006	(10091024)	67.14087	(14081104)	63.76420	(14081104)
3879950.0	79.24369	(10091024)	76.11155	(10091024)	72.85554	(10091024)	67.91048	(10091024)	64.85827	(14081104)
3879850.0	78.84397	(10091024)	77.19676	(10091024)	74.19007	(10091024)	70.17828	(10091024)	66.19790	(14081104)
3879750.0	79.59256	(10091024)	77.25915	(10091024)	75.01670	(10091024)	71.83547	(10091024)	67.00044	(10091024)
3879650.0	79.35729	(10091024)	77.56232	(10091024)	75.74016	(10091024)	72.69227	(10091024)	68.85164	(10091024)
3879550.0	79.51727	(10091024)	77.83942	(10091024)	76.07026	(10091024)	73.92560	(10091024)	70.64610	(10091024)
3879450.0	79.86473	(10091024)	77.80589	(10091024)	76.28910	(10091024)	74.14981	(10091024)	71.28082	(10091024)
3879350.0	80.23887	(10091024)	77.99531	(10091024)	76.31376	(10091024)	74.87228	(10091024)	72.40870	(10091024)

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: 1
 INCLUDING SOURCE(S): 1 ,

*** NETWORK ID: 1 ; NETWORK TYPE: GRIDCART ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

Y-COORD (METERS)	721550.00	721650.00	X-COORD (METERS) 721750.00	721850.00	721950.00					
3883250.0	71.86044	(11020103)	68.92615	(11020103)	67.00638	(14013101)	64.73880	(14013101)	63.12221	(14013101)
3883150.0	71.15350	(11020103)	67.88000	(11020103)	66.20251	(14013101)	64.76588	(14013101)	62.84858	(10121522)
3883050.0	69.89098	(11020103)	67.56183	(14013101)	66.12626	(14013101)	63.68610	(14013101)	62.71979	(10121522)
3882950.0	68.93526	(14013101)	67.02343	(14013101)	64.78702	(14013101)	62.98223	(10121522)	62.81161	(10121522)
3882850.0	68.21155	(14013101)	66.37373	(14013101)	63.89750	(14013101)	62.93501	(10121522)	63.01219	(10121522)
3882750.0	68.09122	(14013101)	65.80985	(14013101)	63.38246	(10121522)	63.12336	(10121522)	62.74117	(10121522)
3882650.0	67.30948	(14013101)	64.16459	(14013101)	63.47760	(10121522)	63.18021	(10121522)	62.47563	(10121522)
3882550.0	66.20426	(14013101)	63.98272	(10121522)	63.62333	(10121522)	62.94522	(10121522)	62.21331	(10121522)
3882450.0	64.51504	(14013101)	63.77142	(10121522)	63.27869	(10121522)	62.73427	(10121522)	61.91970	(10121522)
3882350.0	64.20221	(10121522)	63.82844	(10121522)	63.29010	(10121522)	62.26630	(10121522)	60.76855	(10121522)
3882250.0	64.31268	(10121522)	63.85802	(10121522)	62.78626	(10121522)	61.29918	(10121522)	59.33337	(10121522)
3882150.0	64.16178	(10121522)	63.31525	(10121522)	62.35042	(10121522)	60.18523	(10121522)	56.84473	(10121522)
3882050.0	63.97790	(10121522)	62.63674	(10121522)	60.79170	(10121522)	57.79211	(10121522)	54.47735	(10022003)
3881950.0	62.94246	(10121522)	61.71899	(10121522)	58.43147	(10121522)	55.20467	(10022003)	53.89940	(10022003)
3881850.0	62.28360	(10121522)	59.31133	(10121522)	55.97201	(10022003)	54.47397	(10022003)	51.91173	(10022003)
3881750.0	60.18826	(10121522)	56.22886	(10022003)	54.68608	(10022003)	52.41982	(10022003)	51.34194	(13022023)
3881650.0	56.92013	(10121522)	55.05860	(10022003)	52.86503	(10022003)	51.56225	(13022023)	51.39021	(13022023)
3881550.0	55.69537	(10022003)	53.34165	(10022003)	51.92094	(13022023)	51.53951	(13022023)	51.36014	(13022023)
3881450.0	53.88334	(10022003)	52.03246	(13022023)	51.82722	(13022023)	51.56011	(13022023)	51.22901	(13022023)
3881350.0	52.18221	(13022023)	51.89553	(13022023)	51.67359	(13022023)	51.44655	(13022023)	51.02240	(13022023)
3881250.0	52.20223	(13022023)	52.10137	(13022023)	51.57795	(13022023)	51.07793	(13022023)	50.22490	(13022023)
3881150.0	52.11188	(13022023)	51.75934	(13022023)	51.13193	(13022023)	50.14993	(13022023)	48.59857	(13022023)
3881050.0	51.92512	(13022023)	51.13570	(13022023)	49.92508	(13022023)	47.73892	(13022023)	46.98165	(12052203)
3880950.0	53.09813	(10031821)	50.62251	(10031821)	48.00966	(13092506)	47.37111	(12052203)	46.96256	(12052203)
3880850.0	54.02753	(10031821)	52.55914	(10031821)	50.07023	(10031821)	47.43641	(12052203)	46.94819	(12052203)
3880750.0	54.30084	(10031821)	52.91036	(10031821)	51.61901	(10031821)	49.50023	(10031821)	46.97941	(12052203)

3880650.0	54.84731	(10092620)	53.42620	(10031821)	52.32139	(10031821)	50.90232	(10031821)	48.89823	(10031821)
3880550.0	55.83019	(10092620)	54.28208	(10092620)	52.73994	(10031821)	51.62395	(10031821)	50.17937	(10031821)
3880450.0	58.22262	(10072822)	54.59148	(10092620)	53.01830	(10031821)	52.29816	(10031821)	51.25120	(10031821)
3880350.0	60.00505	(10072822)	56.90668	(10072822)	53.81301	(10092620)	52.33389	(10092620)	51.33095	(10031821)
3880250.0	61.04874	(10072822)	58.64586	(10072822)	55.12975	(10072822)	52.73054	(10092620)	51.62541	(10031821)
3880150.0	62.03551	(10072822)	59.79646	(10072822)	57.11967	(10072822)	53.84837	(10072822)	51.98995	(10092620)
3880050.0	62.19146	(10072822)	60.76647	(10072822)	58.49819	(10072822)	55.92756	(10072822)	52.59723	(10072822)
3879950.0	62.36565	(10072822)	61.09513	(10072822)	59.50282	(10072822)	57.36895	(10072822)	54.83734	(10072822)
3879850.0	63.23177	(14081104)	61.54159	(10072822)	60.48848	(10072822)	58.36169	(10072822)	56.30468	(10072822)
3879750.0	64.50978	(14081104)	61.67007	(10072822)	60.67287	(10072822)	59.26731	(10072822)	57.39518	(10072822)
3879650.0	64.93049	(14081104)	62.55492	(14081104)	60.81589	(10072822)	59.58034	(10072822)	57.95169	(10072822)
3879550.0	66.38265	(10091024)	63.40788	(14081104)	61.21107	(10072822)	59.60778	(10072822)	58.85392	(10072822)
3879450.0	67.59572	(10091024)	64.23245	(14081104)	61.70367	(14081104)	60.34883	(10072822)	59.06128	(10072822)
3879350.0	69.36331	(10091024)	65.22890	(10091024)	62.42872	(14081104)	60.01540	(14081104)	59.63376	(10072822)

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*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3

**

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID	
1	1ST HIGHEST VALUE IS	24.63988 AT (720050.00,	3881550.00,	79.60,	79.60,	0.00) GC 1
	2ND HIGHEST VALUE IS	24.63692 AT (720050.00,	3881450.00,	79.60,	79.60,	0.00) GC 1
	3RD HIGHEST VALUE IS	24.61544 AT (720050.00,	3881650.00,	79.60,	79.60,	0.00) GC 1
	4TH HIGHEST VALUE IS	24.60931 AT (720050.00,	3881350.00,	79.60,	79.60,	0.00) GC 1
	5TH HIGHEST VALUE IS	24.60760 AT (720050.00,	3881750.00,	79.60,	79.60,	0.00) GC 1
	6TH HIGHEST VALUE IS	24.60532 AT (720050.00,	3881850.00,	79.60,	79.60,	0.00) GC 1
	7TH HIGHEST VALUE IS	24.58991 AT (720050.00,	3881250.00,	79.60,	79.60,	0.00) GC 1
	8TH HIGHEST VALUE IS	24.54948 AT (720050.00,	3881050.00,	79.60,	79.60,	0.00) GC 1
	9TH HIGHEST VALUE IS	24.53655 AT (720050.00,	3881950.00,	79.60,	79.60,	0.00) GC 1
	10TH HIGHEST VALUE IS	24.49151 AT (720050.00,	3881150.00,	79.60,	79.60,	0.00) GC 1

*** RECEPTOR TYPES: GC = GRIDCART
 GP = GRIDPOLR
 DC = DISCCART
 DP = DISCPOLR

• *** AERMOD - VERSION 16216r *** *** Roadway Calcs ***
 *** AERMET - VERSION 14134 *** ***

*** 12/07/18
 *** 14:26:04
 *** PAGE 21

*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3

**

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
----------	--------------	-----------------	--	---------	-----------------

```

1      HIGH      1ST HIGH VALUE IS      406.19341 ON 11121303: AT ( 719950.00, 3882750.00, 79.60, 79.60, 0.00) GC 1

*** RECEPTOR TYPES: GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
• *** AERMOD - VERSION 16216r *** *** Roadway Calcs ***
*** AERMET - VERSION 14134 *** ***
*** MODELOPTs: NonDEFAULT CONC FLAT BETA RURAL LW1w/Mods
*** Message Summary : AERMOD Model Execution ***

----- Summary of Total Messages -----
A Total of      0 Fatal Error Message(s)
A Total of      6 Warning Message(s)
A Total of    1705 Informational Message(s)

A Total of    43824 Hours Were Processed
A Total of      533 Calm Hours Identified
A Total of    1172 Missing Hours Identified ( 2.67 Percent)

***** FATAL ERROR MESSAGES *****
*** NONE ***

***** WARNING MESSAGES *****
CO W200      6      TITLES: Missing Parameter(s). No Options Specified For      TITLETWO
CO W121      7      MODEPT: LowWind1 Beta Option specified on MODELOPT Keyword Non-DEFAULT
CO W112     12      LOW_WND: User-specified minimum Sigma-V on LOW_WIND Keyword      1.0000
CO W113     12      LOW_WND: User-specified minimum WindSpeed on LOW_WIND Keywd      1.0000
SO W390     20      LPARM: Aspect ratio (L/W) of LINE source greater than 100      1
ME W186     41      MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used      0.50

*****
*** AERMOD Finishes Successfully ***
*****

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***      12/07/18
***      14:26:04
***      PAGE 22

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Appendix B.3

Proposed Trucking Health Risk Assessment



ExxonMobil SYU Interim Trucking Project

Health Risk Assessment

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Prepared March 2020

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1.0 Executive Summary

An air toxics health risk assessment (HRA) has been prepared for the Interim Trucking Project. The HRA analyses risk not only from sources associated with the proposed interim trucking operation (crude load rack, piping components, and diesel crude delivery trucks) but also existing sources including those at the Las Flores Canyon (LFC) and POPCO facilities. Cancer risk and non-cancer Hazard Index (HI) risk values were calculated and compared to Santa Barbara County APCD significance thresholds and were found to be below the thresholds as summarized in Table 1 below.

Table 1. Pathway and Target Organ Systems by Pollutant

Risk Type	All Equipment Plus Interim Trucking Project Maximum Risk	Risk from Interim Trucking Project Sources Only at Max Receptor	Significance Threshold
Cancer risk	7.0 per million	0.16 per million	≥10 per million
Chronic non-cancer risk (HI)	0.05	0.0015	>1
8-hour chronic non-cancer risk (HI)	0.006	0.0003	>1
Acute non-cancer risk (HI)	0.8	0.1	>1

As indicated in Table 1 above, the fraction of risk at the maximum impacted receptors attributed to the Interim Trucking Project was relatively minor – 2% for cancer risk, 3% for chronic non-cancer risk, 5% for 8-hour chronic non-cancer risk, and 14% for acute non-cancer risk.

2.0 Facility Information

The ExxonMobil Santa Ynez Unit (SYU) facilities is located west of Goleta, CA in the foothills of the Santa Ynez mountains. The general location is shown in Figure 1. The complete address is as follows:

ExxonMobil – Santa Ynez Unit (SYU) (Facility ID: 1060)

12000 Calle Real

Goleta, CA 93117

UTM Coordinates (approximate center): 771785E, 3819430N, UTM Zone 10, NAD27

SYU Project develops production from three platforms (Platforms Hondo, Harmony and Heritage) located offshore California in the Santa Barbara Channel. The production is transported to shore through a subsea pipeline and treated in two production facilities located in Las Flores Canyon. Las Flores Canyon processing facility (LFC) receives the produced crude/water/gas emulsion from the offshore platforms via the 20-inch emulsion pipeline and gas via the 12-inch produced gas pipeline. The produced gas pipeline directs gas to POPCO and LFC. LFC is subdivided into the following plants: Oil Treating Plant (OTP), Stripping Gas Treating Plant (SGTP), Transportation Terminal (TT), and the Cogeneration Power Plant (CPP).

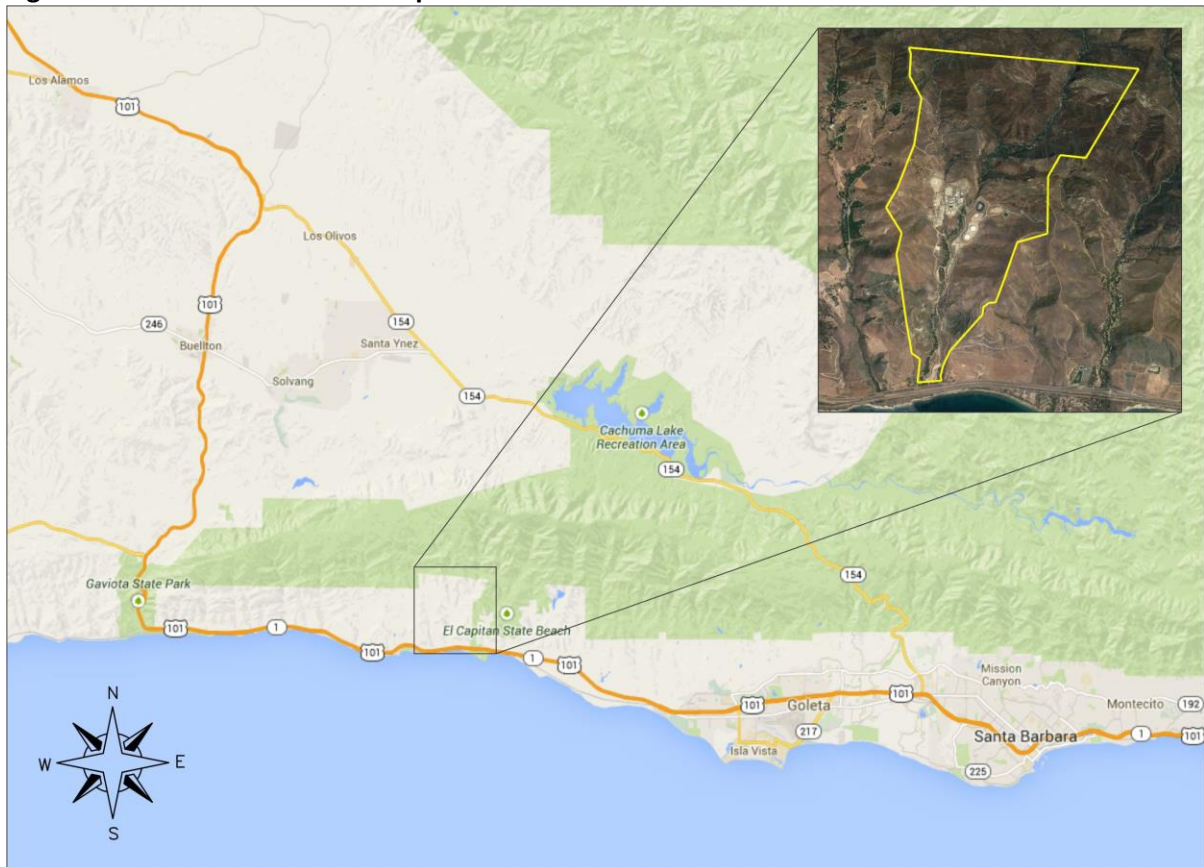
SYU INTERIM TRUCKING PROJECT HEALTH RISK ASSESSMENT

The POPCO Gas Plant receives the raw natural gas from the offshore platforms via the 12-inch produced gas pipeline. The Gas Plant produces PUC quality natural gas, propane, butane and sulfur products for sale.

Prior to the failure of the All American Pipeline Company (AAPL) pipeline, LFC transported the crude via the pipeline. The LFC and POPCO facilities have been in a preservation mode since the pipeline failure. ExxonMobil is proposing to take a phased approach to restarting offshore oil production at the SYU facilities by initiating interim trucking of limited crude oil production until a pipeline alternative becomes available to transport crude oil to a refinery destination. This Interim Trucking phase is the subject of this HRA.

A table of emitted substances and their annual and maximum hourly emission rates is provided in Table A-1 in Appendix A.

Figure 1. General Location Map



3.0 Source and Emission Inventory Information

The emission sources included in the modeling for this HRA include currently permitted equipment operations, portable diesel equipment, maintenance related exempt activities, mobile sources and the proposed crude load rack. Equipment operations include:

- Gas turbine and heat recovery steam generator (HRSG)
- Boilers
- Flares/thermal oxidizers
- Tail gas incinerator
- Internal combustion engines (generators, fire pumps, portable engines)
- Stretford System
- Piping components
- Pigging
- Produced water system (aerators, clarifiers, tanks)
- Sumps and oil-water separators
- Storage tanks
- Sulfur loading
- Compressor vents
- Welding
- Abrasive blasting
- Solvent and paint usage
- Mobile sources (crude delivery trucks, employee vehicles, delivery vehicles, and propane-butane delivery trucks)

Sources were modeled as point sources, volume sources, area sources, and line sources. Source coordinates and parameters for each of the sources are provided in Table B-1, Table B-2, Table B-3, and Table B-4 in Appendix B. Diagrams showing the source locations are provided as Figure C-1, Figure C-2, and Figure C-3 in Appendix C.

As noted above, mobile source emissions (crude delivery trucks, employee vehicles, delivery vehicles, propane-butane delivery trucks) were included in the modeling. Per District policy, this included routes within the facility and along roads outside the facility from the facility boundary to a distance of 1,000 feet. Offsite roads, which were relatively straight with minimal elevation change, were modeled as line sources. Onsite roads, due to the presence of many curving sections and significant elevation change, were modeled as a string of volume sources following District guidance. A detailed description of the mobile source modeling methodology and distribution of emissions is provided in Appendix D.

Most emission sources at SYU generally operate continuously. Exceptions include solvent and paint usage, abrasive blasting, sulfur loading and welding operations, and diesel internal combustion engines. Permitted emergency equipment (generators and fire pump engines) operate intermittently for maintenance/testing (typically less than an hour per week) but are modeled to

operate on a continuous basis during an emergency situation. Contractor portable diesel equipment operates on an as needed basis and schedule is dependent on the particular equipment (e.g., generators for daytime work operate during daylight hours and light stands operate only at night). Table E-1 in the Appendix provides the operating schedule for each device.

A modeling protocol was submitted to and approved by the District and the County¹. The protocol, *Modeling Protocol Tables revised 2-6-20.xlsx*, includes modeling options and source and building parameters and is provided with other electronic files in Appendix J.

4.0 Emission Quantification

Detailed emission rates and supporting calculations and documentation are provided in Appendix I and Appendix J. A summary of annual and maximum hourly emissions is provided in Table A-1.

5.0 Model Information

This HRA was performed following the Santa Barbara County APCD and Office of Environmental Health Hazard Assessment (OEHHA) guidelines². As recommended by these guidelines, the California Air Resources Board (CARB) Hotspots Analysis and Reporting Program Version 2 (HARP) was used to perform a refined health risk assessment for the project's emission sources. The most current version of HARP (v 19121, health database file dated 9/9/2019) was used. The AMS/EPA Regulatory Model (AERMOD, v 19191) was used as the air dispersion model for this analysis. HARP includes AERMOD but also allows model runs to be performed with AERMOD outside of HARP. For this project, AERMOD was run outside of HARP, and the results were imported into HARP to complete the risk analysis.

AERMOD control options chosen were the regulatory default options with rural dispersion and a flagpole receptor height of 1.5 meters. Building downwash was considered. AERMOD-ready meteorological data for years 2012-2016 for the Las Flores Canyon meteorological station was used for the analysis. The dataset was developed by the Santa Barbara County APCD using AERMET version 16216, the AERMOD meteorological data preprocessor, and available for use in this analysis via the SBCAPCD website. A windrose showing a graphical distribution of wind speed and wind direction for the time period modeled is included as Figure F-1 in the Appendix. All relevant AERMOD input and output files are included in the electronic submittal, provided in Appendix J.

¹ Energy & Minerals Division of the Santa Barbara County Planning & Development Department

² California Office of Environmental Health Hazard Assessment (OEHHA), [Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments](#), February 2015.

Santa Barbara County Air Pollution Control District, [Modeling Guidelines for Health Risk Assessments](#), Form-15i, July 2019.

6.0 Building Parameters

Building downwash was selected as a control option in the air dispersion analysis and structures were included in the HRA. Figure C-1 in Appendix C shows the locations of the downwash structures. Structure coordinates and heights are provided in electronic format in the *Building Parameters* tab of the modeling protocol spreadsheet (filename: *Modeling Protocol Tables revised 2-6-20.xlsx*).

7.0 HARP2 Options

Risk calculations in HARP followed District guidance per Form-15i. Residential cancer risk was calculated per the “RMP using the Derived Method” while worker cancer and all chronic non-cancer risk was calculated using the “OEHHA Derived Method.” A 30-year exposure duration was assumed for residential cancer risk and a 25-year exposure was assumed for worker cancer risk. All risk calculations for the point of maximum impact (PMI) receptor were based on residential risk calculation methodologies.

For residential receptors, the following pathways were considered:

- Inhalation
- Soil ingestion
- Dermal
- Mother’s milk
- Homegrown produce
- Chicken
- Eggs

For worker receptors, only inhalation, soil ingestion, and dermal pathways were considered. As a conservative approach and per District guidance, a deposition rate of 0.05 m/s was used. The fraction of time at home option was applied to residential risk calculations only for age bins greater than 16 years. “Warm” climate was selected for the dermal pathway.

Although most sources at SYU operate on a continuous basis, the diesel equipment operates on an intermittent basis and some of the diesel equipment would be expected to operate during normal business hours. Because diesel engine exhaust particulate matter is the driver of cancer risk in worker receptors, a worker adjustment factor of 4.2 was conservatively applied to worker cancer risk calculations in HARP.

$$WAF_{cancer} = \frac{H_{residential}}{H_{source}} * \frac{D_{residential}}{D_{source}} * DF$$

where: WAF_{cancer} = the worker adjustment factor for cancer risk

$H_{residential}$ = the number of hours per day on which the long-term residential concentration is based = 24 hours

H_{source} = the number of hours per day that the source operates (assume 8)

$D_{\text{residential}}$ = the number of days per week on which the long-term residential concentration is based = 7 days

D_{source} = the number of days per week that the source operates (assume 5)

DF = the discount factor = 1

Note that the above calculation assumes all sources operate 8 hours per day and 5 days per week. The WAF could also be calculated assuming all sources operate 1 hour per day and 1 day per week; this would also result in a WAF equal to 4.2.

The default values for households that farm were used for the homegrown produce, chicken and egg pathways. The fraction of chicken drinking water from contaminated sources was set to zero.

8.0 Receptor Placement

As requested by the Energy & Minerals Division of the Santa Barbara County Planning & Development Department (County), the same receptor grid that was used in the SYU AB2588 HRA (developed by the District) was used in this analysis. Property boundary receptor spacing was 50 meters. For the grid receptors, spacing was as follows:

- 50 meter spacing from the centroid of the source polygon out to 2,500 meters
- 100 meter spacing from 2,500 meters out to 5,000 meters
- 250 meter spacing from 5,000 meters out to 7,500 meters

No onsite receptors were included. A total of 17,759 receptors were analyzed for the HRA, including 319 property boundary receptors, 16 discrete residential receptors, and 7 discrete worker receptors. No sensitive receptors were included as no schools, daycare facilities, hospitals, or care facilities were located within the modeling domain. All receptors were given a flagpole height of 1.5 meters per District guidance.

Diagrams showing the receptor grid are included as Figure G-1 and Figure G-2 in Appendix G. The discrete residential and worker receptor coordinates are provided in Table G-1.

9.0 Multipathway Information

Some multipathway substances are emitted. Those substances, along with the specific pathways affected by these substances, are shown in Table 2, below.

Table 2. Exposure Pathways by Pollutant³

Substance	CAS #	Inhalation	Soil	Dermal	Homegrown Produce	Mother's Milk	Chicken	Eggs
Arsenic and compounds	7440-38-2	X	X	X	X		X	X
Cr(VI) and compounds	18540-29-9	X	X	X	X			
Lead and compounds	7439-92-1	X	X	X	X	X	X	X
Mercury and compounds	7439-97-6	X	X	X	X		X	X
Nickel and compounds	7440-02-0	X	X	X	X		X	X
PAHs	multiple	X	X	X	X	X	X	X
Polychlorinated dibenzo-p-dioxins and dibenzofurans	multiple	X	X	X	X	X	X	X

10.0 Summary of Results

Results of the HRA indicated that none of the cancer, chronic non-cancer, non-cancer 8-hr chronic, or non-cancer acute significance thresholds were exceeded. Summaries of the HRA results are provided below.

Table 3. Summary of Cancer Health Risk Results

Receptor Type	Receptor Number	UTM Coordinates (NAD27)		Cancer Risk (per million)	Significance Threshold (per million)
		Easting (m)	Northing (m)		
PMI	160	771143	3819209	23.6	N/A
MEIR	325	770589	3818959	7.0	≥10
MEIW	343	770805	3819065	3.5	≥10

³ Worker receptors are only impacted through the inhalation, soil ingestion, and dermal pathways. Residential receptors may also be impacted through the homegrown produce, mother's milk, chicken, and egg ingestion pathways.

Table 4. Summary of Chronic Non-Cancer Health Risk Results

Receptor Type	Receptor Number	UTM Coordinates (NAD27)		Chronic HI	Health Endpoint(s)	Significance Threshold (HI)
		Easting (m)	Northing (m)			
PMI	3113	770570	3819050	0.047	Respiratory	N/A
MEIR	325	770589	3818959	0.047	Respiratory	>1
MEIW	343	770805	3819065	0.017	Respiratory	>1

Table 5. Summary of 8-Hour Chronic Non-Cancer Health Risk Results

Receptor Type	Receptor Number	UTM Coordinates (NAD27)		8-Hr Chronic HI	Health Endpoint(s)	Significance Threshold (HI)
		Easting (m)	Northing (m)			
PMI	3215	770620	3819100	0.007	Blood	N/A
MEIR	325	770589	3818959	0.006	Blood	>1
MEIW	338	773357	3817644	0.002	Blood	>1

Table 6. Summary of Acute Non-Cancer Health Risk Results

Receptor Type	Receptor Number	UTM Coordinates (NAD27)		Acute HI	Health Endpoint(s)	Significance Threshold (HI)
		Easting (m)	Northing (m)			
PMI	3013	770520	3819100	0.79	Central nervous system	N/A
MEIR	325	770589	3818959	0.68	Central nervous system	>1
MEIW	338	773357	3817644	0.37	Central nervous system	>1

11.0 Risk Drivers

The sources and chemicals driving the cancer and non-cancer risk are described below. Due to the large number of emission sources at SYU and large number of pollutants emitted, only the highest contributors are described.

11.1 Cancer

The highest cancer risk at a residential receptor is a cancer risk value of 7.0 in one million, at receptor #325 located about 500 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. Cancer risk is primarily due to exposure to diesel particulate matter (DPM); DPM accounts for 75% of the cancer risk. DPM emissions from contractor portable engines used at OTP are the largest source of risk, accounting for 64% of the total cancer risk at receptor #325. Benzene (17%) is the only other significant

SYU INTERIM TRUCKING PROJECT HEALTH RISK ASSESSMENT

contributor to cancer risk. The main sources of benzene contributing to the cancer risk at the maximum residential receptor are fugitive piping component emissions at SGTP and POPCO.

The highest cancer risk at a worker receptor is 3.5 per million, at receptor #343 located about 300 meters west of the facility boundary and about 750 meters southwest of the nearest emission sources at the POPCO plant. Over 94% of the cancer risk at receptor #343 is due to DPM, primarily from the OTP contractor portable diesel engines with lesser contributions from the firewater pumps.

The cancer risk at the PMI, assuming residential exposure, was 23.6 per million, at a fenceline receptor (#160) on the western boundary of the facility.

The tables below show the cancer risk by substance and by emission source at the MEIR and the MEIW. Isopleth maps showing the 30-yr residential cancer risk and the 25-yr worker cancer risk as well as the locations of the PMI, MEIR, and MEIW are included in as Figure H-1, Figure H-2, Figure H-3, and Figure H-4 in the Appendix.

Table 7. Cancer Risk by Pollutant at the MEIR

Pollutant	CAS Number	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	7.0	100.0%
DPM	9901	5.3	76.0%
Benzene	71-43-2	1.2	16.6%
Naphthalene	91-20-3	0.3	3.7%

Table 8. Cancer Risk by Source at the MEIR

HARP Source ID	Description	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	7.0	100.0%
S129	Unpermitted - Portable (OTP)	4.5	63.8%
S107	SGTP (FHC, Paint) 1	0.3	4.2%
S108	SGTP (FHC, Paint) 2	0.3	3.8%
S130	Unpermitted - Portable (POPCO)	0.2	3.1%
S067	Firewater Pump (805)	0.2	2.3%
S113	POPCO (FHC, Paint, Ab. Blast) 1 ⁴	0.2	2.2%
S068	Firewater Pump (806)	0.1	1.7%
S114	POPCO (FHC, Paint) 2	0.1	1.5%
S013	Demulsifier Tote Tank 2	0.1	1.4%

⁴ Abrasive blasting at POPCO took place in the vicinity of volume source S113; all POPCO abrasive blasting emissions were assigned to S113 and not S114 or S115.

Table 9. Cancer Risk by Pollutant at the MEIW

Pollutant	CAS Number	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	3.5	100.0%
DPM	9901	3.3	94.2%
Benzene	71-43-2	0.1	2.7%
Naphthalene	91-20-3	0.1	2.4%

Table 10. Cancer Risk by Source at the MEIW

HARP Source ID	Description	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	3.5	100.0%
S129	Unpermitted - Portable (OTP)	2.8	80.1%
S067	Firewater Pump (805)	0.2	5.2%
S068	Firewater Pump (806)	0.2	4.4%
S008	Firewater Pump B	0.1	1.9%
S007	Firewater Pump A	0.1	1.8%

11.2 Chronic Non-Cancer

The chronic non-cancer risk at the PMI is 0.052, at receptor #3113 located about 500 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. The highest chronic non-cancer risk at a residential receptor is a hazard index value of 0.051, at receptor #325 located near the PMI, about 500 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. The main contributors to chronic non-cancer risk at receptor #325 are hydrogen sulfide, phosphoric acid, ammonia, and arsenic with risk contributions of 58%, 16%, 13%, and 5%, respectively. Hydrogen sulfide emissions are emitted primarily as fugitives from piping components and to a lesser extent sulfur trucking loading. Phosphoric acid is emitted from the phosphoric acid storage tank. Ammonia is primarily emitted from the ammonia storage vessel and injection system. The main source of arsenic emissions is abrasive blasting. The dominant health endpoint is the respiratory system.

The highest chronic non-cancer risk at a worker receptor is 0.018, at receptor #343 located about 300 meters west of the facility boundary and about 750 meters southwest of the nearest emission sources at the POPCO plant. Phosphoric acid and hydrogen sulfide were the largest contributors at 29% and 26%, respectively. Ammonia, DPM (primarily from contractor engines at OTP), and hydrochloric acid (from the acid skid and HCl tanks) were also significant contributors.

The tables below show the chronic non-cancer risk by substance and by emission source at the MEIR and the MEIW. A map showing the locations of the PMI, MEIR, and MEIW is included as Figure H-5 in the Appendix. As the chronic non-cancer risk did not exceed 0.1 at any receptor, no isopleths are shown.

Table 11. Chronic Non-Cancer Risk by Pollutant at the MEIR

Pollutant	CAS Number	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	0.047	100.0%
Hydrogen sulfide	7783-06-4	0.027	58.0%
Phosphoric acid	7664-38-2	0.008	16.3%
Ammonia	7664-41-7	0.006	13.3%
Arsenic	7440-38-2	0.003	5.4%

Table 12. Chronic Non-Cancer Risk by Source at the MEIR

HARP Source ID	Description	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	0.047	100.0%
S113	POPCO (FHC, Paint, Ab. Blast) 1	0.011	22.7%
S114	POPCO (FHC, Paint) 2	0.008	16.5%
S031	Phosphoric Acid Tank	0.008	16.3%
S131	Ammonia Storage Vessel and Injection System	0.006	12.4%
S115	POPCO (FHC, Paint) 3	0.006	12.4%

Table 13. Chronic Non-Cancer Risk by Pollutant at the MEIW

Pollutant	CAS Number	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	0.017	100.0%
Phosphoric acid	7664-38-2	0.005	29.5%
Hydrogen sulfide	7783-06-4	0.005	26.2%
Ammonia	7664-41-7	0.003	16.3%
DPM	9901	0.003	14.6%
Hydrochloric acid	7647-01-0	0.002	9.2%

Table 14. Chronic Non-Cancer Risk by Source at the MEIW

HARP Source ID	Description	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	0.017	100.0%
S031	Phosphoric Acid Tank	0.005	29.5%
S131	Ammonia Storage Vessel and Injection System	0.002	13.2%
S129	Unpermitted - Portable (OTP)	0.002	12.4%
S048	Acid Skid	0.001	5.8%
S115	POPCO PC 3	0.001	4.6%
S136	Interim trucking crude load rack	0.001	4.6%
S113	POPCO PC 1	0.001	3.1%

11.3 8-Hour Chronic Non-Cancer

The 8-hour chronic non-cancer risk at the PMI is 0.007, at receptor #3215 located about 500 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. The highest chronic non-cancer risk at a residential receptor is a hazard index value of 0.006, at receptor #325 located near the PMI, about 500 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. The highest chronic non-cancer risk at a worker receptor is 0.002, at receptor #338 located about 1300 meters southeast of the property boundary and about 2,000 meters from the nearest non-road onsite emission sources.

Benzene is the primary risk driver pollutant for the 8-hour chronic non-cancer risk at the PMI, MEIR and MEIW. Benzene is emitted from many sources at SYU; the largest contributors to 8-hour chronic non-cancer risk are piping component fugitive emissions from SGTP and POPCO. Because the benzene emission sources operate continuously, no worker adjustment factor was applied to the worker 8-hour chronic non-cancer risk calculations in HARP. The dominant health endpoint is the blood.

Because benzene contributes 100% of the 8-hour chronic non-cancer risk at the MEIR and MEIW, only the risk driver source tables are shown below. A map showing the locations of the PMI, MEIR, and MEIW is included as Figure H-6 in the Appendix. As the 8-hour chronic non-cancer risk did not exceed 0.1 at any receptor, no isopleths are shown.

Table 15. 8-Hour Chronic Non-Cancer Risk by Source at the MEIR

HARP Source ID	Description	8-Hr Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total 8-Hr Chronic Non-Cancer Risk
Total	--	0.0057	100.0%
S107	SGTP (FHC, Paint) 1	0.0014	25.0%
S108	SGTP (FHC, Paint) 2	0.0013	22.5%
S113	POPCO (FHC, Paint) 1	0.0005	9.6%
S114	POPCO (FHC, Paint) 2	0.0005	9.1%
S115	POPCO (FHC, Paint) 3	0.0004	6.8%
S005	SOV Distance Piece Vent	0.0003	4.5%

Table 16. 8-Hour Chronic Non-Cancer Risk by Source at the MEIW

HARP Source ID	Description	8-Hr Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total 8-Hr Chronic Non-Cancer Risk
Total	--	0.0021	100.0%
S107	SGTP (FHC, Paint) 1	0.0005	24.6%
S108	SGTP (FHC, Paint) 2	0.0005	22.9%
S113	POPCO (FHC, Paint, Ab. Blast) 1	0.0002	8.3%
S114	POPCO (FHC, Paint) 2	0.0002	7.6%
S115	POPCO (FHC, Paint) 3	0.0001	6.1%
S136	Interim trucking crude load rack	0.0001	5.9%

11.4 Acute Non-Cancer

The acute non-cancer risk at the PMI is 0.79, at receptor #3013 located about 600 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. The highest acute non-cancer risk at a residential receptor is a hazard index value of 0.68, at receptor #325 located about 500 meters west of the facility boundary and about 1,000 meters southwest of the nearest emission sources at the POPCO plant. The highest acute non-cancer risk at a worker receptor is 0.37, at receptor #338 located about 1300 meters southeast of the property boundary and about 2,000 meters from the nearest non-road onsite emission sources.

Hydrogen sulfide is the primary risk driver pollutant for the acute non-cancer risk at the PMI, MEIR and MEIW. Hydrogen sulfide is emitted from various equipment throughout the facility, primarily as fugitive emissions from piping components but also from sulfur loading and the proposed crude load rack. The dominant health endpoint is the central nervous system.

Note that the acute risk values should be considered screening values. The modeling assumed all hydrogen sulfide sources were emitting continuously, including those that emit on an intermittent basis such as sulfur loading. Because the maximum acute non-cancer risk is below the significance level of 1, a refined risk analysis was not performed.

The tables below show the acute non-cancer risk by substance and by emission source at the PMI. Isoleth maps showing the acute non-cancer risk as well as the locations of the PMI, MEIR, and MEIW are included as Figure H-7 and Figure H-8 in the Appendix.

Table 17. Acute Non-Cancer Risk by Pollutant at the PMI

Pollutant	CAS Number	Acute Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Acute Non-Cancer Risk
Total	--	0.787	100.0%
Hydrogen sulfide	7783-06-4	0.695	88.3%
Toluene	108-88-3	0.033	4.2%
Arsenic	7440-38-2	0.026	3.3%
Xylenes (mixed)	1330-20-7	0.026	3.3%

Table 18. Acute Non-Cancer Risk by Source at the PMI

HARP Source ID	Description	Acute Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Acute Non-Cancer Risk
Total	--	0.787	100.0%
S113	POPCO (FHC, Paint, Ab. Blast) 1	0.192	24.4%
S114	POPCO (FHC, Paint) 2	0.162	20.6%
S115	POPCO (FHC, Paint) 3	0.111	14.1%
S073	Sulfur Loading	0.099	12.6%
S136	Interim trucking crude load rack	0.091	11.6%

12.0 Risk from Interim Trucking Sources

As requested by the County, the contribution to risk at the maximum impacted receptors from sources only associated with the interim trucking project are provided in the tables below. The sources include the crude load rack, fugitive emissions from piping components at the transportation terminal⁵, and diesel exhaust emissions from crude delivery trucks within the facility boundary and outside the facility boundary within 1,000 feet from the facility entrance.

⁵ Fugitive emissions from piping components at the transportation terminal were calculated based on current component counts plus the proposed additional piping components to be installed with the load rack. Therefore, the contribution from the piping fugitives is an overestimation as not all of the emissions can be attributed to the interim trucking project.

Table 19. Cancer Risk by Pollutant at the MEIR, Interim Trucking Sources Only

Pollutant	CAS Number	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	0.164	2.3%
DPM	9901	0.075	1.1%
Benzene	71-43-2	0.061	0.9%
Naphthalene	91-20-3	0.022	0.3%
Ethyl benzene	100-41-4	0.006	0.1%

Table 20. Cancer Risk by Source at the MEIR, Interim Trucking Sources Only

HARP Source ID	Description	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	0.164	2.3%
CTON	Crude trucks onsite roads	0.075	1.1%
S136	Interim trucking crude load rack	0.067	1.0%
S099	TT (FHC, Paint, Ab. Blast) 1	0.019	0.3%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	0.002	0.04%
CTOFF	Crude trucks offsite roads	0.0002	0.003%

Table 21. Cancer Risk by Pollutant at the MEIW, Interim Trucking Sources Only

Pollutant	CAS Number	Cancer Risk Contribution at the MEIW (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	0.034	1.0%
Benzene	71-43-2	0.015	0.4%
DPM	9901	0.012	0.4%
Naphthalene	91-20-3	0.005	0.2%
Ethyl benzene	100-41-4	0.001	0.04%

Table 22. Cancer Risk by Source at the MEIW, Interim Trucking Sources Only

HARP Source ID	Description	Cancer Risk Contribution at the MEIW (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	0.034	1.0%
S136	Interim trucking crude load rack	0.021	0.6%
CTON	Crude trucks onsite roads	0.012	0.4%
S099	TT (FHC, Paint, Ab. Blast) 1	0.0002	0.01%
CTOFF	Crude trucks offsite roads	0.0001	0.002%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	0.00003	0.001%

Table 23. Chronic Non-Cancer Risk by Pollutant at the MEIR, Interim Trucking Sources Only

Pollutant	CAS Number	Chronic Non-Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	1.5E-03	3.3%
Hydrogen sulfide	7783-06-4	1.5E-03	3.1%
Naphthalene	91-20-3	3.0E-05	0.06%
DPM	9901	2.0E-05	0.04%
Toluene	108-88-3	6.0E-06	0.01%
Xylenes (mixed)	1330-20-7	2.8E-06	0.006%
Ammonia	7664-41-7	3.0E-09	0.00001%

Table 24. Chronic Non-Cancer Risk by Source at the MEIR, Interim Trucking Sources Only

HARP Source ID	Description	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	1.5E-03	3.3%
S136	Interim trucking crude load rack	8.8E-04	1.9%
S099	TT (FHC, Paint) 1	6.1E-04	1.3%
CTON	Crude trucks onsite roads	2.0E-05	0.04%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	1.1E-06	0.002%
CTOFF	Crude trucks offsite roads	5.5E-08	0.0001%

Table 25. Chronic Non-Cancer Risk by Pollutant at the MEIW, Interim Trucking Sources Only

Pollutant	CAS Number	Chronic Non-Cancer Risk Contribution at the MEIW (in a million)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	8.3E-04	4.8%
Hydrogen sulfide	7783-06-4	7.9E-04	4.5%
Naphthalene	91-20-3	2.2E-05	0.1%
DPM	9901	9.5E-06	0.05%
Toluene	108-88-3	4.3E-06	0.02%
Xylenes (mixed)	1330-20-7	1.9E-06	0.01%
Ammonia	7664-41-7	1.6E-09	0.00001%

Table 26. Chronic Non-Cancer Risk by Source at the MEIW, Interim Trucking Sources Only

HARP Source ID	Description	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	8.3E-04	4.8%
S136	Interim trucking crude load rack	8.0E-04	4.6%
S099	TT (FHC, Paint, Ab. Blast) 1	2.2E-05	0.1%
CTON	Crude trucks onsite roads	9.5E-06	0.05%
CTOFF	Crude trucks offsite roads	5.5E-08	0.0003%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	4.0E-08	0.0002%

Table 27. 8-Hour Chronic Non-Cancer Risk by Pollutant at the MEIR, Interim Trucking Sources Only

Pollutant	CAS Number	8-Hour Chronic Non-Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total 8-Hour Chronic Non-Cancer Risk
Benzene	71-43-2	3.0E-04	5.2%

Table 28. 8-Hour Chronic Non-Cancer Risk by Source at the MEIR, Interim Trucking Sources Only

HARP Source ID	Description	8-Hour Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total 8-Hour Chronic Non-Cancer Risk
Total	--	3.0E-04	5.2%
S136	Interim trucking crude load rack	2.3E-04	4.0%
S099	TT (FHC, Paint, Ab. Blast) 1	6.4E-05	1.1%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	8.3E-06	0.1%
CTON	Crude trucks onsite roads	0.0E+00	0.0%
CTOFF	Crude trucks offsite roads	0.0E+00	0.0%

Table 29. 8-Hour Chronic Non-Cancer Risk by Pollutant at the MEIW, Interim Trucking Sources Only

Pollutant	CAS Number	8-Hour Chronic Non-Cancer Risk Contribution at the MEIW (in a million)	Percentage Contribution to Total 8-Hour Chronic Non-Cancer Risk
Benzene	71-43-2	1.6E-04	7.7%

Table 30. 8-Hour Chronic Non-Cancer Risk by Source at the MEIW, Interim Trucking Sources Only

HARP Source ID	Description	8-Hour Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total 8-Hour Chronic Non-Cancer Risk
Total	--	1.6E-04	7.7%
S136	Interim trucking crude load rack	1.2E-04	5.9%
S099	TT (FHC, Paint, Ab. Blast) 1	3.2E-05	1.5%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	4.2E-06	0.2%
CTON	Crude trucks onsite roads	0.0E+00	0.0%
CTOFF	Crude trucks offsite roads	0.0E+00	0.0%

Table 31. Acute Non-Cancer Risk by Pollutant at the PMI, Interim Trucking Sources Only

Pollutant	CAS Number	Acute Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Acute Non-Cancer Risk
Total	--	1.1E-01	14.2%
Hydrogen sulfide	7783-06-4	1.1E-01	14.0%
Xylenes (mixed)	1330-20-7	9.7E-04	0.1%
Toluene	108-88-3	2.8E-05	0.004%
Arsenic	7440-38-2	9.0E-06	0.001%
Methanol	67-56-1	1.4E-07	0.00002%
Mercury	7439-97-6	1.4E-08	0.000002%

Table 32. Acute Non-Cancer Risk by Source at the PMI, Interim Trucking Sources Only

HARP Source ID	Description	Acute Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Acute Non-Cancer Risk
Total	--	1.1E-01	14.2%
S136	Interim trucking crude load rack	9.1E-02	11.6%
S099	TT (FHC, Paint, Ab. Blast) 1	2.0E-02	2.6%
CTON	Crude trucks onsite roads	9.7E-06	0.001%
CTOFF	Crude trucks offsite roads	2.0E-07	0.00003%
S103	TT (Pump Seal, Comp. Seal, Solvents) 1	4.6E-07	0.00006%

13.0 Risk from POPCO Sources

As requested by the County, the contribution to risk from sources at the POPCO facility are provided in the tables below.

Table 33. Cancer Risk by Source at the MEIR, POPCO Sources Only

HARP Source ID	Description	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	9.9E-01	14.1%
S130	Unpermitted - Portable (POPCO)	2.2E-01	3.1%
S067	Firewater Pump (805)	1.6E-01	2.3%
S113	POPCO (FHC, Paint, Ab. Blast) 1	1.5E-01	2.2%
S068	Firewater Pump (806)	1.2E-01	1.7%
S114	POPCO (FHC, Paint) 2	1.1E-01	1.5%
S115	POPCO (FHC, Paint) 3	8.1E-02	1.2%
S069	Emergency Air Generator	6.3E-02	0.9%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	3.9E-02	0.6%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	2.0E-02	0.3%
S063	Boiler B	9.2E-03	0.1%
S062	Boiler A	5.3E-03	0.1%
S064	Sulfinol TEG Reboiler	4.7E-03	0.1%
S061	Planned Continuous Flaring (Baseline System Leakage)	1.9E-03	0.03%
S065	GPU TEG Glycol Reboiler	5.2E-04	0.01%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	5.2E-04	0.01%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	4.9E-04	0.01%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	3.7E-04	0.01%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	1.5E-04	0.002%
S002	Anaerobic Filter B	3.1E-07	0.000004%
S001	Anaerobic Filter A	3.1E-07	0.000004%
S074	Diesel Tanks (POPCO)	7.0E-09	0.0000001%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S070	Evaporative Cooler	0.0E+00	0.0%
S075	Methanol Tank	0.0E+00	0.0%
S076	Wastewater Tank	0.0E+00	0.0%

Table 34. Cancer Risk by Source at the MEIW, POPCO Sources Only

HARP Source ID	Description	Cancer Risk Contribution at the MEIR (in a million)	Percentage Contribution to Total Cancer Risk
Total	--	3.6E-01	10.3%
S067	Firewater Pump (805)	1.8E-01	5.2%
S068	Firewater Pump (806)	1.6E-01	4.4%
S063	Boiler B	5.3E-03	0.1%
S115	POPCO (FHC, Paint, Ab. Blast) 3	4.0E-03	0.1%
S130	Unpermitted - Portable (POPCO)	2.7E-03	0.1%
S062	Boiler A	2.4E-03	0.1%
S113	POPCO (FHC, Paint, Ab. Blast) 1	2.2E-03	0.1%
S114	POPCO (FHC, Paint, Ab. Blast) 2	2.0E-03	0.1%
S069	Emergency Air Generator	2.0E-03	0.1%
S061	Planned Continuous Flaring (Baseline System Leakage)	1.2E-03	0.04%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	4.8E-04	0.01%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	2.4E-04	0.01%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	2.1E-04	0.01%
S064	Sulfinol TEG Reboiler	1.2E-04	0.003%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	1.6E-05	0.0005%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	6.5E-06	0.0002%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	6.4E-06	0.0002%
S065	GPU TEG Glycol Reboiler	3.9E-06	0.0001%
S001	Anaerobic Filter A	1.8E-07	0.000005%
S002	Anaerobic Filter B	1.3E-07	0.000004%
S074	Diesel Tanks (POPCO)	2.8E-10	0.00000001%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S070	Evaporative Cooler	0.0E+00	0.0%
S075	Methanol Tank	0.0E+00	0.0%
S076	Wastewater Tank	0.0E+00	0.0%

Table 35. Chronic Non-Cancer Risk by Source at the MEIR, POPCO Sources Only

HARP Source ID	Description	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	2.4E-02	52.0%
S113	POPCO (FHC, Paint, Ab. Blast) 1	1.1E-02	22.7%
S114	POPCO (FHC, Paint) 2	7.7E-03	16.5%
S115	POPCO (FHC, Paint) 3	5.8E-03	12.4%
S130	Unpermitted - Portable (POPCO)	5.9E-05	0.1%
S067	Firewater Pump (805)	4.3E-05	0.1%
S068	Firewater Pump (806)	3.3E-05	0.1%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	2.1E-05	0.04%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	2.0E-05	0.04%
S069	Emergency Air Generator	1.7E-05	0.04%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	1.5E-05	0.03%
S061	Planned Continuous Flaring (Baseline System Leakage)	1.1E-05	0.02%
S063	Boiler B	3.8E-06	0.01%
S062	Boiler A	2.2E-06	0.005%
S064	Sulfinol TEG Reboiler	2.1E-06	0.004%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	1.2E-06	0.003%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	6.3E-07	0.001%
S065	GPU TEG Glycol Reboiler	2.3E-07	0.0005%
S076	Wastewater Tank	7.6E-08	0.0002%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	4.1E-08	0.0001%
S002	Anaerobic Filter B	1.8E-08	0.00004%
S001	Anaerobic Filter A	1.8E-08	0.00004%
S074	Diesel Tanks (POPCO)	6.1E-11	0.0000001%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S070	Evaporative Cooler	0.0E+00	0.0%
S075	Methanol Tank	0.0E+00	0.0%

Table 36. Chronic Non-Cancer Risk by Source at the MEIW, POPCO Sources Only

HARP Source ID	Description	Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Chronic Non-Cancer Risk
Total	--	2.2E-03	12.5%
S115	POPCO (FHC, Paint, Ab. Blast) 3	8.1E-04	4.6%
S113	POPCO (FHC, Paint) 1	5.5E-04	3.1%
S114	POPCO (FHC, Paint) 2	4.2E-04	2.4%
S067	Firewater Pump (805)	1.4E-04	0.8%
S068	Firewater Pump (806)	1.2E-04	0.7%
S063	Boiler B	8.0E-05	0.5%
S062	Boiler A	3.7E-05	0.2%
S061	Planned Continuous Flaring (Baseline System Leakage)	2.0E-05	0.1%
S130	Unpermitted - Portable (POPCO)	2.1E-06	0.01%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	1.9E-06	0.01%
S064	Sulfinol TEG Reboiler	1.7E-06	0.01%
S069	Emergency Air Generator	1.5E-06	0.01%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	7.6E-07	0.004%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	7.4E-07	0.004%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	1.6E-07	0.001%
S065	GPU TEG Glycol Reboiler	5.6E-08	0.0003%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	4.3E-08	0.0002%
S001	Anaerobic Filter A	3.1E-08	0.0002%
S002	Anaerobic Filter B	2.2E-08	0.0001%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	2.1E-08	0.0001%
S076	Wastewater Tank	2.8E-09	0.00002%
S074	Diesel Tanks (POPCO)	7.0E-12	0.00000004%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S070	Evaporative Cooler	0.0E+00	0.0%
S075	Methanol Tank	0.0E+00	0.0%

Table 37. 8-Hr Chronic Non-Cancer Risk by Source at the MEIR, POPCO Sources Only

HARP Source ID	Description	8-Hr Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total 8-Hr Chronic Non-Cancer Risk
Total	--	1.8E-03	30.8%
S113	POPCO (FHC, Paint, Ab. Blast) 1	5.5E-04	9.6%
S114	POPCO (FHC, Paint) 2	5.2E-04	9.1%
S115	POPCO (FHC, Paint) 3	3.9E-04	6.8%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	1.9E-04	3.4%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	1.0E-04	1.8%
S061	Planned Continuous Flaring (Baseline System Leakage)	3.4E-06	0.1%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	2.5E-06	0.04%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	2.4E-06	0.04%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	1.8E-06	0.03%
S063	Boiler B	7.9E-07	0.01%
S064	Sulfinol TEG Reboiler	5.5E-07	0.01%
S062	Boiler A	4.6E-07	0.01%
S065	GPU TEG Glycol Reboiler	6.1E-08	0.001%
S002	Anaerobic Filter B	1.4E-09	0.00003%
S001	Anaerobic Filter A	1.4E-09	0.00002%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S067	Firewater Pump (805)	0.0E+00	0.0%
S068	Firewater Pump (806)	0.0E+00	0.0%
S069	Emergency Air Generator	0.0E+00	0.0%
S070	Evaporative Cooler	0.0E+00	0.0%
S074	Diesel Tanks (POPCO)	0.0E+00	0.0%
S075	Methanol Tank	0.0E+00	0.0%
S076	Wastewater Tank	0.0E+00	0.0%
S130	Unpermitted - Portable (POPCO)	0.0E+00	0.0%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	0.0E+00	0.0%

Table 38. 8-Hr Chronic Non-Cancer Risk by Source at the MEIW, POPCO Sources Only

HARP Source ID	Description	8-Hr Chronic Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total 8-Hr Chronic Non-Cancer Risk
Total	--	5.9E-04	28.1%
S113	POPCO (FHC, Paint, Ab. Blast) 1	1.7E-04	8.3%
S114	POPCO (FHC, Paint, Ab. Blast) 2	1.6E-04	7.6%
S115	POPCO (FHC, Paint, Ab. Blast) 3	1.3E-04	6.1%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	7.6E-05	3.7%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	4.1E-05	2.0%
S061	Planned Continuous Flaring (Baseline System Leakage)	5.4E-06	0.3%
S063	Boiler B	1.6E-06	0.1%
S062	Boiler A	1.0E-06	0.05%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	7.0E-07	0.03%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	6.4E-07	0.03%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	5.2E-07	0.02%
S064	Sulfinol TEG Reboiler	1.8E-07	0.01%
S065	GPU TEG Glycol Reboiler	5.2E-08	0.003%
S001	Anaerobic Filter A	1.8E-09	0.0001%
S002	Anaerobic Filter B	1.8E-09	0.0001%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S067	Firewater Pump (805)	0.0E+00	0.0%
S068	Firewater Pump (806)	0.0E+00	0.0%
S069	Emergency Air Generator	0.0E+00	0.0%
S070	Evaporative Cooler	0.0E+00	0.0%
S074	Diesel Tanks (POPCO)	0.0E+00	0.0%
S075	Methanol Tank	0.0E+00	0.0%
S076	Wastewater Tank	0.0E+00	0.0%
S130	Unpermitted - Portable (POPCO)	0.0E+00	0.0%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	0.0E+00	0.0%

Table 39. Acute Non-Cancer Risk by Source at the PMI, POPCO Sources Only

HARP Source ID	Description	Acute Non-Cancer Risk Contribution at the MEIR (HI)	Percentage Contribution to Total Acute Non-Cancer Risk
Total	--	4.8E-01	60.9%
S113	POPCO (FHC, Paint, Ab. Blast) 1	1.9E-01	24.4%
S114	POPCO (FHC, Paint) 2	1.6E-01	20.6%
S115	POPCO (FHC, Paint) 3	1.1E-01	14.1%
S067	Firewater Pump (805)	3.4E-03	0.4%
S075	Methanol Tank	3.3E-03	0.4%
S068	Firewater Pump (806)	3.0E-03	0.4%
S069	Emergency Air Generator	2.5E-03	0.3%
S122	POPCO (Pump Seal, Comp. Seal, Solvents) 2	8.1E-04	0.1%
S121	POPCO (Pump Seal, Comp. Seal, Solvents) 1	7.2E-04	0.1%
S123	POPCO (Pump Seal, Comp. Seal, Solvents) 3	4.2E-04	0.1%
S001	Anaerobic Filter A	8.6E-06	0.001%
S002	Anaerobic Filter B	8.6E-06	0.001%
S076	Wastewater Tank	3.6E-06	0.0005%
S071	Aerator A (Oxidizer Tank 1 - POPCO)	1.0E-06	0.0001%
S072	Aerator B (Oxidizer Tank 2 - POPCO)	5.9E-07	0.0001%
S063	Boiler B	4.2E-07	0.0001%
S062	Boiler A	3.3E-07	0.00004%
S061	Planned Continuous Flaring (Baseline System Leakage)	2.4E-07	0.00003%
S064	Sulfinol TEG Reboiler	6.4E-08	0.00001%
S065	GPU TEG Glycol Reboiler	2.5E-08	0.000003%
S074	Diesel Tanks (POPCO)	3.8E-09	0.0000005%
S070	Evaporative Cooler	5.5E-10	0.0000001%
S066	Emergency Generator (G-800)	0.0E+00	0.0%
S130	Unpermitted - Portable (POPCO)	0.0E+00	0.0%
S135	Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	0.0E+00	0.0%

APPENDIX A. SUBSTANCES EMITTED

Table A-1. Substances Emitted

CAS Number	Substance Name	Annual Average Emission Rate (lb/yr)	Maximum 1-Hr Emission Rate (lb/hr)
1151	PAHs, total, w/o individ. components reported [PAH, POM]	8.3E+00	5.8E-03
9901	Diesel Particulate Matter	1.4E+02	0.0E+00
50-00-0	Formaldehyde	2.8E+03	1.1E+00
50-32-8	Benzo[a]pyrene [PAH, POM]	4.6E-04	1.4E-06
53-70-3	Dibenz[a,h]anthracene [PAH, POM]	5.1E-05	9.9E-08
56-55-3	Benz[a]anthracene [PAH, POM]	2.5E-04	7.3E-07
67-56-1	Methyl Alcohol	3.3E+02	1.4E+00
67-63-0	Isopropyl Alcohol	3.6E+01	4.1E-03
71-43-2	Benzene	2.8E+02	7.7E-02
75-07-0	Acetaldehyde	1.6E+02	1.2E-01
75-15-0	Carbon Disulfide	1.6E+01	1.8E-03
75-56-9	Propylene Oxide	1.1E+02	3.7E-02
78-93-3	Methyl Ethyl Ketone	5.2E+01	6.7E+00
83-32-9	Acenaphthene [PAH, POM]	1.6E-02	1.4E-05
85-01-8	Phenanthrene	2.8E-01	2.5E-04
86-73-7	Fluorene [PAH, POM]	2.3E-02	3.2E-05
91-20-3	Naphthalene	3.3E+01	2.5E-02
95-63-6	Trimethylbenzene (1,2,4)	3.1E+01	2.1E+00
100-41-4	Ethylbenzene	2.1E+02	1.7E+00
100-42-5	Styrene	1.2E-02	3.3E-05
106-99-0	1,3-Butadiene	1.6E+00	1.8E-02
107-02-8	Acrolein	2.9E+01	1.3E-02
107-21-1	Ethylene Glycol	1.1E-02	1.2E-06
108-88-3	Toluene	7.3E+02	2.1E+01
108-90-7	Chlorobenzene	0.0E+00	1.6E-05
110-54-3	Hexane (-n)	7.8E+02	3.0E-01
110-82-7	Cyclohexane	3.0E+02	4.1E-02
111-46-6	Diethylene Glycol	1.5E+00	1.7E-04
112-34-5	Butyl Dioxitol	1.4E+00	1.6E-04
115-07-1	Propylene	1.0E+03	4.6E-01
120-12-7	Anthracene [PAH, POM]	4.7E-04	4.5E-06
129-00-0	Pyrene [PAH, POM]	3.2E-03	8.5E-06
191-24-2	Benzo[g,h,i]perylene	1.3E-03	3.4E-06
193-39-5	Indeno[1,2,3-cd]pyrene [PAH, POM]	5.4E-04	1.3E-06
205-99-2	Benzo[b]fluoranthene	0.0E+00	6.5E-08
206-44-0	Fluoranthene [PAH, POM]	1.1E-01	7.2E-05

CAS Number	Substance Name	Annual Average Emission Rate (lb/yr)	Maximum 1-Hr Emission Rate (lb/hr)
207-08-9	Benzo[k]fluoranthene [PAH, POM]	2.8E-04	8.0E-07
208-96-8	Acenaphthylene [PAH, POM]	2.3E-03	1.2E-05
218-01-9	Chrysene [PAH, POM]	4.6E-03	3.4E-06
463-58-1	Carbonyl Sulfide	1.3E+01	1.4E-03
1310-73-2	Sodium Hydroxide	5.0E+01	5.7E-03
1330-20-7	Xylenes (mixed isomers)	4.0E+02	7.9E+00
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	6.1E-15	6.1E-13
3268-87-9	Octachlorodibenzo-p-dioxin	3.5E-13	3.6E-11
7439-92-1	Lead Compounds	1.4E-02	1.2E-03
7439-96-5	Manganese Compounds	6.6E-02	1.5E-03
7439-97-6	Mercury Compounds	8.9E-10	1.6E-04
7440-02-0	Nickel Compounds	3.8E-04	3.3E-04
7440-38-2	Arsenic Compounds	1.1E-03	1.7E-04
7440-43-9	Cadmium Compounds	0.0E+00	1.2E-04
7440-47-3	Chromium Compounds	1.4E-03	9.9E-05
7440-50-8	Copper Compounds	4.8E-02	2.2E-03
7440-62-2	Vanadium (fume or dust)	1.6E-05	1.6E-06
7647-01-0	Hydrogen Chloride	1.4E+02	3.2E-02
7664-38-2	Phosphoric Acid	5.0E+02	5.7E-02
7664-41-7	Ammonia	1.6E+04	5.8E+00
7782-49-2	Selenium Compounds	0.0E+00	1.8E-04
7783-06-4	Hydrogen Sulfide	2.9E+03	4.0E-01
18540-29-9	Hexavalent Chromium	2.7E-04	1.4E-05
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	3.7E-15	3.7E-13
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	4.4E-14	4.6E-12

Note that for diesel combustion sources, diesel particulate matter (DPM) is the only pollutant modeled for cancer and chronic risk as DPM is considered a surrogate for all toxic emissions from diesel combustion sources. As acute risk reference exposure levels (RELs) have yet to be developed for DPM, toxic emissions from diesel combustion sources were speciated for the maximum hourly emissions. Per District policy, speciation was performed only for the following types of diesel engines: diesel-fueled vehicles, stationary Tier 2 engines less than or equal to 750 bhp, and stationary Tier 0 and Tier 1 engines.

APPENDIX B. SOURCE PARAMETERS

Table B-1. Project Point Source Parameters

Source Description	Source ID	UTM Coordinates (NAD27)		Base Elevation (m)	Stack Release Type	Stack Height (m)	Stack Gas Exit Temperature (K)	Stack Gas Exit Velocity (m/s)	Stack Diameter (m)
		X (m)	Y(m)						
Quality Control Lab	S004	771799.2	3819702.1	123.7	VERTICAL	5.2	0.0	0.001	0.03
SOV Distance Piece Vent	S005	771684.9	3819635.4	82.4	VERTICAL	1.2	0.0	0.001	0.03
VRU Distance Piece Vent	S006	771807.9	3819516.8	72.4	VERTICAL	1.2	0.0	0.001	0.03
Firewater Pump A	S007	771854.9	3819586.8	83.5	VERTICAL	4.7	644.3	18.1	0.20
Firewater Pump B	S008	771860.9	3819586.8	83.3	VERTICAL	4.7	644.3	18.1	0.20
FW Pump Diesel Fuel Tanks (OTP)	S009	771857.9	3819584.4	82.7	VERTICAL	5.0	0.0	0.001	0.03
Demulsifier Tote Tank 1	S012	771700.6	3819545.4	86.0	VERTICAL	3.8	0.0	0.001	0.03
Demulsifier Tote Tank 2	S013	771702.3	3819545.4	86.2	VERTICAL	3.8	0.0	0.001	0.03
Demineralizer Caustic Tank	S014	771699.3	3819475.0	79.3	VERTICAL	4.3	0.0	0.001	0.03
Open Drain Sump (OTP)	S015	771807.5	3819542.0	76.1	VERTICAL	1.2	0.0	0.001	0.03
Area Drain Oil/Water Separator (OTP)	S017	771865.4	3819565.1	77.0	VERTICAL	1.4	0.0	0.001	0.03
Diesel Storage Tank (OTP)	S018	771706.2	3819540.5	86.2	VERTICAL	4.9	0.0	0.001	0.03
Oily Sludge Thickener	S022	771772.0	3819614.1	102.2	VERTICAL	9.8	0.0	0.001	0.03
Equalization Tank	S023	771676.0	3819583.8	80.6	VERTICAL	4.9	0.0	0.001	0.03
HCl Tank A	S029	771698.9	3819512.3	82.3	VERTICAL	10.4	0.0	0.001	0.03
HCl Tank B	S030	771698.9	3819521.4	83.3	VERTICAL	10.4	0.0	0.001	0.03
Phosphoric Acid Tank	S031	771698.7	3819502.4	81.2	VERTICAL	5.8	0.0	0.001	0.03
Caustic Tank	S032	771710.5	3819475.9	83.1	VERTICAL	7.3	0.0	0.001	0.03
Backwash Sump	S034	771782.2	3819617.7	103.4	VERTICAL	1.2	0.0	0.001	0.03
Centrate Tank	S035	771736.2	3819580.4	96.2	VERTICAL	3.7	0.0	0.001	0.03
Thermal Oxidizer	S038	771838.4	3819536.0	71.8	VERTICAL	35.1	310.0	0.007	10.80
Deaerator	S042	771820.1	3819567.8	80.5	VERTICAL	24.7	0.0	0.001	0.03
SU/SD Combined CPP & Bypass Stacks	S045	771820.1	3819602.2	90.7	VERTICAL	19.8	548.7	14.3	3.70
Acid Skid	S048	771837.5	3819630.6	96.7	VERTICAL	3.0	0.0	0.001	0.03
CPP - Normal Ops. Modes (GTG and GTG/HRSO Ops)	S049	771820.1	3819562.8	79.3	VERTICAL	29.9	436.5	16.3	3.70
Area Drain Oil/Water Separator (TT)	S052	771816.5	3819119.5	58.1	VERTICAL	1.2	0.0	0.001	0.03

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Source Description	Source ID	UTM Coordinates (NAD27)		Base Elevation (m)	Stack Release Type	Stack Height (m)	Stack Gas Exit Temperature (K)	Stack Gas Exit Velocity (m/s)	Stack Diameter (m)
		X (m)	Y(m)						
Oil Emulsion Pig Receiver	S055	771865.6	3819056.7	62.9	VERTICAL	1.5	0.0	0.001	0.03
Area Drain Oil/Water Separator (SGTP)	S057	771616.7	3819531.0	68.1	VERTICAL	6.1	0.0	0.001	0.03
Open Drain Sump (SGTP)	S058	771638.4	3819536.3	70.1	VERTICAL	1.2	0.0	0.001	0.03
Waste Gas Incinerator	S060	771619.8	3819521.1	67.3	VERTICAL	30.5	1255.4	1.4	0.80
Planned Continuous Flaring (Baseline System Leakage)	S061	771557.8	3819497.0	67.2	VERTICAL	38.1	310.0	0.012	7.32
Boiler A	S062	771569.2	3819471.3	64.5	VERTICAL	22.9	443.4	4.8	1.06
Boiler B	S063	771569.2	3819464.4	64.7	VERTICAL	22.9	428.2	3.6	1.06
Sulfinol TEG Reboiler	S064	771544.8	3819363.9	61.7	VERTICAL	11.0	525.4	1.3	0.38
GPU TEG Glycol Reboiler	S065	771606.2	3819361.4	60.9	VERTICAL	8.8	547.0	1.8	0.31
Emergency Generator (G-800)	S066	771637.2	3819656.6	73.6	VERTICAL	2.7	533.2	18.6	0.08
Firewater Pump (805)	S067	771558.2	3819553.0	71.0	VERTICAL	8.5	533.2	18.4	0.15
Firewater Pump (806)	S068	771554.3	3819553.0	71.3	VERTICAL	8.5	533.2	18.4	0.15
Emergency Air Generator	S069	771574.2	3819475.7	63.7	VERTICAL	2.7	533.2	18.6	0.08
Evaporative Cooler	S070	771610.0	3819501.9	64.7	VERTICAL	7.6	316.5	8.7	2.13
Sulfur Loading	S073	771650.8	3819498.4	69.2	HORIZONTAL	3.6	292.0	14.7	0.10
Diesel Tanks (POPCO)	S074	771556.2	3819577.6	71.7	VERTICAL	9.1	0.0	0.001	0.03
Methanol Tank	S075	771557.0	3819416.0	68.6	VERTICAL	7.3	0.0	0.001	0.03
Wastewater Tank	S076	771623.0	3819334.7	61.3	VERTICAL	0.9	0.0	23.3	0.05
E/S Diesel Flood Water Pump Duetz TCD 7.8 L6 T4F 335 HP (ID 393540)	S132	771853.7	3819551.5	74.2	HORIZONTAL	2.4	769.3	88.617	0.102
Emergency Backup Generator John Deere 6068 240 HP (ID 390274)	S133	771793.4	3819647.0	109.2	RAINCAP	2.1	688.2	39.709	0.102
Emergency Backup Generator John Deere 6090 440 HP (ID 390275)	S134	771779.4	3819039.9	58.6	RAINCAP	2.4	725.4	64.443	0.127
Emergency Backup Generator Izuzu BR4JJ1X 95 HP (ID 390276)	S135	771624.6	3819676.0	73.8	RAINCAP	1.8	806.5	48.433	0.089

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Table B-2. Project Volume Source Parameters

Source Description	Source ID	UTM Coordinates (NAD27)		Base Elevation (m)	Release Height (m)	Init. Horizontal Dimension (m)	Init. Vertical Dimension (m)
		X (m)	Y (m)				
Maintenance Shop	S039	771824.4	3819687.4	120.17	4.64	4.2	4.312
OTP (FHC, Paint, Ab. Blast) 1	S077	771692.5	3819428.5	82.28	4.57	18.3	4.253
OTP (FHC, Paint, Ab. Blast) 2	S078	771692.5	3819507.4	80.27	4.57	18.3	4.253
OTP (FHC, Paint, Ab. Blast) 3	S079	771692.5	3819586.3	85.64	4.57	18.3	4.253
OTP (FHC, Paint, AB. BLAST) 4	S080	771692.5	3819665.2	88.14	4.57	18.3	4.253
OTP (FHC, Paint, AB. BLAST) 5	S081	771771.4	3819428.5	82.11	4.57	18.3	4.253
OTP (FHC, Paint, AB. BLAST) 6	S082	771771.4	3819507.4	80.45	4.57	18.3	4.253
OTP (FHC, Paint, AB. BLAST) 7	S083	771771.4	3819586.3	95.05	4.57	18.3	4.253
OTP (FHC, Paint, AB. BLAST) 8	S084	771771.4	3819665.2	111.48	4.57	18.3	4.253
OTP (Pump Seal, Comp. Seal, Solvents) 1	S085	771692.5	3819428.5	82.28	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 2	S086	771692.5	3819507.4	80.27	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 3	S087	771692.5	3819586.3	85.64	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 4	S088	771692.5	3819665.2	88.14	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 5	S089	771771.4	3819428.5	82.11	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 6	S090	771771.4	3819507.4	80.45	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 7	S091	771771.4	3819586.3	95.05	1.50	18.3	1.396
OTP (Pump Seal, Comp. Seal, Solvents) 8	S092	771771.4	3819665.2	111.48	1.50	18.3	1.396
CPP (FHC, Paint, Ab. Blast) 1	S093	771842.9	3819554.0	75.16	2.29	13.7	2.125
CPP (FHC, Paint, Ab. Blast) 2	S094	771842.9	3819612.8	91.36	2.29	13.7	2.125
CPP (FHC, Paint, Ab. Blast) 3	S095	771842.9	3819671.6	113.69	2.29	13.7	2.125
CPP (Pump Seal, Comp. Seal, Solvents) 1	S096	771842.9	3819554.0	75.16	1.50	13.7	1.396
CPP (Pump Seal, Comp. Seal, Solvents) 2	S097	771842.9	3819612.8	91.36	1.50	13.7	1.396
CPP (Pump Seal, Comp. Seal, Solvents) 3	S098	771842.9	3819671.6	113.69	1.50	13.7	1.396
TT (FHC, Paint, Ab. Blast) 1	S099	771822.4	3819080.0	58.63	0.92	34.4	0.851
TT (Pump Seal, Comp. Seal, Solvents) 1	S103	771822.4	3819080.0	58.63	1.50	34.4	1.396
SGTP (FHC, Paint) 1	S107	771630.0	3819533.7	68.58	6.86	13.7	6.378
SGTP (FHC, Paint) 2	S108	771630.0	3819592.5	71.75	6.86	13.7	6.378
SGTP (Pump Seal, Comp. Seal, Solvents) 1	S110	771630.0	3819533.7	68.58	1.50	13.7	1.396
SGTP (Pump Seal, Comp. Seal, Solvents) 2	S111	771630.0	3819592.5	71.75	1.50	13.7	1.396

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Source Description	Source ID	UTM Coordinates (NAD27)		Base Elevation (m)	Release Height (m)	Init. Horizontal Dimension (m)	Init. Vertical Dimension (m)
		X (m)	Y (m)				
POPCO (FHC, Paint, Ab. Blast) 1	S113	771589.0	3819344.0	60.66	5.00	28.6	4.652
POPCO (FHC, Paint, Ab. Blast) 2	S114	771589.0	3819467.0	61.98	5.00	28.6	4.65
POPCO (FHC, Paint, Ab. Blast) 3	S115	771589.0	3819590.0	71.76	5.00	28.6	4.65
POPCO (Pump Seal, Comp. Seal, Solvents) 1	S121	771589.0	3819344.0	60.66	1.50	28.6	1.40
POPCO (Pump Seal, Comp. Seal, Solvents) 2	S122	771589.0	3819467.0	61.98	1.50	28.6	1.40
POPCO (Pump Seal, Comp. Seal, Solvents) 3	S123	771589.0	3819590.0	71.76	1.50	28.6	1.40
Unpermitted - Portable (OTP)	S129	771738.8	3819590.7	97.26	3.00	24.5	0.70
Unpermitted - Portable (POPCO)	S130	771595.0	3819433.3	61.39	3.00	14.2	0.70
Interim trucking crude load rack	S136	772045.6	3819372.5	85.76	1.52	5.8	1.42
Crude trucks onsite roads (1 of 256)	CTON001-CTON256	--	--	--	3.40	6.5	3.2
Crude trucks onsite roads northbound lane	CT_NB_01-CT_NB_06	--	--	--	3.40	4.2	3.2
Crude trucks onsite roads southbound lane	CT_SB_01-CT_SB_06	--	--	--	3.40	4.2	3.2
Employee/delivery/propane-butane trucks (EDT) onsite roads	EDTON001-EDTON185	--	--	--	1.30	6.5	1.2
Employee/delivery/propane-butane trucks onsite roads northbound lane	EDT_NB01-EDT_NB06	--	--	--	1.30	4.2	1.2
Employee/delivery/propane-butane trucks onsite roads southbound lane	EDT_SB01-EDT_SB06	--	--	--	1.30	4.2	1.2

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Table B-3. Project Area Source Parameters

Source Description	Source ID	UTM Coordinates (NAD27)		Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North (degrees)	Initial Vertical Dimension (m)
		X (m)	Y (m)						
Anaerobic Filter A	S001	771718.6	3819562.0	91.38	14.6	14.2	14.2	0.0	0.0
Anaerobic Filter B	S002	771740.4	3819562.0	94.16	14.6	14.2	14.2	0.0	0.0
VF Tower Feed Drum	S003	771717.8	3819584.2	92.85	3.0	2.7	2.7	0.0	0.0
Rerun Tank A	S010	771703.9	3819434.6	85.41	14.6	19.9	19.9	0.0	0.0
Rerun Tank B	S011	771746.6	3819435.6	90.06	14.6	19.9	19.9	0.0	0.0
Area Drain Sump (OTP)	S016	771853.8	3819554.3	74.89	0.0	15.2	6.4	0.0	0.0
Backwash Collection Tank	S021	771767.0	3819633.0	105.81	6.1	2.7	2.7	0.0	0.0
Aerator A (OTP)	S024	771720.2	3819523.4	87.45	10.7	20.5	19.0	0.0	0.0
Aerator B (OTP)	S025	771740.7	3819523.4	87.45	10.7	20.5	19.0	0.0	0.0
Clarifier A	S026	771719.7	3819499.9	86.58	5.8	20.5	19.0	0.0	0.0
Clarifier B	S027	771740.2	3819499.9	86.89	5.8	20.5	19.0	0.0	0.0
Outfall Batch Tank	S028	771726.5	3819497.9	86.68	5.8	34.1	1.5	0.0	0.0
Skim Tank	S036	771720.0	3819497.9	86.59	5.8	6.1	1.5	0.0	0.0
Sludge Cake Tote Bins	S037	771743.0	3819580.3	97.44	1.2	1.8	4.6	0.0	0.0
Steam Condensate System	S041	771788.8	3819578.8	89.1	8.5	3.0	11.9	0.0	0.0
Steam System	S043	771819.4	3819573.9	82.24	29.0	1.8	10.6	0.0	0.0
Cooling Water System	S044	771790.6	3819594.4	93.72	0.3	1.2	1.2	0.0	0.0
Steam System Chemical Injection System	S046	771790.3	3819567.7	85.45	2.1	1.9	4.6	0.0	0.0
Caustic Skid (CPP)	S047	771837.6	3819633.3	97.9	0.2	4.0	2.7	0.0	0.0
Oil Storage Tank A	S050	771917.5	3819133.0	72.86	17.1	54.1	54.1	0.0	0.0
Oil Storage Tank B	S051	771983.9	3819234.2	79.99	17.1	54.1	54.1	0.0	0.0
Area Drain Sump (TT)	S053	771812.9	3819111.0	57.43	0.0	2.7	5.5	0.0	0.0
Area Drain Sump (SGTP)	S056	771620.5	3819530.3	68.15	0.0	5.2	1.8	0.0	0.0
Fresh Caustic Day Tank	S059	771641.2	3819559.8	71.94	0.3	0.6	0.6	0.0	0.0
Aerator A (Oxidizer Tank 1 - POPCO)	S071	771597.0	3819502.4	64.13	7.0	2.9	2.9	0.0	0.0
Aerator B (Oxidizer Tank 2 - POPCO)	S072	771599.9	3819496.9	63.26	7.0	4.9	4.9	0.0	0.0
Ammonia Storage Vessel and Injection System	S131	771825.0	3819577.5	82.75	6.1	4.1	1.5	0.0	0.0

Table B-4. Project Line Source Parameters

Source Description	Source ID	UTM Coordinates (NAD27)				Base Elevation (m)	Release Height (m)	Line Width (m)	Initial Vertical Dimension (m)
		Start Easting (Xs1) (m)	Start Northing (Ys1) (m)	End Easting (Xs2) (m)	End Northing (Ys2) (m)				
Crude trucks offsite on Calle Real west of entrance	CT_CR_W	771406.0	3817364.5	771669.9	3817411.0	16.6	3.4	14.0	3.2
Crude trucks offsite on entrance road Calle Real to gate	CT_ENT	771668.4	3817415.3	771668.2	3817452.3	19.0	3.4	14.0	3.2
EDT offsite Calle Real east of entrance	EDT_CR_E	771936.4	3817443.3	771670.2	3817411.4	24.9	1.3	14.0	1.2
EDT offsite Calle Real west of entrance	EDT_CR_W	771406.0	3817364.5	771669.9	3817411.0	16.6	1.3	14.0	1.2
EDT offsite on entrance road Calle Real to gate	EDT_ENT	771668.4	3817415.3	771668.2	3817452.3	19.0	1.3	14.0	1.2

UTM North, Zone 10, NAD27 (meters)

UTM East, Zone 10, NAD27 (meters)

LEGEND

- Point Source
- Volume Source
- Area Source
- Building/Downwash Structure

Figure C-2. Locations of Crude Delivery Truck Emission Sources

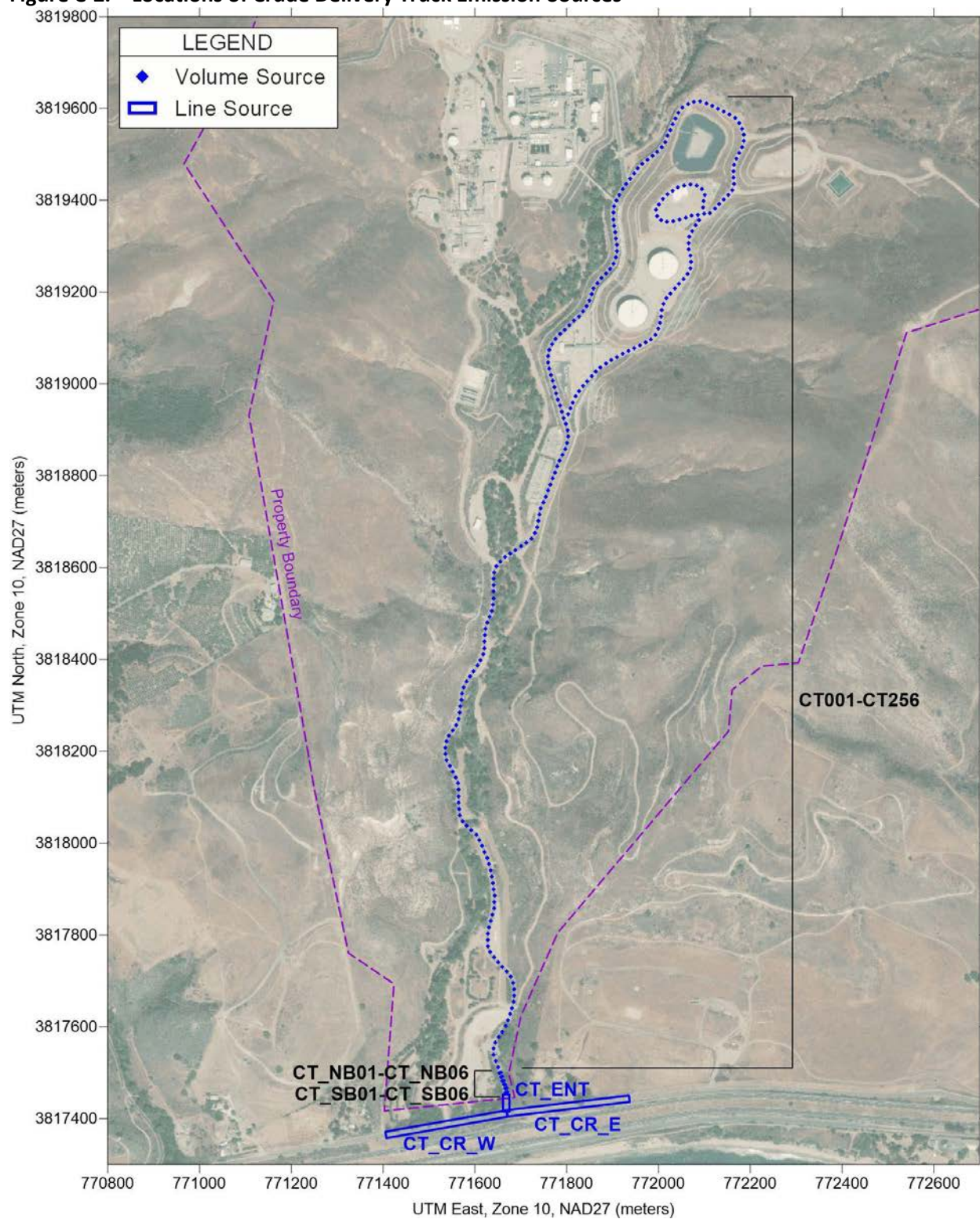
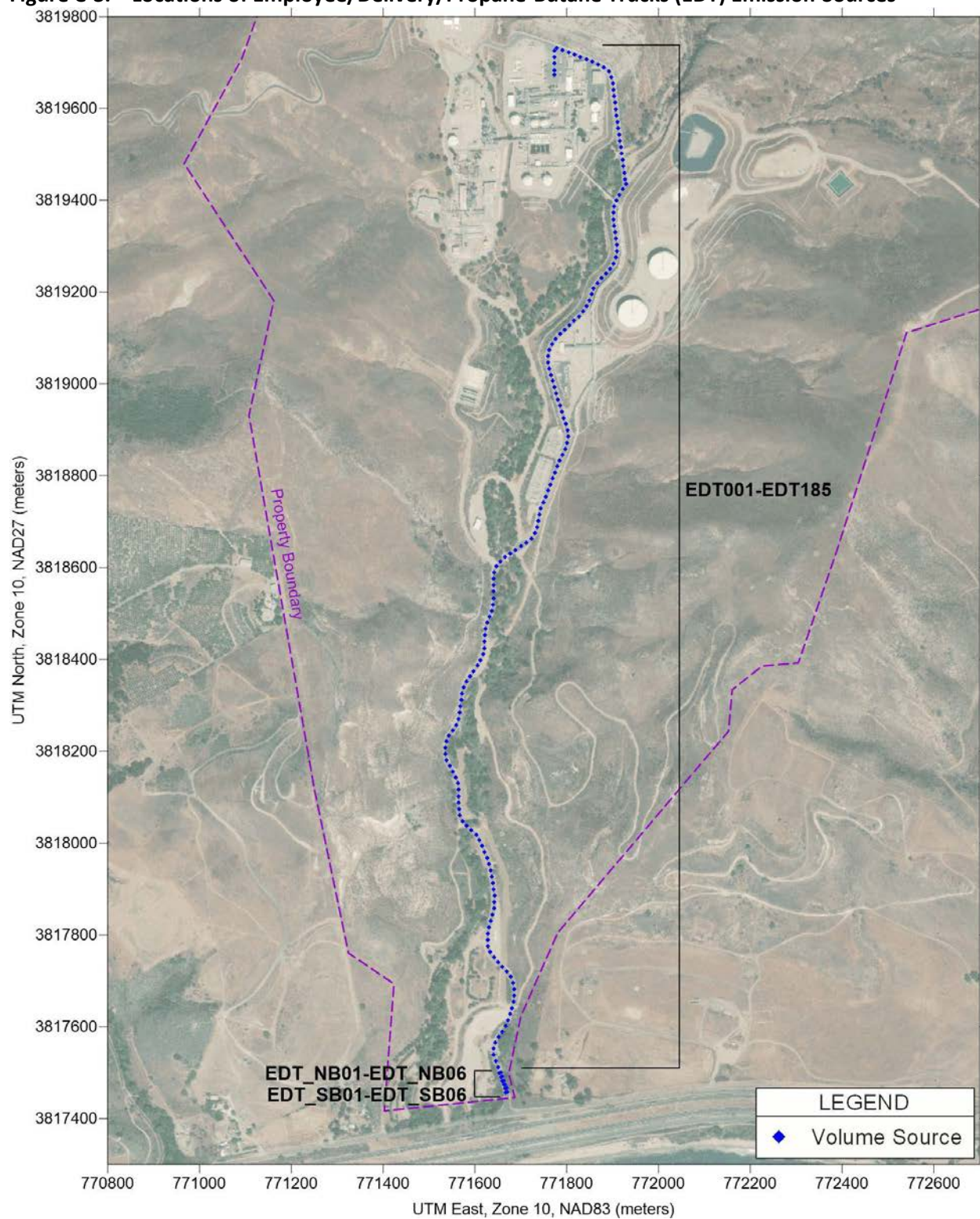


Figure C-3. Locations of Employee/Delivery/Propane-Butane Trucks (EDT) Emission Sources



APPENDIX D. MOBILE SOURCE MODELING METHODOLOGY

Mobile sources (crude delivery trucks, and employee vehicles/delivery vehicles/propane-butane trucks) were modeling using the following methodology:

There are two groups of mobile sources – (1) crude delivery trucks, and (2) employee vehicles/delivery vehicles/propane-butane trucks (EDT). Each group was divided into offsite roads and onsite roads and each source group was modeled with a total emission rate of 1.0 g/s. The four source groups were crude delivery trucks onsite roads (“CTON”), crude delivery trucks offsite roads (“CTOFF”), EDT vehicles onsite roads (“EDTON”), and EDT vehicle offsite roads (“EDTOFF”).

Offsite Roads

For the crude delivery trucks, it was assumed the trucks come from the north/west, so the offsite roads include 1,000 ft from the gate along the short segment of road to Calle Real and along Calle Real to the west. For the EDT vehicles, it was assumed the vehicles could come from north/west or south/east, so the offsite roads include 1,000 ft from the gate along the short segment of road to Calle Real and along Calle Real to the west and to the east.

The offsite roads were modeled as LINE sources with a width of 14m (road width of 8m plus 6m per SBCAPCD guidance). Emissions from the crude delivery trucks were divided proportionally (based on line source length) between the western line source on Calle Real (AERMOD Source ID: CT_CR_W) and the short stretch of road between Calle Real and the entrance gate (AERMOD Source ID: CR_ENT). Emissions from the EDT vehicles were divided proportionally (based on line source length) between the western line source on Calle Real (AERMOD Source ID: EDT_CR_W), the eastern line source on Calle Real (AERMOD Source ID: EDT_CR_E), and the short stretch of road between Calle Real and the entrance gate (AERMOD Source ID: EDT_ENT). Note that EDT_ENT is traveled on twice as often as EDT_CR_W or EDT_CR_E so emissions were adjusted accordingly. The g/s and g/s/m² emission rate for each individual line source is provided in the table below.

Onsite Roads

For the onsite roads, the crude delivery trucks travel north from the gate then loop to the east to the load rack then reconnect with the main road on the way out (see Figure C-2). The EDT vehicles travel north on the main road then east to the offices area then return along the same path (see Figure C-3).

The onsite roads were modeled as adjacent volume sources. Per the District’s request, the initial stretch from the gate northward to a point approximately 50 meters north (where the road is relatively close to property boundary receptors) was modeled with adjacent volume sources in both lanes assuming a vehicle width of 3m and a plume width of 9m (3m + 6m = 9m) and a Sigma Y of 4.19 (9m/2.15 = 4.19m). The remainder of the roads were modeled with the entire road (both lanes) represented by a string of single volume sources assuming a road width of 8m and a plume width of 14m (8m + 6m = 14m) and a Sigma Y of 6.5 (14m/2.15 = 6.5m).

Crude delivery truck emissions on the onsite roads are distributed in AERMOD as follows. 12 adjacent volume sources (6 on the northbound lane, 6 on the southbound lane) were placed along the initial 50

meter stretch of road north of the entrance gate. 256 adjacent volume sources were placed on the remainder of the road up to the crude load rack and back. Sources 1-115 are traveled on twice (once going in, once going out) and sources 116-256 (the loop at the far north) are traveled on once. Therefore each of the volume sources 1-115 had an emission rate that was double that of sources 116-256, and the total emissions of all the 268 volume sources was 1.0 g/s. The g/s emission rate for each individual volume source is provided in the table below.

EDT vehicle emissions on the onsite roads were distributed similarly, with 12 adjacent volume sources along northbound and southbound lanes for the first 50 meters and 185 adjacent volume sources for the remainder. All segments of the road are traveled on twice (once going in, once going out), so no adjustment as was made for the crude truck “loop” described above was necessary. The g/s emission rate for each individual volume source is provided in the table below.

AERMOD Source Group Name/ID	Description	Source Type	Source IDs	Quantity of Volume Sources	Emission Rate per Source	
					g/s	g/s/m ²
CTOFF	Crude trucks offsite roads	Line	CT_CR_W	N/A	0.8787	0.000234
			CT_ENT	N/A	0.1213	0.000234
CTON	Crude trucks onsite roads	Volume	CTON001-CTON256 CT_NB_01-CT_NB_06 CT_SB_01-CT_SB_06	111	0.005333 (CTON001-CTON111)	N/A
				145	0.002667 (CTON112-CTON256)	N/A
				12	0.001778 (All CT_NB and _SB)	N/A
EDTOFF	Employee/delivery/propane-butane trucks (EDT) offsite roads	Line	EDT_CR_E	N/A	0.4394	0.000117
			EDT_CR_W	N/A	0.4394	0.000117
			EDT_ENT	N/A	0.1213	0.000234
EDTON	Employee/delivery/propane-butane trucks (EDT) onsite roads	Volume	EDTON001-EDTON185 EDT_NB_01-EDT_NB_06 EDT_SB_01-EDT_SB_06	185	0.005291 (EDTON001-EDTON185)	N/A
				12	0.001764 (All EDT_NB and _SB)	N/A

Notes:

1. The crude trucks are assumed to travel to the facility from the north. The employee/delivery/propane-butane trucks will travel to the facility from north and south (assume 50% each).
2. The roads represented by the CTON and EDTOFF sources have some segments that will be travelled on twice as often as the other segments – the sources representing those segments were assigned twice the emission rate.

APPENDIX E. EQUIPMENT OPERATING SCHEDULE

Table E-1. Equipment Operating Schedule

HARP Source ID	APCD Permit Device ID	Equipment Description	Operating Schedule			Primary ¹
			Hours per Day	Days per Week	Weeks per Year	
CTOFF		Offsite Crude Truck Transport	24	7	52	Yes
CTON		Onsite Crude Truck Transport	24	7	52	Yes
EDTOFF		Employee Delivery Truck Offsite Roads	24	7	52	No
EDTON		Employee Delivery Truck Onsite Roads	24	7	52	No
S001		Anaerobic Filter A	24	7	52	Yes
S002		Anaerobic Filter B	24	7	52	Yes
S003		VF Tower Feed Drum	24	7	52	Yes
S004		Quality Control Lab	24	7	52	Yes
S005	7881	SOV Distance Piece Vent	24	7	52	Yes
S006	7882	VRU Distance Piece Vent	24	7	52	Yes
S007	1085	Firewater Pump A	See note 2 below			No
S008	1086	Firewater Pump B	See note 2 below			No
S009		FW Pump Diesel Fuel Tanks (OTP)	24	7	52	No
S010	6570	Rerun Tank A	24	7	52	Yes
S011	6571	Rerun Tank B	24	7	52	Yes
S012	6583	Demulsifier Tote Tank 1	24	7	52	Yes
S013	6583	Demulsifier Tote Tank 2	24	7	52	Yes
S014		Demineralizer Caustic Tank	24	7	52	Yes
S015	6576	Open Drain Sump (OTP)	24	7	52	Yes
S016	6581	Area Drain Sump (OTP)	24	7	52	Yes
S017	6577	Area Drain Oil/Water Separator (OTP)	24	7	52	Yes
S018		Diesel Storage Tank (OTP)	24	7	52	No
S021	7885	Backwash Collection Tank	24	7	52	Yes
S022	6574	Oily Sludge Thickener	24	7	52	Yes
S023	6573	Equalization Tank	24	7	52	Yes
S024		Aerator A (OTP)	24	7	52	Yes
S025		Aerator B (OTP)	24	7	52	Yes
S026		Clarifier A	24	7	52	Yes
S027		Clarifier B	24	7	52	Yes
S028		Outfall Batch Tank	24	7	52	Yes
S029		HCl Tank A	24	7	52	Yes
S030		HCl Tank B	24	7	52	Yes
S031		Phosphoric Acid Tank	24	7	52	Yes
S032		Caustic Tank	24	7	52	Yes
S034	6575	Backwash Sump	24	7	52	Yes
S035		Centrate Tank	24	7	52	Yes
S036		Skim Tank	24	7	52	Yes
S037		Sludge Cake Tote Bins	24	7	52	Yes
S038		Thermal Oxidizer	24	7	52	Yes
S039		Maintenance Shop	24	7	52	No

SYU INTERIM TRUCKING PROJECT HEALTH RISK ASSESSMENT

HARP Source ID	APCD Permit Device ID	Equipment Description	Operating Schedule			Primary ¹
			Hours per Day	Days per Week	Weeks per Year	
S041		Steam Condensate System	24	7	52	Yes
S042		Deaerator	24	7	52	Yes
S043		Steam System	24	7	52	Yes
S044		Cooling Water System	24	7	52	Yes
S045	7864	SU/SD Combined CPP & Bypass Stacks	24	7	52	Yes
S046		Steam System Chemical Injection System	24	7	52	Yes
S047		Caustic Skid (CPP)	24	7	52	Yes
S048		Acid Skid	24	7	52	Yes
S049	6585, 7865	CPP - Normal Ops. Modes (GTG and GTG/HRSO Ops)	24	7	52	Yes
S050	6566	Oil Storage Tank A	24	7	52	Yes
S051	6567	Oil Storage Tank B	24	7	52	Yes
S052	6572	Area Drain Oil/Water Separator (TT)	24	7	52	Yes
S053	6580	Area Drain Sump (TT)	24	7	52	Yes
S055	6565	Oil Emulsion Pig Receiver	24	7	52	Yes
S056	6582	Area Drain Sump (SGTP)	24	7	52	Yes
S057	6578	Area Drain Oil/Water Separator (SGTP)	24	7	52	Yes
S058	6579	Open Drain Sump (SGTP)	24	7	52	Yes
S059		Fresh Caustic Day Tank	24	7	52	Yes
S060	7867	Waste Gas Incinerator	24	7	52	Yes
S061	102615	Planned Continuous Flaring (Baseline System Leakage)	24	7	52	Yes
S062	2350	Boiler A	24	7	52	Yes
S063	2351	Boiler B	24	7	52	Yes
S064	2352	Sulfinol TEG Reboiler	24	7	52	Yes
S065	2353	GPU TEG Glycol Reboiler	24	7	52	Yes
S066	2357	Emergency Generator (G-800)	See note 2 below			No
S067	2359	Firewater Pump (805)	See note 2 below			No
S068	2356	Firewater Pump (806)	See note 2 below			No
S069	2357	Emergency Air Generator	See note 2 below			No
S070	105199	Evaporative Cooler	24	7	52	Yes
S071	105191	Aerator A (Oxidizer Tank 1 - POPCO)	24	7	52	Yes
S072	105192	Aerator B (Oxidizer Tank 2 - POPCO)	24	7	52	Yes
S073		Sulfur Loading	1	1	52	Yes
S074	115227	Diesel Tanks (POPCO)	24	7	52	No
S075	102620	Methanol Tank	24	7	52	Yes
S076	103103	Wastewater Tank	24	7	52	Yes
S077	8126	OTP (FHC, Paint, Ab. Blast) 1	24	7	52	Yes
S078		OTP (FHC, Paint, Ab. Blast) 2	24	7	52	Yes
S079		OTP (FHC, Paint, Ab. Blast) 3	24	7	52	Yes
S080		OTP (FHC, Paint, Ab. Blast) 4	24	7	52	Yes
S081		OTP (FHC, Paint, Ab. Blast) 5	24	7	52	Yes
S082		OTP (FHC, Paint, Ab. Blast) 6	24	7	52	Yes

SYU INTERIM TRUCKING PROJECT HEALTH RISK ASSESSMENT

HARP Source ID	APCD Permit Device ID	Equipment Description	Operating Schedule			Primary ¹
			Hours per Day	Days per Week	Weeks per Year	
S083		OTP (FHC, Paint, Ab. Blast) 7	24	7	52	Yes
S084		OTP (FHC, Paint, Ab. Blast) 8	24	7	52	Yes
S085	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 1	24	7	52	Yes
S086	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 2	24	7	52	Yes
S087	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 3	24	7	52	Yes
S088	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 4	24	7	52	Yes
S089	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 5	24	7	52	Yes
S090	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 6	24	7	52	Yes
S091	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 7	24	7	52	Yes
S092	5740, 6555, 7879, 6561	OTP (Pump Seal, Comp. Seal, Solvents) 8	24	7	52	Yes
S093	8126	CPP (FHC, Paint, Ab. Blast) 1	24	7	52	Yes
S094		CPP (FHC, Paint, Ab. Blast) 2	24	7	52	Yes
S095		CPP (FHC, Paint, Ab. Blast) 3	24	7	52	Yes
S096	5740, 6555, 7879, 6561	CPP (Pump Seal, Comp. Seal, Solvents) 1	24	7	52	Yes
S097	5740, 6555, 7879, 6561	CPP (Pump Seal, Comp. Seal, Solvents) 2	24	7	52	Yes
S098	5740, 6555, 7879, 6561	CPP (Pump Seal, Comp. Seal, Solvents) 3	24	7	52	Yes
S099		TT (FHC, Paint, Ab. Blast) 1	24	7	52	Yes
S103		TT (Pump Seal, Comp. Seal, Solvents) 1	24	7	52	Yes
S107	8126	SGTP (FHC, Paint) 1	24	7	52	Yes
S108		SGTP (FHC, Paint) 2	24	7	52	Yes
S110	5740, 6555, 7879, 6561	SGTP (Pump Seal, Comp. Seal, Solvents) 1	24	7	52	Yes
S111	5740, 6555, 7879, 6561	SGTP (Pump Seal, Comp. Seal, Solvents) 2	24	7	52	Yes
S113	8796	POPCO (FHC, Paint, Ab. Blast) 1	24	7	52	Yes
S114		POPCO (FHC, Paint, Ab. Blast) 2	24	7	52	Yes
S115		POPCO (FHC, Paint, Ab. Blast) 3	24	7	52	Yes
S121	7079, 7080, 7081, 8795, 8662	POPCO (Pump Seal, Comp. Seal, Solvents) 1	24	7	52	Yes
S122	7079, 7080, 7081, 8795, 8662	POPCO (Pump Seal, Comp. Seal, Solvents) 2	24	7	52	Yes
S123	7079, 7080,	POPCO (Pump Seal, Comp. Seal,	24	7	52	Yes

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HARP Source ID	APCD Permit Device ID	Equipment Description	Operating Schedule			Primary ¹
			Hours per Day	Days per Week	Weeks per Year	
	7081, 8795, 8662	Solvents) 3				
S129		Unpermitted - Portable (OTP)	See note 3 below			No
S130		Unpermitted - Portable (POPCO)	See note 3 below			No
S131	105500	Ammonia Storage Vessel and Injection System	24	7	52	Yes
S132	393540	E/S Diesel Flood Water Pump	See note 2 below			No
S133	390274	Emergency Backup Generator	See note 2 below			No
S134	390275	Emergency Backup Generator	See note 2 below			No
S135	390276	Emergency Backup Generator	See note 2 below			No
S136		Crude Truck Loading Rack	24	7	52	Yes
S137		Foam Tank A	24	7	52	Yes
S138		Foam Tank B	24	7	52	Yes

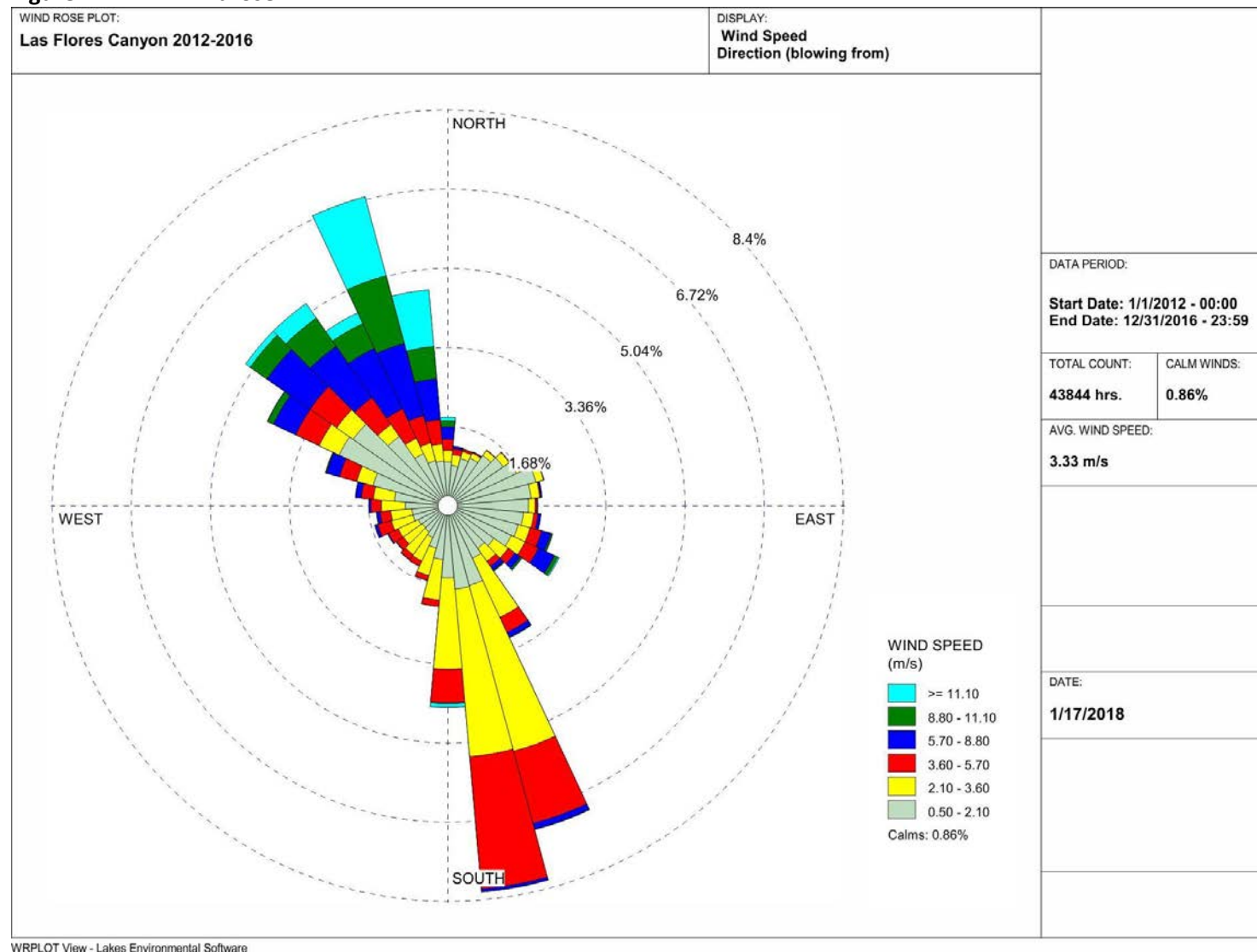
¹ Yes in this column means the device is part of the primary function of the facility.

² Fire pump engines, generators, and the flood water pump typically operate less than one hour per week for maintenance and testing (during normal business hours) but operate on a continuous basis when needed.

³ Portable engines operate on an as needed basis with no specific schedule. Some equipment operates only during daylight hours, some equipment operates only during nighttime hours, and some equipment operates any time of day.

APPENDIX F. WINDROSE

Figure F-1. Windrose



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APPENDIX G. RECEPTOR GRID

Figure G-1. All Receptor Locations

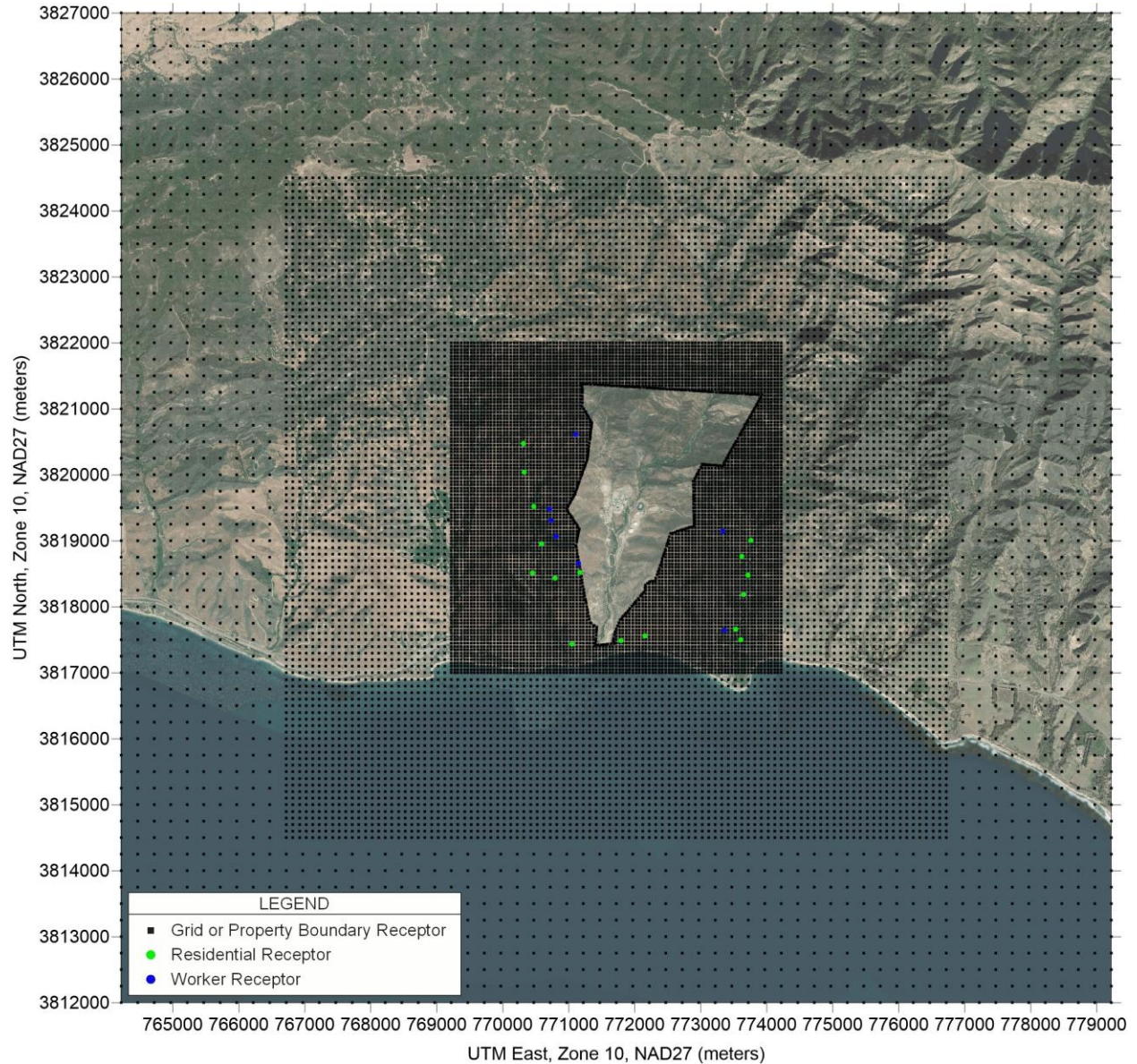


Figure G-2. Near-Field Receptor Locations

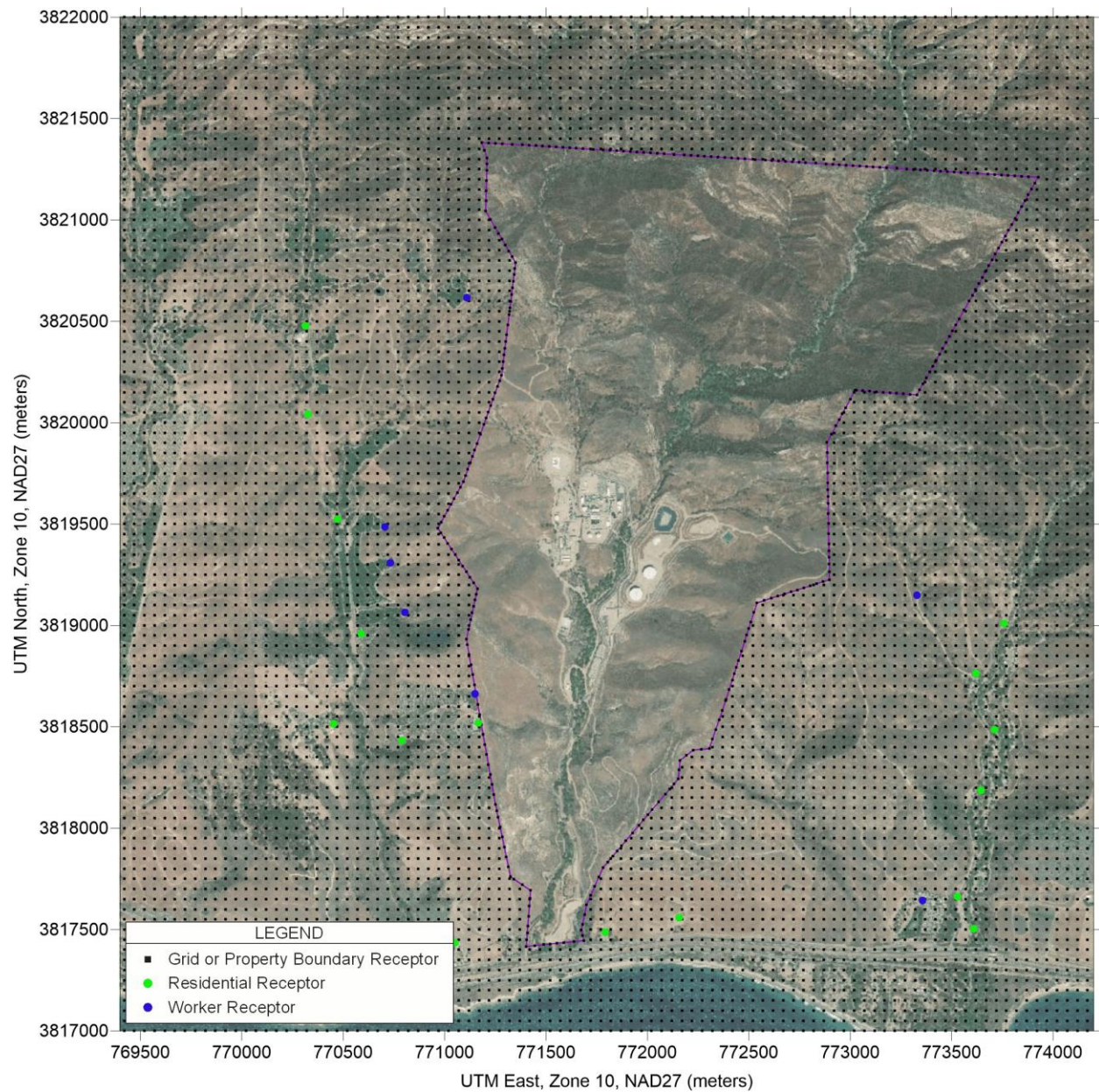


Table G-1. Discrete Residential and Worker Receptors

Receptor Number	UTM Coordinates (NAD27)		Type
	X (m)	Y (m)	
322	771166	3818520	Residential
323	771050	3817435	Residential
324	770789	3818434	Residential
325	770589	3818959	Residential
326	770471	3819524	Residential
327	770326	3820043	Residential
328	770313	3820477	Residential
329	770452	3818516	Residential
330	771792	3817488	Residential
331	772156	3817559	Residential
332	773610	3817505	Residential
333	773530	3817662	Residential
334	773645	3818187	Residential
335	773713	3818485	Residential
336	773620	3818763	Residential
337	773758	3819011	Residential
338	773357	3817644	Worker
339	771110	3820617	Worker
340	770705	3819485	Worker
341	771149	3818663	Worker
342	770733	3819309	Worker
343	770805	3819065	Worker
344	773330	3819148	Worker

APPENDIX H. ISOPLETH MAPS

Figure H-1. Residential Cancer Risk Isoleth and Maximum Receptor Diagram

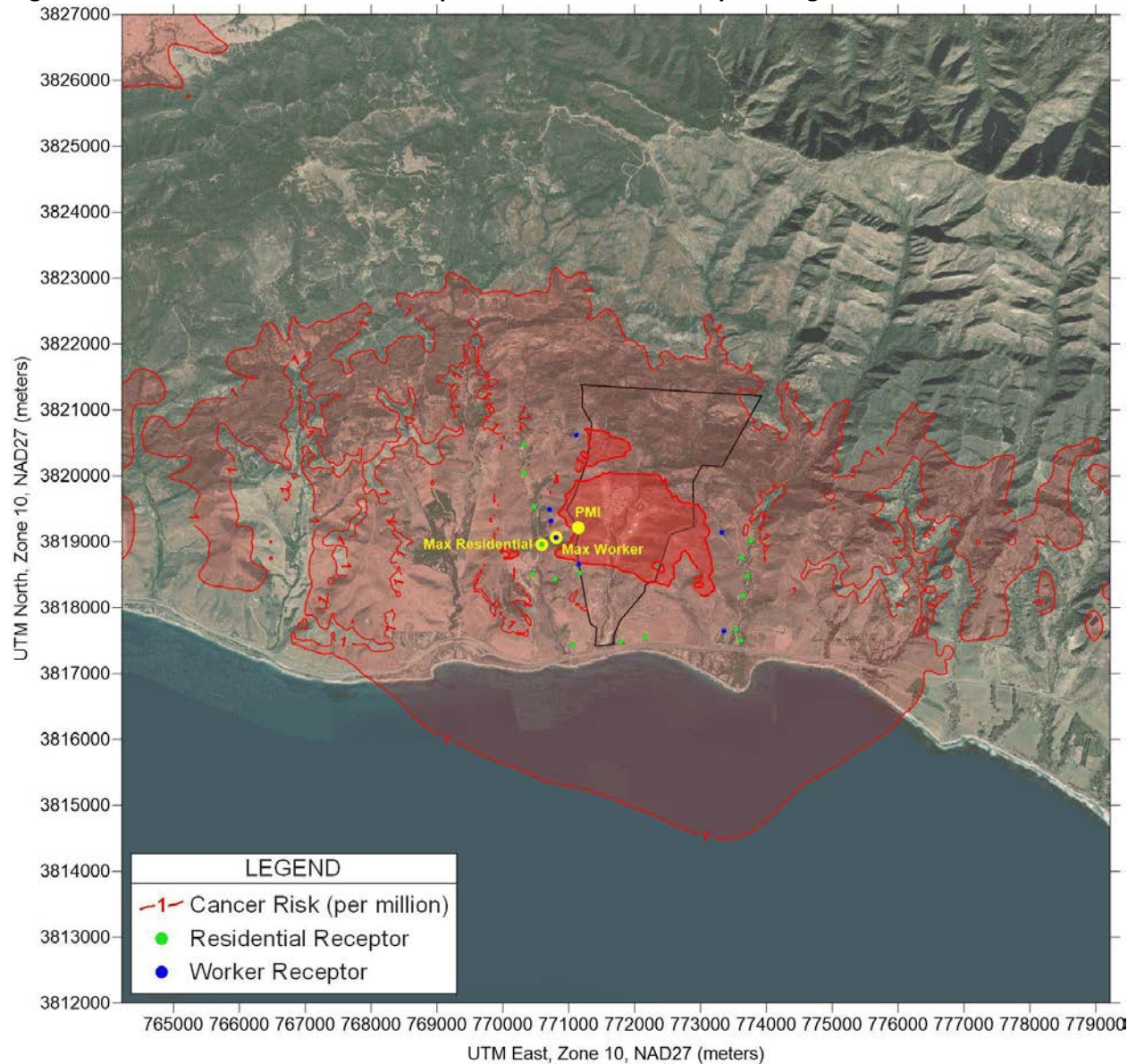


Figure H-2. Residential Cancer Risk Isoleth and Maximum Receptor Diagram (Zoom View)

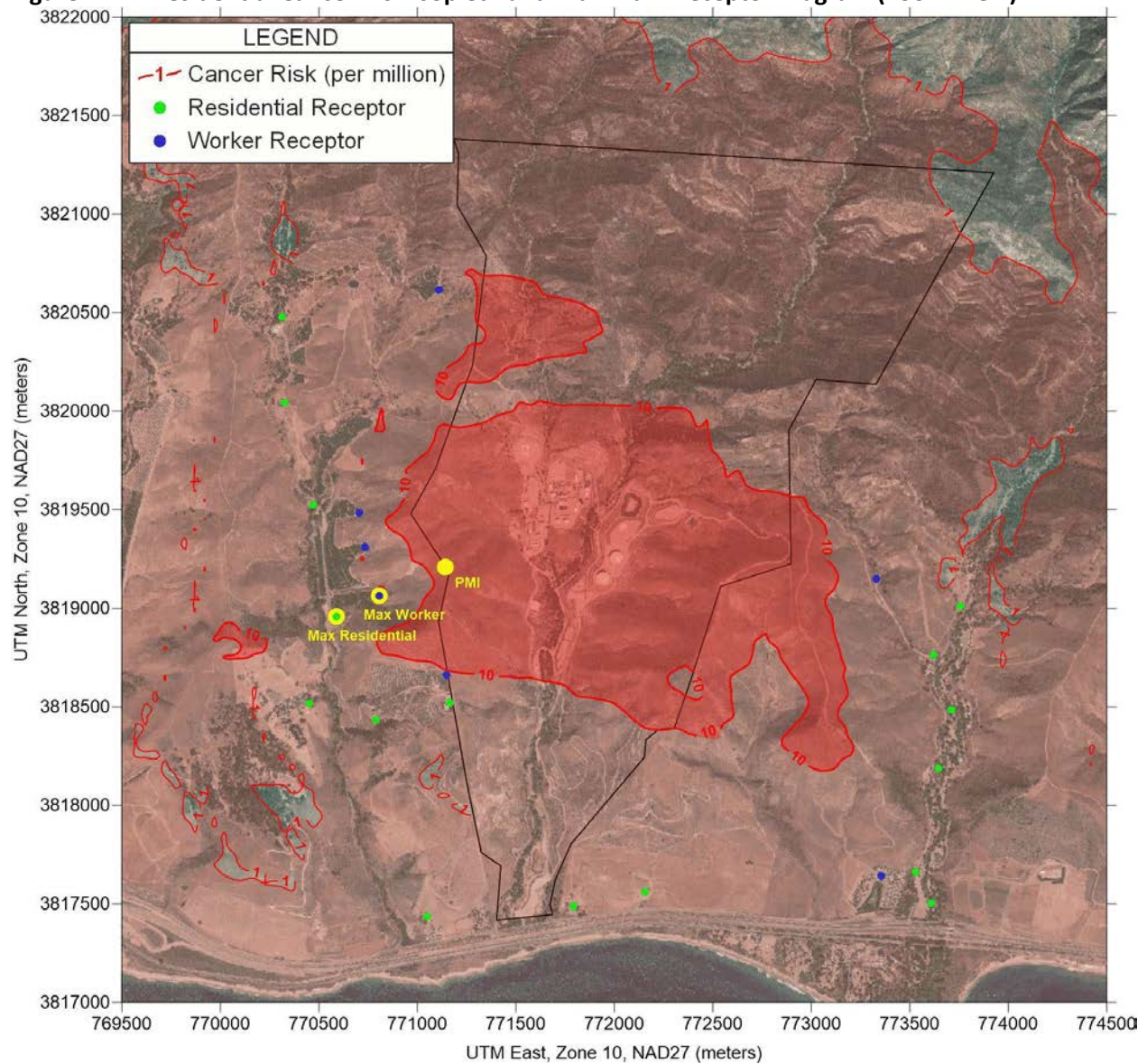


Figure H-3. Worker Cancer Risk Isopleth and Maximum Receptor Diagram

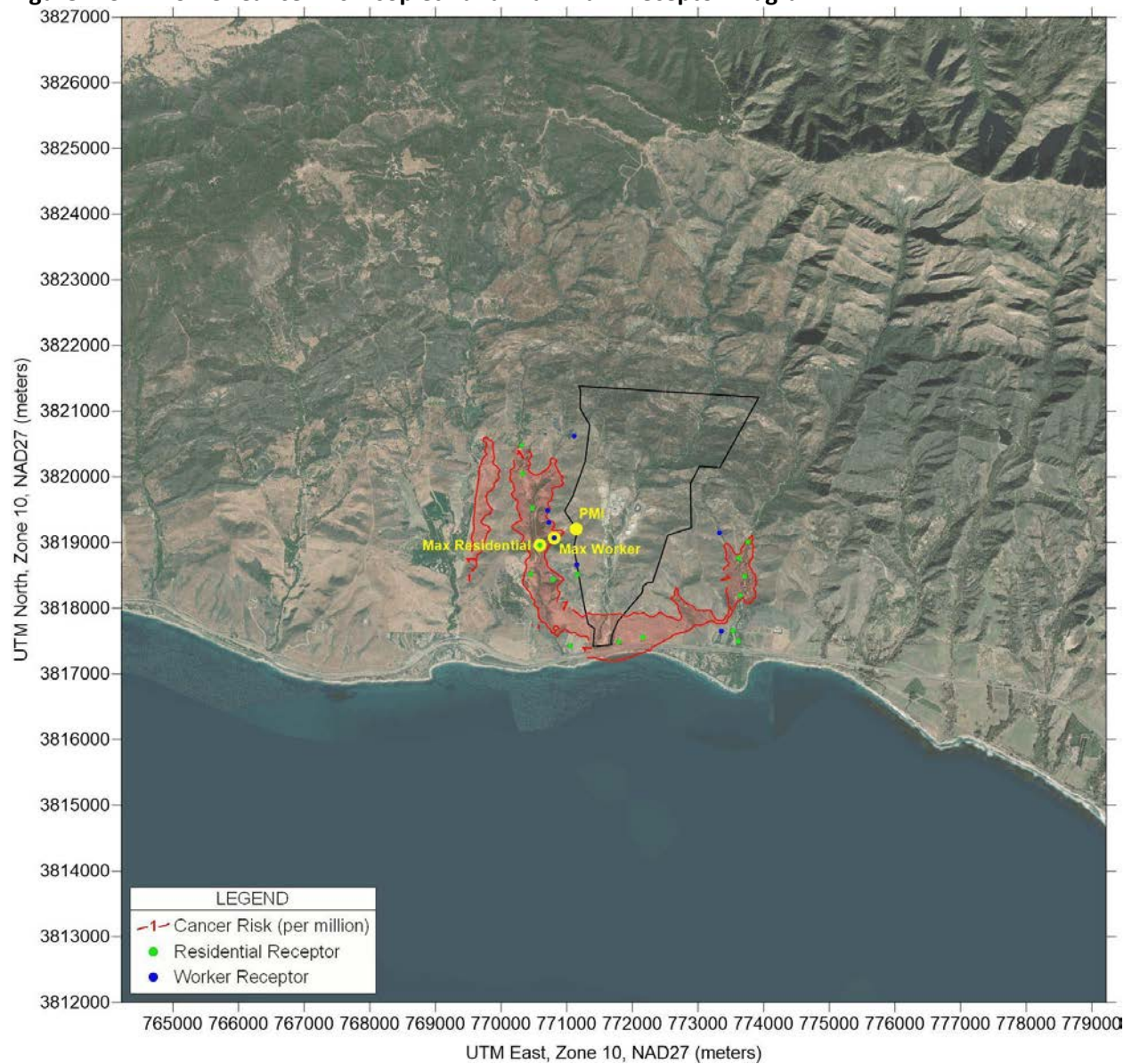


Figure H-4. Worker Cancer Risk Isopleth and Maximum Receptor Diagram (Zoom View)

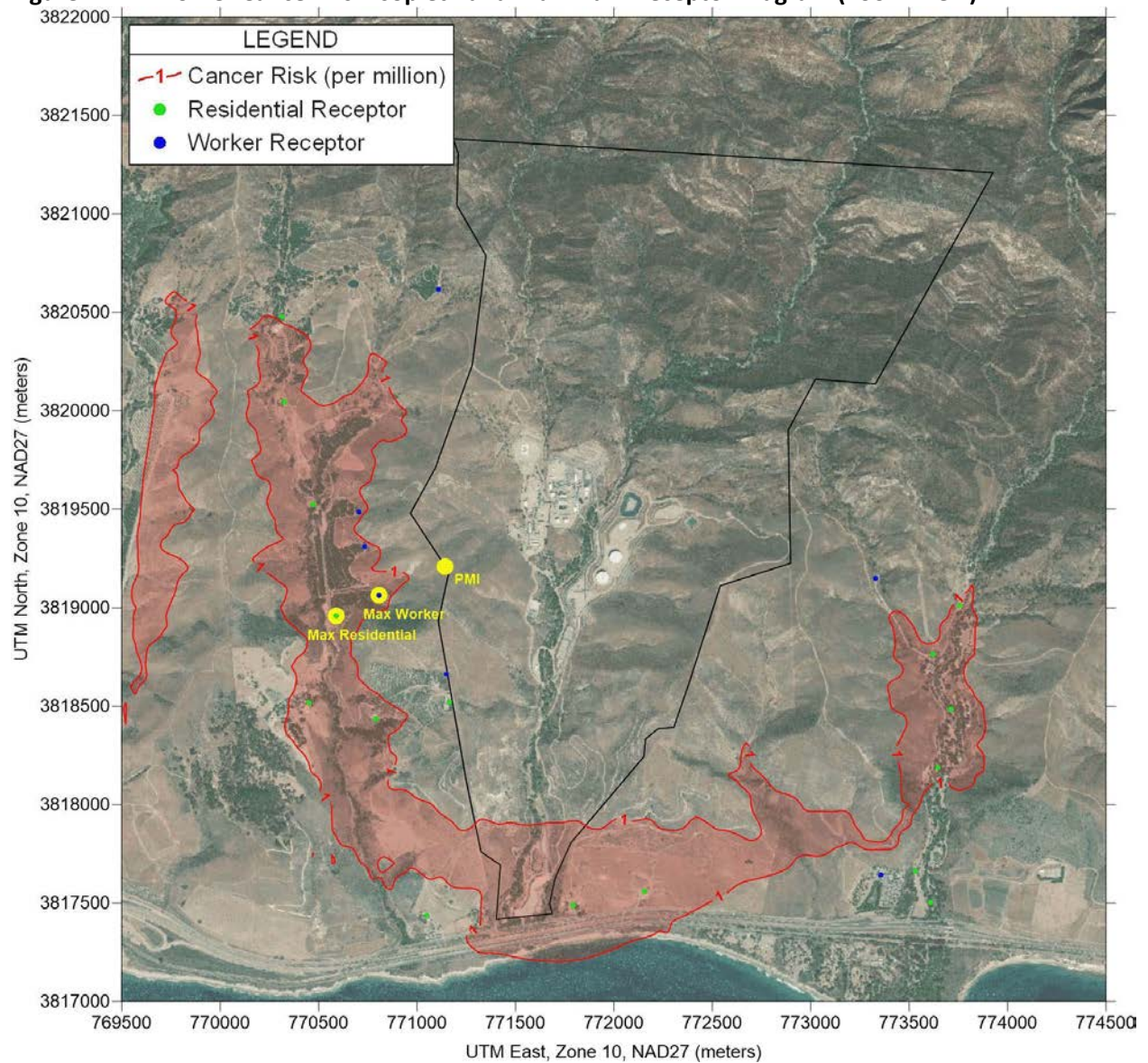
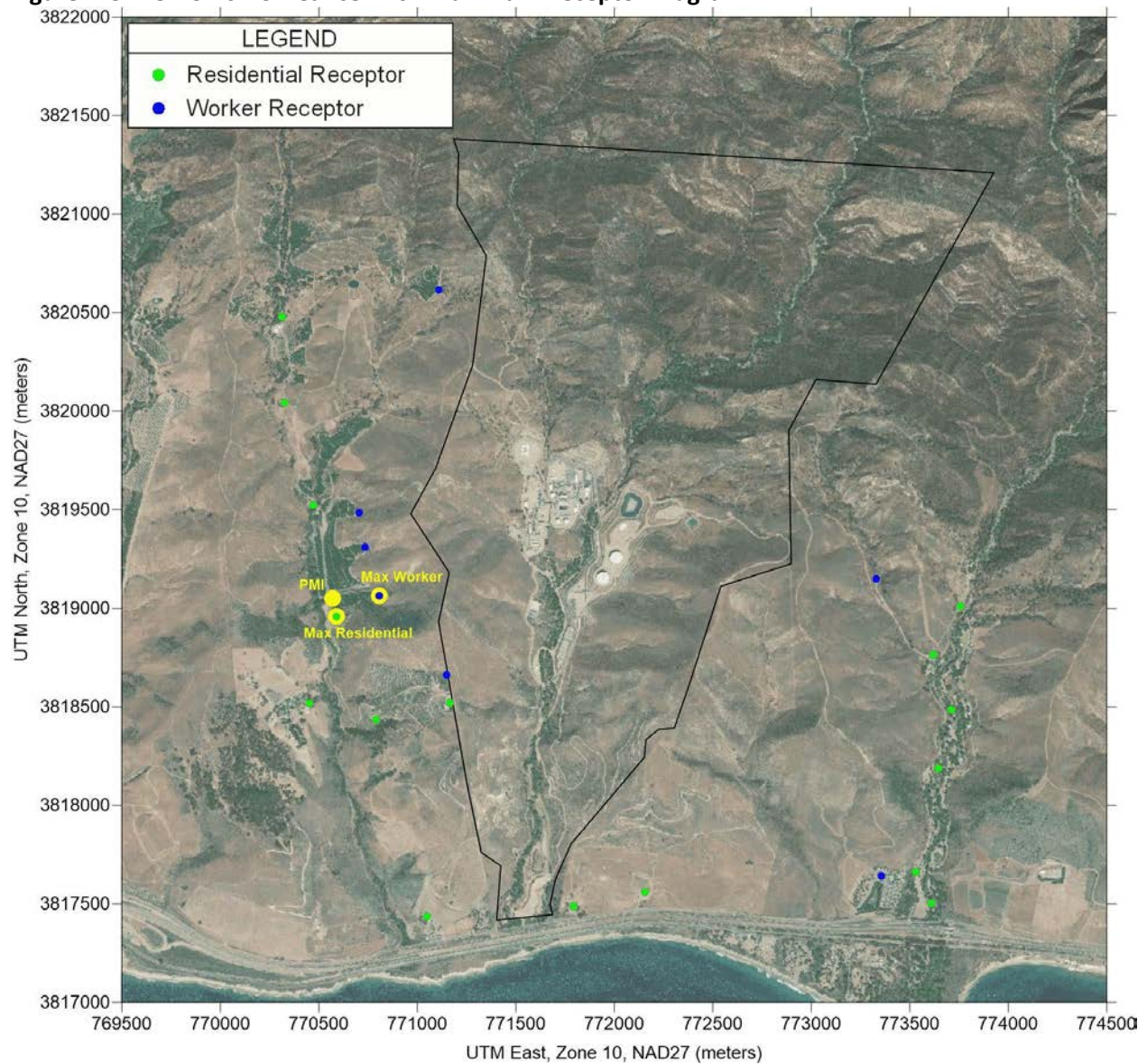
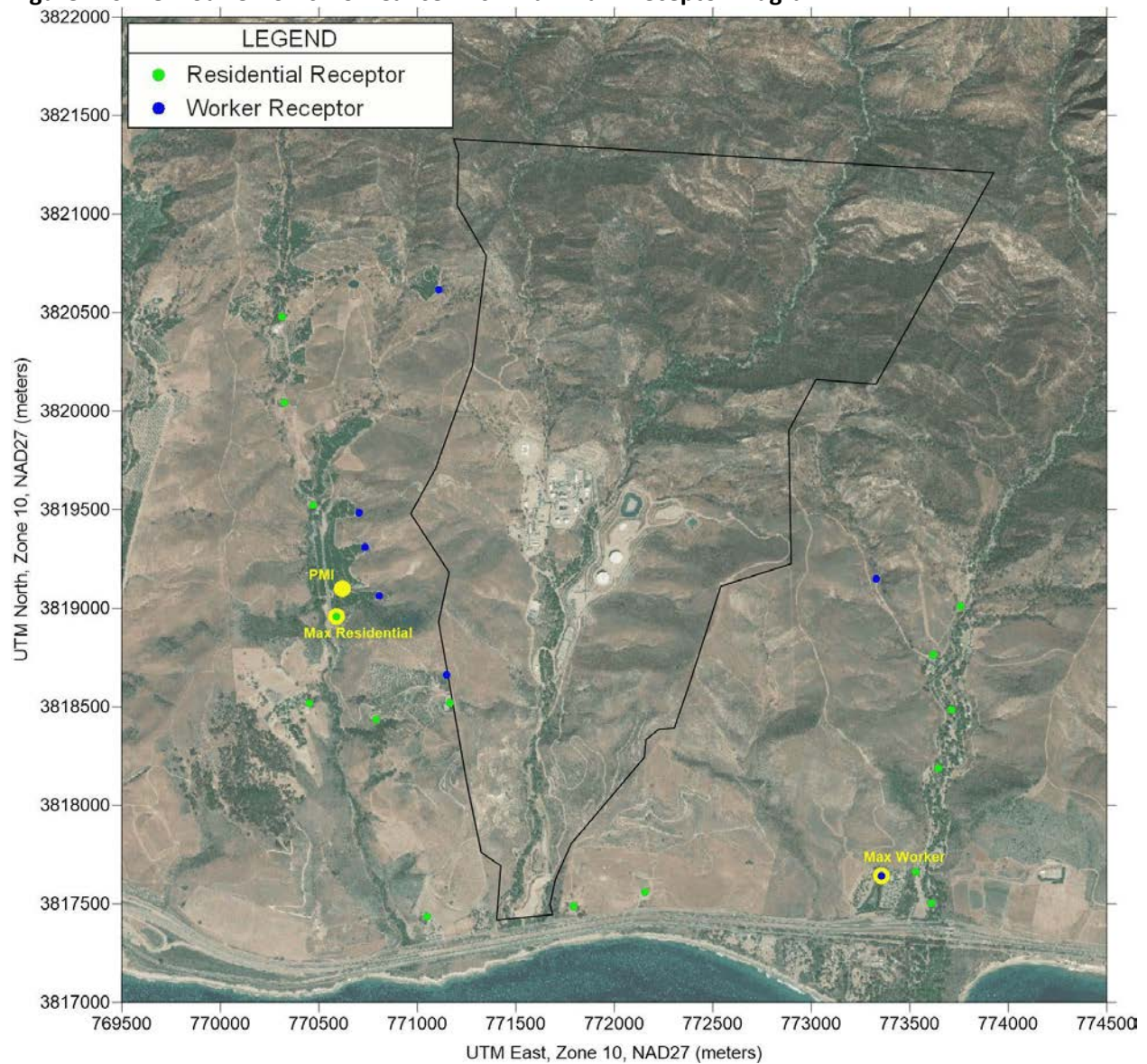


Figure H-5. Chronic Non-Cancer Risk Maximum Receptor Diagram⁶



⁶ No isopleth is shown as the maximum chronic non-cancer risk is below 0.1 at all receptors modeled.

Figure H-6. 8-Hour Chronic Non-Cancer Risk Maximum Receptor Diagram⁷



⁷ No isopleth is shown as the maximum 8-hour chronic non-cancer risk is below 0.1 at all receptors modeled.

Figure H-7. Acute Non-Cancer Risk Isopleth and Maximum Receptor Diagram

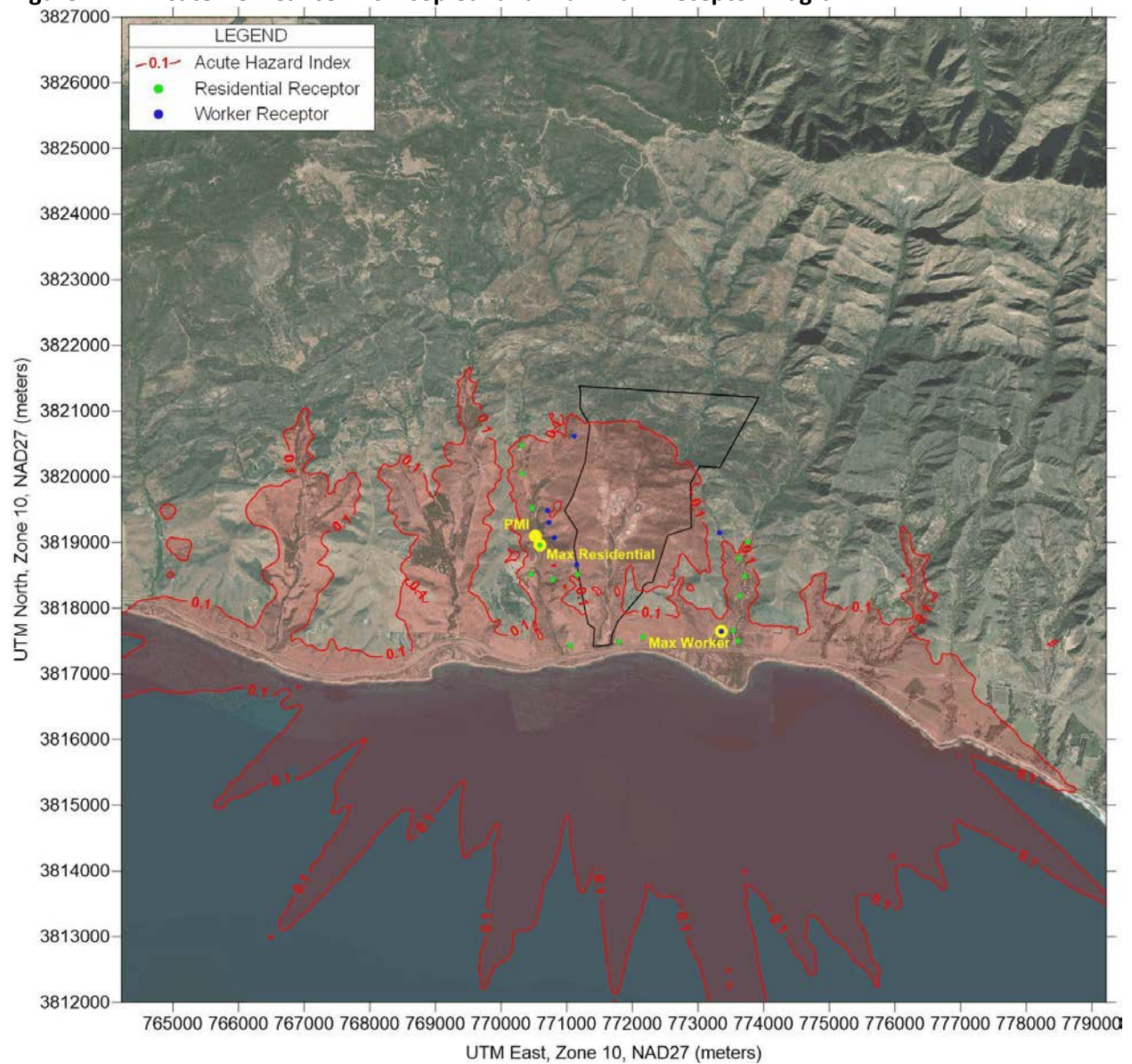
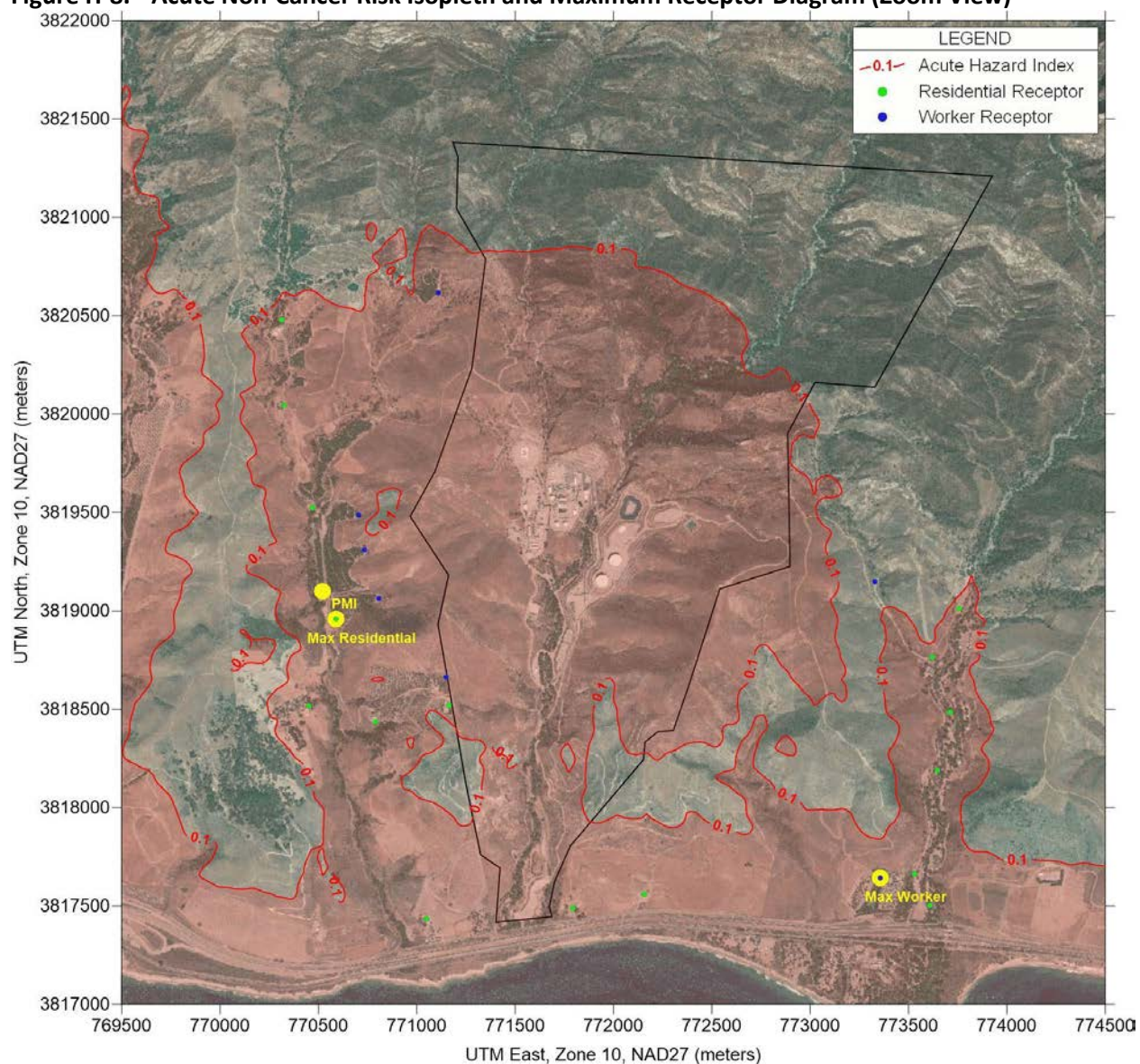


Figure H-8. Acute Non-Cancer Risk Isopleth and Maximum Receptor Diagram (Zoom View)



APPENDIX I. EMISSION CALCULATIONS AND SUPPORTING DOCUMENTATION

APPENDIX I

EMISSIONS ESTIMATING TECHNIQUES

This appendix provides information on how emission rates are estimated for both the Las Flores Canyon (LFC) and POPCO facilities. The information presented is based on the APCD approved methodologies under the Exxon – SYU Air Toxic Emission Inventory Plan for AB2588 - 2013, with updates to reflect the changes proposed for the Interim Trucking project. Emission Estimation Techniques (EETs) are presented in the following sections on a source category basis. Emission factors used to estimate criteria pollutant emissions and air toxics are documented in the tables summarizing spreadsheet calculations included with this appendix.

The Project will initiate the interim trucking of limited crude oil production as a temporary solution until a pipeline alternative becomes available to transport crude oil to a refinery destination. Trucking will occur seven days per week, 24-hours per day, with 70 trucks leaving the facility within a 24-hours period to one or both of the two receiver sites located in Santa Maria and Maricopa.

During the Interim Trucking project, all equipment at the LFC facility (with the exception of Oil Tank B) will be in operation, albeit with reduced flowrates. Processing systems and flows will not vary from the detailed descriptions in PTO 5651.

Emulsion from one or more of the platforms will be limited to meet the permitted trucking volumes. Once onshore, the emulsion will follow the regular process flow for crude dehydration and stabilization and will then be sent to Oil Tank A at the Transportation Terminal. Oil Tank B will not be in operation during the Interim Trucking project.

The Cogeneration System (CPP) which provides steam and electrical power will be operated at reduced rates. With crude trucking occurring no more than 70 trucks per day, engineering has determined that operation of the CPP at 3,645,360 MMBtu/year will provide adequate steam to process the emulsion and also provide sufficient electricity to sustain the Interim Trucking operations.

At some point during the interim trucking period POPCO facility may be brought online in order to begin commercial gas sales. Decisions on whether to begin commercial gas sales will be dependent upon reservoir performance post trucking start-up. Due to the reduced oil production rates during Interim Trucking and the expected corresponding reduction in gas production from the platforms, the POPCO facility would also operate at reduced load. Due to the low gas production rates under the Interim Trucking operations, the POPCO steam boilers can be run at a lower steam generation load, reducing fuel and emissions compared to normal operations. For the purposes of the HRA and as a conservative assumption, ExxonMobil has assumed full operations of the POPCO gas plant.

Calendar year 2013 operations from POPCO and LFC have been assumed in preparing the calculations for the HRA as directed by the SBC APCD. Calendar year 2013 was selected for consistency with the recently approved AB2588 HRA modeling and is representative of the baseline years of operation considered for the Interim Trucking project SEIR.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Las Flores Canyon Facility

Gas Turbine

Emissions from the Cogeneration Power Plant (CPP) come from the gas turbine generator and the low-NO_x duct burner associated with the Heat Recovery Steam Generator (HRSG). NO_x emissions from the gas turbine and duct burner are controlled by an ammonia injection selective catalytic reduction (SCR) unit. Emissions are determined for the CPP under three operating modes, as permitted in Part 70/APCD PTO 5651.

Table 1 CPP Operating Modes

Mode	Equipment	Load	Heat Input (MMBtu/hr)	APCD Device No.	Device ID	Stack ID
Normal Operations	Gas Turbine	99%	460	6585	126021	26020
	HRSG	41%	141	7865	126021	26020
	Turbine Bypass	1% Gas Turbine	4.60	7864	125010	25010
HRSG Only	HRSG	100%	345	7865	126022	26020
Planned SU/SD	Gas Turbine/HRSG		308.821	7866	125010	25010

Air toxic emissions are estimated from the gas turbine, turbine bypass and HRSG using emission factors from Table 3.1-3 of US EPA AP-42, as recommended by Ventura County APCD (VC APCD, 2001) for natural gas fired turbines. Hexane and propylene emissions for the gas turbine are calculated using the emission factors defined by the California Air Toxic Emission Factor (CATEF) website as identified in Table E-1. Emissions from the turbine bypass stack during Normal Operations are based on a leakage rate of one percent of the gas turbine exhaust. Emissions from the HRSG/SCR unit associated with the injection of ammonia (Device ID 221050) are estimated by multiplying the outlet concentration of ammonia (slip) times the stack flowrate, as monitored by the continuous emission monitoring system (CEM) as described further below. Maximum hourly air toxic emissions are based on “Normal Mode” operations at the rated heat input described in Part 70/APCD PTO 5651.

Annual air toxic emissions assume a reduced demand of 3,645,360 MMBtu/yr during Interim Trucking operations.

Equation 1 Annual Average Emissions of NH₃

$$E_{yr}NH_3 = \frac{(C_{avg} * Q * 10^{-6} * M_{NH_3} * C_2 * C_3)}{(C_1)}$$

Where:

E_{yr},NH₃ = Average emission rate of ammonia, [lb/year]

C_{avg} = Average stack ammonia concentration, [ppm]

APPENDIX I

EMISSIONS ESTIMATING TECHNIQUES

Q = Stack flowrate, [dscfm]

M_{NH3} = Molecular weight of ammonia, [17 lb/lb-mole]

C₁ = Standard molar volume at 68 °F, [385 ft³/lb-mole]

C₂ = 60 minute/hour

C₃ = Hours of operation per year, [8,760 hours/year]

Equation 2 Hourly Maximum Emissions of NH₃

$$E_{hr} NH_3 = \frac{(C_{max} * Q * 10^{-6} * M_{NH_3} * C_2)}{(C_1)}$$

Where:

E_{hr,NH₃} = Maximum emission rate of ammonia, [lb/hour]

C_{max} = Maximum hourly recorded stack ammonia concentration, [ppm]

Thermal Oxidizer and Waste Gas Incinerator

This category includes the thermal oxidizer in the Oil Treating Plant (OTP) as well as the waste gas incinerator in the Stripping Gas Treating Plant (SGTP). The waste gas incinerator has not operated with the Merox vent; so, emissions from this mode of operation are not estimated. Emissions associated with unplanned startup/shutdown activities of the waste gas incinerator are also not calculated due to the infrequent and unpredictable nature of these events. Air toxic emission factors are based on the approach defined by the Ventura County APCD in their AB 2588 Combustion Emission Factors document (VC APCD, 2001) for flares.

The Ventura County APCD defined air toxic emission factors by applying the weight fraction of toxics defined for natural gas internal combustion engines (CARB profile 719) to the ROC factor (lb/MMBtu) defined for flares in EPA AP-42. The emission factors applied to the thermal oxidizer and waste gas incinerator were calculated directly from the CARB profile and EPA TOC factor. Note that the factor presented by Ventura County APCD for ethylbenzene is incorrect by two decimal places. The factor for ethylbenzene has been corrected to 0.144 lb/MMscf as approved by the SBC APCD.

PAH emission factors identified by the Ventura County APCD are directly from EPA (EPA-454/R-98-014), Table 4.3.8-1 for Landfill Flares. The VC APCD AB2588 document only provides the sum of the speciated PAH factors presented in the EPA source document, converted using a heating value of 1050 Btu/scf. In order to more accurately reflect risk, ExxonMobil has reported each PAH as speciated by EPA in the single source document in units of lb/MMBtu, applying the heat content of the fuels combusted by the thermal oxidizer and Waste Gas Incinerator, as approved by the SBC APCD.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Table 2 Thermal Oxidizer and Waste Gas Incinerator Devices

Plant Area	Device Name	APCD Device No.	Device ID	Stack ID
SGTP	Waste Gas Incinerator (w/out Merox)	7868	146031	46030
SGTP	WGI - Planned Startup/Shutdown/Maintenance	7869	146032	46030
OTP	Thermal Oxidizer - Purge and Pilot	1088	116011	16010
OTP	Thermal Oxidizer - Planned Continuous (AG, LP)	1088	116012	16010
OTP	Thermal Oxidizer - Planned Other	1088	116013	16010
OTP	Thermal Oxidizer - Unplanned Other	1088	116014	16010

Emissions from the thermal oxidizer are calculated based on the following operating scenarios: Planned Continuous – Acid Gas, Planned Continuous – Low Pressure, Purge & Pilot, Planned – Other, and Unplanned – Other. Annual emissions of each toxic compound will be calculated using the actual annual fuel use data and waste gas reported for 2013 for these operating scenarios. Hourly air toxic emissions are estimated using the rated heat input for the waste gas incinerator and maximum hourly gas flow rate for the thermal oxidizer as reported in the 2013 CVR.

Equation 3 Hourly Maximum Emissions for Thermal Oxidizer

$$E_{i,max} = V_{max,TO} \times EF_i$$

Equation 4 Hourly Maximum Emissions for Waste Gas Incinerator

$$E_{i,max} = V_{max,WGI} \div HHV \times EF_i$$

Equation 5 Average Annual Emissions for Thermal Oxidizer and WGI

$$E_{i,avg} = V \times EF_i$$

Where:

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

V = Total annual Volume of gas combusted [MMscf/year]

$V_{max,TO}$ = Max hourly gas flow rate [MMscf/hour]

$V_{max,WGI}$ = Max hourly heat input rate [MMBtu/hr]

HHV –Higher Heating Value of fuel combusted in WGI [Btu/scf]

EF_i = Emission factor of toxic pollutant, [lb/MMscf]

Internal Combustion Engines

There are five permitted diesel-fired internal combustion engines, two of which power firewater pumps, one floodwater pump, and two emergency backup generators. LFC also operates several permit exempt diesel-fired internal combustion engines throughout the year. The list of permit exempt engines is based on historical operations and is intended to represent future ongoing use of permit exempt engines.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Air toxic emission factors were based on source testing conducted by several different organizations, as reported by Ventura County APCD (VC APCD, 2001) with the exception of diesel particulate matter. Diesel particulate matter emissions from the permitted and permit exempt diesel-fired engines are based on the EPA tier factors determined from the model year and maximum rated brake horsepower for each engine.

For the permitted stationary engines, ExxonMobil applied the maximum recorded hours of operation for each engine from the period 2016 – 2018. For the permit exempt engines, ExxonMobil used calendar year 2015 exempt internal combustion engine activity as the basis of the engine inventory for the Interim Trucking Project. Calendar year 2015 represents a year with the highest level of activity requiring portable engines between calendar year 2011 and 2018. The 2015 inventory of engines has been modified based on the anticipated tier of engines which will be available during the project years, and certain engines have been removed from the inventory based on unique activities that occurred during 2015 that will not occur during the Interim Trucking Period¹. Usage hour estimates were based on operating data collected during 2015.

Emissions from the permit-exempt diesel fired engines will be grouped according to the general location in which they are operated. The engines at Las Flores Canyon will be associated with operations in the Oil Treating Plant (OTP).

Table 3 Internal Combustion Engines

Plant Area	Device Name	Engine Count	APCD Device No.	Device ID	Stack ID
Stationary Engines					
OTP	Firewater Pump A	1	1085	113961	13961
OTP	Firewater Pump B	1	1086	113962	13962
OTP	E/S Diesel Flood Water Pump	1	393540 ²	393540	393540
OTP	Emergency Backup Generator	1	390274	390274	390274
OTP	Emergency Backup Generator	1	390275	390275	390275
Portable, Non-Road Engines					
OTP	Plate Compactors	3	N/A	300110	70101
OTP	Other General Industrial Equipment - Light Tower	13	N/A	300110	70101
OTP	Excavators	1	N/A	300110	70101
OTP	Trenchers	1	N/A	300110	70101
OTP	Pressure Washers	5	N/A	300110	70101
OTP	Air Compressors (<100 hp)	6	N/A	300110	70101
OTP	Air Compressors (100 – 500 hp)	9	N/A	300110	70101
OTP	Cement and Mortar Mixers	1	N/A	300110	70101

¹ Unique engines associated with power cable installation activities that occurred in 2015 have been omitted from the inventory. This project is complete.

² The Diesel Flood Water Pump (previously called the Stang Pump) was replaced on 11/19/19 with a Tier 4 engine (see ATC 15362).

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Plant Area	Device Name	Engine Count	APCD Device No.	Device ID	Stack ID
OTP	Generator Sets (<100 hp)	10	N/A	300110	70101
OTP	Generator Sets (100 – 500 hp)	11	N/A	300110	70101
OTP	Generator Sets (>500 hp)	1	N/A	300110	70101
OTP	Cranes	1	N/A	300110	70101
OTP	Surfacing Equipment	1	N/A	300110	70101
Mobile, Non-Road Engines					
OTP	Aerial Lifts (<100 hp)	5	N/A	300110	70101
OTP	Aerial Lifts (100 – 500 hp)	2	N/A	300110	70101
OTP	Cranes (<100 hp)	1	N/A	300110	70101
OTP	Cranes (100 – 500 hp)	6	N/A	300110	70101
OTP	Cranes (>500 hp)	1	N/A	300110	70101
OTP	Other General Industrial Equipment - Offroad Utility Vehicle	3	N/A	300110	70101
OTP	Excavators	4	N/A	300110	70101
OTP	Forklifts (<100 hp)	3	N/A	300110	70101
OTP	Forklifts (100 – 500 hp)	2	N/A	300110	70101
OTP	Rollers	1	N/A	300110	70101
OTP	Skid Steer Loaders	4	N/A	300110	70101
OTP	Tractors/Loaders/Backhoes	7	N/A	300110	70101
OTP	Trenchers	1	N/A	300110	70101

Annual emissions of diesel particulate matter will be calculated using the rated brake horsepower of each engine, annual hours of operation³, and estimated engine load factors. Engine loads have been estimated based on CalEEMod, Appendix D load factors defined for offroad engines.

Hourly emissions of other air toxics will be calculated based on the brake-specific fuel consumption (BSFC), brake horsepower (BHP), and higher heating value of diesel. Note that hourly emissions estimates will not apply a load factor since the hourly emissions must represent the maximum potential emissions in an hour. The two firewater pump engines which are Tier 0 will be included in the hourly emission estimate.

Equation 6 Hourly Max Emissions for ICE (Diesel PM)

$$E_{i,avg} = (bhp) \times EF_i \div CF2$$

Equation 7 Average Annual Emissions for ICE (Diesel PM)

$$E_{i,avg} = (bhp) \times L \times OH \times EF_i \div CF2$$

³ Annual hours of operation for the permitted emergency generator and firewater pumps engines include emergency use as reported in 2013. Portable, permit exempt engine hours of operation are based on 2015 usage, which represents the highest year of portable engine usage between 2011 – 2018.

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EMISSIONS ESTIMATING TECHNIQUES

Equation 8 Hourly Max Emissions for ICE (Other Air Toxics)

$$E_{i,avg} = (bhp) \times (BSFC) \times EF_i \div HHV \times CF1$$

Equation 9 Average Annual Emissions for ICE (Other Air Toxics)

$$E_{i,avg} = (bhp) \times (BSFC) \times L \times OH \times EF_i \div HHV \times CF1$$

Where:

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

Bhp = Maximum rated brake horsepower

BSFC = Brake Specific Fuel Consumption, [BTU/bhp-hr]

OH = Operating Hours, [Hours/year]

EF_i = Emission factor of toxic pollutant, [g/bhp-hr for Diesel PM, lb/kgal for all other air toxics]

HHV = Higher Heating Value of fuel, [137,000 BTU/gal]

CF1 = Conversion Factor, [kgal/1000 gal]

CF2 = Conversion Factor [453.6g/lb]

L = Actual Engine Load

The higher heating value of the diesel fuel is assumed to be 137,000 Btu/gal. Engines built prior to the EPA Tier standards ("Tier 0") are assumed to be naturally aspirated, with a BSFC of 7,800 Btu/bhp-hr. All other engines are EPA Tier 2, Tier 3 or Tier 4, and are assumed to be turbocharged, with a BSFC of 7,500 Btu/bhp-hr.

Fixed Roof Storage Tanks

LFC has several fixed roof storage tanks operating at the facility: (2) two oil storage tanks, (2) two rerun tanks, (3) three diesel tanks, and (2) two demulsifier tote tanks. Breathing and working losses from the rerun, and diesel tanks are estimated using the equations defined for fixed roof tanks in chapter 7 of US EPA AP-42. Emissions from the oil storage tanks are based on total potential annual throughput based on annual trucking limitations and the possibility of completely filling the tank during the peak year (160 bbl/truck * 70 * 366 + 225,000 BBL). This equates to a throughput peak of 4,324,200 barrels per year. Emissions from the re-run tanks are based on the existing permitted throughput limit of 1,825,000 bbl/year. Emissions from the diesel tanks, and demulsifier tote tanks are based on actual throughput as recorded in 2013.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Table 4 Fixed Roof Storage Tanks

Profile	Process Stream	Plant Location	Service	Device Name	APCD ID	Device ID	Stack ID
LFC-7	Crude	OTP	Liq	Rerun Tank A	6570	214011	14011
				Rerun Tank B	6571	214012	14012
		TT	Liq	Oil Storage Tank A	6566	234011	34011
				Oil Storage Tank B (OOS)	6567	234012	34012
CARB	Diesel	OTP	Liq	FW Pump Diesel Fuel Tanks		113963	13963
		OTP	Liq	Diesel Storage Tank		114160	14160
CARB	Demulsifier	OTP	Liq	Demulsifier Tote Tanks 1 and 2	6583	114021	14021
						114022	14022

Emissions from the rerun and oil storage tanks are controlled through connections to the vapor recovery system. The demulsifier tote tanks are connected to carbon canisters. The diesel tanks vent to atmosphere. Oil Storage Tank B is out of service, and will remain out-of-service throughout the duration of Interim Trucking Operations.

Air toxic emission factors for the rerun tanks and the oil storage tanks were based on samples collected from several streams throughout the process to more accurately describe the emission from various locations. Sampling was conducted in 2013 as part of the ATEIP/R for LFC and POPCO. The stream profile for the crude process stream (LFC-7) was sampled from LFC's treated crude. Air toxic emission factors for the diesel and demulsifier tote tanks are based on the CARB speciation manual, profile number 297 (Crude Oil Evaporation) as currently identified in Part 70/APCD 5651 for tanks.

Hourly and annual emissions of each toxic compound will be calculated for the oil storage tanks using the proposed permitted maximum daily and the possibility of completely filling the tank during the peak year for the Interim Trucking project. For all other tanks the throughput for 2013 was utilized. The Rerun tanks and Oil Storage tanks are connected to vapor recovery. Emissions are assumed to be reduced by 95% on an hourly and daily basis, and up to 99.8% on an annual average. The TVP and temperature of the crude stored has been adjusted based on the anticipated maximum TVP defined for the Interim Trucking Project (2.68 psia at 130 deg F). Emissions are estimated based on USEPA AP-42, Chapter 7 equations consistent with the Part 70/APCD PTO 5651.

Note that potable water treatment at both LFC and POPCO is performed through the use of UV radiation sterilization. Chlorine was used many years ago for water purification but is no longer utilized or stored onsite at the plants.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Wastewater Storage Devices

The produced water treatment system is located in the OTP; and treats the produced water removed from the oil/water emulsion as well as the miscellaneous process wastewater streams. The produced water treatment system include both closed (vented to VR or SRU) and open (fugitive) process devices. The closed portions of the system include an equalization tank, two anaerobic filters, and the vacuum flash tower feed drum. The open portions of the system are in the OTP and include aeration tanks, clarifiers, a skim tank, the outfall batch tank, the waste - transfer unit, and the centrate sump. The waste sludge cake transfer tote bins receive aerobic sludge from the aeration basins via the sludge cake transfer pumps.

Table 5 Produced Water Device Stream Grouping

Profile	Process Stream	Plant Location	Service	Device Name	APCD ID	Device ID	Stack ID
LFC-5	Anaerobic	OTP	Liq	Anaerobic Filter A	N/A	211090	11090
				Anaerobic Filter B	N/A	211190	11190
				Equalization Tank	6573	114240	14240
LFC-6	Aeration	OTP	Liq	Aeration Tank A	N/A	214250	14250
				Aeration Tank B	N/A	214260	14260
				Clarifier A	N/A	214280	14280
				Clarifier B	N/A	214290	14290
				Skim Tank	N/A	214500	14500
				Outfall Batch Tank	N/A	214310	14310
				Centrate Sump	N/A	114430	14430
				Waste Sludge Cake Transfer – Tote Bin A	N/A	113601	13601
				Waste Sludge Cake Transfer – Tote Bin B	N/A	113602	13602
				Waste Sludge Cake Transfer – Tote Bin C	N/A	113603	13603
LFC-1	Emulsion	OTP	Liq	Vacuum Flash Tower Feed Drum	N/A	211380	11380

Air toxic emission factors for these devices are determined using Henry's Law and Raoult's Law. These emission factors are derived from assumed partial pressures associated with the known constituents in the wastewater and Henry's Law constants defined for the individual air toxic pollutants. The air toxics in the produced water were determined through process stream sample data collected in 2013 specified in Table 5 as documented in Exxon – SYU AB2588 ATEIP. The stream profiles used for the anaerobic, aeration, and emulsion process streams were sampled at LFC.

Equation 10 Henry's Law for Produced Water Treatment System

$$p_{i,t} = H_i \times x_i$$

$$M_{i,w} = \frac{p_{i,t}}{p_{w,i}}$$

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Where:

X_i = Mole fraction of substance i in water, [lb-mole/lb-mole]

H_i = Henry's Law constant at temperature t , [atm/lb-mole/lb-mole]

$M_{i,w}$ = Mass ratio for evaporation [lb substance i /lb water]

$p_{i,t}$ = Partial pressure of substance i at temperature t , [mm Hg]

$p_{w,t}$ = Partial pressure of water at temperature t , [mm Hg]

Equation 11 Raoult's Law for Produced Water Treatment System

$$M_{i,w} = C_1 \times \frac{p_{i,t}}{p_{w,i}}$$

Where:

$M_{i,w}$ = Mass ratio for evaporation [lb substance i /lb water]

C_1 = Concentration of substance in water, [fraction]

$p_{i,t}$ = Vapor pressure of substance i at temperature t , [mm Hg]

$p_{w,t}$ = Vapor pressure of water at temperature t , [mm Hg]

Hourly and annual emissions of each toxic compound will be calculated using the permitted surface area of each device, the amount of water processed in a given hour, and the stream speciation data consistent with the CARB/KVB Report (*Emissions Characteristics of Crude Oil Production in California*, January 1983) used in Part 70/APCD PTO 5651.

Equation 12 Hourly Maximum Emissions from Produced Water Treatment System

$$E_{i,max} = N_a \times M \times A \times M_{i,w} \times \left(\frac{1 - CE}{100} \right)$$

Equation 13 Annual Average Emissions from Produced Water Treatment System

$$E_{i,avg} = N_a \times M \times A \times M_{i,w} \times OH \times \left(\frac{1 - CE}{100} \right)$$

Where:

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

N_a = Molar flux of water to air, [lb-mole/hr-ft²]

M = Molecular weight of water, 18 lb/lb-mole

A = Emitting surface area, [ft²]

$M_{i,w}$ = Mass ratio for evaporation of Raoult's Law, [lb substance i /lb water]

OH = Annual operating hours, [hours/year]

CE = Efficiency of emission control device connected to equipment

Equation 14 Diffusivity of Water to Air

$$D_{AB,t} = 3.875 \times D_{AB} \times \left(\frac{T}{273} \right)^{1.75} \times \left(\frac{1}{P} \right)$$

Where:

$D_{AB,t}$ = Diffusivity of water to air at temperature t , ft²/hr

D_{AB} = Diffusivity of water to air at 0°C, 0.220 cm²/sec

T = Temperature, °K

P = Barometric pressure, atm

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Equation 15 Molar Flux of Water to Air

$$N_A = \frac{[D_{AB,t} \times P \times (p_{a1} - p_{a2})]}{[R \times t \times z \times p_{bm}]}$$

Where:

N_a = Molar flux of water to air, [lb-mole/hr-ft²]

p_{a1} = vapor pressure of water at temperature t , atm

$p_{a2} = 0$

R = Gas Constant, 0.730 atm-ft³/lb mole-°R

z = Gas film thickness, ft

t = Temperature, °R

$p_{bm} = [(P - p_{a2}) - (P - p_{a1})] / \ln [(P - p_{a2}) / (P - p_{a1})]$

Acids and Caustics Storage Devices

The devices at LFC containing various acids and caustics include the following:

Table 6 Acids and Caustics Storage Device Process Streams

Plant Area	MSDS	Device Name	APCD Device No.	Device ID	Stack ID
Various	NA	Chemical Storage Tote Tanks	7886	OOS	OOS
SGTP	Sodium Hydroxide, Various Dilutions (20%)	Fresh Caustic Day Tank		244120	44120
OTP	Sodium Hydroxide, Various Dilutions (20%)	Caustic Tank		114380	14380
OTP	Sodium Hydroxide, Various Dilutions (20%)	Waste Caustic Tank ⁴		OOS	OOS
OTP	Sodium Hydroxide, Various Dilutions (20%)	Demineralizer Caustic Tank		114100	14100
OTP	Ansulite 3% (DGME 10%)	Foam Tank		134040	34040
OTP	Hydrochloric Acid, 33-38%	HCL Tanks		114360	14360
OTP	Phosphoric Acid, 70-85%	Phosphoric Acid Tank		114370	14370
TT	Ansulite 3% (DGME 10%)	Foam Tank		134040	34040
CPP	Hydrochloric Acid, 33-38%	Acid Skid		125060	25060
CPP	Sodium Hydroxide, 4% (1N)	Cooling Water System		224060	24060
CPP	Sodium Hydroxide, Various Dilutions (20%)	Caustic Skid		225050	25050
	Sodium Hydroxide, Various Dilutions (20%)	Backwash Sump		114420	14420

The Raoult's Law and vapor diffusion method of estimating emissions of dilute acids and caustics in water solution from liquid surfaces to air provides a conservative emission

⁴ The waste caustic tank has been out of service for several years and will not be used during the Interim Trucking project.

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estimate technique for these substances. See Appendix C for the table of default values used to calculate emissions came from the CRC Handbook of Chemistry and Physics.

Equation 16 Raoult's Law for Dilute Acids and Caustics

$$M_{i,w} = C_1 \times C_2 \times \frac{p_{i,t}}{p_{w,i}}$$

Where:

$M_{i,w}$ = Mass ratio for evaporation [lb substance i/lb water]

C_1 = Concentration of stock in water, [fraction]

C_2 = Concentration of substance in stock (per MSDS), [fraction]

$p_{i,t}$ = Vapor pressure of substance i at temperature t , [mm Hg]

$p_{w,t}$ = Vapor pressure of water at temperature t , [mm Hg]

Air toxic emissions are calculated in a similar manner as the wastewater storage devices described in the previous section) using the concentration of the caustic or acid, along with the vapor pressure of water and the caustic/acid at the given temperature for the device. Speciation data is based on the MSDS sheets for the solutions maintained in each of these tanks.

Hourly and annual emissions of each toxic compound will be calculated using the permitted surface area of each device and the amount of caustic in water solution processed in a given hour (See Equation 12, Equation 13, Equation 14, and Equation 15). Emissions from the Chemical Storage Tote Tanks or the Caustic Tank will not be included because the tanks did not operate during the reporting period.

Steam System

All steam condensate used throughout the plant is returned to the CPP condensate handling system. This system condenses steam to assist in power generation. The system also heats the condensate and make-up water, and reduces the oxygen content of the stream to the requirements of the HRSG. ExxonMobil uses carbohydrazide as the reducing agent. Carbohydrazide is not a listed compound under AB2588 nor does it have a health risk value under OEHHA, as such there are no air toxic emissions to characterize from this system. This section was originally included in the TEIP because hydrazine was previously used as a reducing agent. That material has not been used for well over a decade, and therefore this section is no longer relevant.

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Table 7 Steam System Equipment

Plant Area	MSDS	Device Name	APCD Device No.	Device ID	Stack ID
CPP	TRASAR (Carbohydrazide 5%)	Steam Condensate System		221090	21090
CPP	TRASAR (Carbohydrazide 5%)	Steam Drum		221120	21120
CPP	TRASAR (Carbohydrazide 5%)	Deaerator		121110	21110
CPP	TRASAR (Carbohydrazide 5%)	Steam System Chemical Injection System		225020	25020

The deaerator (121110) is used to remove dissolved oxygen, carbon dioxide and other gases present in the demineralized makeup water and hot steam condensate through mechanical separation. Oxygen removal is enhanced through the use of the oxygen scavenger (carbohydrazide) added to chemically reduce the dissolved oxygen concentration. Carbohydrazide is stored in the steam chemical injection system (225020). As previously stated, carbohydrazide is not considered an air toxic under AB2588 nor does it have a health risk value under OEHHA.

Sumps and Separators

The sumps and separators operating at LFC include the following:

Table 8 Sumps and Separators Process Stream Grouping

Profile	Process Stream	Plant Location	Service	Device Name	APCD ID	Device ID	Stack ID
POP-8	Sump	SGTP	Liq	Area Drain Oil/Water Separator	6578	144060	44060
				Area Drain Sump	6582	244050	44050
				Open Drain Sump	6579	144070	44070
LFC-1	Emulsion	OTP	Liq	Backwash Collection Tank	7885	214210	14210
MSDS	NaOH (20%)	OTP	Liq	Backwash Sump	6575	114420	14420
LFC-7	Crude	OTP	Liq	Area Drain Sump	6581	214140	14140
				Open Drain Sump	6576	114130	14130
				Area Drain Oil/Water Separator	6577	114150	14150
		TT	Liq	Area Drain Oil/Water Separator	6572	134020	34020
NA	NA	CPP		Area Drain Sump	6580	234030	34030
NA	NA	CPP		Chemical Sump		NA	NA
CARB 297	Crude Oil Evaporation	OTP		Oily Sludge Thickener	6574	114230	14230

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Emissions from these devices are estimated using CARB/KVB method which is dependent upon the surface area of the sump or separator, the type of material being processed through the device (heavy crude), as well as the service (1°, 2°, or 3°). Note that all sumps and separators identified in Table 8 are assumed to be in tertiary, heavy oil service (3°). Air toxic emission factors for these devices were based on samples collected from several streams throughout the process to more accurately describe the emission from various locations as identified in Table 8. Sampling was conducted in 2013 as part of the 2014 ATEIR for LFC and POPCO. The profile used for the sump process stream was sampled at POPCO. The profiles for the emulsion, and crude process streams were specifically sampled at LFC. The results of this sampling are found in Appendix A.

The chemical sump is a part of the Demineralized Water System and was identified in the previous ATEIP/ATEIR, as being a non-emitting piece of equipment. The activities associated with this device and system remains unchanged; therefore, this device will not be included in this emissions evaluation. The oily sludge thickener emissions have been calculated using the CARB speciation manual, profile number 297 (Crude Oil Evaporation), as defined in Part 70/APCD PTO 5651. The backwash sump receives the waste caustic material which was previously diverted to the waste caustic tank (1455⁵). As a result, the emissions associated with the backwash sump will include a 20% sodium hydroxide solution and will be calculated according to the methods described for acids and caustics storage.

Hourly and annual emissions of each toxic compound will be calculated using the permitted surface area of each device.

Equation 17 CARB/KVB Equation for Sumps and Separators

$$E_{i,avg} = \left(\frac{EF \times SA}{24} \right) \times (1 - CE) \times OH \times Wt_i$$

$$E_{i,max} = \left(\frac{EF \times SA}{24} \right) \times (1 - CE) \times Wt_i$$

Where:

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

EF = ROC emission factor, [lb/ft²-day]

SA = Unit surface area, [ft²]

CE = Control Efficiency

OH = Annual operating hours, [hours/year]

Wt_i = Weight fraction of toxic species i , [fraction]

Compressor Vent

LFC operates three SOV compressors and two vapor recovery (VR) compressors in the OTP, each equipped with dual sealing systems which are connected to vapor recovery via the

⁵ The Waste Caustic Tank has been out of service for several years, and currently remains out of service. As such, it will not be included in the model.

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distance piece of each compressor. The emissions from the back end of each distance piece are routed through a common vent system, and directed to a carbon canister system. TOC emissions will be calculated using the ROC emission factor defined in Part 70/APCD PTO 5651 which was established based on past source test data collected at the outlet of the vents and applying the ROC/TOC factor from the CARB Speciation Manual, #757, to convert to TOC.

Table 9 Compressor Vents

Profile	Plant Area	Device Name	APCD Device No.	Device ID	Stack ID
CARB 757	OTP	SOV Distance Piece Vent – Compressor A	7881	113011	13010
CARB 757	OTP	SOV Distance Piece Vent – Compressor B	7881	113012	13010
CARB 757	OTP	SOV Distance Piece Vent – Compressor C	7881	113013	13010
CARB 757	OTP	VRU Distance Piece Vent – Compressor A	7882	113020	13020
CARB 757	OTP	VRU Distance Piece Vent – Compressor B	7882	113030	13020

Profile Number 757 from the CARB Speciation Manual was used to determine air toxic emissions from each compressor vent as specified in the current Part 70/APCD PTO 5651.

Equation 18 Max Hourly and Annual Average Emissions from Compressor Vents

$$E_{i,avg} = (EF) \times \left(\frac{TOC}{ROC} \right) \times OH \times Wt_i$$

$$E_{i,max} = (EF) \times \left(\frac{TOC}{ROC} \right) \times Wt_i$$

Where:

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

EF = ROC emission factor, [lb/hr]

TOC/ROC = CARB Speciation Profile #757 conversion to TOC

OH = Annual operating hours, [hours/year]

Wt_i = Weight fraction of toxic species i , [fraction]

Pigging Equipment

LFC operates one oil emulsion pig receiver at the Transportation Terminal. TOC emissions will be calculated using the ROC emission factor and applying the ROC/TOC fraction defined in Part 70/APCD PTO 5651, and 2013 pigging event data.

Table 10 Pigging Equipment

Profile	Plant Area	Device Name	APCD Device No.	Device ID	Stack ID
CARB 757	TT	Oil Emulsion Pig Receiver	6565	137100	37100

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Equation 19 Density of Vapor at Actual Conditions

$$\rho = \frac{P \times MW}{R \times T} = \frac{(14.7 + 1) \times 19.3}{10.73 \times 560} = 0.0504 \left[\frac{lb}{ft^3} \right]$$

Where:

- ρ = Density of vapor remaining in vessel, lb ROC/ft³
- P = Remaining vessel pressure, psig
- MW = 19.3 lb/lb-mol
- T = Temperature in Rankine, 100°F
- R = 10.73 ft³/psi*R*lb-mol

Equation 20 TOC Emission Factor

$$EF = V * \rho$$

$$EF = 78.5 \left[ft^3 \right] * 0.0504 \left[\frac{lb}{ft^3} \right]$$

$$EF = 3.956 \left[lb - TOC / event \right]$$

Where:

- EF = lb TOC/pigging event
- V = Volume of vessel, ft³
- ρ = Density of vapor remaining in vessel, lb ROC/ft³

Air toxic emissions were determined using the TOC emission factor calculated from equations Equation 19 and Equation 20 above.

Equation 19 is described in section 4 of Part 70/APCD PTO 5651 for pigging events. The pig receiver is purged with sweet fuel gas prior to opening, as such the emitting stream consists primarily of gas vapors. CARB speciation profile #757 – Oil & Gas Production Fugitives – Gas Service, is used to calculate the air toxic emissions as described in the current permit.

Fugitive Components

LFC maintains fugitive components consisting of valves, connections, compressor seals, and pump seals in both gas and oil service. These components have been grouped according to the location of the facility they are found (Stripping Gas Treating Plant, Oil Treating Plant, Cogeneration Power Plant, and Transportation Terminal), the service code identified for the components, and whether they are in gas or oil service. Each P&ID was reviewed to identify an appropriate stream profile for each gas and liquid service components prior to grouping the components by plant area. The stream profiles were chosen based on the type of equipment and the processes occurring (service code) within the P&ID.

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TOC emissions have been calculated using the component leakpath (clp) emission factors defined in Part 70/APCD PTO 5651. Air toxic emissions are calculated using the stream data collected in 2013. The most appropriate gas and liquid stream for each P&ID and service code were chosen based on the type of equipment and processes occurring in the P&ID.

The tables which group the fugitive components by P&ID are fairly extensive and were included as an appendix to the AB2588 ATEIP.

Pipeline quality fuel gas will be used to provide makeup gas for the vapors drawn off the trucks during loading. Pipeline quality fuel gas is very low in hydrogen sulfide and other air toxics. As a conservative assumption, the emission calculations assume that components in gas service will be based on the maximum calculated weight fractions noted in LFC-2 (Sour Gas/VRS) and LFC-3 (Fuel Gas) streams in order to account for potential H₂S and other toxics. For components in liquid service, fugitive emissions are assumed to be the same as crude oil.

Maintenance - Welding

LFC and POPCO conduct welding operations on an as needed basis to ensure equipment is maintained in good working order without cracks or stress points that might cause the equipment to fail. As part of this plan update ExxonMobil has identified the specific type of welding operations that occur, noted in the table below.

Table 11 Welding Operations

Profile	Plant Area	Device Name	APCD Device No.	Device ID	Stack ID
SDAPCD E7018	OTP - Shop	Shielded Metal Arc (SMAW)	NA	318021	18020
SDAPCD ER706-6	OTP - Shop	Tungsten Inert Gas Arc (TIG) Welding	NA	318022	18020

The equations for estimating emissions from Shielded Metal Arc Welding (SMAW) and Tungsten Inert Gas Arc (TIG) Welding come from San Diego County APCD and EPA. For trace metals without an AP-42 listed emissions factor (AP-42 Section 12.19), the factors identified by San Diego APCD were used. Electrode specific emission factors for SMAW assume the use of E7018 rods, and ER 70S-6 rods are assumed for TIG welding. No additional control efficiency has been applied to the emission estimates.

Hourly emissions assume the use of 1 lb rod per hour as a maximum, worst case operating scenario. Annual emissions are based on actual rod usage for 2013 (60 lb of Rod E7018 for SMAW welding and 10 lb of ER70S-6 for TIG welding).

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Equation 21 Max Hourly and Annual Average Emissions from Welding – with AP-42 Factor

$$E_a = (EF) \times U_a \times (1 - e)$$

$$E_h = (EF) \times U_h \times (1 - e)$$

Where:

Ea = Annual emissions of each listed toxic air contaminant per device, (lbs/year)

Ua = Annual usage of each welding rod, (lbs/year)

EF = Listed substance emission factor from AP-42, (lbs listed substance/lb rod consumed)

Equation 22 Max Hourly and Annual Average Emissions from Welding – without AP-42 Factor

$$E_a = (EF) \times U_a \times \left(\frac{\text{Fume generate rate lbs fume}}{\text{lb rod}} \right) \times (\text{NASSCO Fume Correction Factor}) \\ \times SD \times C_i$$

$$E_h = (EF) \times U_h \times \left(\frac{\text{Fume generate rate lbs fume}}{\text{lb rod}} \right) \times (\text{NASSCO Fume Correction Factor}) \\ \times SD \times C_i$$

Where:

Ea = Annual emissions of each listed toxic air contaminant per device, (lbs/year)

Ua = Annual usage of each welding rod, (lbs/year)

FGR = Fume Generation Rate (lb fume/lb rod)

FCF = Fume Correction Factor

SD = San Diego APCD adjustment factor specific to chromium pollutants*

C_i = Concentration of listed substance in each welding rod, (lbs substance/lb metal)

e = Control equipment PM₁₀ collection and removal efficiency

*For SDAPCD welding profiles which include chromium, the SDAPCD defines a specific fraction of the total chromium which is assumed to be hexavalent, and a fraction that is non-hexavalent. These fractions are included in the determination of air toxic emissions as applied in the “SD” term noted in Equation 22 above.

Maintenance – Abrasive Blasting

LFC and POPCO conduct dry abrasive blasting using CARB-certified sands in preparation for surface coating the equipment. This process emits particulates coming from the base material to be blasted, from the prior surface coating being removed, as well as from the abrasive blasting material. Actual air contaminants released depend on the specific abrasive blasting activity, but will include metals and silica.

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Table 12 Abrasive Blasting

Plant Area	Device Name	APCD Device No.	Device ID	Stack ID
CPP	Abrasive Blasting	NA	370211	60211
OTP	Abrasive Blasting	NA	370111	60111
SGTP	Abrasive Blasting	NA	370411	60411
TT	Abrasive Blasting	NA	370311	60311
POPCO	Abrasive Blasting	NA	370511	60511

The equations for estimating emissions from abrasive blasting come from Bay Area AQMD Permit Handbook and EPA AP-42 Ch. 13.2.6. Emissions are estimated based on the quantity, type, and the flow rate of the abrasive used. EPA defines the abrasive flow rate (lb/hr) as a function of nozzle diameter and nozzle pressure, specific to the use of sand abrasives. The sand flow rate is converted to the flow rate specific to the type of abrasive used by applying the density of the specific abrasive to that of sand as follows:

Equation 23 Determination of Flow Rate of Abrasive Material Through Nozzle

$$m_a = m_s \times \frac{(D_a)^2}{(D_s)^2} \times \frac{\rho_a}{\rho_s}$$

Where:

M_a = Mass flow rate (lb/hr) of abrasive with nozzle internal diameter D_a

M_s = Mass flow rate (lb/hr) of sand with nozzle internal diameter D_s from Table 2-2 of AP-42, Section 13.2.6 Support Document

D_a = Actual nozzle internal diameter (in)

D_s = Nozzle internal diameter (in) from Table 2-2

P_s = Bulk density of sand (99 lb/ft³)

P_a = Bulk density of abrasive (lb/ft³)

The mass flow rate of the abrasive used at the facility as calculated by Equation 4-23 is used as the basis for determining the maximum hourly emissions.

The amount of particulate matter emitted (lb PM/lb abrasive) as a result of the abrasive blasting operations is also a function of the type of abrasive material used. EPA AP-42 only defines PM emission rates based on the use of sand, as such data available from the San Joaquin Valley APCD and San Diego APCD were reviewed to identify emission rates appropriate to the specific abrasive used.

Air toxic emissions are a function of the particulate matter emissions and the composition of the abrasive material used. The California Air Toxics Emission Factors (CATEF) database was queried to identify emission factors for common particulate metals emitted during abrasive blasting operations. The CATEF air toxic speciation data for abrasive blasting materials is not specific to the type of abrasive material in use, as such the data available from the San Joaquin

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Valley APCD and Advanced Technology Institute, was used to specify the air toxics for the specific blasting material used⁶. No additional control efficiency is applied to the emission estimates.

Equation 24 Max Hourly and Annual Average Emissions from Abrasive Blasting

$$E_a = (EF) \times U_a \times WF \times (1 - A/100)$$

$$E_h = (EF) \times U_h \times WF \times (1 - A/100)$$

Where:

Ea = Annual emissions of particulate metal, (lbs/year)

Eh = Maximum hourly emissions of particulate metal, (lbs/hour)

Ua = Annual usage of blasting material (lbs/year)

Uh = Maximum hourly usage of blasting material, (lbs/hour)

EF = PM emission factor, (lb PM/ lb Abrasive)

WF = Weight Fraction of listed substance in Abrasive

A = Abatement Efficiency (%)

Solvent Use

LFC and POPCO use solvents for a variety of purposes throughout each facility. Solvents are used for parts cleaning/degreasing, surface wiping cleaning, lab analysis, and paint thinning. Solvent use is conducted in the maintenance shop, the QC lab, and at the actual location of the equipment being maintained.

Table 13 Solvent Use Sources

Plant Area	Device Name	APCD Device No.	Device ID	Stack ID
OTP	Painting & Coating		370112	60111-8
CPP	Painting & Coating		370212	60211-3
TT	Painting & Coating		370312	60311
SGTP	Painting & Coating		370412	60411-2
POPCO	Painting & Coating		370512	60511-3
QC Lab	Lab Analysis		111990	11990
Maintenance Shop	Parts Cleaning		318023	18020
OTP	Process Solvent Loss		390120	60121-8
CPP	Process Solvent Loss		390220	60221-3
TT	Process Solvent Loss		390320	60321
SGTP	Process Solvent Loss		390420	60421-2
POPCO	Process Solvent Loss		390520	60521-3

⁶ POPCO used KleenBlast in 2013 which is a copper slag based material. Emission factors for copper slag were used from Table 5 of Residual Risk from Abrasive Blasting Emissions, as approved by San Joaquin Valley APCD. http://www.nsrp.org/3-RA-Panel_Final_Reports/2005_Residual_Risk_%20Blasting%20Emissions_Final_Report.pdf

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Emissions are estimated based on the type of solvent used, the VOC content and density of the solvent, solvent recovery method, and amount used each year, consistent with existing reporting requirements under Part 70/APCD PTO 5651. Annual emissions are determined from the sum of each type of paint or solvent used during the year. Maximum hourly emissions are estimated based on the maximum daily solvent use, by type of solvent, where the maximum daily is assumed to equal the maximum hourly emissions.

The specific location of paint usage is not required to be reported, as such the hourly and annual emissions at LFC have been evenly divided among the four plant areas (CPP, OTP, SGTP, and TT).

The following emission calculation methods are used depending type of solvent use as approved under LFC's Solvent Reclamation Plan:

Type of Solvent Use	Recovery Method	Control Efficiency	Calculation Method
Parts Cleaning w/Exempt Cleaners and Equipment	Open Drain	75%	A
	Closed Container	90%	A
Parts Cleaners/Degreasers w/Remote Solvent Reservoir	Open Drain	75%	A
	Closed Container	90%	A
Wipe Cleaning	Open Drain or Closed Container	0%	B
Lab Analysis	Open Drain	75%	C
	Closed Container	90%	C
Spray Painting	Closed Container	90%	D
Brush Painting	Closed Container	90%	D

Equation 25 Emission Calculation Method for Parts Cleaning – Method A

$$E_A = [\{V_d - (V_r \times 0.97)\} + \{V_r \times 0.97 \times (1 - RE)\}] \times VOC\ Content$$

Equation 26 Emission Calculation Method for Wipe Cleaning – Method B

$$E_B = V_d \times VOC\ Content$$

Equation 27 Emission Calculation Method for Lab Analysis – Method C

$$E_C = [\{V_d \times (1 - 0.95)\} + \{(V_d \times 0.95) \times (1 - RE)\}] \times VOC\ Content$$

Equation 28 Emission Calculation Method for Painting – Method D

$$E_D = [\{V_d - V_r\} + \{V_r \times (1 - RE)\}] \times VOC\ Content$$

Where:

V_d = Volume of solvent dispensed

V_r = Volume of solvent recovered

RE = Recovery Efficiency

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Sulfur Loading

The Sulfur Recovery Unit (SRU), consisting of a Claus Unit and a Tail Gas Cleanup Unit, followed by a Waste Gas Incinerator, is designed to recover 99.9% of the sulfur in the inlet gas under full load conditions and produce a specification sulfur product for sale. The recovered molten sulfur is stored in a sulfur tank at the SGTP and periodically pumped into sulfur trucks.

Table 14 Sulfur Loading Sources

Device Name	APCD Device No.	Operator ID	Device ID	Stack ID
Sulfur Loading	NA	Xx	150161	50161

The air toxic emission factor for hydrogen sulfide during loading operations is based on source testing completed in September 1990 during actual sulfur loading at the POPCO truck loading station. The results of the source test estimated hydrogen sulfide emissions at 0.0015 lb/minute based on the following assumptions:

- Sulfur loading rate of ~1670 lb S/minute
- Air flow rate = 245 scfm
- Hydrogen Sulfide concentration = 69 ppmv

Annual emissions are based on total reported sulfur loaded in 2013. The maximum hourly emissions are calculated based on the day with the highest amount of sulfur loaded in 2013 (50,540 lbs sulfur). Based on the assumed loading rate, this event took ~30.26 minutes to complete.

Crude Loading

The Interim Trucking project will include the operation of a truck rack at the transportation terminal (TT) to facilitate the transfer of crude oil offsite for further refining.

Table 15 Crude Loading Sources

Device Name	APCD Device No.	Operator ID	Device ID	Stack ID
Crude Loading Truck Rack	NA	NA	234045	234045

The emissions from the truck loading and vapor transfer operation will be controlled by the use of low-leak components and, utilizing transport trucks that have successfully passed the NSPS-level annual leak tests per NSPS Subpart XX, as well as capturing the truck vapors generated during loading operations and transfer to facility's existing vapor recovery system.

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The max hourly ROC emissions are based on a maximum loading rate of eight trucks per hour, each truck holding 160 bbl which equates to 1,280 bbl/hr. The annual emissions assume the max daily rate of 70 trucks per day for 365 days. The TVP of the crude loaded is assumed to be 2.68 psia⁷ at 130 deg F.

Air toxic emissions from the crude loading operations apply the calculated TOC factor (lb/hr) to the stream data collected in 2013. The maximum concentrations from LFC-2 (Sour Gas) and LFC-7 (Stabilized Crude) stream data were applied as a conservative estimate of air toxic emissions from the crude loading operations.

Crude Transport

The Interim Trucking project will include crude trucks used to transport produced crude offsite for further refining.

Table 16 Crude Transport Sources

Device Name	APCD Device No.	Operator ID	Device ID	Stack ID
Travel Within Facility Boundary - Local Road	NA	NA	234046	234046
Travel 1,000 ft from Facility Boundary - Local Road	NA	NA	234047	234047

The emissions from the crude transport are evaluated within the LFC facility boundary, and 1,000 ft from the facility boundary. The max hourly emissions assume eight trucks leave the facility per hour. Over the course of a year 25,550 trucks will leave the facility (based on a maximum of 70 trucks per day each day). The criteria pollutant emissions (VOC and PM) used for air toxic speciation were developed based on EMFAC 2017 criteria pollutant emission factors for T7 Tractor engines operated in Santa Barbara County.

Air toxic emissions are calculated using the air toxic fractions for VOCs, PAHs (in terms of PAH/VOC and PAH/PM_{2.5}), and metals as described in EPA MOVES2014. Emissions factors are specified for diesel engine exhaust assuming model year 2007 and later engines (Air Toxic Emissions from On-Road Vehicles in MOVES2014, Section 4, EPA-420-R-16-016).

Mobile Source Equipment

The Interim Trucking project will include various delivery vehicles as well as employee transport.

⁷ In February of 2014 ExxonMobil conducted analysis of the crude oil, with a reported TVP of 1.34 psia. ExxonMobil has applied a contingency factor of 100% to the TVP of the crude due to the potential variability of the crude vapor pressure, and to insure a conservative estimate of emissions from the loading operations.

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Table 17 Mobile Source Equipment

Device Name	APCD Device No.	Operator ID	Device ID	Stack ID
Onsite Delivery Truck Transport	NA	NA	234048	234048
Offsite Delivery Truck Transport	NA	NA	234049	234049
Employee Onsite Transport	NA	NA	234050	234050
Employee Offsite Transport	NA	NA	234051	234051
Truck (T7) Onsite Transport	NA	NA	234052	234052
Truck (T7) Offsite Transport	NA	NA	234053	234053

The emissions from the various delivery vehicles and employee transport are evaluated within the LFC facility boundary, and 1,000 ft from the facility boundary. The max hourly emissions assume one of each vehicle type leaves the facility per hour. Over the course of a year, delivery vehicles and employees are assumed to come and go every day. The number of vehicles trips defined in the Final EIR has been applied to these calculations.

The criteria pollutant emissions (VOC and PM) used for air toxic speciation were developed based on EMFAC 2017 criteria pollutant emission factors for each vehicle category as applied in the Final EIR. Delivery Trucks apply the Medium Duty Vehicle (MDV, diesel) EMFAC category for 2015 in Santa Barbara County. Employee vehicles apply the Light Duty Vehicle (LDA, gasoline) EMFAC category for 2015 in Santa Barbara County. Truck (T7) vehicles apply the Tractor T7 (diesel) EMFAC category for 2015 in Santa Barbara County.

Air toxic emissions for diesel trucks (MDV and Tractor T7) are calculated using the air toxic fractions for VOCs, PAHs (in terms of PAH/VOC and PAH/PM_{2.5}), and metals as described in EPA MOVES2014. Emissions factors are specified for diesel engine exhaust assuming model year 2007 and later engines (Air Toxic Emissions from On-Road Vehicles in MOVES2014, Section 4, EPA-420-R-16-016).

Air toxic emissions for the gasoline vehicles (LDA) are calculated using the air toxic fractions for VOCs, PAHs (in terms of PAH/VOC and PAH/PM_{2.5}), and metals as described in EPA MOVES2014 for gasoline vehicles, assuming an ethanol content of 10%, as specified for California based fuels.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

POPCO Gas Plant

External Combustion Equipment

The external combustion equipment at POPCO includes two utility boilers (B-801 A and B-801 B), the Sulfinol TEG reboiler, the GPU TEG glycol reboiler, and the forced air furnace. Air toxic emissions for these units are estimated using emission factors developed by source tests completed by the California Air Resources Board (CARB), as reported by the Ventura County APCD (VC APCD, 2001).

The utility boilers combust plant fuel gas as well as Stretford tailgas resulting from the three-stage sulfur recovery unit. The VC APCD natural gas-based emission factors have been modified from natural gas factors assuming the tailgas has an average higher heating value of 25 Btu/scf as specified in the current Part 70/APCD PTO 8092.

The forced air furnace is currently out of service, as such it will not be included in the Interim trucking project risk assessment.

Table 18 External Combustion Equipment

Device Name	APCD Device No.	Device ID	Stack ID
Boiler A – Plant Fuel Gas	2350	150021	50020
Boiler A – Tailgas Incineration		150022	50020
Boiler B – Plant Fuel Gas	2351	150031	50030
Boiler B – Tailgas Incineration		150032	50030
Forced Air Furnace ⁸	8792	OOS	OOS
GPU TEG Glycol Reboiler	2353	150050	50050
Sulfinol TEG Reboiler	2352	150040	50040

Hourly and annual emissions of each toxic compound will be calculated using the rated heat input of each device and the actual annual fuel use data reported for 2013, respectively.

Hourly air toxic emissions associated with the Sulfur Recovery Unit Stretford tailgas incineration in the boilers are calculated assuming there is approximately 5.62 MMBtu/hr additional heat released to the boilers from the Stretford tailgas. Annual air toxic emissions associated with the SRU are calculated using the actual annual tailgas fuel use data reported for 2013.

Equation 29 Maximum Hourly Emissions from External Combustion Equipment

$$E_{i,max} = MFR \div HHV \times CF_1 \div CF_2 \times EF_i$$

⁸ The forced air furnace is located within the POPCO administration offices. This office has not been occupied for many years. The furnace will not be used during Interim Trucking

APPENDIX I

EMISSIONS ESTIMATING TECHNIQUES

Equation 30 Average Annual Emissions from External Combustion Equipment

$$E_{i,avg} = AF \times EF_i$$

Where:

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

MFR = Maximum firing rate, [MMBtu/hr]

AF = Annual Fuel Use, [MMscf/year]

HHV = Higher Heating Value, [Btu/scf]

CF_1 = Conversion Factor, 10^6 Btu/MMBtu

CF_2 = Conversion Factor, 10^6 scf/MMscf

EF_i = Toxic emission factor, [lb/MMscf]

Sulfur Loading

Table 19 Sulfur Loading Equipment

Device Name	APCD Device No.	Operator ID	Device ID	Stack ID
Sulfur Loading	105182	P-A403 A/B	150160	50160
Sulfur Pit	105178	SP-A401	NA	NA

Acid gas from the amine unit is processed in three stages in the SRU. The third stage of the unit takes the H₂S enriched tailgas through a Stretford process where the H₂S is absorbed in a two-stage contactor system. Once the H₂S has been absorbed, it is converted to elemental sulfur, which is then skimmed from the Stretford solution and sent to a filter press to remove residual Stretford solution prior to being shipped offsite via trucks.

The sulfur shipped offsite is maintained in the sulfur pit (SP-A401) prior to shipment. Emissions from the pit are routed through a vent to the Evaporative Cooler where the H₂S is scrubbed with Stretford solution prior to release to the atmosphere (See Appendix B). Emissions associated with the sulfur pit are accounted for at the Evaporative Cooler.

The air toxic emission factor for hydrogen sulfide during loading operations is based on source testing completed in September 1990 during actual sulfur loading at the POPCO truck loading station. The results of the source test estimated hydrogen sulfide emissions at 0.0015 lb/minute based on the following assumptions:

- Sulfur loading rate of ~1670 lb Sulfur/minute
- Air flow rate = 245 scfm
- Hydrogen Sulfide concentration = 69 ppmv

APPENDIX I

EMISSIONS ESTIMATING TECHNIQUES

Annual emissions are based on total reported sulfur loaded in 2013. The maximum hourly emissions are calculated based on the day with the highest amount of sulfur loaded in 2013 (50,540 lbs). Based on the assumed loading rate, this event took ~30.26 minutes to complete. As during normal operation during Interim Trucking only LFC or POPCO will load sulfur during any one hour period.

Internal Combustion Engines

There are four permitted diesel-fired internal combustion engine, two of which are permitted to power firewater pumps, one for emergency power, and one to generate power for an emergency air compressor. POPCO also operates several permit exempt diesel-fired internal combustion engines throughout the year. The list of permit exempt engines is based on historical operations and is intended to represent future ongoing use of permit exempt engines.

Air toxic emission factors were based on source testing conducted by several different organizations, as reported by Ventura County APCD (VC APCD, 2001) with the exception of diesel particulate matter. Diesel particulate matter emissions from the permitted and permit exempt diesel-fired engines are based on the EPA tier factors determined from the model year and maximum rated brake horsepower for each engine.

Emissions from the permit-exempt diesel fired engines will be grouped according to the general location in which they are operated. The engines at POPCO will be associated with operations near the facility perimeter, by the office parking lot.

For the permitted stationary engines, ExxonMobil applied the maximum recorded hours of operation for each engine from the period 2016 – 2018. For the permit exempt engines, ExxonMobil used calendar year 2015 exempt internal combustion engine activity as the basis of the engine inventory for the Interim Trucking Project. Calendar year 2015 represents a year with the highest level of activity requiring portable engines between calendar year 2011 and 2018. The 2015 inventory of engines has been modified based on the anticipated tier of engines which will be available during the project years, and certain engines have been removed from the inventory based on unique activities that occurred during 2015 that will not occur during the Interim Trucking Period⁹. Usage hour estimates were based on operating data collected during 2015.

⁹ Unique engines associated with power cable installation activities that occurred in 2015 have been omitted from the inventory. This project is complete.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Table 20 Internal Combustion Engines

Plant Area	Device Name	Engine Count	APCD Device No.	Device ID	Stack ID
Stationary Engines					
POPCO	Emergency Air Generator	1	10514	150090	50090
POPCO	Emergency Backup Generator	1	390276	390276	390276
POPCO	Firewater Pump (805)	1	2359	150070	50070
POPCO	Firewater Pump (806)	1	2356	150080	50080
Portable, Non-Road Engines					
POPCO	Generator Sets (< 100 hp)	1	NA	300510	70501
POPCO	Generator Sets (100 – 500 hp)	2	NA	300510	70501
POPCO	Air Compressors	1	NA	300510	70501
POPCO	Other General Industrial Equipment - Light Tower	4	NA	300510	70501
POPCO	Pressure Washers	4	NA	300510	70501
Mobile, Non-Road Engines					
POPCO	Cranes (100-500 hp)	1	NA	300510	70501
POPCO	Forklifts (<100 hp)	1	NA	300510	70501

Annual emissions of diesel particulate matter will be calculated using the rated brake horsepower of each engine, annual hours of operation¹⁰, and estimated engine load factors. Engine loads have been estimated based on CalEEMod, Appendix D load factors defined for offroad engines.

Hourly emissions of other air toxics will be calculated based on the brake-specific fuel consumption (BSFC), brake horsepower (BHP), and higher heating value of diesel. Note that hourly emissions estimates will not apply a load factor since the hourly emissions must represent the maximum potential emissions in an hour. The two firewater pump engines and emergency air generator which are Tier 0 will be included in the hourly emission estimate.

Equation 31 Hourly Max Emissions for ICE (Diesel PM)

$$E_{i,avg} = (bhp) \times EF_i \div CF2$$

Equation 32 Average Annual Emissions for ICE (Diesel PM)

$$E_{i,avg} = (bhp) \times L \times OH \times EF_i \div CF2$$

Equation 33 Hourly Max Emissions for ICE (Other Air Toxics)

$$E_{i,avg} = (bhp) \times (BSFC) \times EF_i \div HHV \times CF1$$

¹⁰ Annual hours of operation for the permitted emergency generator and firewater pumps engines include emergency use as reported in 2013. Portable, permit exempt engine hours of operation are based on 2015 usage, which represents the highest year of portable engine usage between 2011 – 2018.

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EMISSIONS ESTIMATING TECHNIQUES

Equation 34 Average Annual Emissions for ICE (Other Air Toxics)

$$E_{i,avg} = (bhp) \times (BSFC) \times L \times OH \times EF_i \div HHV \times CF1$$

Where:

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

Bhp = Maximum rated brake horsepower

BSFC = Brake Specific Fuel Consumption, [BTU/bhp-hr]

OH = Operating Hours, [Hours/year]

EF_i = Emission factor of toxic pollutant, [g/bhp-hr for Diesel PM, lb/kgal for all other air toxics]

HHV = Higher Heating Value of fuel, [137,000 BTU/gal]

CF1 = Conversion Factor, [kgal/1000 gal]

CF2 = Conversion Factor [453.6g/lb]

L = Actual Engine Load

The higher heating value of the diesel fuel is assumed to be 137,000 Btu/gal. Engines built prior to the EPA Tier standards ("Tier 0") are assumed to be naturally aspirated, with a BSFC of 7,800 Btu/bhp-hr. All other engines are EPA Tier 2, Tier 3 or Tier 4, and are assumed to be turbocharged, with a BSFC of 7,500 Btu/bhp-hr.

Thermal Oxidizer

This category includes the John Zink thermal oxidizer operated at the POPCO Gas Plant. Table 21 lists all flaring categories permitted under Part 70/APCD PTO 8092 as well as ATC/PTO 12020. The Unplanned Other – SRU Failure and Unplanned Other – Worst Case Emergency categories have not been included in the air toxic emission calculations or modeling since no actual emissions have occurred for the reporting year.

Air toxic emission factors were developed by applying the CARB speciation profiles to the total organic carbon (TOC) emission factor for flares from US EPA AP-42; as provided by Ventura County APCD in their AB 2588 Combustion Emission Factors (VC APCD, 2001).

The Ventura County APCD defined air toxic emission factors by applying the weight fraction of toxics defined for natural gas internal combustion engines (CARB profile 719) to the ROC factor (lb/MMBtu) defined for flares in EPA AP-42. The emission factors applied to the thermal oxidizer were calculated directly from the CARB profile and EPA TOC factor. Note that the factor presented by Ventura County APCD for ethylbenzene has been corrected to 0.144 lb/MMscf, as approved by the SBC APCD.

PAH emission factors identified by the Ventura County APCD are directly from EPA (EPA-454/R-98-014), Table 4.3.8-1 for Landfill Flares. The VC APCD AB2588 document only provides the sum of the speciated PAH factors presented in the EPA source document, converted using a heating value of 1050 Btu/scf. In order to more accurately reflect risk, ExxonMobil has reported each PAH as speciated by EPA in the single source document in units of lb/MMBtu, applying the heat content of the fuel combusted by the thermal oxidizer, as approved by the SBC APCD.

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Table 21 Thermal Oxidizer Equipment

Device Name	APCD Device No.	Device ID	Stack ID
Purge and Pilot	102614	150011	50010
Planned Continuous Flaring	107202	150012	50010
Planned Other (SU, Maintenance, TG Incin)	102616	150013	50010
Unplanned Other (Miscellaneous, SRU Failure)	108095	150014	50010
Unplanned Other – Worst Case Emergency	102617	NA	NA

Hourly and annual emissions of each toxic compound will be calculated using the rated heat input for each flaring category and actual annual fuel use data reported for 2013, respectively.

Equation 35 Maximum Hourly Emissions from Flaring

$$E_{i,max} = MFR \div HHV \times CF_1 \div CF_2 \times EF_i$$

Equation 36 Average Annual Emissions from Flaring

$$E_{i,avg} = AF \times EF_i$$

Where:

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

MFR = Maximum firing rate, per flare category, [MMBtu/hr]

AF = Annual Fuel Use, [MMscf/year]

HHV = Higher Heating Value, [Btu/scf]

CF_1 = Conversion Factor, 10^6 Btu/MMBtu

CF_2 = Conversion Factor, 10^6 scf/MMscf

EF_i = Toxic emission factor, [lb/MMscf]

Aerators and Evaporative Cooler

The aerators (referred to as the Stretford Oxidizer Tanks in Part 70/APCD PTO 8092) and evaporative cooler are a part of the Sulfur Recovery Unit (SRU). Two aerators bubble air through the process solution. The process solution is then pumped to the evaporative cooler where air flows countercurrent to the solution, resulting in some fluid entrainment as drift droplets. Emissions of sodium hydroxide, hydrogen sulfide, and dissolved metals will be calculated at the outlet of the evaporative cooler only, as it represents the primary emission point in the process.

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EMISSIONS ESTIMATING TECHNIQUES

Table 22 Aerators and Evaporative Cooler

Profile	Process Stream	Device Name	APCD Device No.	Device ID	Stack ID
POP-9	Stretford Absorber Outlet	Aerator A (Oxidizer Tank No. 1)	105191	250120	50120
POP-9	Stretford Absorber Outlet	Aerator B (Oxidizer Tank No. 2)	105192	250130	50130
POP-9	Stretford Absorber Outlet	Evaporative Cooler	105199	150100	50100

Emissions of ROC from the aerators come from the results of the APCD approved source tests completed in 2008, 2010, and 2013 (See Appendix D). The average ROC lb/hr reported from these three source tests is applied to the annual air toxics emissions evaluation, whereas the maximum ROC lb/hr reported for these three source tests is applied to the max hourly air toxics emission evaluation. All source test results were below the detection limit. The total ROC is speciated for toxics based on CARB Speciation Profile #532 - Oil & Gas Extraction – Well heads, cellars, and oil & water separators. The air toxic emissions are adjusted based on the ROC/TOC ratio specified by CARB Speciation Profile #532.

Emissions of sodium hydroxide, hydrogen sulfide, and dissolved metals from the evaporative cooler were determined using the CARB-sponsored cooling tower emission estimation technique (ARB, 1988). The drift fraction selected from the CARB method assumes low efficiency drift eliminators are present in the evaporative cooler, consistent with manufacturer design specifications. This method uses the speciation data obtained at POPCO from the outlet of the Stretford Absorber Columns (POP-9) collected as part of the 2013 sampling series¹¹. This sample point represents the location in which the Stretford solution is expected to be the most concentrated as it moves through the aerators and evaporative cooler.

Equation 37 Maximum Hourly Emissions from Aerators and Evaporative Cooler

$$E_{i,max} = DF \times WR \times WF_i \times \rho \times CF_1$$

Equation 38 Average Annual Emissions from Aerators and Evaporative Cooler

$$E_{i,avg} = DF \times WR \times WF_i \times OH \times \rho \times CF_1$$

Where:

$E_{i,avg}$ = Average emission rate of substance i , [lb/year]

$E_{i,max}$ = Max emission rate of substance i , [lb/hour]

DF = Drift Fraction, [0.0002 gpm/gpm]¹²

WR = Water Circulation Rate, [330 gpm]

WF_i = Weight Fraction of substance i in Stretford Solution, [ppmv $i/10^6$ H₂O]

OH = Operating Hours [Hours/year]

ρ = Density, [8.33 lb/gal]

CF_1 = Conversion Factor, [60 min/hour]

¹¹ See Exxon – SYU AB2588 ATEIP for additional details pertaining to sampling series conducted.

¹² California Air Resources Board, 1988. Technical Support Document to Proposed Hexavalent Chromium Control Plan, January 1, 1990

APPENDIX I EMISSIONS ESTIMATING TECHNIQUES

Storage Tanks

POPCO has a few miscellaneous storage tanks permitted to operate at the facility: the methanol tank and the two diesel tanks. Breathing and working losses from the diesel tanks are estimated using the equations defined for fixed roof tanks in chapter 7 of US EPA AP-42.

Emissions from the methanol tank are based on the ideal gas law and vapor displacement during tank fillings as described in the South Coast Air Quality Management District (AQMD) Supplemental Instructions for Liquid Organic Storage Tanks (2011).

Air toxic emission factors for the diesel tanks are based on the CARB speciation manual, profile number 297 (Crude Oil Evaporation) as currently permitted.

Table 23 Storage Tanks

Profile	Process Stream	Service	Device Name	APCD ID	Device ID	Stack ID
CARB 297	Diesel	Liquid	Diesel Tanks	NA	250200	50200
MSDS	Methanol	Liquid	Methanol Tank	102620	150210	50210

Max hourly emissions of each air toxic are calculated based on the max hourly throughput for each tank. The maximum volume of methanol delivered on a given day in 2013 was used to represent the maximum hour for the Methanol Tank. The maximum hourly diesel fuel consumption for the diesel engines using the diesel fuel in 2013 was used to represent the maximum hour for the diesel tanks. Annual emissions of each toxic compound will be calculated using the actual annual throughput to these tanks as reported for 2013.

Wastewater Storage Tanks

POPCO operates two wastewater tanks. Emissions from these tanks are controlled by carbon canisters. Tank T-807 has not been in service for many years and will not be used during the Interim Trucking project.

Table 24 Wastewater Storage Tanks

Profile	Process Stream	Service	Device Name	APCD Device No.	Device ID	Stack ID
POP-8	Sour Water Stripper	Liquid	Waste Liquid Storage Tank (601)	103103	150270	50270
NA	NA	Liquid	Waste Liquid Storage Tank (807)	103104	OOS	OOS

ROC emissions from the wastewater tank T-601 are based on the APCD permit (PT70/PTO 8092) and Rule 325 which requires a minimum of 90% control for the carbon canisters. The ROC emissions were converted to TOC using the CARB Speciation Profile #532 – Oil & Gas

APPENDIX I

EMISSIONS ESTIMATING TECHNIQUES

Extraction – Well heads, cellars, and oil & water separators. The air toxics in the wastewater were determined from the sour water process stream (POP-8) collected at the inlet to the sour water stripper at POPCO which receives water prior to being sent to the wastewater tanks. This stream data was collected in 2013 as provided in Appendix A.

Air toxic emission factors for the operating wastewater tank are determined using Henry's Law and Raoult's Law as described in Section 4.1.5 for the Wastewater storage tanks used at LFC. These emission factors are derived from assumed partial pressures associated with the known constituents in the wastewater and Henry's Law constants defined for the individual air toxic pollutants as described in Appendix C.

Maintenance - Welding

POPCO conducts welding operations on an as needed basis to ensure equipment is maintained in good working order without cracks or stress points that might cause the equipment to fail. ExxonMobil uses the Shielded Metal Arc Welding (SMAW) process and the Tungsten Inert Gas Arc (TIG) welding processes. Note, welding operations for LFC and POPCO are conducted at the maintenance shop at LFC, as such there is not a separate emissions point for POPCO. See Section 4.1.11 for additional details

Fugitive Components

POPCO maintains fugitive components consisting of valves, connections, compressor seals, and pump seals in gas and light liquid service. Each P&ID was reviewed to identify an appropriate stream profile for the processes shown in the P&ID. Due to the smaller size of POPCO relative to LFC the applicable streams for each P&ID are summarized plant-wide as one volume source for the facility. See Appendix B for the location of the stream samples used, and Appendix I for the component summary by stream profile.

TOC emissions have been calculated using the emission factors defined by component leak path (clp) in Part 70/APCD PTO 8092. Air toxic emissions are calculated using the stream data collected in 2013. The most appropriate gas and liquid stream for each P&ID and service code were chosen based on the type of equipment and processes occurring in the P&ID.

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EMISSIONS ESTIMATING TECHNIQUES

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**Abrasive Blasting
Exxon - SYU
Interim Trucking Project**

			Abrasive Blasting	CPP Maint. Abrasive Blasting	OTP Maint. Abrasive Blasting	POPCO Maint. Abrasive Blasting	SGTP Maint. Abrasive Blasting	TT Maint. Abrasive Blasting
			Device ID	370211	370111	370511	370411	370311
			Type of Abrasive			SJVAPCD Copper Slag		
			Qty (lbs)			19000		
			PM (lb/lb Abrasive)			0.005		
			No. Processes	1	1	1	1	1
CAS #	AB2588 No.		SJVAPCD Copper Slag	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
N020	7440382	Arsenic Compounds	1.14E-05			1.08E-03		
N040	7440393	Barium Compounds	0.00E+00					
N050	7440417	Beryllium Compounds	0.00E+00					
N078	7440439	Cadmium Compounds	0.00E+00					
N090	7440473	Chromium Compounds	1.00E-05			9.50E-04		
7440-48-4	7440484	Cobalt	3.08E-05			2.93E-03		
N100	7440508	Copper Compounds	4.97E-04			4.72E-02		
18540-29-9	18540299	Hexavalent Chromium	5.00E-07			4.75E-05		
N420	7439921	Lead Compounds	1.44E-04			1.37E-02		
N450	7439965	Manganese Compounds	3.05E-05			2.89E-03		
N458	7439976	Mercury Compounds	0.00E+00					
N495	7440020	Nickel Compounds	1.84E-06			1.75E-04		
N725	7782492	Selenium Compounds	0.00E+00					
N982	7440666	Zinc Compounds	5.85E-04			5.56E-02		

**Abrasive Blasting
Exxon - SYU
Interim Trucking Project**

			Abrasive Blasting	CPP Maint. Abrasive Blasting	OTP Maint. Abrasive Blasting	POPCO Maint. Abrasive Blasting	SGTP Maint. Abrasive Blasting	TT Maint. Abrasive Blasting
			Device ID	370211	370111	370511	370411	370311
			Type of Abrasive			SJVAPCD Copper Slag		
			Qty (lbs)			730.00		
			PM (lb/lb Abrasive)			0.005		
			No. Processes	1	1	1	1	1
			SJVAPCD Copper Slag	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
CAS #	AB2588 No.							
N020	7440382	Arsenic Compounds	1.14E-05		4.15E-05			
N040	7440393	Barium Compounds	0.00E+00					
N050	7440417	Beryllium Compounds	0.00E+00					
N078	7440439	Cadmium Compounds	0.00E+00					
N090	7440473	Chromium Compounds	1.00E-05		3.65E-05			
7440-48-4	7440484	Cobalt	3.08E-05		1.12E-04			
N100	7440508	Copper Compounds	4.97E-04		1.81E-03			
18540-29-9	18540299	Hexavalent Chromium	5.00E-07		1.83E-06			
N420	7439921	Lead Compounds	1.44E-04		5.26E-04			
N450	7439965	Manganese Compounds	3.05E-05		1.11E-04			
N458	7439976	Mercury Compounds	0.00E+00					
N495	7440020	Nickel Compounds	1.84E-06		6.72E-06			
N725	7782492	Selenium Compounds	0.00E+00					
N982	7440666	Zinc Compounds	5.85E-04		2.14E-03			

Notes:

EPA AP-42 Section 13.2.6, Table 2-2 defines sand flow rate based on nozzle diameter and nozzle pressure.

Abrasive blasting activities at ExxonMobil are typically completed with a 3/8" nozzle at 90 psi.

Sand Flow Rate: 657 lb/hr

Quantity of Abrasive through nozzle/hour adjusted based on density of abrasive relative to density of sand.

Density of Sand: 99 lb/ft³

Abrasive Flow Rate: 730

PM Emission factor (lb PM/lb Abrasive) As reported by San Diego APCD

**Acids Caustics
Exxon - SYU
Interim Trucking Project**

Exxon - SYU

CAS No.	Stream Type	AB2588 No.	Caustic						
			Sodium Hydroxide (20%)	Hydrochloric Acid	Phosphoric Acid	DGME	Carbohydrazide	Sodium Hydroxide (4%)	
			MSDS	MSDS	MSDS	MSDS	MSDS	MSDS	
100-41-4	Ethylbenzene	100414							
1330-20-7	Xylenes (mixed isomers)	1330207							
112-34-5	Butyl Dioxitol	112345				0.10			
497-18-7	Carbohydrazide						0.0500		
7647-01-0	Hydrogen Chloride	7647010		0.38					
67-63-0	Isopropyl Alcohol	67630							
91-20-3	Naphthalene	91203							
7664-38-2	Phosphoric Acid	7664382			0.85				
1310-73-2	Sodium Hydroxide	1310732	0.20					0.04	
	Weight Percent		0.200	0.380	0.850	0.100	0.0500	0.040	
	Vapor Pressure	mm Hg	0.030	0.700	0.700	0.020	12.000	0.030	

	Device	Foam Tank A	Foam Tank B	Deaerator	Steam System Chemical Injection System	Acid Skid	HCL Tank A	HCL Tank B	Phosphoric Acid Tank	Caustic Skid	Caustic Tank	Demineralizer Caustic Tank	Fresh Caustic Day Tank	Waste Caustic Tank	Backwash Sump	Cooling Water System
	Device ID	114410	134040	121110	225020	125060	114361	114362	114370	225050	114380	114100	244120	214550	114420	224060
	Surface Area (ft2)	44.2	19.6	112	3.14	19.6	307.9	307.9	78.5	19.6	176.7	78.5	9.62	78.5	312	3.14
	Control Efficiency						95%	95%							95%	
	Annual Hours of Operation	8760	8760	No Air Toxics	No Air Toxics	8760	8760	8760	8760	8760	8760	8760	8760	OOS	8760	8760
	Msw (lb/lb H2O)	8.44E-05	8.44E-05			1.12E-02	1.12E-02	1.12E-02	2.51E-02	2.53E-04	2.53E-04	2.53E-04	2.53E-04	2.53E-04	2.53E-04	5.06E-05
CAS #	Annual Emissions (lb/year)	DGME	DGME	Trasar (Carbohydrazide 5%)	Trasar (Carbohydrazide 5%)	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Phosphoric Acid	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (4%)
112-34-5	Butyl Dioxitol	0.95	0.42													
497-18-7	Carbohydrazide															
7647-01-0	Hydrogen Chloride					56.01	43.99	43.99								
7783-06-4	Hydrogen Sulfide															
67-56-1	Methyl Alcohol															
7664-38-2	Phosphoric Acid								501.78							
1310-73-2	Sodium Hydroxide									1.26	11.39	5.06	0.62		1.01	0.04

**Acids Caustics
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	Device	Foam Tank A	Foam Tank B	Deaerator	Steam System Chemical Injection System	Acid Skid	HCL Tank A	HCL Tank B	Phosphoric Acid Tank	Caustic Skid	Caustic Tank	Demineralizer Caustic Tank	Fresh Caustic Day Tank	Waste Caustic Tank	Backwash Sump	Cooling Water System
	Device ID	114410	134040	121110	225020	125060	114361	114362	114370	225050	114380	114100	244120	214550	114420	224060
	Surface Area (ft ²)	44.2	19.6	112	3.14	19.6	307.9	307.9	78.5	19.6	176.7	78.5	9.62	78.5	312	3.14
	Control Efficiency						95%	95%							95%	
	Annual Hours of Operation	8760	8760	No Air Toxics	No Air Toxics	8760	8760	8760	8760	8760	8760	8760	8760	OOS	8760	8760
	Msw (lb/lb H ₂ O)	8.44E-05	8.44E-05			1.12E-02	1.12E-02	1.12E-02	2.51E-02	2.53E-04	2.53E-04	2.53E-04	2.53E-04	2.53E-04	2.53E-04	5.06E-05
CAS #	Max Hourly Emissions (lb/hr)	DGME	DGME	Trasar (Carbohydrazide 5%)	Trasar (Carbohydrazide 5%)	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Phosphoric Acid	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (20%)	Sodium Hydroxide (4%)
112-34-5	Butyl Dioxitol	1.08E-04	4.81E-05													
497-18-7	Carbohydrazide															
7647-01-0	Hydrogen Chloride					6.39E-03	5.02E-03	5.02E-03								
7783-06-4	Hydrogen Sulfide															
67-56-1	Methyl Alcohol															
7664-38-2	Phosphoric Acid								5.73E-02							
1310-73-2	Sodium Hydroxide									1.44E-04	1.30E-03	5.78E-04	7.08E-05		1.15E-04	4.62E-06

Acids and Caustics Variables

Diffusivity of Water to Air (D _{AB,i})	0.995	
Molar Flux of Water to Air (N _A)	0.0016	
pa1 (atm)	0.0313	
pa2 (atm)	-	
pb1 = P - pa1	0.969	
pb2 = P - pa2	1.000	
pbm = (pb2 - pb1)/ln(pb2/pb1)	0.984	
Temperature (K)	298.150	536.67 Deg Rankine
Barometric Pressure (atm)	1.000	
Gas Constant (atm-ft ³ /lb mole-R)	0.730	
Gas Film Thickness (ft)	0.050	
Diffusivity of Water to Air at 0 C	0.220	

Notes:

The Deaerator and Steam Chemical System now use Carbohydrazide which is not an Air Toxic listed under AB2588 and does not have a health risk value under OEHHHA.

The HCL Tanks are equipped with a fume scrubber to control emissions. Per Table 5 of the CARB technical guidance document the scrubber is assumed to have an emission control efficiency of 95%.

**External Combustion
Exxon - SYU
Interim Trucking Project**

Annual Total			POPCO External Combustion Units	Boiler A -- natural gas	Boiler A -- Stretford Tailgas	Boiler B -- natural gas	Boiler B -- Stretford Tailgas	POPCO External Combustion Units	GPU TEG Glycol Reboiler	Sulfinol TEG Reboiler
			Dev	150021	150022	150031	150032	Dev	150050	150040
			Location	POPCO	POPCO	POPCO	POPCO	Location	POPCO	POPCO
			Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Fuel Type	Natural Gas	Natural Gas
			Fuel Units	MMscf	MMscf	MMscf	MMscf	Fuel Units	MMscf	MMscf
			Fuel Quantity	94.2429	440.0765	93.7324	664.4231	Fuel Quantity	1.6	7.7
CAS #	AB2588 No.		10-100 MMBTU/hr (lbs/MMscf)	lb/year	lb/year	lb/year	lb/year	<10 MMBTU/hr (lbs/MMscf)	lb/year	lb/year
106-99-0	106990	1,3-Butadiene	0.0000					0.0000		
75-07-0	75070	Acetaldehyde	0.0031	2.92E-01	1.36E+00	2.91E-01	2.06E+00	0.0043	6.88E-03	3.31E-02
107-02-8	107028	Acrolein	0.0027	2.54E-01	1.19E+00	2.53E-01	1.79E+00	0.0027	4.32E-03	2.08E-02
N020	7440382	Arsenic Compounds	0.0000					0.0000		
71-43-2	71432	Benzene	0.0058	5.47E-01	2.55E+00	5.44E-01	3.85E+00	0.0080	1.28E-02	6.16E-02
N078	7440439	Cadmium Compounds	0.0000					0.0000		
108-90-7	108907	Chlorobenzene	0.0000					0.0000		
N100	7440508	Copper Compounds	0.0000					0.0000		
100-41-4	100414	Ethylbenzene	0.0069	6.50E-01	3.04E+00	6.47E-01	4.58E+00	0.0095	1.52E-02	7.32E-02
50-00-0	50000	Formaldehyde	0.0123	1.16E+00	5.41E+00	1.15E+00	8.17E+00	0.0170	2.72E-02	1.31E-01
110-54-3	110543	Hexane (-n)	0.0046	4.34E-01	2.02E+00	4.31E-01	3.06E+00	0.0063	1.01E-02	4.85E-02
18540-29-9	18540299	Hexavalent Chromium	0.0000					0.0000		
7647-01-0	7647010	Hydrogen Chloride	0.0000					0.0000		
N420	7439921	Lead Compounds	0.0000					0.0000		
N450	7439965	Manganese Compounds	0.0000					0.0000		
N458	7439976	Mercury Compounds	0.0000					0.0000		
91-20-3	91203	Naphthalene	0.0003	2.83E-02	1.32E-01	2.81E-02	1.99E-01	0.0003	4.80E-04	2.31E-03
N495	7440020	Nickel Compounds	0.0000					0.0000		
1151	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.0001	9.42E-03	4.40E-02	9.37E-03	6.64E-02	0.0001	1.60E-04	7.70E-04
115-07-1	115071	Propylene	0.5300	4.99E+01	2.33E+02	4.97E+01	3.52E+02	0.7310	1.17E+00	5.63E+00
75-56-9	75569	Propylene Oxide	0.0000					0.0000		
N725	7782492	Selenium Compounds	0.0000					0.0000		
108-88-3	108883	Toluene	0.0265	2.50E+00	1.17E+01	2.48E+00	1.76E+01	0.0366	5.86E-02	2.82E-01
N090	7440473	Chromium Compounds	0.0000					0.0000		
1330-20-7	1330207	Xylenes (mixed isomers)	0.0197	1.86E+00	8.67E+00	1.85E+00	1.31E+01	0.0272	4.35E-02	2.09E-01
N982	7440666	Zinc Compounds	0.0000					0.0000		

**External Combustion
Exxon - SYU
Interim Trucking Project**

Max Hourly

			POPCO External Combustion Units	Boiler A -- natural gas	Boiler A -- Stretford Tailgas	Boiler B -- natural gas	Boiler B -- Stretford Tailgas	POPCO External Combustion Units	GPU TEG Glycol Reboiler	Sulfinol TEG Reboiler
			Dev	150021	150022	150031	150032	Dev	150050	150040
			Location	POPCO	POPCO	POPCO	POPCO	Location	POPCO	POPCO
			Max Rating (MMBtu/hr)	41	5.62	41	5.62	Max Rating (MMBtu/hr)	1.2	2.1
			Fuel Type	Natural Gas	Natural Gas	Natural Gas	Tail Gas	Fuel Type	Natural Gas	Natural Gas
			Fuel Units	MMscf	MMscf	MMscf	No Units	Fuel Units	MMscf	MMscf
			Fuel Quantity (MMScf/hr)	0.035	0.182	0.035	0.182	Fuel Quantity (MMScf/hr)	0.001	0.002
			HHV	1176	30.96	1176	30.96	HHV	1176	1176
CAS #	AB2588 No.		10-100 MMBTU/hr (lbs/MMScf)	lb/hr	lb/hr	lb/hr	lb/hr	<10 MMBTU/hr (lbs/MMscf)	lb/hr	lb/hr
106-99-0	106990	1,3-Butadiene	0.0000					0.0000		
75-07-0	75070	Acetaldehyde	0.0031	1.08E-04	5.63E-04	1.08E-04	5.63E-04	0.0043	4.39E-06	7.68E-06
107-02-8	107028	Acrolein	0.0027	9.41E-05	4.90E-04	9.41E-05	4.90E-04	0.0027	2.76E-06	4.82E-06
N020	7440382	Arsenic Compounds	0.0000					0.0000		
71-43-2	71432	Benzene	0.0058	2.02E-04	1.05E-03	2.02E-04	1.05E-03	0.0080	8.16E-06	1.43E-05
N078	7440439	Cadmium Compounds	0.0000					0.0000		
108-90-7	108907	Chlorobenzene	0.0000					0.0000		
N100	7440508	Copper Compounds	0.0000					0.0000		
100-41-4	100414	Ethylbenzene	0.0069	2.41E-04	1.25E-03	2.41E-04	1.25E-03	0.0095	9.69E-06	1.70E-05
50-00-0	50000	Formaldehyde	0.0123	4.29E-04	2.23E-03	4.29E-04	2.23E-03	0.0170	1.73E-05	3.04E-05
110-54-3	110543	Hexane (-n)	0.0046	1.60E-04	8.35E-04	1.60E-04	8.35E-04	0.0063	6.43E-06	1.13E-05
18540-29-9	18540299	Hexavalent Chromium	0.0000					0.0000		
7647-01-0	7647010	Hydrogen Chloride	0.0000					0.0000		
N420	7439921	Lead Compounds	0.0000					0.0000		
N450	7439965	Manganese Compounds	0.0000					0.0000		
N458	7439976	Mercury Compounds	0.0000					0.0000		
91-20-3	91203	Naphthalene	0.0003	1.05E-05	5.45E-05	1.05E-05	5.45E-05	0.0003	3.06E-07	5.36E-07
N495	7440020	Nickel Compounds	0.0000					0.0000		
1151	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.0001	3.49E-06	1.82E-05	3.49E-06	1.82E-05	0.0001	1.02E-07	1.79E-07
115-07-1	115071	Propylene	0.5300	1.85E-02	9.62E-02	1.85E-02	9.62E-02	0.7310	7.46E-04	1.31E-03
75-56-9	75569	Propylene Oxide	0.0000					0.0000		
N725	7782492	Selenium Compounds	0.0000					0.0000		
108-88-3	108883	Toluene	0.0265	9.24E-04	4.81E-03	9.24E-04	4.81E-03	0.0366	3.73E-05	6.54E-05
N090	7440473	Chromium Compounds	0.0000					0.0000		
1330-20-7	1330207	Xylenes (mixed isomers)	0.0197	6.87E-04	3.58E-03	6.87E-04	3.58E-03	0.0272	2.78E-05	4.86E-05
N982	7440666	Zinc Compounds	0.0000					0.0000		

Internal Combustion
Exxon - SYU
Interim Trucking Project

Annual Total			Internal Combustion Units	Firewater Pump A	Firewater Pump B	Firewater Pump (805)	Firewater Pump (806)	Emergency Air Generator	E/S Diesel Flood Water Pump	Emergency Backup Generator	Emergency Backup Generator	Emergency Backup Generator
Dev	113961	113962	150070	150080	150090	393540	390274	390275	390276			
Location	LFC	LFC	POPCO	POPCO	POPCO	LFC	LFC	LFC	POPCO			
Fuel Type	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel			
Emission Tier	T0	T0	T0	T0	T0	T4-603	T4i-302	T4i-603	T4-101			
Hours/Year	26.0	33.3	33.1	27.9	11.9	16.9	25.3	27.4	11.7			
HP	238	238	420	420	111	335	240	440	95			
Load Factor	0.55	0.55	0.50	0.50	0.60	0.74	0.74	0.74	0.74			
CAS #	AB2588 No.	Compound Name	PM (g/bhp-hr)	1.000	1.000	1.000	1.000	1.000	0.015	0.015	0.015	0.015
9901	9901	Diesel Particulate Matter	lb/year	7.50	9.61	15.32	12.92	1.75	0.14	0.15	0.29	0.03

POPCO Permit Exempt Internal Combustion Units	Generator Sets	Generator Sets	Air Compressors	Other General Industrial Equipment - Light Tower	Pressure Washers	Cranes	Forklifts
Device ID	PE-15	PE-16	PE-17	PE-18	PE-19	PE-33	PE-34
Location	POP	POP	POP	POP	POP	POP	POP
Fuel Type	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Emission Tier	T4-75	T4i-174	T4i-174	T4-25	T3-174	T3-603	T3-101
Hours/Year	109	8	29	88	10	1	4
HP	74	107	130	12	148	445	82
Load Factor	0.74	0.74	0.48	0.34	0.30	0.29	0.20
Engine Count	1	2	1	4	4	1	1
PM (g/bhp-hr)	0.022	0.015	0.015	0.298	0.224	0.149	0.298
lb/year	0.29	0.04	0.06	0.96	0.85	0.04	0.04

Max Hourly			Internal Combustion Units	Firewater Pump A	Firewater Pump B	Firewater Pump (805)	Firewater Pump (806)	Emergency Air Generator	E/S Diesel Flood Water Pump	Emergency Backup Generator	Emergency Backup Generator	Emergency Backup Generator
Dev	113961	113962	150070	150080	150090	393540	390274	390275	390276			
Location	LFC	LFC	POPCO	POPCO	POPCO	LFC	LFC	LFC	POPCO			
Fuel Type	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel			
Emission Tier	T0	T0	T0	T0	T0	T4-603	T4i-302	T4i-603	T4-101			
BSFC (Btu/bhp-hr)	7,800	7,800	7,800	7,800	7,800	7,800	7,500	7,500	7,500	7,500		
HP	238	238	420	420	111	335	240	440	95			
Load Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
CAS #	AB2588 No.	Compound Name	Diesel Internal Combustion (lb/Mgal)	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
100-41-4	100414	Ethylbenzene	0.0109	1.48E-04	1.48E-04	2.61E-04	2.61E-04	6.89E-05				
106-99-0	106990	1,3-Butadiene	0.2174	2.95E-03	2.95E-03	5.20E-03	5.20E-03	1.37E-03				
107-02-8	107028	Acrolein	0.0339	4.59E-04	4.59E-04	8.11E-04	8.11E-04	2.14E-04				
108-88-3	108883	Toluene	0.1054	1.43E-03	1.43E-03	2.52E-03	2.52E-03	6.66E-04				
108-90-7	108907	Chlorobenzene	0.0002	2.71E-06	2.71E-06	4.78E-06	4.78E-06	1.26E-06				
110-54-3	110543	Hexane (-n)	0.0269	3.65E-04	3.65E-04	6.43E-04	6.43E-04	1.70E-04				
115-07-1	115071	Propylene	0.467	6.33E-03	6.33E-03	1.12E-02	1.12E-02	2.95E-03				
1330-20-7	1330207	Xylenes (mixed isomers)	0.0424	5.75E-04	5.75E-04	1.01E-03	1.01E-03	2.68E-04				
18540-29-9	18540299	Hexavalent Chromium	0.0001	1.36E-06	1.36E-06	2.39E-06	2.39E-06	6.32E-07				
50-00-0	50000	Formaldehyde	1.7261	2.34E-02	2.34E-02	4.13E-02	4.13E-02	1.09E-02				
71-43-2	71432	Benzene	0.1863	2.52E-03	2.52E-03	4.45E-03	4.45E-03	1.18E-03				
75-07-0	75070	Acetaldehyde	0.7833	1.06E-02	1.06E-02	1.87E-02	1.87E-02	4.95E-03				
7647-01-0	7647010	Hydrogen Chloride	0.1863	2.52E-03	2.52E-03	4.45E-03	4.45E-03	1.18E-03				
91-20-3	91203	Naphthalene	0.0197	2.67E-04	2.67E-04	4.71E-04	4.71E-04	1.24E-04				
N020	7440382	Arsenic Compounds	0.0016	2.17E-05	2.17E-05	3.83E-05	3.83E-05	1.01E-05				
N078	7440439	Cadmium Compounds	0.0015	2.03E-05	2.03E-05	3.59E-05	3.59E-05	9.48E-06				
N090	7440473	Chromium Compounds	0.0006	8.13E-06	8.13E-06	1.43E-05	1.43E-05	3.79E-06				
N100	7440508	Copper Compounds	0.0041	5.56E-05	5.56E-05	9.80E-05	9.80E-05	2.59E-05				
N420	7439921	Lead Compounds	0.0083	1.12E-04	1.12E-04	1.98E-04	1.98E-04	5.25E-05				
N450	7439965	Manganese Compounds	0.0031	4.20E-05	4.20E-05	7.41E-05	7.41E-05	1.96E-05				
N458	7439976	Mercury Compounds	0.002	2.71E-05	2.71E-05	4.78E-05	4.78E-05	1.26E-05				
N495	7440020	Nickel Compounds	0.0039	5.28E-05	5.28E-05	9.33E-05	9.33E-05	2.46E-05				
1151	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.0362	4.91E-04	4.91E-04	8.66E-04	8.66E-04	2.29E-04				
N725	7782492	Selenium Compounds	0.0022	2.98E-05	2.98E-05	5.26E-05	5.26E-05	1.39E-05				
N982	7440666	Zinc Compounds	0.0224	3.04E-04	3.04E-04	5.36E-04	5.36E-04	1.42E-04				

POPCO Permit Exempt Internal Combustion Units	Generator Sets	Generator Sets	Air Compressors	Other General Industrial Equipment - Light Tower	Pressure Washers	Cranes	Forklifts
Device ID	PE-14	PE-15	PE-16	PE-17	PE-18	PE-32	PE-33
Location	POP	POP	POP	POP	POP	POP	POP
Fuel Type	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Emission Tier	T4-75	T4i-174	T4i-174	T4-25	T3-174	T3-603	T3-101
BSFC (Btu/bhp-hr)	7,500	7,500	7,500	7,500	7,500	7,500	7,500
HP	74	107	130	12	148	445	82
Load Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Engine Count	1	2	1	4	4	1	1
Diesel Internal Combustion (lb/Mgal)	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
0.0109							
0.2174							
0.0339							
0.1054							
0.0002							
0.0269							
0.467							
0.0424							
0.0001							
1.7261							
0.1863							
0.7833							
0.1863							
0.0197							
0.0016							
0.0015							
0.0006							
0.0041							
0.0083							
0.0031							
0.002							
0.0039							
0.0362							
0.0022							
0.0224							

**Internal Combustion
Exxon - SYU
Interim Trucking Project**

Annual Total			LFC Permit Exempt Internal Combustion Units	30 Ton Crane	Crane (< 35 Ton)	Small Fork Lift DP30	Large Fork Lift DP70	Forklift															Plate Compactors	Other General Industrial Equipment - Light Tower	Other General Industrial Equipment - Light Tower	Excavators	Trenchers	Pressure Washers	Air Compressors	Air Compressors	Cement and Mortar Mixers	Generator Sets	Generator Sets	Generator Sets	Cranes	Surfacing Equipment		
			Device ID	LFC3	LFC5	LFC1	LFC2	LFC4															PE-01	PE-02	PE-03	PE-04	PE-05	PE-06	PE-07	PE-08	PE-09	PE-10	PE-11	PE-12	PE-13	PE-14		
			Location	LFC	LFC	LFC	LFC	LFC															LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC
			Fuel Type	Diesel	Diesel	Diesel	Diesel	Diesel															Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
			Emission Tier	T0	T4-75	T4-50	T0	T2-101															T2-25	T4-25	T4i-50	T4-50	T4i-50	T3-75	T4-50	T4i-174	T3-174	T4-75	T4i-302	T4i-1207	T4i-302	T3-174		
			Hours/Year	0	150	330	0	174															13	413	413	21	4	14	47	78	4	91	113	202	28	26		
			HP	152	74	49	94	86															16	12	26	36	42	62	49	149	113	51	197	779	250	130		
			Load Factor	0.29	0.29	0.20	0.20	0.20															0.43	0.34	0.34	0.38	0.50	0.30	0.48	0.48	0.56	0.74	0.74	0.74	0.29	0.30		
			Engine Count																				3	4	9	1	1	5	6	9	1	10	11	1	1	1		
CAS #	AB2588 No.	Compound Name	PM (g/bhp-hr)	1.000	0.022	0.224	1.000	0.298															0.597	0.298	0.224	0.224	0.224	0.298	0.022	0.015	0.224	0.022	0.015	0.075	0.015	0.224		
9901	9901	Diesel Particulate Matter	lb/year		0.16	1.59		1.97															0.35	4.50	16.19	0.14	0.04	0.83	0.32	1.65	0.12	1.70	5.94	19.14	0.07	0.50		

Max Hourly			LFC Permit Exempt Internal Combustion Units	30 Ton Crane	Crane (< 35 Ton)	Small Fork Lift DP30	Large Fork Lift DP70	Forklift	Plate Compactors	Other General Industrial Equipment - Light Tower	Other General Industrial Equipment - Light Tower	Excavators	Trenchers	Pressure Washers	Air Compressors	Air Compressors	Cement and Mortar Mixers	Generator Sets	Generator Sets	Generator Sets	Cranes	Surfacing Equipment
Device ID	LFC3		LFC5	LFC1	LFC2	LFC4																
Location	LFC		LFC	LFC	LFC	LFC																
Fuel Type	Diesel		Diesel	Diesel	Diesel	Diesel																
Emission Tier	T0		T4-75	T4-50	T0	T2-101																
BSFC (Btu/bhp-hr)	7,800		7,500	7,500	7,800	7,500																
HP	152		74	49	94	86																
Load Factor	0.00		1.00	1.00	0.00	0.00																
Engine Count																						
CAS #	AB2588 No.	Compound Name	Diesel Internal Combustion (lb/Mgal)	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	PE-01	PE-02	PE-02	PE-03	PE-04	PE-05	PE-06	PE-07	PE-08	PE-09	PE-10	PE-11	PE-12	PE-13
100-41-4	100414	Ethylbenzene	0.0109						LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC
106-99-0	106990	1,3-Butadiene	0.2174						Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
107-02-8	107028	Acrolein	0.0339						T2-25	T4-25	T4i-50	T4i-50	T4i-50	T3-75	T4-50	T4i-174	T3-174	T4-75	T4i-302	T4i-1207	T4i-302	T3-174
108-88-3	108883	Toluene	0.1054						7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
108-90-7	108907	Chlorobenzene	0.0002						16	12	26	36	42	62	49	149	113	51	197	779	250	130
110-54-3	110543	Hexane (-n)	0.0269						0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
115-07-1	115071	Propylene	0.467						3	4	9	1	1	5	6	9	1	10	11	1	1	1
1330-20-7	1330207	Xylenes (mixed isomers)	0.0424						lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
18540-29-9	18540299	Hexavalent Chromium	0.0001																			
50-00-0	50000	Formaldehyde	1.7261																			
71-43-2	71432	Benzene	0.1863																			
75-07-0	75070	Acetaldehyde	0.7833																			
7647-01-0	7647010	Hydrogen Chloride	0.1863																			
91-20-3	91203	Naphthalene	0.0197																			
N020	7440382	Arsenic Compounds	0.0016																			
N078	7440439	Cadmium Compounds	0.0015																			
N090	7440473	Chromium Compounds	0.0006																			
N100	7440508	Copper Compounds	0.0041																			
N420	7439921	Lead Compounds	0.0083																			
N450	7439965	Manganese Compounds	0.0031																			
N458	7439976	Mercury Compounds	0.002																			
N495	7440020	Nickel Compounds	0.0039																			
1151	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.0362																			
N725	7782492	Selenium Compounds	0.0022																			
N982	7440666	Zinc Compounds	0.0224																			

Internal Combustion
Exxon - SYU
Interim Trucking Project

Annual Total

CAS #	AB2588 No.	Compound Name
9901	9901	Diesel Particulate Matter

Aerial Lifts	Aerial Lifts	Cranes	Cranes	Cranes	Other General Industrial Equipment - Offroad Utility Vehicle	Excavators	Forklifts	Forklifts	Rollers	Skid Steer Loaders	Tractors/Loaders/Backhoes	Trenchers
PE-20	PE-21	PE-22	PE-23	PE-24	PE-25	PE-26	PE-27	PE-28	PE-29	PE-30	PE-31	PE-32
LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC	LFC
Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
T3-75	T4i-174	T3-75	T3-302	T4i-603	T4-25	T4-174	T3-101	T3-174	T4i-50	T3-75	T4i-101	T4i-50
32	174	12	45	7	300	80	131	140	6	16	78	7
61	127	70	277	550	23	174	82	106	36	57	92	42
0.31	0.31	0.29	0.29	0.29	0.34	0.38	0.20	0.20	0.38	0.37	0.37	0.50
5	2	1	6	1	3	4	3	2	1	4	7	1
0.298	0.015	0.298	0.149	0.015	0.298	0.015	0.298	0.224	0.224	0.298	0.015	0.224
2.00	0.45	0.16	7.16	0.04	4.57	0.69	4.27	2.91	0.04	0.89	0.61	0.07

Max Hourly

APCD

CAS #	AB2588 No.	Compound Name
100-41-4	100414	Ethylbenzene
106-99-0	106990	1,3-Butadiene
107-02-8	107028	Acrolein
108-88-3	108883	Toluene
108-90-7	108907	Chlorobenzene
110-54-3	110543	Hexane (n)
115-07-1	115071	Propylene
1330-20-7	1330207	Xylenes (mixed isomers)
18540-29-9	18540299	Hexavalent Chromium
50-00-0	50000	Formaldehyde
71-43-2	71432	Benzene
75-07-0	75070	Acetaldehyde
7647-01-0	7647010	Hydrogen Chloride
91-20-3	91203	Naphthalene
N020	7440382	Arsenic Compounds
N078	7440349	Cadmium Compounds
N090	7440473	Chromium Compounds
N100	7440508	Copper Compounds
N420	7439921	Lead Compounds
N450	7439965	Manganese Compounds
N458	7439976	Mercury Compounds
N495	7440020	Nickel Compounds
1151	1151	PAHs, total, w/o indivd. components reported [PAH, POM]
N725	7782492	Selenium Compounds
N982	7440666	Zinc Compounds

[illegible]

**Flare
Exxon - SYU
Interim Trucking Project**

Annual Total

Annual Total			POPCO Thermal Oxidizer	Thermal Oxidizer -- Planned Continuous Flaring	Thermal Oxidizer -- Planned Other (SU, Maint., Tailgas)	Thermal Oxidizer -- Purge & Pilot	Thermal Oxidizer -- Unplanned Other (Misc., SRU Fail)	LFC Thermal Oxidizer	Thermal Oxidizer -- Contin. (Acid Gas, Low Press.)	Thermal Oxidizer -- Planned -- Other	Thermal Oxidizer -- Purge and Pilot	Thermal Oxidizer -- Unplanned -- Other	LFC Waste Gas Incinerator	Waste Gas Incinerator -- Normal Ops	Waste Gas Incinerator -- Planned SU/SD/Maintenance
			DEV	150012	150013	150011	150014	DEV	116012	116013	116011	116014	DEV	146031	146032
			Location	POPCO	POPCO	POPCO	POPCO	Location	LFC	LFC	LFC	LFC	Location	LFC	LFC
			Stack Flow Rate (dscfm)					Stack Flow Rate (dscfm)					Stack Flow Rate (dscfm)	2871.67	
			Average NH3 Concentration (ppm)					Average NH3 Concentration (ppm)					Average NH3 Concentration (ppm)	10.90	
			Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Fuel Gas (MMscf)	46.43	0.04
			HHV (Btu/scf)	1176	1176	1176	1176	HHV (Btu/scf)	1220	1220	1220	1220	HHV (Btu/scf)	1220	1220
			Fuel Units	MMscf	MMscf	MMscf	MMscf	Fuel Units	MMscf	MMscf	MMscf	MMscf	Tail Gas (MMscf)	453.12	0.0000
			Fuel Quantity	2.28	1.18	18.16	0.42	Fuel Quantity	14.5400	0.488	25.66	8.67	Total Fuel (MMBtu)	61872.39	48.79
CAS #	AB2588 No.		lb/MMscf	lb/year	lb/year	lb/year	lb/year	lb/MMscf	lb/year	lb/year	lb/year	lb/year	lb/MMBtu	lb/year	lb/year
7664-41-7	7664417	Ammonia												726.45	
106-99-0	106990	1,3-Butadiene	0.00E+00					0.00E+00					0.00E+00		
75-07-0	75070	Acetaldehyde	4.30E-02	9.80E-02	5.07E-02	7.81E-01	1.81E-02	4.30E-02	6.25E-01	2.10E-02	1.10E+00	3.73E-01	4.20E-05	2.599	0.002
107-02-8	107028	Acrolein	1.04E-02	2.38E-02	1.23E-02	1.89E-01	4.38E-03	1.04E-02	1.52E-01	5.09E-03	2.67E-01	9.04E-02	1.02E-05	0.632	0.000
71-43-2	71432	Benzene	1.59E-01	3.63E-01	1.88E-01	2.89E+00	6.68E-02	1.59E-01	2.31E+00	7.76E-02	4.08E+00	1.38E+00	1.54E-04	9.528	0.008
108-90-7	108907	Chlorobenzene	0.00E+00					0.00E+00					0.00E+00		
100-41-4	100414	Ethylbenzene	1.43E-02	3.26E-02	1.68E-02	2.59E-01	6.00E-03	1.43E-02	2.08E-01	6.97E-03	3.66E-01	1.24E-01	1.40E-05	0.866	0.001
50-00-0	50000	Formaldehyde	1.17E+00	2.67E+00	1.38E+00	2.12E+01	4.91E-01	1.17E+00	1.70E+01	5.70E-01	3.00E+01	1.01E+01	1.13E-03	70.163	0.055
110-54-3	110543	Hexane (n)	2.90E-02	6.61E-02	3.42E-02	5.27E-01	1.22E-02	2.90E-02	4.22E-01	1.42E-02	7.44E-01	2.51E-01	2.80E-05	1.732	0.001
18540-29-9	18540299	Hexavalent Chromium	0.00E+00					0.00E+00					0.00E+00		
7647-01-0	7647010	Hydrogen Chloride	0.00E+00					0.00E+00					0.00E+00		
115-07-1	115071	Propylene	2.44E+00	5.56E+00	2.88E+00	4.43E+01	1.02E+00	2.44E+00	3.55E+01	1.19E+00	6.26E+01	2.12E+01	2.37E-03	146.390	0.115
75-56-9	75569	Propylene Oxide	0.00E+00					0.00E+00					0.00E+00		
N725	7782492	Selenium Compounds	0.00E+00					0.00E+00					0.00E+00		
108-88-3	108883	Toluene	5.80E-02	1.32E-01	6.84E-02	1.05E+00	2.44E-02	5.80E-02	8.43E-01	2.83E-02	1.49E+00	5.03E-01	5.60E-05	3.465	0.003
1330-20-7	1330207	Xylenes (mixed isomers)	2.90E-02	6.61E-02	3.42E-02	5.27E-01	1.22E-02	2.90E-02	4.22E-01	1.42E-02	7.44E-01	2.51E-01	2.80E-05	1.732	0.001
56-55-3	56553	Benzo(a)anthracene	7.36E-08	1.68E-07	8.68E-08	1.34E-06	3.09E-08	7.64E-08	1.11E-06	3.73E-08	1.96E-06	6.62E-07	6.26E-11	3.87E-06	3.05E-09
50-32-8	50328	Benzo(a)pyrene	1.34E-07	3.06E-07	1.58E-07	2.43E-06	5.63E-08	1.39E-07	2.02E-06	6.79E-08	3.57E-06	1.21E-06	1.14E-10	7.05E-06	5.56E-09
207-08-9	207089	Benzo(k)fluoranthene	7.63E-08	1.74E-07	9.00E-08	1.39E-06	3.21E-08	7.92E-08	1.15E-06	3.86E-08	2.03E-06	6.86E-07	6.49E-11	4.02E-06	3.17E-09
218-01-9	218019	Chrysene	3.49E-05	7.96E-05	4.12E-05	6.34E-04	1.47E-05	3.62E-05	5.27E-04	1.77E-05	9.30E-04	3.14E-04	2.97E-08	1.84E-03	1.45E-06
53-70-3	53703	Dibenz(a,h)anthracene	3.26E-07	7.43E-07	3.84E-07	5.92E-06	1.37E-07	3.38E-07	4.91E-06	1.65E-07	8.67E-06	2.93E-06	2.77E-10	1.71E-05	1.35E-08
193-39-5	193395	Indeno(1,2,3-cd)pyrene	6.86E-07	1.56E-06	8.09E-07	1.25E-05	2.88E-07	7.11E-07	1.03E-05	3.47E-07	1.82E-05	6.16E-06	5.83E-10	3.61E-05	2.84E-08
83-32-9	83329	Acenaphthene	1.23E-04	2.82E-04	1.46E-04	2.24E-03	5.19E-05	1.28E-04	1.86E-03	6.25E-05	3.29E-03	1.11E-03	1.05E-07	6.50E-03	5.12E-06
208-96-8	208968	Acenaphthylene	5.02E-05	1.14E-04	5.92E-05	9.12E-04	2.11E-05	5.21E-05	7.57E-04	2.54E-05	1.34E-03	4.52E-04	4.27E-08	2.64E-03	2.08E-06
191-24-2	191242	Benzo(ghi)perylene	1.12E-06	2.56E-06	1.32E-06	2.04E-05	4.71E-07	1.16E-06	1.69E-05	5.67E-07	2.98E-05	1.01E-05	9.53E-10	5.90E-05	4.65E-08
120-12-7	120127	Anthracene	2.73E-07	6.22E-07	3.22E-07	4.96E-06	1.15E-07	2.83E-07	4.11E-06	1.38E-07	7.26E-06	2.45E-06	2.32E-10	1.44E-05	1.13E-08
206-44-0	206440	Fluoranthene	8.54E-04	1.95E-03	1.01E-03	1.55E-02	3.59E-04	8.85E-04	1.29E-02	4.32E-04	2.27E-02	7.68E-03	7.26E-07	4.49E-02	3.54E-05
86-73-7	86737	Fluorene	1.76E-04	4.02E-04	2.08E-04	3.20E-03	7.41E-05	1.83E-04	2.66E-03	8.93E-05	4.69E-03	1.59E-03	1.50E-07	9.28E-03	7.32E-06
91-20-3	91203	Naphthalene	1.18E-02	2.68E-02	1.39E-02	2.14E-01	4.94E-03	1.22E-02	1.77E-01	5.95E-03	3.13E-01	1.06E-01	1.00E-05	6.19E-01	4.88E-04
85-01-8	85018	Phenanthrene	2.21E-03	5.04E-03	2.61E-03	4.02E-02	9.29E-04	2.29E-03	3.33E-02	1.12E-03	5.88E-02	1.99E-02	1.88E-06	1.16E-01	9.17E-05
129-00-0	129000	Pyrene	1.83E-05	4.18E-05	2.16E-05	3.33E-04	7.71E-06	1.90E-05	2.77E-04	9.29E-06	4.88E-04	1.65E-04	1.56E-08	9.65E-04	7.61E-07

**Flare
Exxon - SYU
Interim Trucking Project**

Max Hourly

POPCO Thermal Oxidizer	Thermal Oxidizer -- Planned Continuous Flaring	Thermal Oxidizer -- Planned Other (SU, Maint., Tailgas)	Thermal Oxidizer -- Purge & Pilot	Thermal Oxidizer -- Unplanned Other (Misc., SRU Fail)	LFC Thermal Oxidizer	Thermal Oxidizer -- Planned -- Contin. (Acid Gas, Low Press.)	Thermal Oxidizer -- Planned -- Other	Thermal Oxidizer -- Purge and Pilot	Thermal Oxidizer -- Unplanned -- Other	LFC Waste Gas Incinerator	Waste Gas Incinerator -- Normal Ops	Waste Gas Incinerator -- Planned SU/SD/Maintenance
DEV	150012	150013	150011	150014	DEV	116012	116013	116011	116014	DEV	146031	146032
Location	POPCO	POPCO	POPCO	POPCO	Location	LFC	LFC	LFC	LFC	Location	LFC	LFC
Max Rating (MMBtu/hr)	1.08	3.98	2.62	2.835	Max Rating (MMBtu/hr)	1.980	19.500	4.800	18.120	Max Rating (MMBtu/hr)		
Max Stack Flow Rate (dscfm)					Max Stack Flow Rate (dscfm)					Max Stack Flow Rate (dscfm)	3873.33	
Max NH3 Concentration (ppm)					Max NH3 Concentration (ppm)					Max NH3 Concentration (ppm)	17.00	
Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Fuel Type	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Fuel Gas (MMscf)	0.0091	0.0091
HHV (Btu/scf)	1176	1176	1176	1176	HHV (Btu/scf)	1220	1220	1220	1220	Tailgas (Btu/scf)	11.57	
Fuel Units	MMscf	MMscf	MMscf	MMscf	Fuel Units	MMscf	MMscf	MMscf	MMscf	HHV (Btu/scf)	1220	1220
Fuel Quantity (MMscf/hr)	0.0009	0.0077	0.0022	0.0036	Fuel Quantity (MMscf/hr)	0.0017	0.0184	0.0040	0.0157	Tail Gas (MMscf)	0.1337	0.0000
HHV	1190	519.33	1190	785.5	HHV	1200	1057.6	1200	1153.75	Total Fuel (MMBtu)	12.60	11.05
lb/MMscf	lb/hr	lb/hr	lb/hr	lb/hr	lb/MMscf	lb/hr	lb/hr	lb/hr	lb/hr	lb/MMBtu	lb/hr	lb/hr
											0.17	
0.00E+00					0.00E+00					0.00E+00		
4.30E-02	3.90E-05	3.30E-04	9.47E-05	1.55E-04	4.30E-02	7.10E-05	7.93E-04	1.72E-04	6.75E-04	4.20E-05	5.29E-04	4.64E-04
1.04E-02	9.46E-06	7.99E-05	2.29E-05	3.76E-05	1.04E-02	1.72E-05	1.92E-04	4.17E-05	1.64E-04	1.02E-05	1.29E-04	1.13E-04
1.59E-01	1.44E-04	1.22E-03	3.50E-04	5.74E-04	1.59E-01	2.62E-04	2.93E-03	6.36E-04	2.50E-03	1.54E-04	1.94E-03	1.70E-03
0.00E+00					0.00E+00					0.00E+00		
1.43E-02	1.30E-05	1.09E-04	3.14E-05	5.15E-05	1.43E-02	2.36E-05	2.63E-04	5.71E-05	2.24E-04	1.40E-05	1.76E-04	1.55E-04
1.17E+00	1.06E-03	8.96E-03	2.57E-03	4.22E-03	1.17E+00	1.93E-03	2.16E-02	4.68E-03	1.84E-02	1.13E-03	1.43E-02	1.25E-02
2.90E-02	2.63E-05	2.22E-04	6.38E-05	1.05E-04	2.90E-02	4.79E-05	5.35E-04	1.16E-04	4.55E-04	2.80E-05	3.53E-04	3.09E-04
0.00E+00					0.00E+00					0.00E+00		
0.00E+00					0.00E+00					0.00E+00		
2.44E+00	2.21E-03	1.87E-02	5.37E-03	8.81E-03	2.44E+00	4.03E-03	4.50E-02	9.76E-03	3.83E-02	2.37E-03	2.98E-02	2.61E-02
0.00E+00					0.00E+00					0.00E+00		
0.00E+00					0.00E+00					0.00E+00		
5.80E-02	5.26E-05	4.44E-04	1.28E-04	2.09E-04	5.80E-02	9.57E-05	1.07E-03	2.32E-04	9.11E-04	5.60E-05	7.05E-04	6.19E-04
2.90E-02	2.63E-05	2.22E-04	6.38E-05	1.05E-04	2.90E-02	4.79E-05	5.35E-04	1.16E-04	4.55E-04	2.80E-05	3.53E-04	3.09E-04
7.36E-08	6.68E-11	5.64E-10	1.62E-10	2.66E-10	7.64E-08	1.26E-10	1.41E-09	3.05E-10	1.20E-09	6.26E-11	7.89E-10	6.92E-10
1.34E-07	1.22E-10	1.03E-09	2.95E-10	4.84E-10	1.39E-07	2.29E-10	2.56E-09	5.56E-10	2.18E-09	1.14E-10	1.44E-09	1.26E-09
7.63E-08	6.93E-11	5.85E-10	1.68E-10	2.75E-10	7.92E-08	1.31E-10	1.46E-09	3.17E-10	1.24E-09	6.49E-11	8.18E-10	7.17E-10
3.49E-05	3.17E-08	2.68E-07	7.69E-08	1.26E-07	3.62E-05	5.98E-08	6.68E-07	1.45E-07	5.69E-07	2.97E-08	3.74E-07	3.28E-07
3.26E-07	2.96E-10	2.50E-09	7.17E-10	1.18E-09	3.38E-07	5.58E-10	6.23E-09	1.35E-09	5.31E-09	2.77E-10	3.49E-09	3.06E-09
6.86E-07	6.22E-10	5.25E-09	1.51E-09	2.47E-09	7.11E-07	1.17E-09	1.31E-08	2.84E-09	1.12E-08	5.83E-10	7.34E-09	6.44E-09
1.23E-04	1.12E-07	9.46E-07	2.72E-07	4.46E-07	1.28E-04	2.11E-07	2.36E-06	5.12E-07	2.01E-06	1.05E-07	1.32E-06	1.16E-06
5.02E-05	4.56E-08	3.85E-07	1.11E-07	1.81E-07	5.21E-05	8.59E-08	9.60E-07	2.08E-07	8.18E-07	4.27E-08	5.38E-07	4.72E-07
1.12E-06	1.02E-09	8.59E-09	2.47E-09	4.04E-09	1.16E-06	1.92E-09	2.14E-08	4.65E-09	1.83E-08	9.53E-10	1.20E-08	1.05E-08
2.73E-07	2.48E-10	2.09E-09	6.01E-10	9.85E-10	2.83E-07	4.67E-10	5.22E-09	1.13E-09	4.44E-09	2.32E-10	2.92E-09	2.56E-09
8.54E-04	7.75E-07	6.54E-06	1.88E-06	3.08E-06	8.85E-04	1.46E-06	1.63E-05	3.54E-06	1.39E-05	7.26E-07	9.15E-06	8.02E-06
1.76E-04	1.60E-07	1.35E-06	3.88E-07	6.37E-07	1.83E-04	3.02E-07	3.37E-06	7.32E-07	2.87E-06	1.50E-07	1.89E-06	1.66E-06
1.18E-02	1.07E-05	9.01E-05	2.59E-05	4.24E-05	1.22E-02	2.01E-05	2.25E-04	4.88E-05	1.92E-04	1.00E-05	1.26E-04	1.11E-04
2.21E-03	2.01E-06	1.69E-05	4.87E-06	7.98E-06	2.29E-03	3.78E-06	4.23E-05	9.17E-06	3.60E-05	1.88E-06	2.37E-05	2.08E-05
1.83E-05	1.66E-08	1.41E-07	4.04E-08	6.62E-08	1.90E-05	3.14E-08	3.51E-07	7.61E-08	2.99E-07	1.56E-08	1.97E-07	

**Turbine
Exxon - SYU
Interim Trucking Project**

Annual Total

			LFC Cogeneration Power Plant	CPP -- HRSG Only	CPP -- Normal Ops. Modes	CPP -- Planned Bypass (SU/SD, etc)
			DEV	126022	126021	125010
			Location	LFC	LFC	LFC
			Fuel Type	Natural Gas	Natural Gas	Natural Gas
			Fuel Units	MMscf	MMscf	MMscf
			Fuel Quantity	65.3400	2988.82	0.67
			Fuel HHV	1220	1220	1220
CAS #	AB2588 No.		Turbine (lbs/MMBtu)	lb/year	lb/year	lb/year
100-41-4	100414	Ethylbenzene	0.000032	2.55E+00	1.17E+02	2.61E-02
106-99-0	106990	1,3-Butadiene	0.00000043	3.43E-02	1.57E+00	3.51E-04
107-02-8	107028	Acrolein	0.0000064	5.10E-01	2.33E+01	5.23E-03
108-88-3	108883	Toluene	0.00013	1.04E+01	4.74E+02	1.06E-01
1330-20-7	1330207	Xylenes (mixed isomers)	0.000064	5.10E+00	2.33E+02	5.23E-02
50-00-0	50000	Formaldehyde	0.00071	5.66E+01	2.59E+03	5.80E-01
71-43-2	71432	Benzene	0.000012	9.56E-01	4.37E+01	9.81E-03
75-07-0	75070	Acetaldehyde	0.00004	3.19E+00	1.46E+02	3.27E-02
75-56-9	75569	Propylene Oxide	0.000029	2.31E+00	1.06E+02	2.37E-02
91-20-3	91203	Naphthalene	0			
1151	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.0000022	1.75E-01	8.02E+00	1.80E-03

Notes:

Emission factors per EPA, AP-42, Table 3.1-3.

**Turbine
Exxon - SYU
Interim Trucking Project**

Max Hourly

			LFC Cogeneration Power Plant	CPP -- HRSG Only	CPP -- Normal Ops. Modes	CPP -- Planned Bypass (SU/SD, etc)
			DEV	126022	126021	125010
			Location	LFC	LFC	LFC
			Max Rating (MMBtu/hr)	345	605.14	309
			Fuel Type	Natural Gas	Natural Gas	Natural Gas
			Fuel Units	MMscf	MMscf	MMscf
			Fuel Quantity (MMscf/hr)	0.2829	0.4962	0.2533
			Fuel HHV	1220	1220	1220
CAS #	AB2588 No.		Turbine (lbs/MMBtu)	lb/hr	lb/hr	lb/hr
100-41-4	100414	Ethylbenzene	0.000032	0.011	0.019	0.010
106-99-0	106990	1,3-Butadiene	0.00000043	1.48E-04	2.60E-04	1.33E-04
107-02-8	107028	Acrolein	0.0000064	0.0022	0.0039	0.0020
108-88-3	108883	Toluene	0.00013	4.49E-02	7.87E-02	4.02E-02
1330-20-7	1330207	Xylenes (mixed isomers)	0.000064	2.21E-02	3.87E-02	1.98E-02
50-00-0	50000	Formaldehyde	0.00071	0.24	0.43	0.22
71-43-2	71432	Benzene	0.000012	4.14E-03	7.26E-03	3.71E-03
75-07-0	75070	Acetaldehyde	0.00004	1.38E-02	2.42E-02	1.24E-02
75-56-9	75569	Propylene Oxide	0.000029	1.00E-02	1.75E-02	8.96E-03
91-20-3	91203	Naphthalene	0			
1151	1151	PAHs, total, w/o individ. components reported [PAH, POM]	0.0000022	7.59E-04	1.33E-03	6.80E-04

**Stretford System
Exxon - SYU
Interim Trucking Project**

Annual Emissions

Device	Evaporative Cooler	Aerator A (Oxidizer Tank No. 1)	Aerator B (Oxidizer Tank No. 2)
DEV	150100	250120	250130
Speciation	POP-9		
Flowrate (gal/min)	330		
Operating Hours	8,760	8,760	8,760
ROC Speciation		CARB 532	CARB 532
ROC (lb/hr)		0.022	0.011
FROG		0.606	0.606
POP-9 (ppm)	lb/year	lb/year	lb/year
0.00E+00			
1.29E-01	3.72E-02		
1.02E+02	2.94E+01		

CAS #	AB2588 No.	Compound Name	Oil & gas extraction - well heads & cellars/oil&water separator		lb/year	lb/year
71-43-2	71432	Benzene	0.016		5.01	2.62
110-54-3	110543	Hexane (-n)	0.032		10.02	5.24
108-88-3	108883	Toluene	0.010		3.13	1.64

**Stretford System
Exxon - SYU
Interim Trucking Project**

Hourly Emissions:

Device	Evaporative Cooler	Aerator A (Oxidizer Tank No. 1)	Aerator B (Oxidizer Tank No. 2)
DEV	150100	250120	250130
Speciation	POP-9		
Flowrate (gal/min)	330		
ROC Speciation		CARB 532	CARB 532
ROC (lb/hr)		0.027	0.016
FROG		0.606	0.606
POP-9 (ppm)	lb/hour	lb/hour	lb/hour
0.00E+00			
1.29E-01	4.24E-06		
1.02E+02	3.35E-03		

CAS #	AB2588 No.	Compound Name	Oil & gas extraction - well heads & cellars/oil&water separator	lb/hour	lb/hour	lb/hour
71-43-2	71432	Benzene	0.016		0.00071	0.00042
110-54-3	110543	Hexane (-n)	0.032		0.00143	0.00084
108-88-3	108883	Toluene	0.010		0.00045	0.00026

**FHC - Gas Toxics
Exxon - SYU
Interim Trucking Project**

SYU		SYU Gas Total	CPP Fugitive Components (Gas)	OTP Fugitive Components (Gas)	SGTP Fugitive Components (Gas)	TT Fugitive Components (Gas)	POPCO Fugitive Components (Gas)
Annual Total (lb/yr)		Dev	360211	360111	360411	360311	360511
CAS #	AB2588 No.	No. Processes:	3	8	2	1	3
7783-06-4	7783064	Hydrogen Sulfide	7.52E-01	3.66E+01	1.27E+02	6.41E+01	6.95E+02
75-15-0	75150	Carbon Disulfide	7.05E-02		6.29E+00		8.16E-01
463-58-1	463581	Carbonyl Sulfide	5.53E-02		4.94E+00		7.41E-01
100-41-4	100414	Ethylbenzene	3.56E-02	3.98E-01	3.13E+00	5.06E-01	9.04E-01
107-21-1	107211	Ethylene Glycol			5.28E-03		
108-10-1	108101	Methyl Isobutyl Ketone					
108-88-3	108883	Toluene	3.11E-01	7.82E-01	2.72E+01	1.03E+00	7.20E+00
108-90-7	108907	Chlorobenzene					
110-54-3	110543	Hexane (-n)					
110-82-7	110827	Cyclohexane	1.14E+00	9.45E-01	9.48E+01	1.37E+00	1.93E+01
111-46-6	111466	Diethylene Glycol	6.53E-03	8.04E-05	6.02E-01		7.56E-02
111-76-2	111762	Glycol Ether EB					
112-34-5	112345	Butyl Dioxitol					
127-18-4	127184	Tetrachloroethene					
1310-73-2	1310732	Sodium Hydroxide			4.10E-01		
1330-20-7	1330207	Xylenes (mixed isomers)	3.89E-02	7.84E-01	3.41E+00	1.01E+00	1.18E+00
50-00-0	50000	Formaldehyde					
67-56-1	67561	Methyl Alcohol	9.10E-06	3.90E-02	2.38E-04	7.50E-03	5.70E+01
67-63-0	67630	Isopropyl Alcohol					
71-43-2	71432	Benzene	6.72E-01	4.74E-01	5.70E+01	6.69E-01	1.42E+01
7664-41-7	7664417	Ammonia	2.95E-05	1.87E-03	7.02E-03	2.64E-03	7.34E-03
78-93-3	78933	Methyl Ethyl Ketone					
91-20-3	91203	Naphthalene	2.45E-04	1.25E-01	9.31E-03	1.49E-01	
95-63-6	95636	Trimethylbenzene (1,2,4)	4.58E-04	2.15E-01	1.60E-02	2.79E-01	4.45E-02

SYU		SYU Gas Total	CPP Fugitive Components (Gas)	OTP Fugitive Components (Gas)	SGTP Fugitive Components (Gas)	TT Fugitive Components (Gas)	POPCO Fugitive Components (Gas)
Max Hour (lb/hr)		Dev	360211	360111	360411	360311	360511
CAS #	AB2588 No.	No. Processes	3	8	2	1	3
7783-06-4	7783064		8.59E-05	4.18E-03	1.45E-02	7.32E-03	7.94E-02
75-15-0	75150		8.05E-06		7.18E-04		9.32E-05
463-58-1	463581		6.31E-06		5.63E-04		8.46E-05
100-41-4	100414		4.07E-06	4.55E-05	3.58E-04	5.78E-05	1.03E-04
107-21-1	107211				6.03E-07		
108-10-1	108101						
108-88-3	108883		3.55E-05	8.92E-05	3.11E-03	1.17E-04	8.21E-04
108-90-7	108907						
110-54-3	110543						
110-82-7	110827		1.30E-04	1.08E-04	1.08E-02	1.57E-04	2.20E-03
111-46-6	111466		7.46E-07	9.17E-09	6.87E-05		8.64E-06
111-76-2	111762						
112-34-5	112345						
127-18-4	127184						
1310-73-2	1310732				4.68E-05		
1330-20-7	1330207		4.44E-06	8.95E-05	3.90E-04	1.15E-04	1.34E-04
50-00-0	50000						
67-56-1	67561		1.04E-09	4.45E-06	2.72E-08	8.56E-07	6.51E-03
67-63-0	67630						
71-43-2	71432		7.67E-05	5.41E-05	6.51E-03	7.64E-05	1.62E-03
7664-41-7	7664417		3.37E-09	2.14E-07	8.01E-07	3.02E-07	8.38E-07
78-93-3	78933						
91-20-3	91203		2.80E-08	1.43E-05	1.06E-06	1.70E-05	
95-63-6	95636		5.23E-08	2.45E-05	1.83E-06	3.18E-05	5.08E-06

**FHC - Oil Toxics
Exxon - SYU
Interim Trucking Project**

SYU		SYU Gas Total	CPP Fugitive Components (Oil)	OTP Fugitive Components (Oil)	SGTP Fugitive Components (Oil)	TT Fugitive Components (Oil)
Annual Total (lb/yr)		Dev	360212	360112	360412	360312
CAS #	AB2588 No.	No. Processes:	3	8	2	1
7783-06-4	7783064	Hydrogen Sulfide	9.38E-04	1.25E+00	7.30E-01	2.33E-01
75-15-0	75150	Carbon Disulfide	2.03E-03		9.29E-02	
463-58-1	463581	Carbonyl Sulfide	1.59E-03		7.29E-02	
100-41-4	100414	Ethylbenzene	9.96E-04	1.89E+00	6.16E-02	1.43E+00
107-21-1	107211	Ethylene Glycol				
108-10-1	108101	Methyl Isobutyl Ketone				
108-88-3	108883	Toluene	8.76E-03	2.96E-01	4.31E-01	2.81E+00
108-90-7	108907	Chlorobenzene				
110-54-3	110543	Hexane (-n)				
110-82-7	110827	Cyclohexane	3.10E-02	2.87E-01	1.42E+00	2.74E+00
111-46-6	111466	Diethylene Glycol	1.88E-04	6.54E-06	8.61E-03	
111-76-2	111762	Glycol Ether EB				
112-34-5	112345	Butyl Dioxitol				
127-18-4	127184	Tetrachloroethene				
1310-73-2	1310732	Sodium Hydroxide				
1330-20-7	1330207	Xylenes (mixed isomers)	1.07E-03	1.43E+00	8.11E-02	2.86E+00
50-00-0	50000	Formaldehyde				
67-56-1	67561	Methyl Alcohol		1.04E+00	1.93E-04	1.77E-02
67-63-0	67630	Isopropyl Alcohol		3.68E+00		
71-43-2	71432	Benzene	1.85E-02	1.45E-01	8.53E-01	1.37E+00
7664-41-7	7664417	Ammonia		8.09E-05	2.84E-05	9.55E-06
78-93-3	78933	Methyl Ethyl Ketone				
91-20-3	91203	Naphthalene		6.81E-01	4.73E-03	4.23E-01
95-63-6	95636	Trimethylbenzene (1,2,4)		1.86E-01	8.84E-03	7.90E-01

SYU		SYU Gas Total	CPP Fugitive Components (Oil)	OTP Fugitive Components (Oil)	SGTP Fugitive Components (Oil)	TT Fugitive Components (Oil)
Max Hour (lb/hr)		Dev	360212	360112	360412	360312
CAS #	AB2588 No.	No. Processes	3	8	2	1
7783-06-4	7783064		1.07E-07	1.43E-04	8.33E-05	2.66E-05
75-15-0	75150		2.31E-07		1.06E-05	
463-58-1	463581		1.81E-07		8.32E-06	
100-41-4	100414		1.14E-07	2.16E-04	7.04E-06	1.64E-04
107-21-1	107211					
108-10-1	108101					
108-88-3	108883		9.99E-07	3.37E-05	4.92E-05	3.21E-04
108-90-7	108907					
110-54-3	110543					
110-82-7	110827		3.54E-06	3.28E-05	1.63E-04	3.13E-04
111-46-6	111466		2.14E-08	7.47E-10	9.83E-07	
111-76-2	111762					
112-34-5	112345					
127-18-4	127184					
1310-73-2	1310732					
1330-20-7	1330207		1.22E-07	1.63E-04	9.26E-06	3.27E-04
50-00-0	50000					
67-56-1	67561			1.19E-04	2.20E-08	2.02E-06
67-63-0	67630			4.20E-04		
71-43-2	71432		2.12E-06	1.65E-05	9.74E-05	1.56E-04
7664-41-7	7664417			9.24E-09	3.24E-09	1.09E-09
78-93-3	78933					
91-20-3	91203			7.77E-05	5.40E-07	4.83E-05
95-63-6	95636			2.12E-05	1.01E-06	9.02E-05

**FHC - Pump Seal Toxics
Exxon - SYU
Interim Trucking Project**

SYU	SYU Gas Total	CPP Pump Seals	OTP Pump Seals	SGTP Pump Seals	TT Pump Seals	POPCO Pump Seals
Annual Total (lb/yr)	Dev	380221	380121	380421	380321	380521
CAS #	AB2588 No.	No. Processes:				
		3	8	2	1	3
7783-06-4	7783064	Hydrogen Sulfide	3.35E-04	1.16E+00		1.55E+00
75-15-0	75150	Carbon Disulfide		1.14E-01		5.57E-03
463-58-1	463581	Carbonyl Sulfide		8.96E-02		4.38E-03
100-41-4	100414	Ethylbenzene	2.66E-01	5.60E-02	2.76E-01	3.22E-03
107-21-1	107211	Ethylene Glycol				
108-10-1	108101	Methyl Isobutyl Ketone				
108-88-3	108883	Toluene	2.28E-02	4.91E-01	5.41E-01	2.73E-02
108-90-7	108907	Chlorobenzene				
110-54-3	110543	Hexane (-n)				
110-82-7	110827	Cyclohexane	2.22E-02	1.71E+00	5.27E-01	8.87E-02
111-46-6	111466	Diethylene Glycol		1.06E-02		5.16E-04
111-76-2	111762	Glycol Ether EB				
112-34-5	112345	Butyl Dioxitol				
127-18-4	127184	Tetrachloroethene				
1310-73-2	1310732	Sodium Hydroxide				
1330-20-7	1330207	Xylenes (mixed isomers)	1.51E-01	6.04E-02	5.51E-01	3.70E-03
50-00-0	50000	Formaldehyde				
67-56-1	67561	Methyl Alcohol	6.03E-04		3.02E-03	
67-63-0	67630	Isopropyl Alcohol	7.64E-01			
71-43-2	71432	Benzene	1.11E-02	1.03E+00	2.63E-01	5.65E-02
7664-41-7	7664417	Ammonia		4.56E-05		7.02E-06
78-93-3	78933	Methyl Ethyl Ketone				
91-20-3	91203	Naphthalene	2.89E-02		8.14E-02	
95-63-6	95636	Trimethylbenzene (1,2,4)	6.42E-03		1.52E-01	4.24E-05

SYU	SYU Gas Total	CPP Pump Seals	OTP Pump Seals	SGTP Pump Seals	TT Pump Seals	POPCO Pump Seals
Max Hour (lb/hr)	Dev	380221	380121	380421	380321	380521
CAS #	AB2588 No.	No. Processes				
		3	8	2	1	3
7783-06-4	7783064		3.83E-08	1.32E-04		1.77E-04
75-15-0	75150			1.30E-05		6.36E-07
463-58-1	463581			1.02E-05		5.00E-07
100-41-4	100414		3.04E-05	6.40E-06	3.15E-05	3.67E-07
107-21-1	107211					
108-10-1	108101					
108-88-3	108883		2.61E-06	5.60E-05	6.18E-05	3.11E-06
108-90-7	108907					
110-54-3	110543					
110-82-7	110827		2.54E-06	1.95E-04	6.02E-05	1.01E-05
111-46-6	111466			1.21E-06		5.89E-08
111-76-2	111762					
112-34-5	112345					
127-18-4	127184					
1310-73-2	1310732					
1330-20-7	1330207		1.72E-05	6.89E-06	6.29E-05	4.23E-07
50-00-0	50000					
67-56-1	67561		6.88E-08		3.45E-07	
67-63-0	67630		8.73E-05			
71-43-2	71432		1.27E-06	1.17E-04	3.01E-05	6.45E-06
7664-41-7	7664417			5.20E-09		8.02E-10
78-93-3	78933					
91-20-3	91203		3.30E-06		9.30E-06	
95-63-6	95636		7.33E-07		1.74E-05	4.84E-09

**FHC - CompressorSeal Toxics
Exxon - SYU
Interim Trucking Project**

SYU			SYU Gas Total	CPP Compressor Seals	OTP Compressor Seals	SGTP Compressor Seals	TT Compressor Seals	POPCO Compressor Seals
Annual Total (lb/yr)			Dev	380222	380122	380422	380322	380522
CAS #	AB2588 No.	No. Processes		3	8	2	1	3
7783-06-4	7783064	Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00
75-15-0	75150	Carbon Disulfide		0.00	0.00	0.00	0.00	0.00
463-58-1	463581	Carbonyl Sulfide		0.00	0.00	0.00	0.00	0.00
100-41-4	100414	Ethylbenzene		0.00	0.00	0.00	0.00	0.00
107-21-1	107211	Ethylene Glycol		0.00	0.00	0.00	0.00	0.00
108-10-1	108101	Methyl Isobutyl Ketone		0.00	0.00	0.00	0.00	0.00
108-88-3	108883	Toluene		0.00	0.00	0.00	0.00	0.00
108-90-7	108907	Chlorobenzene		0.00	0.00	0.00	0.00	0.00
110-54-3	110543	Hexane (-n)		0.00	0.00	0.00	0.00	0.00
110-82-7	110827	Cyclohexane		0.00	0.00	0.00	0.00	0.00
111-46-6	111466	Diethylene Glycol		0.00	0.00	0.00	0.00	0.00
111-76-2	111762	Glycol Ether EB		0.00	0.00	0.00	0.00	0.00
112-34-5	112345	Butyl Dioxitol		0.00	0.00	0.00	0.00	0.00
127-18-4	127184	Tetrachloroethene		0.00	0.00	0.00	0.00	0.00
1310-73-2	1310732	Sodium Hydroxide		0.00	0.00	0.00	0.00	0.00
1330-20-7	1330207	Xylenes (mixed isomers)		0.00	0.00	0.00	0.00	0.00
50-00-0	50000	Formaldehyde		0.00	0.00	0.00	0.00	0.00
67-56-1	67561	Methyl Alcohol		0.00	0.00	0.00	0.00	0.00
67-63-0	67630	Isopropyl Alcohol		0.00	0.00	0.00	0.00	0.00
71-43-2	71432	Benzene		0.00	0.00	0.00	0.00	0.00
7664-41-7	7664417	Ammonia		0.00	0.00	0.00	0.00	0.00
78-93-3	78933	Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.00
91-20-3	91203	Naphthalene		0.00	0.00	0.00	0.00	0.00
95-63-6	95636	Trimethylbenzene (1,2,4)		0.00	0.00	0.00	0.00	0.00

SYU			SYU Gas Total	CPP Compressor Seals	OTP Compressor Seals	SGTP Compressor Seals	TT Compressor Seals	POPCO Compressor Seals
Max Hour (lb/hr)			Dev	380222	380122	380422	380322	380522
CAS #	AB2588 No.	No. Processes		3	8	2	1	3
7783-06-4	7783064	Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00
75-15-0	75150	Carbon Disulfide		0.00	0.00	0.00	0.00	0.00
463-58-1	463581	Carbonyl Sulfide		0.00	0.00	0.00	0.00	0.00
100-41-4	100414	Ethylbenzene		0.00	0.00	0.00	0.00	0.00
107-21-1	107211	Ethylene Glycol		0.00	0.00	0.00	0.00	0.00
108-10-1	108101	Methyl Isobutyl Ketone		0.00	0.00	0.00	0.00	0.00
108-88-3	108883	Toluene		0.00	0.00	0.00	0.00	0.00
108-90-7	108907	Chlorobenzene		0.00	0.00	0.00	0.00	0.00
110-54-3	110543	Hexane (-n)		0.00	0.00	0.00	0.00	0.00
110-82-7	110827	Cyclohexane		0.00	0.00	0.00	0.00	0.00
111-46-6	111466	Diethylene Glycol		0.00	0.00	0.00	0.00	0.00
111-76-2	111762	Glycol Ether EB		0.00	0.00	0.00	0.00	0.00
112-34-5	112345	Butyl Dioxitol		0.00	0.00	0.00	0.00	0.00
127-18-4	127184	Tetrachloroethene		0.00	0.00	0.00	0.00	0.00
1310-73-2	1310732	Sodium Hydroxide		0.00	0.00	0.00	0.00	0.00
1330-20-7	1330207	Xylenes (mixed isomers)		0.00	0.00	0.00	0.00	0.00
50-00-0	50000	Formaldehyde		0.00	0.00	0.00	0.00	0.00
67-56-1	67561	Methyl Alcohol		0.00	0.00	0.00	0.00	0.00
67-63-0	67630	Isopropyl Alcohol		0.00	0.00	0.00	0.00	0.00
71-43-2	71432	Benzene		0.00	0.00	0.00	0.00	0.00
7664-41-7	7664417	Ammonia		0.00	0.00	0.00	0.00	0.00
78-93-3	78933	Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.00
91-20-3	91203	Naphthalene		0.00	0.00	0.00	0.00	0.00
95-63-6	95636	Trimethylbenzene (1,2,4)		0.00	0.00	0.00	0.00	0.00

**HRS
Exxon - SYU
Interim Trucking Project**

			Device Desc	Ammonia Storage Vessel/Injection System
			Device ID	221050
			Speciation	Ammonia Slip
			Average NH3 (ppm)	2.70
			Average Stack Flow Rate (dscfm)	221,666.67
CAS #	AB2588 No.			
7664-41-7	7664417	Ammonia	lb/yr	13,890.17

			Device Desc	Ammonia Storage Vessel/Injection System
			Device ID	221050
			Speciation	Ammonia Slip
			Max NH3 (ppm)	8.00
			Max Stack Flow Rate (dscfm)	256,666.67
CAS #	AB2588 No.			
7664-41-7	7664417	Ammonia	lb/hr	5.44

Notes:

Average Stack flow for 2013.

CPP = 13.3 mmscfh
slip samples

slip samples

taken

Highest hour CPP stack flow occurred on 1/15/13 @ 07:00 = 15.4 mmscfh

cpp NH3 slip ranged from 2 to 8 ppm

**Solvents
Exxon - SYU
Interim Trucking Project**

		StkName	Quality Control Lab	Maintenance Shop -- Parts Cleaning	CPP Process Solvent Loss	OTP Process Solvent Loss	SGTP Process Solvent Loss	TT Process Solvent Loss	POPCO Process Solvent Loss
		Facility	LFC	LFC	LFC	LFC	LFC	LFC	POPCO
		Plant Area	QC Lab	Maintenance Shop	CPP	OTP	SGTP	TT	POPCO
		Device Name	Lab Analysis	Parts Cleaning	Process Solvent Loss	Process Solvent Loss	Process Solvent Loss	Process Solvent Loss	Process Solvent Loss
		Device ID	111990	318023	390220	390120	390420	390320	390520
		No. Processes:	1	1	3	8	2	1	3
CAS #	AB2588 No.		lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
95-63-6	95636	Trimethylbenzene (1,2,4)	1.56	0.00	0.00	0.00	0.00	0.00	0.00
100-41-4	100414	Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110-43-0	110430	Methyl Amyl Ketone	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78-93-3	78933	Methyl Ethyl Ketone	0.00	0.00	0.00	0.00	0.00	0.00	12.60
N020	7440382	Arsenic Compounds	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108-88-3	108883	Toluene	46.76	0.00	0.00	0.00	0.00	0.00	0.00
1330-20-7	1330207	Xylenes (mixed isomers)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		StkName	Quality Control Lab	Maintenance Shop -- Parts Cleaning	CPP Process Solvent Loss	OTP Process Solvent Loss	SGTP Process Solvent Loss	TT Process Solvent Loss	POPCO Process Solvent Loss
		Facility	LFC	LFC	LFC	LFC	LFC	LFC	POPCO
		Plant Area	QC Lab	Maintenance Shop	CPP	OTP	SGTP	TT	POPCO
		Device Name	Lab Analysis	Parts Cleaning	Process Solvent Loss	Process Solvent Loss	Process Solvent Loss	Process Solvent Loss	Process Solvent Loss
		Device ID	111990	318023	390220	390120	390420	390320	390520
		No. Processes:	1	1	3	8	2	1	3
CAS #	AB2588 No.		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
95-63-6	95636	Trimethylbenzene (1,2,4)	0.22	0.00	0.00	0.00	0.00	0.00	0.00
100-41-4	100414	Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110-43-0	110430	Methyl Amyl Ketone	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78-93-3	78933	Methyl Ethyl Ketone	0.00	0.00	0.00	0.00	0.00	0.00	0.73
N020	7440382	Arsenic Compounds	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108-88-3	108883	Toluene	10.49	0.00	0.00	0.00	0.00	0.00	0.00
1330-20-7	1330207	Xylenes (mixed isomers)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Paints
Exxon - SYU
Interim Trucking Project**

		StkName	CPP Maint. Painting & Coating	OTP Maint. Painting & Coating	SGTP Maint. Painting & Coating	TT Maint. Painting & Coating	POPCO Maint. Painting & Coating
		Facility	LFC	LFC	LFC	LFC	POPCO
		Plant Area	CPP	OTP	SGTP	TT	POPCO
		Device Name	Painting & Coating	Painting & Coating	Painting & Coating	Painting & Coating	Painting & Coating
		Device ID	370212	370112	370412	370312	370512
		No. Processes:	3	8	2	1	3
CAS #	AB2588 No.		(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
95-63-6	95636	Trimethylbenzene (1,2,4)	0.09	0.03	0.13	0.26	3.73
100-41-4	100414	Ethylbenzene	0.10	0.04	0.15	0.30	2.92
107-21-1	107211	Ethylene Glycol	0.00	0.00	0.00	0.00	0.00
108-65-6	108656	Glycol Ether PM Acetate	0.00	0.00	0.00	0.01	2.68
110-43-0	110430	Methyl Amyl Ketone	0.27	0.10	0.41	0.81	6.18
78-93-3	78933	Methyl Ethyl Ketone	0.22	0.08	0.33	0.67	3.95
108-10-1	108101	Methyl Isobutyl Ketone	0.00	0.00	0.00	0.00	0.00
108-88-3	108883	Toluene	0.00	0.00	0.00	0.01	9.36
1330-20-7	1330207	Xylenes (mixed isomers)	0.39	0.15	0.58	1.16	14.31

		StkName	CPP Maint. Painting & Coating	OTP Maint. Painting & Coating	SGTP Maint. Painting & Coating	TT Maint. Painting & Coating	POPCO Maint. Painting & Coating
		Facility	LFC	LFC	LFC	LFC	POPCO
		Plant Area	CPP	OTP	SGTP	TT	POPCO
		Device Name	Painting & Coating	Painting & Coating	Painting & Coating	Painting & Coating	Painting & Coating
		Device ID	370212	370112	370412	370312	370512
		No. Processes:	3	8	2	1	3
CAS #	AB2588 No.		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
95-63-6	95636	Trimethylbenzene (1,2,4)	0.01	0.00	0.02	0.04	0.56
100-41-4	100414	Ethylbenzene	0.02	0.01	0.03	0.05	0.47
107-21-1	107211	Ethylene Glycol	0.00	0.00	0.00	0.00	0.00
108-65-6	108656	Glycol Ether PM Acetate	0.00	0.00	0.00	0.00	0.63
110-43-0	110430	Methyl Amyl Ketone	0.03	0.01	0.04	0.08	0.99
78-93-3	78933	Methyl Ethyl Ketone	0.02	0.01	0.03	0.07	1.41
108-10-1	108101	Methyl Isobutyl Ketone	0.00	0.00	0.00	0.00	0.00
108-88-3	108883	Toluene	0.00	0.00	0.00	0.00	3.42
1330-20-7	1330207	Xylenes (mixed isomers)	0.06	0.02	0.09	0.18	2.36

**Pigging
Exxon - SYU
Interim Trucking Project**

Exxon - SYU

			Device Desc	Oil Emulsion Pig Receiver
			Device ID	137100
			Location	TT
			Speciation	757
			Density of Vapor in Vessel (lb/ft3)	0.0504
			TOC EF (lb-TOC/Event)	3.9586
			Number of Events	43.00
CAS #	AB2588 No.		Wt Fraction	lb/yr
110-54-3	110543	Hexane (-n)	5.20E-02	8.85E+00
71-43-2	71432	Benzene	1.00E-03	1.70E-01

			Device Desc	Oil Emulsion Pig Receiver
			Device ID	137100
			Location	TT
			Speciation	757
			Density of Vapor in Vessel (lb/ft3)	0.0504
			TOC EF (lb-TOC/Event)	3.9586
			Max Event/Hour	1.00
CAS #	AB2588 No.		Wt Fraction	lb/hr
110-54-3	110543	Hexane (-n)	5.20E-02	2.06E-01
71-43-2	71432	Benzene	1.00E-03	3.96E-03

**Produced Water System
Exxon - SYU
Interim Trucking Project**

			Device Name	Aerator A	Aerator B	Centrate tank	Clarifier A	Clarifier B	Outfall Batch Tank	Skim tank	Sludge Cake Tote Bins A
			Device ID	214250	214260	114430	214280	214290	214310	214500	113601
			Speciation	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6
			Surface Area (ft2)	8,668	8,668	144	8,537	8,537	561	200	90
			Hours of Operation	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
			Control Efficiency	0%	0%	0%	0%	0%	0%	0%	0%
			Ewater (lb/hr)	251.94	251.94	4.19	248.13	248.13	16.30	5.81	2.62
CAS #	AB2588 No.		LFC-6	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
7783-06-4	7783064	Hydrogen Sulfide	0.00E+00								
75-15-0	75150	Carbon Disulfide	0.00E+00								
463-58-1	463581	Carbonyl Sulfide	0.00E+00								
100-41-4	100414	Ethylbenzene	0.00E+00								
107-21-1	107211	Ethylene Glycol	0.00E+00								
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00								
108-88-3	108883	Toluene	0.00E+00								
108-90-7	108907	Chlorobenzene	0.00E+00								
110-54-3	110543	Hexane (-n)	0.00E+00								
110-82-7	110827	Cyclohexane	0.00E+00								
111-46-6	111466	Diethylene Glycol	0.00E+00								
111-76-2	111762	Glycol Ether EB	0.00E+00								
112-34-5	112345	Butyl Dioxitol	0.00E+00								
127-18-4	127184	Tetrachloroethene	0.00E+00								
1310-73-2	1310732	Sodium Hydroxide	0.00E+00								
1330-20-7	1330207	Xylenes (mixed isomers)	0.00E+00								
50-00-0	50000	Formaldehyde	0.00E+00								
67-56-1	67561	Methyl Alcohol	0.00E+00								
67-63-0	67630	Isopropyl Alcohol	0.00E+00								
71-43-2	71432	Benzene	0.00E+00								
7664-41-7	7664417	Ammonia	1.34E-04	296.63	296.63	4.93	292.15	292.15	19.19	6.84	3.08
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00								
91-20-3	91203	Naphthalene	0.00E+00								
95-63-6	95636	Trimethylbenzene (1,2,4)	0.00E+00								

**Produced Water System
Exxon - SYU
Interim Trucking Project**

			Device Name	Aerator A	Aerator B	Centrate tank	Clarifier A	Clarifier B	Outfall Batch Tank	Skim tank	Sludge Cake Tote Bins A
			Device ID	214250	214260	114430	214280	214290	214310	214500	113601
			Speciation	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6	LFC-6
			Surface Area (ft2)	8,668	8,668	144	8,537	8,537	561	200	90
			Control Efficiency	0%	0%	0%	0%	0%	0%	0%	0%
			Ewater (lb/hr)	251.94	251.94	4.19	248.13	248.13	16.30	5.81	2.62
CAS #	AB2588 No.		LFC-6	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour
7783-06-4	7783064	Hydrogen Sulfide	0.00E+00								
75-15-0	75150	Carbon Disulfide	0.00E+00								
463-58-1	463581	Carbonyl Sulfide	0.00E+00								
100-41-4	100414	Ethylbenzene	0.00E+00								
107-21-1	107211	Ethylene Glycol	0.00E+00								
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00								
108-88-3	108883	Toluene	0.00E+00								
108-90-7	108907	Chlorobenzene	0.00E+00								
110-54-3	110543	Hexane (-n)	0.00E+00								
110-82-7	110827	Cyclohexane	0.00E+00								
111-46-6	111466	Diethylene Glycol	0.00E+00								
111-76-2	111762	Glycol Ether EB	0.00E+00								
112-34-5	112345	Butyl Dioxitol	0.00E+00								
127-18-4	127184	Tetrachloroethene	0.00E+00								
1310-73-2	1310732	Sodium Hydroxide	0.00E+00								
1330-20-7	1330207	Xylenes (mixed isomers)	0.00E+00								
50-00-0	50000	Formaldehyde	0.00E+00								
67-56-1	67561	Methyl Alcohol	0.00E+00								
67-63-0	67630	Isopropyl Alcohol	0.00E+00								
71-43-2	71432	Benzene	0.00E+00								
7664-41-7	7664417	Ammonia	1.34E-04	3.39E-02	3.39E-02	5.63E-04	3.34E-02	3.34E-02	2.19E-03	7.81E-04	3.52E-04
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00								
91-20-3	91203	Naphthalene	0.00E+00								
95-63-6	95636	Trimethylbenzene (1,2,4)	0.00E+00								

**Produced Water System
Exxon - SYU
Interim Trucking Project**

	Sludge Cake Tote Bins B	Sludge Cake Tote Bins C	Device Name	Anaerobic Filter A	Anaerobic Filter B	Equalization Tank	Device Name	VF Tower Feed Drum	Device Name	Wastewater Tank
	113602	113603	Device ID	211090	211190	114240	Device ID	211380	Device ID	150270
	LFC-6	LFC-6	Speciation	LFC-5	LFC-5	LFC-5	Speciation	LFC-1	Speciation	POP-8
	90	90	Surface Area (ft2)	2,290	2,290	3,849	Surface Area (ft2)	700	Surface Area (ft2)	2,278
	8,760	8,760	Hours of Operation	8,760	8,760	8,760	Hours of Operation	8,760	Hours of Operation	8,760
	0%	0%	Control Efficiency	99.8%	99.8%	75%	Control Efficiency	99.8%	Control Efficiency	90%
	2.62	2.62	Ewater (lb/hr)	66.56	66.56	111.86	Ewater (lb/hr)	20.35	Ewater (lb/hr)	66.20
CAS #	lb/yr	lb/yr	LFC-5	lb/yr	lb/yr	lb/yr	LFC-1	lb/yr	POP-8	lb/yr
7783-06-4			1.08E-05	1.26E-02	1.26E-02	1.06E-02	3.29E-05	1.17E-02	9.94E-08	5.77E-03
75-15-0			0.00E+00				0.00E+00		0.00E+00	
463-58-1			0.00E+00				0.00E+00		0.00E+00	
100-41-4			2.02E-08	2.36E-05	2.36E-05	4.95E-03	1.09E-06	3.87E-04	0.00E+00	
107-21-1			0.00E+00				0.00E+00		0.00E+00	
108-10-1			0.00E+00				0.00E+00		0.00E+00	
108-88-3			1.60E-07	1.87E-04	1.87E-04	3.93E-02	2.77E-06	9.86E-04	0.00E+00	
108-90-7			0.00E+00				0.00E+00		0.00E+00	
110-54-3			0.00E+00				0.00E+00		0.00E+00	
110-82-7			0.00E+00				1.24E-06	4.41E-04	0.00E+00	
111-46-6			0.00E+00				0.00E+00		0.00E+00	
111-76-2			0.00E+00				0.00E+00		0.00E+00	
112-34-5			0.00E+00				0.00E+00		0.00E+00	
127-18-4			0.00E+00				0.00E+00		0.00E+00	
1310-73-2			0.00E+00				0.00E+00		0.00E+00	
1330-20-7			2.74E-08	3.19E-05	3.19E-05	6.71E-03	2.45E-06	8.72E-04	0.00E+00	
50-00-0			0.00E+00				0.00E+00		0.00E+00	
67-56-1			0.00E+00				4.67E-05	1.66E-02	0.00E+00	
67-63-0			0.00E+00				0.00E+00		0.00E+00	
71-43-2			4.69E-07	5.47E-04	5.47E-04	1.15E-01	2.75E-06	9.80E-04	0.00E+00	
7664-41-7	3.08	3.08	1.75E-04	2.04E-01	2.04E-01	4.29E+01	0.00E+00		0.00E+00	
78-93-3			0.00E+00				0.00E+00		0.00E+00	
91-20-3			1.85E-08	2.15E-05	2.15E-05	4.52E-03	5.00E-07	1.78E-04	0.00E+00	
95-63-6			0.00E+00				8.40E-07	2.99E-04	0.00E+00	

**Produced Water System
Exxon - SYU
Interim Trucking Project**

	Sludge Cake Tote Bins B	Sludge Cake Tote Bins C	Device Name	Anaerobic Filter A	Anaerobic Filter B	Equalization Tank	Device Name	VF Tower Feed Drum	Device Name	Wastewater Tank
	113602	113603	Device ID	211090	211190	114240	Device ID	211380	Device ID	150270
	LFC-6	LFC-6	Speciation	LFC-5	LFC-5	LFC-5	Speciation	LFC-1	Speciation	POP-8
	90	90	Surface Area (ft2)	2,290	2,290	3,849	Surface Area (ft2)	700	Surface Area (ft2)	2,278
	0%	0%	Control Efficiency	95%	95%	75%	Control Efficiency	95%	Control Efficiency	90%
	2.62	2.62	Ewater (lb/hr)	66.56	66.56	111.86	Ewater (lb/hr)	20.35	Ewater (lb/hr)	66.20
CAS #	lb/hour	lb/hour	LFC-5	lb/hour	lb/hour	lb/hour	LFC-1	lb/hour	POP-8	lb/hour
7783-06-4			1.08E-05	3.60E-05	3.60E-05	3.02E-04	3.29E-05	3.35E-05	9.94E-08	6.58E-07
75-15-0			0.00E+00				0.00E+00		0.00E+00	
463-58-1			0.00E+00				0.00E+00		0.00E+00	
100-41-4			2.02E-08	6.72E-08	6.72E-08	5.65E-07	1.09E-06	1.11E-06	0.00E+00	
107-21-1			0.00E+00				0.00E+00		0.00E+00	
108-10-1			0.00E+00				0.00E+00		0.00E+00	
108-88-3			1.60E-07	5.33E-07	5.33E-07	4.48E-06	2.77E-06	2.81E-06	0.00E+00	
108-90-7			0.00E+00				0.00E+00		0.00E+00	
110-54-3			0.00E+00				0.00E+00		0.00E+00	
110-82-7			0.00E+00				1.24E-06	1.26E-06	0.00E+00	
111-46-6			0.00E+00				0.00E+00		0.00E+00	
111-76-2			0.00E+00				0.00E+00		0.00E+00	
112-34-5			0.00E+00				0.00E+00		0.00E+00	
127-18-4			0.00E+00				0.00E+00		0.00E+00	
1310-73-2			0.00E+00				0.00E+00		0.00E+00	
1330-20-7			2.74E-08	9.12E-08	9.12E-08	7.66E-07	2.45E-06	2.49E-06	0.00E+00	
50-00-0			0.00E+00				0.00E+00		0.00E+00	
67-56-1			0.00E+00				4.67E-05	4.75E-05	0.00E+00	
67-63-0			0.00E+00				0.00E+00		0.00E+00	
71-43-2			4.69E-07	1.56E-06	1.56E-06	1.31E-05	2.75E-06	2.80E-06	0.00E+00	
7664-41-7	3.52E-04	3.52E-04	1.75E-04	5.83E-04	5.83E-04	4.90E-03	0.00E+00		0.00E+00	
78-93-3			0.00E+00				0.00E+00		0.00E+00	
91-20-3			1.85E-08	6.14E-08	6.14E-08	5.16E-07	5.00E-07	5.09E-07	0.00E+00	
95-63-6			0.00E+00				8.40E-07	8.55E-07	0.00E+00	

**Steam System
Exxon - SYU
Interim Trucking Project**

		Device Name	Steam Condensate System	Steam Drum
		Device ID:	221090	121120
		Location		
		Speciation	Carbohydrazide	Carbohydrazide
		Density (lb/gal)	8.7	8.7
		Concentration (wt %)	0.05	0.05
		Blowdown (klb/hr)	1.6	1.6
		Makeup Water (klb/hr)	22	22
		Boiler/Feedwater Ratio	0.0727	0.0727
CAS #		Quantity Dispensed (gal/year)	404	404
497-18-7	Carbohydrazide	lb/year	No Air Toxics	No Air Toxics

		Device Desc	Steam Condensate System	Steam Drum
		Device ID	221090	121120
		Location		
		Speciation	Carbohydrazide	Carbohydrazide
		Density (lb/gal)	8.7	8.7
		Concentration (wt %)	0.01	0.01
		Blowdown (klb/hr)	1.6	1.6
CAS #		Boiler/Feedwater Ratio	0.0727	0.0727
497-18-7	Carbohydrazide	lb/hr	No Air Toxics	No Air Toxics

Sumps Separators
Exxon - SYU
Interim Trucking Project

			Device Name	Area Drain Oil/Water Separator - OTP	Area Drain Oil/Water Separator - TT	Area Drain Sump - OTP	Area Drain Sump - TT	Backwash Sump	Open Drain Sump - OTP
			Device ID	114150	134020	214140	234030	114420	114130
			Speciation	LFC-7	LFC-7	LFC-7	LFC-7	LFC-7	LFC-7
			Surface Area (ft2)	113	64	1,056	162	312	59
			Hours of Operation	8,760	8,760	8,760	8,760	8,760	8,760
			Control Efficiency	75%	75%	0%	0%	95%	75%
			EF (lbs/ft2-day)*	0.0015	0.0015	0.0058	0.0058	0.0003	0.0015
			VOC Emissions	59.81	33.66	2,235.55	341.90	33.03	31.23
CAS #	AB2588 No.		LFC-7	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
1310-73-2	1310732	Sodium Hydroxide	0.00E+00					1.01E+00	
7783-06-4	7783064	Hydrogen Sulfide	0.00E+00						
75-15-0	75150	Carbon Disulfide	0.00E+00						
463-58-1	463581	Carbonyl Sulfide	0.00E+00						
100-41-4	100414	Ethylbenzene	9.13E-04	5.46E-02	3.07E-02	2.04E+00	3.12E-01	3.01E-02	2.85E-02
107-21-1	107211	Ethylene Glycol	0.00E+00						
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00						
108-88-3	108883	Toluene	1.79E-03	1.07E-01	6.03E-02	4.00E+00	6.12E-01	5.91E-02	5.59E-02
108-90-7	108907	Chlorobenzene	0.00E+00						
110-54-3	110543	Hexane (-n)	0.00E+00						
110-82-7	110827	Cyclohexane	1.74E-03	1.04E-01	5.87E-02	3.90E+00	5.96E-01	5.76E-02	5.44E-02
111-46-6	111466	Diethylene Glycol	0.00E+00						
111-76-2	111762	Glycol Ether EB	0.00E+00						
112-34-5	112345	Butyl Dioxitol	0.00E+00						
127-18-4	127184	Tetrachloroethene	0.00E+00						
1310-73-2	1310732	Sodium Hydroxide	0.00E+00						
1330-20-7	1330207	Xylenes (mixed isomers)	1.82E-03	1.09E-01	6.13E-02	4.07E+00	6.23E-01	6.01E-02	5.69E-02
50-00-0	50000	Formaldehyde	0.00E+00						
67-56-1	67561	Methyl Alcohol	1.00E-05	5.98E-04	3.37E-04	2.24E-02	3.42E-03	3.30E-04	3.12E-04
67-63-0	67630	Isopropyl Alcohol	0.00E+00						
71-43-2	71432	Benzene	8.71E-04	5.21E-02	2.93E-02	1.95E+00	2.98E-01	2.88E-02	2.72E-02
7664-41-7	7664417	Ammonia	0.00E+00						
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00						
91-20-3	91203	Naphthalene	2.69E-04	1.61E-02	9.07E-03	6.02E-01	9.21E-02	8.89E-03	8.41E-03
95-63-6	95636	Trimethylbenzene (1,2,4)	5.03E-04	3.01E-02	1.69E-02	1.12E+00	1.72E-01	1.66E-02	1.57E-02

Sumps Separators
Exxon - SYU
Interim Trucking Project

			Device Name	Area Drain Oil/Water Separator - OTP	Area Drain Oil/Water Separator - TT	Area Drain Sump - OTP	Area Drain Sump - TT	Backwash Sump	Open Drain Sump - OTP
			Device ID	114150	134020	214140	234030	114420	114130
			Speciation	LFC-7	LFC-7	LFC-7	LFC-7	LFC-7	LFC-7
CAS #	AB2588 No.		LFC-7	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
1310-73-2	1310732	Sodium Hydroxide	0.00E+00					1.15E-04	
7783-06-4	7783064	Hydrogen Sulfide	0.00E+00						
75-15-0	75150	Carbon Disulfide	0.00E+00						
463-58-1	463581	Carbonyl Sulfide	0.00E+00						
100-41-4	100414	Ethylbenzene	9.13E-04	6.23E-06	3.51E-06	2.33E-04	3.56E-05	3.44E-06	3.25E-06
107-21-1	107211	Ethylene Glycol	0.00E+00						
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00						
108-88-3	108883	Toluene	1.79E-03	1.22E-05	6.88E-06	4.57E-04	6.99E-05	6.75E-06	6.38E-06
108-90-7	108907	Chlorobenzene	0.00E+00						
110-54-3	110543	Hexane (-n)	0.00E+00						
110-82-7	110827	Cyclohexane	1.74E-03	1.19E-05	6.70E-06	4.45E-04	6.80E-05	6.57E-06	6.21E-06
111-46-6	111466	Diethylene Glycol	0.00E+00						
111-76-2	111762	Glycol Ether EB	0.00E+00						
112-34-5	112345	Butyl Dioxitol	0.00E+00						
127-18-4	127184	Tetrachloroethene	0.00E+00						
1310-73-2	1310732	Sodium Hydroxide	0.00E+00						
1330-20-7	1330207	Xylenes (mixed isomers)	1.82E-03	1.24E-05	7.00E-06	4.65E-04	7.11E-05	6.87E-06	6.49E-06
50-00-0	50000	Formaldehyde	0.00E+00						
67-56-1	67561	Methyl Alcohol	1.00E-05	6.83E-08	3.84E-08	2.55E-06	3.90E-07	3.77E-08	3.56E-08
67-63-0	67630	Isopropyl Alcohol	0.00E+00						
71-43-2	71432	Benzene	8.71E-04	5.95E-06	3.35E-06	2.22E-04	3.40E-05	3.28E-06	3.10E-06
7664-41-7	7664417	Ammonia	0.00E+00						
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00						
91-20-3	91203	Naphthalene	2.69E-04	1.84E-06	1.03E-06	6.87E-05	1.05E-05	1.02E-06	9.60E-07
95-63-6	95636	Trimethylbenzene (1,2,4)	5.03E-04	3.43E-06	1.93E-06	1.28E-04	1.96E-05	1.90E-06	1.79E-06

**Sumps Separators
Exxon - SYU
Interim Trucking Project**

			Device Name	Backwash Collection Tank	Device Name	Oily Sludge Thickener	Device Name	Area Drain Oil/Water Separator - SGTP	Area Drain Sump - SGTP	Open Drain Sump - SGTP
			Device ID	214210	Device ID	114230	Device ID	144060	244050	144070
			Speciation	LFC-1	Speciation	297	Speciation	POP-8	POP-8	POP-8
			Surface Area (ft2)	113	Surface Area (ft2)	1,809	Surface Area (ft2)	64	102	7
			Hours of Operation	8,760	Hours of Operation	8,760	Hours of Operation	8,760	8,760	8,760
			Control Efficiency	95%	Control Efficiency	95%	Control Efficiency	75%	0%	75%
			EF (lbs/ft2-day)*	0.0003	EF (lbs/ft2-day)*	0.0003	EF (lbs/ft2-day)*	0.0015	0.0058	0.0015
			VOC Emissions	11.96	VOC Emissions	191.48	VOC Emissions	33.67	215.93	3.70
CAS #	AB2588 No.		LFC-1	lb/yr	297	lb/yr	POP-8	lb/yr	lb/yr	lb/yr
1310-73-2	1310732	Sodium Hydroxide	0.00E+00		0.00E+00		0.00E+00			
7783-06-4	7783064	Hydrogen Sulfide	3.29E-05	3.94E-04	1.00E+00		9.94E-08	3.35E-06	2.15E-05	3.68E-07
75-15-0	75150	Carbon Disulfide	0.00E+00		0.00E+00		0.00E+00			
463-58-1	463581	Carbonyl Sulfide	0.00E+00		0.00E+00		0.00E+00			
100-41-4	100414	Ethylbenzene	1.09E-06	1.30E-05	0.00E+00		0.00E+00			
107-21-1	107211	Ethylene Glycol	0.00E+00		0.00E+00		0.00E+00			
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00		1.00E+00		0.00E+00			
108-88-3	108883	Toluene	2.77E-06	3.31E-05	1.40E-02	2.68E+00	0.00E+00			
108-90-7	108907	Chlorobenzene	0.00E+00		0.00E+00		0.00E+00			
110-54-3	110543	Hexane (-n)	0.00E+00		4.70E-02	9.00E+00	0.00E+00			
110-82-7	110827	Cyclohexane	1.24E-06	1.48E-05	0.00E+00		0.00E+00			
111-46-6	111466	Diethylene Glycol	0.00E+00		1.00E+00		0.00E+00			
111-76-2	111762	Glycol Ether EB	0.00E+00		0.00E+00		0.00E+00			
112-34-5	112345	Butyl Dioxitol	0.00E+00		0.00E+00		0.00E+00			
127-18-4	127184	Tetrachloroethene	0.00E+00		0.00E+00		0.00E+00			
1310-73-2	1310732	Sodium Hydroxide	0.00E+00		0.00E+00		0.00E+00			
1330-20-7	1330207	Xylenes (mixed isomers)	2.45E-06	2.93E-05	1.00E+00		0.00E+00			
50-00-0	50000	Formaldehyde	0.00E+00		0.00E+00		0.00E+00			
67-56-1	67561	Methyl Alcohol	4.67E-05	5.58E-04	0.00E+00		0.00E+00			
67-63-0	67630	Isopropyl Alcohol	0.00E+00		0.00E+00		0.00E+00			
71-43-2	71432	Benzene	2.75E-06	3.29E-05	2.40E-02	4.60E+00	0.00E+00			
7664-41-7	7664417	Ammonia	0.00E+00		1.00E+00		0.00E+00			
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00		0.00E+00		0.00E+00			
91-20-3	91203	Naphthalene	5.00E-07	5.99E-06	0.00E+00		0.00E+00			
95-63-6	95636	Trimethylbenzene (1,2,4)	8.40E-07	1.00E-05	0.00E+00		0.00E+00			

Sumps Separators
Exxon - SYU
Interim Trucking Project

			Device Name	Backwash Collection Tank	Device Name	Oily Sludge Thickener	Device Name	Area Drain Oil/Water Separator - SGTP	Area Drain Sump - SGTP	Open Drain Sump - SGTP
			Device ID	214210	Device ID	114230	Device ID	144060	244050	144070
			Speciation	LFC-1	Speciation	297	Speciation	POP-8	POP-8	POP-8
CAS #	AB2588 No.		LFC-1	lb/hr	297	lb/hr	POP-8	lb/hr	lb/hr	lb/hr
1310-73-2	1310732	Sodium Hydroxide	0.00E+00		0.00E+00		0.00E+00			
7783-06-4	7783064	Hydrogen Sulfide	3.29E-05	4.49E-08	0.00E+00		9.94E-08	3.82E-10	2.45E-09	4.21E-11
75-15-0	75150	Carbon Disulfide	0.00E+00		0.00E+00		0.00E+00			
463-58-1	463581	Carbonyl Sulfide	0.00E+00		0.00E+00		0.00E+00			
100-41-4	100414	Ethylbenzene	1.09E-06	1.48E-09	0.00E+00		0.00E+00			
107-21-1	107211	Ethylene Glycol	0.00E+00		0.00E+00		0.00E+00			
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00		0.00E+00		0.00E+00			
108-88-3	108883	Toluene	2.77E-06	3.78E-09	1.40E-02	3.06E-04	0.00E+00			
108-90-7	108907	Chlorobenzene	0.00E+00		0.00E+00		0.00E+00			
110-54-3	110543	Hexane (-n)	0.00E+00		4.70E-02	1.03E-03	0.00E+00			
110-82-7	110827	Cyclohexane	1.24E-06	1.69E-09	0.00E+00		0.00E+00			
111-46-6	111466	Diethylene Glycol	0.00E+00		0.00E+00		0.00E+00			
111-76-2	111762	Glycol Ether EB	0.00E+00		0.00E+00		0.00E+00			
112-34-5	112345	Butyl Dioxitol	0.00E+00		0.00E+00		0.00E+00			
127-18-4	127184	Tetrachloroethene	0.00E+00		0.00E+00		0.00E+00			
1310-73-2	1310732	Sodium Hydroxide	0.00E+00		0.00E+00		0.00E+00			
1330-20-7	1330207	Xylenes (mixed isomers)	2.45E-06	3.34E-09	0.00E+00		0.00E+00			
50-00-0	50000	Formaldehyde	0.00E+00		0.00E+00		0.00E+00			
67-56-1	67561	Methyl Alcohol	4.67E-05	6.37E-08	0.00E+00		0.00E+00			
67-63-0	67630	Isopropyl Alcohol	0.00E+00		0.00E+00		0.00E+00			
71-43-2	71432	Benzene	2.75E-06	3.76E-09	2.40E-02	5.25E-04	0.00E+00			
7664-41-7	7664417	Ammonia	0.00E+00		0.00E+00		0.00E+00			
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00		0.00E+00		0.00E+00			
91-20-3	91203	Naphthalene	5.00E-07	6.83E-10	0.00E+00		0.00E+00			
95-63-6	95636	Trimethylbenzene (1,2,4)	8.40E-07	1.15E-09	0.00E+00		0.00E+00			

Tanks
Exxon - SYU
Interim Trucking Project

Exxon - SYU

Control Efficiencies:

Atm	0.00
VRS	0.998
VRS-Short	0.95
Carbon	0.75

Device Desc	Diesel Storage Tank	Fw Pump Diesel Fuel Tanks (1 of 2)	Fw Pump Diesel Fuel Tanks (2 of 2)	Diesel Tanks (1 of 2)	Diesel Tanks (2 of 2)	Device Desc	SOV Lube Oil Tank	VR Lube Oil Tank	Device Desc	Methanol Tank
Device ID	114160	113963	113964	150200	150201	Device ID	114170	114190	Device ID	150210
Location	OTP	OTP	OTP	POPCO	POPCO	Location			Location	POPCO
TYPE	Small FRT	Small FRT	Small FRT	Small FRT	Small FRT	TYPE	Small FRT	Small FRT	TYPE	Small FRT
SERVICE	Diesel	Diesel	Diesel	Diesel	Diesel	SERVICE	Lube Oil	Lube Oil	SERVICE	Methanol
Speciation	Diesel	Diesel	Diesel	Diesel	Diesel	Speciation	Lube Oil	Lube Oil	Speciation	Methanol
Diameter (ft)	12	3.5	3.5	4	4	Diameter (ft)			Diameter (ft)	10.00
Height (ft)	16	3.5	3.5	6	6	Height (ft)			Height (ft)	21.00
Throughput (Gallons)	700	334	367	560	3,540	Throughput (Gallons)			Throughput (Gallons)	990.00
Withdrawal/Working	0.02	0.01	0.01	0.01	0.09	Withdrawal/Working			Withdrawal/Working	1.28
Standing/Breathing	2.07	0.04	0.04	0.09	0.09	Standing/Breathing			Standing/Breathing	111.21
Uncontrolled VOC (lb/yr)	2.08	0.05	0.05	0.10	0.17	Uncontrolled VOC (lb/yr)			Uncontrolled VOC (lb/yr)	112.49
Control Device	Atm	Atm	Atm	Atm	Atm	Control Device	Atm	Atm	Control Device	Atm
Control Efficiency						Control Efficiency			Control Efficiency	
Withdrawal/Working	0.02	0.01	0.01	0.01	0.09	Withdrawal/Working			Withdrawal/Working	1.28
Standing/Breathing	2.07	0.04	0.04	0.09	0.09	Standing/Breathing			Standing/Breathing	111.21
VOC Emissions	2.08	0.05	0.05	0.10	0.17	VOC Emissions			VOC Emissions	112.49
Diesel	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	Lube Oil	lb/yr	lb/yr	Methanol	lb/yr
7783-06-4	7783064	Hydrogen Sulfide	0.00			0.00			0.00	
75-15-0	75150	Carbon Disulfide	0.00			0.00			0.00	
463-58-1	463581	Carbonyl Sulfide	0.00			0.00			0.00	
100-41-4	100414	Ethylbenzene	0.00	2.08E-04	4.66E-06	4.74E-06	9.98E-06	1.72E-05	0.00	
107-21-1	107211	Ethylene Glycol	0.00						0.00	
108-10-1	108101	Methyl Isobutyl Ketone	0.00						0.00	
108-88-3	108883	Toluene	0.00	6.25E-04	1.40E-05	1.42E-05	2.99E-05	5.15E-05	0.00	
108-90-7	108907	Chlorobenzene	0.00						0.00	
110-54-3	110543	Hexane (-n)	0.00						0.00	
110-82-7	110827	Cyclohexane	0.00						0.00	
111-46-6	111466	Diethylene Glycol	0.00						0.00	
111-76-2	111762	Glycol Ether EB	0.00						0.00	
112-34-5	112345	Butyl Dioxitol	0.00						0.00	
127-18-4	127184	Tetrachloroethene	0.00						0.00	
1310-73-2	1310732	Sodium Hydroxide	0.00						0.00	
1330-20-7	1330207	Xylenes (mixed isomers)	0.00	6.04E-03	1.35E-04	1.37E-04	2.89E-04	4.98E-04	0.00	
50-00-0	50000	Formaldehyde	0.00						0.00	
67-56-1	67561	Methyl Alcohol	0.00						1.00	112.49
67-63-0	67630	Isopropyl Alcohol	0.00						0.00	
71-43-2	71432	Benzene	0.00						0.00	
7664-41-7	7664417	Ammonia	0.00						0.00	
78-93-3	78933	Methyl Ethyl Ketone	0.00						0.00	
91-20-3	91203	Naphthalene	0.00						0.00	
95-63-6	95636	Trimethylbenzene (1,2,4)	0.01	2.08E-02	4.66E-04	4.74E-04	9.98E-04	1.72E-03	0.00	

Tanks
Exxon - SYU
Interim Trucking Project

Device Desc	Diesel Storage Tank	Fw Pump Diesel Fuel Tanks (1 of 2)	Fw Pump Diesel Fuel Tanks (2 of 2)	Diesel Tanks (1 of 2)	Diesel Tanks (2 of 2)	Device Desc	SOV Lube Oil Tank	VR Lube Oil Tank	Device Desc	Methanol Tank
Device ID	114160	113963	113964	150200	150201	Device ID	114170	114190	Device ID	150210
Location	OTP	OTP	OTP	POPCO	POPCO	Location			Location	POPCO
TYPE	Small FRT	Small FRT	Small FRT	Small FRT	Small FRT	TYPE	Small FRT	Small FRT	TYPE	Small FRT
SERVICE	Diesel	Diesel	Diesel	Diesel	Diesel	SERVICE	Lube Oil	Lube Oil	SERVICE	Methanol
Speciation	Diesel	Diesel	Diesel	Diesel	Diesel	Speciation	Lube Oil	Lube Oil	Speciation	Methanol
Diameter (ft)	12	3.5	3.5	4	4	Diameter (ft)			Diameter (ft)	10
Height (ft)	16	3.5	3.5	6	6	Height (ft)			Height (ft)	21
Throughput (Gallons)	26	13.09	13.09	23.10	23.10	Throughput (Gallons)			Throughput (Gallons)	990
Withdrawal/Working	0.0006	0.0003	0.0003	0.0006	0.0006	Withdrawal/Working			Withdrawal/Working	1.28
Standing/Breathing	0.0003	0.0000	0.0000	0.0000	0.0000	Standing/Breathing			Standing/Breathing	0.01
Uncontrolled VOC (lb/hr)	0.00095	0.00032	0.00032	0.00057	0.00057	Uncontrolled VOC (lb/hr)			Uncontrolled VOC (lb/hr)	1.30
Control Device	Atm	Atm	Atm	Atm	Atm	Control Device	Atm	Atm	Control Device	Atm
Control Efficiency						Control Efficiency			Control Efficiency	
Withdrawal/Working	0.0006	0.0003	0.0003	0.0006	0.0006	Withdrawal/Working			Withdrawal/Working	1.28
Standing/Breathing	0.0003	0.0000	0.0000	0.0000	0.0000	Standing/Breathing			Standing/Breathing	0.01
VOC Emissions	0.0009	0.0003	0.0003	0.0006	0.0006	VOC Emissions			VOC Emissions	1.30
Diesel	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	Lube Oil	lb/hr	lb/hr	Methanol	lb/hr
7783-06-4	7783064	Hydrogen Sulfide	0.00			0.00			0.00	
75-15-0	75150	Carbon Disulfide	0.00			0.00			0.00	
463-58-1	463581	Carbonyl Sulfide	0.00			0.00			0.00	
100-41-4	100414	Ethylbenzene	0.00	9.46E-08	3.20E-08	3.20E-08	5.71E-08	5.71E-08	0.00	
107-21-1	107211	Ethylene Glycol	0.00						0.00	
108-10-1	108101	Methyl Isobutyl Ketone	0.00						0.00	
108-88-3	108883	Toluene	0.00	2.84E-07	9.60E-08	9.60E-08	1.71E-07	1.71E-07	0.00	
108-90-7	108907	Chlorobenzene	0.00						0.00	
110-54-3	110543	Hexane (-n)	0.00						0.00	
110-82-7	110827	Cyclohexane	0.00						0.00	
111-46-6	111466	Diethylene Glycol	0.00						0.00	
111-76-2	111762	Glycol Ether EB	0.00						0.00	
112-34-5	112345	Butyl Dioxitol	0.00						0.00	
127-18-4	127184	Tetrachloroethene	0.00						0.00	
1310-73-2	1310732	Sodium Hydroxide	0.00						0.00	
1330-20-7	1330207	Xylenes (mixed isomers)	0.00	2.74E-06	9.28E-07	9.28E-07	1.66E-06	1.66E-06	0.00	
50-00-0	50000	Formaldehyde	0.00						0.00	
67-56-1	67561	Methyl Alcohol	0.00						1.00	1.30
67-63-0	67630	Isopropyl Alcohol	0.00						0.00	
71-43-2	71432	Benzene	0.00						0.00	
7664-41-7	7664417	Ammonia	0.00						0.00	
78-93-3	78933	Methyl Ethyl Ketone	0.00						0.00	
91-20-3	91203	Naphthalene	0.00						0.00	
95-63-6	95636	Trimethylbenzene (1,2,4)	0.01	9.46E-06	3.20E-06	3.20E-06	5.71E-06	5.71E-06	0.00	

**Tanks
Exxon - SYU
Interim Trucking Project**

Exxon - SYU

Control Efficiencies:

Atm	0.00
VRS	0.998
VRS-Short	0.95
Carbon	0.75

Device Desc	Demulsifier Tote Tank 1	Demulsifier Tote Tank 2	Device Desc	Oil Storage Tank A	Oil Storage Tank B	Device Desc	Rerun Tank A	Rerun Tank B
Device ID	114021	114022	Device ID	234011	234012	Device ID	214011	214012
Location	LFC	LFC	Location	LFC	LFC	Location	LFC	LFC
TYPE	FRT	FRT	TYPE	FRT	FRT	TYPE	FRT	FRT
SERVICE	Demulsifier	Demulsifier	SERVICE	LFC-7	LFC-7	SERVICE	LFC-1	LFC-1
Speciation	Demulsifier	Demulsifier	Speciation			Speciation	LFC-1	LFC-1
Diameter (ft)	5.08		Diameter (ft)			Diameter (ft)		
Height (ft)	5.38		Height (ft)			Height (ft)		
Throughput (Gallons)	2,157		Throughput (Gallons)	181,616,400		Throughput (Gallons)	76,650,000	76,650,000
Withdrawl/Working	1.66	1.66	Withdrawl/Working	384,605.16		Withdrawl/Working	107,131.24	107,131.24
Standing/Breathing	187.48	187.48	Standing/Breathing	282,645.18		Standing/Breathing	34,337.46	34,337.46
Uncontrolled VOC (lb/yr)	189.14	189.14	Uncontrolled VOC (lb/yr)	667,250.34		Uncontrolled VOC (lb/yr)	141,468.70	141,468.70
Control Device	Atm	Atm	Control Device	VRS		Control Device	VRS	VRS
Control Efficiency			Control Efficiency	99.8%		Control Efficiency	99.8%	99.8%
Withdrawl/Working	1.66	1.66	Withdrawl/Working	769.21		Withdrawl/Working	214.26	214.26
Standing/Breathing	187.48	187.48	Standing/Breathing	565.29		Standing/Breathing	68.67	68.67
VOC Emissions	189.14	189.14	VOC Emissions	1334.50		VOC Emissions	282.94	282.94
Demulsifier	lb/yr	lb/yr	LFC-7	lb/yr	lb/yr	LFC-1	lb/yr	lb/yr
0.00			0.00E+00			0.00	9.31E-03	9.31E-03
0.00			0.00			0.00		
0.00			0.00			0.00		
0.05	9.46	9.46	0.00	1.22		0.00	3.07E-04	3.07E-04
0.00			0.00			0.00		
0.00			0.00			0.00		
0.00			0.00	2.39		0.00	7.83E-04	7.83E-04
0.00			0.00			0.00		
0.00			0.00			0.00		
0.00			0.00	2.33		0.00	3.50E-04	3.50E-04
0.00			0.00			0.00		
0.00			0.00			0.00		
0.00			0.00			0.00		
0.00			0.00			0.00		
0.05	9.46	9.46	0.00	2.43		0.00	6.92E-04	6.92E-04
0.00			0.00			0.00		
0.10	18.91	18.91	0.00	0.01		0.00	1.32E-02	1.32E-02
0.00			0.00			0.00		
0.00			0.00	1.16		0.00	7.78E-04	7.78E-04
0.00			0.00			0.00		
0.00			0.00			0.00		
0.05	9.46	9.46	0.00	0.36		0.00	1.42E-04	1.42E-04
0.01	1.89	1.89	0.00	0.67		0.00	2.38E-04	2.38E-04

**Tanks
Exxon - SYU
Interim Trucking Project**

Device Desc	Demulsifier Tote Tank 1	Demulsifier Tote Tank 2	Device Desc	Oil Storage Tank A	Oil Storage Tank B	Device Desc	Rerun Tank A	Rerun Tank B
Device ID	114021	114022	Device ID	234011	234012	Device ID	214011	214012
Location	LFC	LFC	Location	LFC	LFC	Location	LFC	LFC
TYPE	FRT	FRT	TYPE	FRT	FRT	TYPE	FRT	FRT
SERVICE	Demulsifier	Demulsifier	SERVICE	LFC-7	LFC-7	SERVICE	LFC-1	LFC-1
Speciation	Demulsifier	Demulsifier	Speciation			Speciation	LFC-1	LFC-1
Diameter (ft)	5.08		Diameter (ft)			Diameter (ft)		
Height (ft)	5.38		Height (ft)			Height (ft)		
Throughput (Gallons)			Throughput (Gallons)			Throughput (Gallons)		
Withdrawl/Working	0.15	0.15	Withdrawl/Working	518.83		Withdrawl/Working	518.83	518.83
Standing/Breathing	0.04	0.04	Standing/Breathing	32.27		Standing/Breathing	3.92	3.92
Uncontrolled VOC (lb/hr)	0.19	0.19	Uncontrolled VOC (lb/hr)	551.10		Uncontrolled VOC (lb/hr)	522.75	522.75
Control Device	Atm	Atm	Control Device	VRS	VRS	Control Device	VRS	VRS
Control Efficiency			Control Efficiency	99.8%	99.8%	Control Efficiency	99.8%	99.8%
Withdrawl/Working	0.15	0.15	Withdrawl/Working	1.04		Withdrawl/Working	1.04	1.04
Standing/Breathing	0.04	0.04	Standing/Breathing	0.06		Standing/Breathing	0.01	0.01
VOC Emissions	0.19	0.19	VOC Emissions	1.10		VOC Emissions	1.05	1.05
Demulsifier	lb/hr	lb/hr	LFC-7	lb/hr	lb/hr	LFC-1	lb/hr	lb/hr
7783-06-4	7783064	Hydrogen Sulfide	0.00	0.00		0.000033	3.44E-05	3.44E-05
75-15-0	75150	Carbon Disulfide	0.00	0.00		0.000000		
463-58-1	463581	Carbonyl Sulfide	0.00	0.00		0.000000		
100-41-4	100414	Ethylbenzene	0.05	0.01	0.00	0.000001	1.14E-06	1.14E-06
107-21-1	107211	Ethylene Glycol	0.00	0.00		0.000000		
108-10-1	108101	Methyl Isobutyl Ketone	0.00	0.00		0.000000		
108-88-3	108883	Toluene	0.00	0.00	0.002	0.000003	2.89E-06	2.89E-06
108-90-7	108907	Chlorobenzene	0.00	0.00		0.000000		
110-54-3	110543	Hexane (-n)	0.00	0.00		0.000000		
110-82-7	110827	Cyclohexane	0.00	0.00	0.002	0.000001	1.29E-06	1.29E-06
111-46-6	111466	Diethylene Glycol	0.00	0.00		0.000000		
111-76-2	111762	Glycol Ether EB	0.00	0.00		0.000000		
112-34-5	112345	Butyl Dioxitol	0.00	0.00		0.000000		
127-18-4	127184	Tetrachloroethene	0.00	0.00		0.000000		
1310-73-2	1310732	Sodium Hydroxide	0.00	0.00		0.000000		
1330-20-7	1330207	Xylenes (mixed isomers)	0.05	0.01	0.00	0.000002	2.56E-06	2.56E-06
50-00-0	50000	Formaldehyde	0.00	0.00		0.000000		
67-56-1	67561	Methyl Alcohol	0.10	0.02	0.00	0.000047	4.88E-05	4.88E-05
67-63-0	67630	Isopropyl Alcohol	0.00	0.00		0.000000		
71-43-2	71432	Benzene	0.00	0.00	0.001	0.000003	2.88E-06	2.88E-06
7664-41-7	7664417	Ammonia	0.00	0.00		0.000000		
78-93-3	78933	Methyl Ethyl Ketone	0.00	0.00		0.000000		
91-20-3	91203	Naphthalene	0.05	0.01	0.00	0.000001	5.23E-07	5.23E-07
95-63-6	95636	Trimethylbenzene (1,2,4)	0.01	0.00	0.00	0.000001	8.78E-07	8.78E-07

**Sulfur Loading
Exxon - SYU
Interim Trucking Project**

Exxon - SYU
Sulfur Loading

			Device Desc	POPCO Sulfur Loading	LFC Sulfur Loading
			Device ID	150160	150161
			Location	Truck Loading Station	Truck Loading Station
			Air Flow (scfm)	245	245
			H2S Conc. (ppmv)	69	69
			Sulfur Loading Rate (lb S/min)	1670	1670
			Loading Duration (min)	30.26	30.26
CAS #	AB2588 No.		Sulfur Emission Rate (lb/min)	0.0015	0.0015
7783-06-4	7783064	Hydrogen Sulfide	lb/hr	4.54E-02	

			Device Desc	POPCO Sulfur Loading	LFC Sulfur Loading
			Device ID	150160	150161
			Location	Truck Loading Station	Truck Loading Station
			Air Flow (scfm)	245	245
			H2S Conc. (ppmv)	69	69
			Sulfur Loading Rate (lb S/min)	1670	1670
			Sulfur Emission Rate (lb/min)	0.0015	0.0015
CAS #	AB2588 No.		Sulfur Loaded (lbs/year)	4,336,640.00	3,004,601.60
7783-06-4	7783064	Hydrogen Sulfide	lb/year	3.90	2.70

Notes:

Molten sulfur leaving:

	Long Tons	Year
POPCO	1,936	2013
LFC	1,340	2013

Max amount of sulfur loaded: 50540 lb
30.26 Minutes to complete load

Notes:

Only one truck is loaded at a given day between LFC and POPCO.
For purposes of modeling, sulfur loading is assumed to occur at POPCO in the max hour scenario.

**Crude Transport Toxics
Exxon - SYU
Interim Trucking Project**

						Total		
Device Desc	Onsite Crude Truck Transport	Offsite Crude Truck Transport	Device Desc	Onsite Crude Truck Transport	Offsite Crude Truck Transport	Device Desc	Onsite Crude Truck Transport	Offsite Crude Truck Transport
Device ID			Device ID			Device ID	234046	234047
Location	Onsite	within 1000 ft	Location	Onsite	within 1000 ft			
Max Vehicles Per Hour	8	8	Max Vehicles Per Hour	8	8			
Trips Per Day	70	70	Trips Per Day	70	70			
Round Trip Length (miles)	4.00	0.19	Round Trip Length (miles)	4.00	0.19			
Round Trip Miles/Hour	32.00	1.52	Round Trip Miles/Hour	32.00	1.52			
Road Type	Local	Local	Road Type	Local	Local			
Running Exhaust (lb/hr)	0.0009	0.0000	Running Exhaust (lb/hr)	0.0008	0.0000			
Idle Exhaust (lb/hr)	0.0332		Idle Exhaust (lb/hr)	0.0001				
Total VOC (lb/hour)	0.0341	0.0000	Total PM10 (lb/hour)	0.0010	0.0000			

CAS #	AB2588 No.		VOC Toxic Fraction (2007+)	lb/hr	lb/hr					lb/hr	lb/hr
106-99-0	106990	1,3-Butadiene	8.00E-04	2.73E-05	3.51E-08					2.73E-05	3.51E-08
540-84-1	540841	2,2,4-Trimethylpentane (isooctane)	7.80E-03	2.66E-04	3.42E-07					2.66E-04	3.42E-07
75-07-0	75070	Acetaldehyde	6.93E-02	2.36E-03	3.04E-06					2.36E-03	3.04E-06
107-02-8	107028	Acrolein	9.99E-03	3.40E-04	4.38E-07					3.40E-04	4.38E-07
71-43-2	71432	Benzene	1.29E-02	4.40E-04	5.66E-07					4.40E-04	5.66E-07
100-41-4	100414	Ethylbenzene	6.30E-03	2.15E-04	2.76E-07					2.15E-04	2.76E-07
50-00-0	50000	Formaldehyde	2.17E-01	7.41E-03	9.53E-06					7.41E-03	9.53E-06
110-54-3	110543	Hexane (-n)	5.40E-03	1.84E-04	2.37E-07					1.84E-04	2.37E-07
100-42-5	100425	Styrene	0.00E+00	0.00E+00	0.00E+00					0.00E+00	0.00E+00
108-88-3	108883	Toluene	3.00E-02	1.02E-03	1.32E-06					1.02E-03	1.32E-06
1330-20-7	1330207	Xylenes (mixed isomers)	3.80E-02	1.29E-03	1.67E-06					1.29E-03	1.67E-06
123-38-6	123386	Propionaldehyde	3.10E-03	1.06E-04	1.36E-07					1.06E-04	1.36E-07
CAS #	AB2588 No.		PAH Gaseous Phase (PAH/VOC)	lb/hr	lb/hr	Particulate Phase (PAH/OC2.5)	lb/hr	lb/hr		lb/hr	lb/hr
50-32-8	50328	Benzo[a]pyrene [PAH, POM]	0.00E+00	0.00E+00	0.00E+00	1.48E-05	1.45E-08	5.89E-10		1.45E-08	5.89E-10
205-99-2	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00	0.00E+00	6.27E-06	6.15E-09	2.49E-10		6.15E-09	2.49E-10
53-70-3	53703	Dibenz[a,h]anthracene [PAH, POM]	0.00E+00	0.00E+00	0.00E+00	4.48E-06	4.40E-09	1.78E-10		4.40E-09	1.78E-10
56-55-3	56553	Benz[a]anthracene [PAH, POM]	3.00E-07	1.02E-08	1.32E-11	3.58E-06	3.51E-09	1.42E-10		1.37E-08	1.56E-10
83-32-9	83329	Acenaphthene [PAH, POM]	5.26E-05	1.79E-06	2.31E-09	0.00E+00	0.00E+00	0.00E+00		1.79E-06	2.31E-09
85-01-8	85018	Phenanthrene	8.51E-04	2.90E-05	3.73E-08	1.92E-03	1.88E-06	7.64E-08		3.09E-05	1.14E-07
86-73-7	86737	Fluorene [PAH, POM]	1.96E-04	6.68E-06	8.59E-09	2.41E-04	2.37E-07	9.59E-09		6.92E-06	1.82E-08
91-20-3	91203	Naphthalene	1.63E-02	5.55E-04	7.15E-07	0.00E+00	0.00E+00	0.00E+00		5.55E-04	7.15E-07
120-12-7	120127	Anthracene [PAH, POM]	3.04E-05	1.04E-06	1.33E-09	1.19E-04	1.17E-07	4.74E-09		1.15E-06	6.07E-09
129-00-0	129000	Pyrene [PAH, POM]	3.79E-05	1.29E-06	1.66E-09	2.09E-04	2.05E-07	8.32E-09		1.50E-06	9.98E-09
191-24-2	191242	Benzo[g,h,i]perylene	2.00E-07	6.82E-09	8.77E-12	8.96E-07	8.79E-10	3.57E-11		7.69E-09	4.44E-11
193-39-5	193395	Indeno[1,2,3-cd]pyrene [PAH, POM]	0.00E+00	0.00E+00	0.00E+00	2.24E-06	2.20E-09	8.91E-11		2.20E-09	8.91E-11
206-44-0	206440	Fluoranthene [PAH, POM]	4.57E-05	1.56E-06	2.00E-09	2.18E-04	2.14E-07	8.67E-09		1.77E-06	1.07E-08
207-08-9	207089	Benzo[k]fluoranthene [PAH, POM]	0.00E+00	0.00E+00	0.00E+00	6.27E-06	6.15E-09	2.49E-10		6.15E-09	2.49E-10
208-96-8	208968	Acenaphthylene [PAH, POM]	8.53E-05	2.91E-06	3.74E-09	0.00E+00	0.00E+00	0.00E+00		2.91E-06	3.74E-09
218-01-9	218019	Chrysene [PAH, POM]	5.00E-07	1.70E-08	2.19E-11	1.12E-05	1.10E-08	4.46E-10		2.80E-08	4.68E-10

**Crude Transport Toxics
Exxon - SYU
Interim Trucking Project**

CAS #	AB2588 No.		Emission Rate (g/mi)	lb/hr	lb/hr
N020	7440382	Arsenic Compounds	2.30E-06	1.62E-07	7.68E-09
18540-29-9	18540299	Chromium, hexavalent (and compounds)	5.80E-09	4.09E-10	1.94E-11
N450	7439965	Manganese Compounds	5.50E-07	3.88E-08	1.84E-09
N458	7439976	Mercury Compounds	1.10E-08	7.76E-10	3.67E-11
N495	7440020	Nickel Compounds	6.50E-07	4.59E-08	2.17E-09
1746-01-6	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	0.00E+00	0.00E+00	0.00E+00
40321-76-4	40321764	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	0.00E+00	0.00E+00	0.00E+00
39227-28-6	39227286	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	0.00E+00	0.00E+00	0.00E+00
57653-85-7	57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	0.00E+00	0.00E+00	0.00E+00
19408-74-3	19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	0.00E+00	0.00E+00	0.00E+00
35822-46-9	35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	1.05E-12	7.41E-14	3.51E-15
3268-87-9	3268879	Octachlorodibenzo-p-dioxin	6.98E-12	4.92E-13	2.33E-14
5120-73-19	51207319	2,3,7,8-Tetrachlorodibenzofuran	5.09E-14	3.59E-15	1.70E-16
57117-41-6	57117416	1,2,3,7,8-Pentachlorodibenzofuran	1.07E-13	7.55E-15	3.57E-16
57117-31-4	57117314	2,3,4,7,8-Pentachlorodibenzofuran	3.24E-13	2.29E-14	1.08E-15
70648-26-9	70648269	1,2,3,4,7,8-Hexachlorodibenzofuran	2.20E-13	1.55E-14	7.35E-16
57117-44-9	57117449	1,2,3,6,7,8-Hexachlorodibenzofuran	2.43E-13	1.71E-14	8.12E-16
72918-21-9	72918219	1,2,3,7,8,9-Hexachlorodibenzofuran	0.00E+00	0.00E+00	0.00E+00
60851-34-5	60851345	2,3,4,6,7,8-Hexachlorodibenzofuran	1.80E-13	1.27E-14	6.01E-16
67562-39-4	67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran	9.94E-13	7.01E-14	3.32E-15
55673-89-7	55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran	5.81E-14	4.10E-15	1.94E-16
39001-02-0	39001020	Octachlorodibenzofuran	1.74E-12	1.23E-13	5.81E-15

lb/hr	lb/hr
1.62E-07	7.68E-09
4.09E-10	1.94E-11
3.88E-08	1.84E-09
7.76E-10	3.67E-11
4.59E-08	2.17E-09
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
0.00E+00	0.00E+00
7.41E-14	3.51E-15
4.92E-13	2.33E-14
3.59E-15	1.70E-16
7.55E-15	3.57E-16
2.29E-14	1.08E-15
1.55E-14	7.35E-16
1.71E-14	8.12E-16
0.00E+00	0.00E+00
1.27E-14	6.01E-16
7.01E-14	3.32E-15
4.10E-15	1.94E-16
1.23E-13	5.81E-15

Device Desc	Onsite Crude Truck Transport	Offsite Crude Truck Transport
Device ID	234046	234047
Location	Onsite	within 1000 ft
Total Number of Vehicles	10,585	10,585
Trips Per Day	70	70
Trips Per Year	25,550	25,550
Round Trip Length (miles)	4.00	0.19
Round Trip Miles/year	102200.00	4839.02
Road Type	Local	Local
Running Exhaust (lb/Year)	2.684	0.127
CAS #	AB2588 No.	Compound
9901	9901	Diesel Particulate Matter
	Idle Exhaust (lb/year)	0.187
	Total PM10 (lb/Year)	2.871

Notes:

1. Assume truck idling only occurs onsite. No offsite idling
2. Diesel vehicle toxic profile per Air Toxic Emissions from On-road Vehicles in MOVES2014, EPA-420-R-16-016.

**Crude Loading
Exxon - SYU
Interim Trucking Project**

Device Desc	Crude Truck Loading Rack	Device Desc	Crude Truck Loading Rack	Device Desc	Crude Truck Loading Rack
Device ID		Device ID		Device ID	234045
Location	Truck Loading Station	Location	Truck Loading Station		
Truck Capacity (bbl/truck)	160	Truck Capacity (bbl/truck)	160		
Max Truck Loading Rate (bbl/hr)	1280	Max Truck Loading Rate (bbl/hr)	1280		
Saturation Factor (S)	0.6	Saturation Factor (S)	0.6		
Molecular Weight (lb/lb-mole)	50	Molecular Weight (lb/lb-mole)	50		
True Vapor Pressure (psia)	2.68	True Vapor Pressure (psia)	2.68		
Liquid Temperature ®	589.67	Liquid Temperature ®	589.67		
ROC/THC Reactivity	0.885	ROC/THC Reactivity	0.885		
Loading Losses (lb ROC/kgal)	1.5035	Loading Losses (lb ROC/kgal)	1.5035		
VRU Efficiency	0.9500	VRU Efficiency	0.9500		
Crude Loaded (bbl/year)	4,088,000	Crude Loaded (bbl/year)	4,088,000		
VOC Emissions (lb/hr)	4.04	VOC Emissions (lb/hr)	4.04	Total	

CAS #	AB2588 No.		LFC-2	lb/hr	LFC-7	lb/hr
7783-06-4	7783064	Hydrogen Sulfide	1.09E-02	0.044	0.00E+00	0.000
75-15-0	75150	Carbon Disulfide	0.00E+00	0.000	0.00E+00	0.000
463-58-1	463581	Carbonyl Sulfide	0.00E+00	0.000	0.00E+00	0.000
100-41-4	100414	Ethylbenzene	0.00E+00	0.000	9.13E-04	0.004
107-21-1	107211	Ethylene Glycol	0.00E+00	0.000	0.00E+00	0.000
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00	0.000	0.00E+00	0.000
108-88-3	108883	Toluene	0.00E+00	0.000	1.79E-03	0.007
108-90-7	108907	Chlorobenzene	0.00E+00	0.000	0.00E+00	0.000
110-54-3	110543	Hexane (-n)	0.00E+00	0.000	0.00E+00	0.000
110-82-7	110827	Cyclohexane	0.00E+00	0.000	1.74E-03	0.007
111-46-6	111466	Diethylene Glycol	0.00E+00	0.000	0.00E+00	0.000
111-76-2	111762	Glycol Ether EB	0.00E+00	0.000	0.00E+00	0.000
112-34-5	112345	Butyl Dioxitol	0.00E+00	0.000	0.00E+00	0.000
127-18-4	127184	Tetrachloroethene	0.00E+00	0.000	0.00E+00	0.000
1310-73-2	1310732	Sodium Hydroxide	0.00E+00	0.000	0.00E+00	0.000
1330-20-7	1330207	Xylenes (mixed isomers)	0.00E+00	0.000	1.82E-03	0.007
50-00-0	50000	Formaldehyde	0.00E+00	0.000	0.00E+00	0.000
67-56-1	67561	Methyl Alcohol	0.00E+00	0.000	1.00E-05	0.000
67-63-0	67630	Isopropyl Alcohol	0.00E+00	0.000	0.00E+00	0.000
71-43-2	71432	Benzene	0.00E+00	0.000	8.71E-04	0.004
7664-41-7	7664417	Ammonia	4.47E-07	0.000	0.00E+00	0.000
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00	0.000	0.00E+00	0.000
91-20-3	91203	Naphthalene	0.00E+00	0.000	2.69E-04	0.001
95-63-6	95636	Trimethylbenzene (1,2,4)	0.00E+00	0.000	5.03E-04	0.002
9901	9901	Diesel Particulate Matter	0.00E+00	0.000	0.00E+00	0.000
112-27-6	112276	Triethylene Glycol	0.00E+00	0.000	0.00E+00	0.000

Total
0.044
0.000
0.000
0.004
0.000
0.000
0.007
0.000
0.000
0.007
0.000
0.000
0.000
0.000
0.007
0.000
0.000
0.004
0.000
0.000
0.001
0.002
0.000
0.000

**Crude Loading
Exxon - SYU
Interim Trucking Project**

Device Desc	Crude Truck Loading Rack	Device Desc	Crude Truck Loading Rack	Device Desc	Crude Truck Loading Rack
Device ID		Device ID		Device ID	234045
Location	Truck Loading Station	Location	Truck Loading Station		
Truck Capacity (bbl/truck)	160	Truck Capacity (bbl/truck)	160		
Max Truck Loading Rate (bbl/hr)	1280	Max Truck Loading Rate (bbl/hr)	1280		
Loading Losses (lb ROC/kgal)	1.5035	Loading Losses (lb ROC/kgal)	1.5035		
VRU Efficiency	0.9500	VRU Efficiency	0.9500		
Crude Loaded (bbl/year)	4,088,000	Crude Loaded (bbl/year)	4,088,000		
VOC Emissions (lb/year)	12,907.39	VOC Emissions (lb/year)	12,907.39		

CAS #	AB2588 No.		LFC-2	lb/year	LFC-7	lb/year
7783-06-4	7783064	Hydrogen Sulfide	1.09E-02	140.081	0.00E+00	0.000
75-15-0	75150	Carbon Disulfide	0.00E+00	0.000	0.00E+00	0.000
463-58-1	463581	Carbonyl Sulfide	0.00E+00	0.000	0.00E+00	0.000
100-41-4	100414	Ethylbenzene	0.00E+00	0.000	9.13E-04	11.780
107-21-1	107211	Ethylene Glycol	0.00E+00	0.000	0.00E+00	0.000
108-10-1	108101	Methyl Isobutyl Ketone	0.00E+00	0.000	0.00E+00	0.000
108-88-3	108883	Toluene	0.00E+00	0.000	1.79E-03	23.104
108-90-7	108907	Chlorobenzene	0.00E+00	0.000	0.00E+00	0.000
110-54-3	110543	Hexane (-n)	0.00E+00	0.000	0.00E+00	0.000
110-82-7	110827	Cyclohexane	0.00E+00	0.000	1.74E-03	22.502
111-46-6	111466	Diethylene Glycol	0.00E+00	0.000	0.00E+00	0.000
111-76-2	111762	Glycol Ether EB	0.00E+00	0.000	0.00E+00	0.000
112-34-5	112345	Butyl Dioxitol	0.00E+00	0.000	0.00E+00	0.000
127-18-4	127184	Tetrachloroethene	0.00E+00	0.000	0.00E+00	0.000
1310-73-2	1310732	Sodium Hydroxide	0.00E+00	0.000	0.00E+00	0.000
1330-20-7	1330207	Xylenes (mixed isomers)	0.00E+00	0.000	1.82E-03	23.504
50-00-0	50000	Formaldehyde	0.00E+00	0.000	0.00E+00	0.000
67-56-1	67561	Methyl Alcohol	0.00E+00	0.000	1.00E-05	0.129
67-63-0	67630	Isopropyl Alcohol	0.00E+00	0.000	0.00E+00	0.000
71-43-2	71432	Benzene	0.00E+00	0.000	8.71E-04	11.242
7664-41-7	7664417	Ammonia	4.47E-07	0.006	0.00E+00	0.000
78-93-3	78933	Methyl Ethyl Ketone	0.00E+00	0.000	0.00E+00	0.000
91-20-3	91203	Naphthalene	0.00E+00	0.000	2.69E-04	3.476
95-63-6	95636	Trimethylbenzene (1,2,4)	0.00E+00	0.000	5.03E-04	6.492
9901	9901	Diesel Particulate Matter	0.00E+00	0.000	0.00E+00	0.000
112-27-6	112276	Triethylene Glycol	0.00E+00	0.000	0.00E+00	0.000

Total lb/year
140.081
0.000
0.000
0.000
11.780
0.000
0.000
23.104
0.000
0.000
22.502
0.000
0.000
0.000
0.000
0.000
23.504
0.000
0.129
0.000
11.242
0.006
0.000
3.476
6.492
0.000
0.000

Notes:

January 2020 Update: Emissions from the crude loading rack have been estimated using a combination of LFC-2 (sour gas/VRU) and LFC-7 (stabilized crude) as directed by the APCD.

Other Vehicle Toxic
Exxon - SYU
Interim Trucking Project

Total									
Device Desc		Truck (T7) Onsite Transport	Truck (T7) Offsite Transport	Device Desc		Truck (T7) Onsite Transport	Truck (T7) Offsite Transport	Truck (T7) Onsite Transport	Truck (T7) Offsite Transport
Device ID				Device ID				234052	234053
Vehicle Type		T7 Tractor	T7 Tractor	Vehicle Type		T7 Tractor	T7 Tractor	T7 Tractor	T7 Tractor
Location		Onsite	within 1000 ft	Location		Onsite	within 1000 ft		
Max Vehicles Per Hour		4	4	Max Vehicles Per Hour		4	4		
Trips Per Day		4	4	Trips Per Day		4	4		
Round Trip Length (miles)		3.18	0.19	Round Trip Length (miles)		3.18	0.19		
Round Trip Miles/Hour		12.72	0.76	Round Trip Miles/Hour		12.72	0.76		
Road Type		Local	Local	Road Type		Local	Local		
Running Exhaust (lb/hr)		0.0130	0.0008	Running Exhaust (lb/hr)		0.0071	0.0004		
Idle Exhaust (lb/hr)		0.0185		Idle Exhaust (lb/hr)		0.0016			
Total VOC (lb/hour)		0.0315	0.0008	Total PM10 (lb/hour)		0.0087	0.0004	Total	
CAS #	AB2588 No.		VOC Toxic Fraction (2007+)	lb/hr	lb/hr			lb/hr	lb/hr
106-99-0	106990	1,3-Butadiene	8.00E-04	2.52E-05	6.19E-07			2.52E-05	6.19E-07
540-84-1	540841	2,2,4-Trimethylpentane (isooctane)	7.80E-03	2.46E-04	6.04E-06			2.46E-04	6.04E-06
75-07-0	75070	Acetaldehyde	6.93E-02	2.18E-03	5.37E-05			2.18E-03	5.37E-05
107-02-8	107028	Acrolein	9.99E-03	3.15E-04	7.73E-06			3.15E-04	7.73E-06
71-43-2	71432	Benzene	1.29E-02	4.06E-04	9.99E-06			4.06E-04	9.99E-06
100-41-4	100414	Ethylbenzene	6.30E-03	1.99E-04	4.88E-06			1.99E-04	4.88E-06
50-00-0	50000	Formaldehyde	2.17E-01	6.85E-03	1.68E-04			6.85E-03	1.68E-04
110-54-3	110543	Hexane (-n)	5.40E-03	1.70E-04	4.18E-06			1.70E-04	4.18E-06
100-42-5	100425	Styrene		0.00E+00	0.00E+00			0.00E+00	0.00E+00
108-88-3	108883	Toluene	3.00E-02	9.45E-04	2.32E-05			9.45E-04	2.32E-05
1330-20-7	1330207	Xylenes (mixed isomers)	3.80E-02	1.20E-03	2.94E-05			1.20E-03	2.94E-05
123-38-6	123386	Propionaldehyde	3.10E-03	9.76E-05	2.40E-06			9.76E-05	2.40E-06
CAS #	AB2588 No.		PAH Gaseous Phase (PAH/VOC)	lb/hr	lb/hr	Particulate Phase (PAH/OC2.5)	lb/hr	lb/hr	lb/hr
50-32-8	50328	Benzo[a]pyrene [PAH, POM]		0.00E+00	0.00E+00	1.48E-05	1.28E-07	6.28E-09	1.28E-07
205-99-2	205992	Benzo[b]fluoranthene		0.00E+00	0.00E+00	6.27E-06	5.44E-08	2.66E-09	5.44E-08
53-70-3	53703	Dibenz[a,h]anthracene [PAH, POM]		0.00E+00	0.00E+00	4.48E-06	3.89E-08	1.90E-09	3.89E-08
56-55-3	56553	Benzo[g]anthracene [PAH, POM]	3.00E-07	9.45E-09	2.32E-10	3.58E-06	3.11E-08	1.52E-09	4.05E-08
83-32-9	83329	Acenaphthene [PAH, POM]	5.26E-05	1.66E-06	4.07E-08		0.00E+00	0.00E+00	1.66E-06
85-01-8	85018	Phenanthrene	8.51E-04	2.69E-05	6.59E-07	1.92E-03	1.67E-05	8.15E-07	4.35E-05
86-73-7	86737	Fluorene [PAH, POM]	1.96E-04	6.17E-06	1.52E-07	2.41E-04	2.09E-06	1.02E-07	8.26E-06
91-20-3	91203	Naphthalene	1.63E-02	5.13E-04	1.26E-05		0.00E+00	0.00E+00	5.13E-04
120-12-7	120127	Anthracene [PAH, POM]	3.04E-05	9.57E-07	2.35E-08	1.19E-04	1.03E-06	5.05E-08	1.99E-06
129-00-0	129000	Pyrene [PAH, POM]	3.79E-05	1.19E-06	2.93E-08	2.09E-04	1.81E-06	8.87E-08	3.01E-06
191-24-2	191242	Benzo[k]perylene	2.00E-07	6.30E-09	1.55E-10	8.96E-07	7.78E-09	3.80E-10	1.41E-08
193-39-5	193395	Indeno[1,2,3-cd]pyrene [PAH, POM]		0.00E+00	0.00E+00	2.24E-06	1.94E-08	9.51E-10	1.94E-08
206-44-0	206440	Fluoranthene [PAH, POM]	4.57E-05	1.44E-06	3.54E-08	2.18E-04	1.89E-06	9.25E-08	3.33E-06
207-08-9	207089	Benzo[k]fluoranthene [PAH, POM]		0.00E+00	0.00E+00	6.27E-06	5.44E-08	2.66E-09	5.44E-08
208-96-8	208968	Acenaphthylene [PAH, POM]	8.53E-05	2.69E-06	6.60E-08		0.00E+00	0.00E+00	2.69E-06
218-01-9	218019	Chrysene [PAH, POM]	5.00E-07	1.57E-08	3.87E-10	1.12E-05	9.72E-08	4.75E-09	1.13E-07
CAS #	AB2588 No.		Emission Rate (g/mi)	lb/hr	lb/hr			lb/hr	lb/hr
N020	7440382	Arsenic Compounds	2.30E-06	6.45E-08	3.85E-09			6.45E-08	3.85E-09
18540-29-9	18540299	Chromium, hexavalent (and compounds)	5.80E-09	1.63E-10	9.72E-12			1.63E-10	9.72E-12
N450	7439965	Manganese Compounds	5.50E-07	1.54E-08	9.22E-10			1.54E-08	9.22E-10
N458	7439976	Mercury Compounds	1.10E-08	3.08E-10	1.84E-11			3.08E-10	1.84E-11
N495	7440020	Nickel Compounds	6.50E-07	1.82E-08	1.09E-09			1.82E-08	1.09E-09
1746-01-6	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)		0.00E+00	0.00E+00			0.00E+00	0.00E+00
40321-76-4	40321764	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin		0.00E+00	0.00E+00			0.00E+00	0.00E+00
39227-29-6	39227296	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin		0.00E+00	0.00E+00			0.00E+00	0.00E+00
57653-85-7	57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin		0.00E+00	0.00E+00			0.00E+00	0.00E+00
19408-74-3	19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin		0.00E+00	0.00E+00			0.00E+00	0.00E+00
35822-46-9	35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	1.05E-12	2.94E-14	1.76E-15			2.94E-14	1.76E-15
3268-87-9	3268879	Octachlorodibenzo-p-dioxin	6.98E-12	1.96E-13	1.17E-14			1.96E-13	1.17E-14
5120-73-19	51207319	2,3,7,8-Tetrachlorodibenzofuran	5.09E-14	1.43E-15	8.53E-17			1.43E-15	8.53E-17
57117-41-6	57117416	1,2,3,7,8-Pentachlorodibenzofuran	1.07E-13	3.00E-15	1.79E-16			3.00E-15	1.79E-16
57117-31-4	57117314	2,3,4,7,8-Pentachlorodibenzofuran	3.24E-13	9.09E-15	5.43E-16			9.09E-15	5.43E-16
70648-26-9	70648269	1,2,3,4,7,8-Hexachlorodibenzofuran	2.20E-13	6.17E-15	3.69E-16			6.17E-15	3.69E-16
57117-44-9	57117449	1,2,3,6,7,8-Hexachlorodibenzofuran	2.43E-13	6.81E-15	4.07E-16			6.81E-15	4.07E-16
72918-21-9	72918219	1,2,3,7,8,9-Hexachlorodibenzofuran		0.00E+00	0.00E+00			0.00E+00	0.00E+00
60851-34-5	60851345	2,3,4,6,7,8-Hexachlorodibenzofuran	1.80E-13	5.05E-15	3.02E-16			5.05E-15	3.02E-16
67562-39-4	67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran	9.94E-13	2.79E-14	1.67E-15			2.79E-14	1.67E-15
55673-89-7	55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran	5.81E-14	1.63E-15	9.73E-17			1.63E-15	9.73E-17
39001-02-0	39001020	Octachlorodibenzofuran	1.74E-12	4.89E-14	2.92E-15			4.89E-14	2.92E-15

**Other Vehicle Toxic
Exxon - SYU
Interim Trucking Project**

			Device Desc	Truck (T7) Onsite Transport	Truck (T7) Offsite Transport
			Device ID	234052	234053
			Vehicle Type	T7 Tractor	T7 Tractor
			Location	Onsite	within 1000 ft
			Total Number of Vehicles	365	365
			Trips Per Day	4	4
			Trips Per Year	1,460	1,460
			Round Trip Length (miles)	3.18	0.19
			Round Trip Miles/year	4642.80	277.40
			Road Type	Local	Local
			Running Exhaust (lb/year)	2.592	0.155
CAS #	AB2588 No.	Compound	Idle Exhaust (lb/year)	0.144	NA
			Total PM (lb/year)	2.736	0.155
9901	9901	Diesel Particulate Matter		2.736	0.155
106-99-0	106990	1,3-Butadiene			
540-84-1	540841	2,2,4-Trimethylpentane (isooctane)			
75-07-0	75070	Acetaldehyde			
107-02-8	107028	Acrolein			
71-43-2	71432	Benzene			
100-41-4	100414	Ethylbenzene			
50-00-0	50000	Formaldehyde			
110-54-3	110543	Hexane (n)			
100-42-5	100425	Styrene			
108-88-3	108883	Toluene			
1330-20-7	1330207	Xylenes (mixed isomers)			
123-38-6	123386	Propionaldehyde			
CAS #	AB2588 No.				
50-32-8	50328	Benzo[a]pyrene [PAH, POM]			
205-99-2	205992	Benzo[b]fluoranthene			
53-70-3	53703	Dibenzo[a,h]anthracene [PAH, POM]			
56-55-3	56553	Benzo[a]anthracene [PAH, POM]			
83-32-9	83329	Acenaphthene [PAH, POM]			
85-01-8	85018	Phenanthrene			
86-73-7	86737	Fluorene [PAH, POM]			
91-20-3	91203	Naphthalene			
120-12-7	120127	Anthracene [PAH, POM]			
129-00-0	129000	Pyrene [PAH, POM]			
191-24-2	191242	Benzo[a,h]iperylene			
193-39-5	193395	Indeno[1,2,3-cd]pyrene [PAH, POM]			
206-44-0	206440	Fluoranthene [PAH, POM]			
207-08-9	207089	Benzo[k]fluoranthene [PAH, POM]			
208-96-8	208968	Acenaphthylene [PAH, POM]			
218-01-9	218019	Chrysene [PAH, POM]			
CAS #	AB2588 No.				
N020	7440382	Arsenic Compounds			
18540-29-9	18540299	Chromium, hexavalent (and compounds)			
N450	7439965	Manganese Compounds			
N458	7439976	Mercury Compounds			
N495	7440020	Nickel Compounds			
1746-01-6	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)			
40321-76-4	40321764	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin			
39227-28-6	39227286	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin			
57653-85-7	57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin			
19408-74-3	19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin			
35822-46-9	35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin			
3268-87-9	3268879	Octachlorodibenzo-p-dioxin			
5120-73-19	51207319	2,3,7,8-Tetrachlorodibenzofuran			
57117-41-6	57117416	1,2,3,7,8-Pentachlorodibenzofuran			
57117-31-4	57117314	2,3,4,7,8-Pentachlorodibenzofuran			
70648-26-9	70648269	1,2,3,4,7,8-Hexachlorodibenzofuran			
57117-44-9	57117449	1,2,3,6,7,8-Hexachlorodibenzofuran			
72918-21-9	72918219	1,2,3,7,8,9-Hexachlorodibenzofuran			
60851-34-5	60851345	2,3,4,6,7,8-Hexachlorodibenzofuran			
67562-39-4	67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran			
55673-89-7	55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran			
39001-02-0	39001020	Octachlorodibenzofuran			

[illegible]

Other Vehicle Toxic
Exxon - SYU
Interim Trucking Project

Total							
Device Desc	Onsite Delivery Truck Transport	Offsite Delivery Truck Transport	Device Desc	Onsite Delivery Truck Transport	Offsite Delivery Truck Transport	Onsite Delivery Truck Transport	Offsite Delivery Truck Transport
Device ID			Device ID			234048	234049
Vehicle Type	MDV	MDV	Vehicle Type	MDV	MDV	MDV	MDV
Location	Onsite	within 1000 ft	Location	Onsite	within 1000 ft		
Max Vehicles Per Hour	3	3	Max Vehicles Per Hour	3	3		
Trips Per Day	3	3	Trips Per Day	3	3		
Round Trip Length (miles)	3.18	0.19	Round Trip Length (miles)	3.18	0.19		
Round Trip Miles/Hour	9.54	0.57	Round Trip Miles/Hour	9.54	0.57		
Road Type	Local	Local	Road Type	Local	Local		
Running Exhaust (lb/hr)	0.0004	0.0000	Running Exhaust (lb/hr)	0.0002	0.0000		
Idle Exhaust (lb/hr)			Idle Exhaust (lb/hr)				
Total VOC (lb/hour)	0.0004	0.0000	Total PM10 (lb/hour)	0.0002	0.0000		
VOC Toxic Fraction (2007+)	lb/hr	lb/hr				lb/hr	lb/hr
8.00E-04	3.05E-07	1.82E-08				3.05E-07	1.82E-08
7.80E-03	2.97E-06	1.77E-07				2.97E-06	1.77E-07
6.93E-02	2.64E-05	1.58E-06				2.64E-05	1.58E-06
9.99E-03	3.80E-06	2.27E-07				3.80E-06	2.27E-07
1.29E-02	4.91E-06	2.94E-07				4.91E-06	2.94E-07
6.30E-03	2.40E-06	1.43E-07				2.40E-06	1.43E-07
2.17E-01	8.28E-05	4.94E-06				8.28E-05	4.94E-06
5.40E-03	2.06E-06	1.23E-07				2.06E-06	1.23E-07
0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00
3.00E-02	1.14E-05	6.82E-07				1.14E-05	6.82E-07
3.80E-02	1.45E-05	8.64E-07				1.45E-05	8.64E-07
3.10E-03	1.18E-06	7.05E-08				1.18E-06	7.05E-08
PAH Gaseous Phase (PAH/VOC)	lb/hr	lb/hr	Particulate Phase (PAH/OC2.5)	lb/hr	lb/hr	lb/hr	lb/hr
1.00E-05	0.00E+00	0.00E+00	1.48E-05	3.30E-09	1.97E-10	3.30E-09	1.97E-10
1.00E-05	0.00E+00	0.00E+00	6.27E-06	1.40E-09	8.34E-11	1.40E-09	8.34E-11
1.00E-05	0.00E+00	0.00E+00	4.48E-06	9.98E-10	5.96E-11	9.98E-10	5.96E-11
3.00E-07	1.14E-10	6.82E-12	3.58E-06	7.97E-10	4.76E-11	9.12E-10	5.45E-11
5.26E-05	2.00E-08	1.20E-09		0.00E+00	0.00E+00	2.00E-08	1.20E-09
8.51E-04	3.24E-07	1.94E-08	1.92E-03	4.28E-07	2.56E-08	7.52E-07	4.49E-08
1.96E-04	7.46E-08	4.46E-09	2.41E-04	5.37E-08	3.21E-09	1.28E-07	7.66E-09
1.63E-02	6.20E-06	3.71E-07		0.00E+00	0.00E+00	6.20E-06	3.71E-07
3.04E-05	1.16E-08	6.91E-10	1.19E-04	2.65E-08	1.58E-09	3.81E-08	2.27E-09
3.79E-05	1.44E-08	8.62E-10	2.09E-04	4.65E-08	2.78E-09	6.10E-08	3.64E-09
2.00E-07	7.61E-11	4.55E-12	8.96E-07	2.00E-10	1.19E-11	2.76E-10	1.65E-11
	0.00E+00	0.00E+00	2.24E-06	4.99E-10	2.98E-11	4.99E-10	2.98E-11
4.57E-05	1.74E-08	1.04E-09	2.18E-04	4.86E-08	2.90E-09	6.59E-08	3.94E-09
	0.00E+00	0.00E+00	6.27E-06	1.40E-09	8.34E-11	1.40E-09	8.34E-11
8.53E-05	3.25E-08	1.94E-09		0.00E+00	0.00E+00	3.25E-08	1.94E-09
5.00E-07	1.90E-10	1.14E-11	1.12E-05	2.49E-09	1.49E-10	2.68E-09	1.60E-10
Emission Rate (g/mi)	lb/hr	lb/hr				lb/hr	lb/hr
2.30E-06	4.84E-08	2.89E-09				4.84E-08	2.89E-09
5.80E-09	1.22E-10	7.29E-12				1.22E-10	7.29E-12
5.50E-07	1.16E-08	6.91E-10				1.16E-08	6.91E-10
1.10E-08	2.31E-10	1.38E-11				2.31E-10	1.38E-11
6.50E-07	1.37E-08	8.17E-10				1.37E-08	8.17E-10
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
1.05E-12	2.21E-14	1.32E-15				2.21E-14	1.32E-15
6.98E-12	1.47E-13	8.77E-15				1.47E-13	8.77E-15
5.09E-14	1.07E-15	6.40E-17				1.07E-15	6.40E-17
1.07E-13	2.25E-15	1.34E-16				2.25E-15	1.34E-16
3.24E-13	6.81E-15	4.07E-16				6.81E-15	4.07E-16
2.20E-13	4.63E-15	2.76E-16				4.63E-15	2.76E-16
2.43E-13	5.11E-15	3.05E-16				5.11E-15	3.05E-16
	0.00E+00	0.00E+00				0.00E+00	0.00E+00
1.80E-13	3.79E-15	2.26E-16				3.79E-15	2.26E-16
9.94E-13	2.09E-14	1.25E-15				2.09E-14	1.25E-15
5.81E-14	1.22E-15	7.30E-17				1.22E-15	7.30E-17
1.74E-12	3.66E-14	2.18E-15				3.66E-14	2.18E-15

Device Desc	Employee Onsite Transport	Employee Offsite Transport	Device Desc	Employee Onsite Transport	Employee Offsite Transport	Employee Onsite Transport	Employee Offsite Transport
Device ID			Device ID			234050	234051
Vehicle Type	LDA	LDA	Vehicle Type	LDA	LDA		
Location	Onsite	within 1000 ft	Location	Onsite	within 1000 ft		
Total Number of Vehicles	365	365	Total Number of Vehicles	365	365		
Trips Per Day	100	100	Trips Per Day	100	100		
Trips Per Year	36,500	36,500	Trips Per Year	36,500	36,500		
Round Trip Length (miles)	3.18	0.19	Round Trip Length (miles)	3.18	0.19		
Round Trip Miles/year	116070.00	6935.00	Round Trip Miles/year	116070.00	6935.00		
Road Type	Local	Local	Road Type	Local	Local		
Running Exhaust (lb/year)	11.648	0.696	Running Exhaust (lb/year)	4.59E-01	2.74E-02		
Idle Exhaust (lb/year)		NA	Idle Exhaust (lb/year)		NA	Total	
Total VOC (lb/year)	11.648	0.696	Total PM10 (lb/year)	4.59E-01	2.74E-02	lb/year	lb/year
VOC Toxic Fraction (E10)							
1.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00
2.15E-01		1.29E-02				2.15E-01	1.29E-02
1.85E-02	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	7.32E-03	4.37E-04				7.32E-03	4.37E-04
6.28E-04	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	2.25E-01	1.34E-02				2.25E-01	1.34E-02
1.93E-02	0.00E+00	0.00E+00				0.00E+00	0.00E+00
	1.86E-01	1.11E-02				1.86E-01	1.11E-02
1.59E-02	1.13E-02	6.75E-04				1.13E-02	6.75E-04
9.70E-04	1.01E+00	6.03E-02				1.01E+00	6.03E-02
8.66E-02	8.19E-01	4.89E-02				8.19E-01	4.89E-02
7.03E-02	1.00E-02	5.99E-04				1.00E-02	5.99E-04
8.60E-04	0.00E+00	0.00E+00				0.00E+00	0.00E+00
						lb/year	lb/year
PAH Gaseous Phase (PAH/VOC)			Particulate Phase (PAH/OC2.5)				
2.94E-07	3.42E-06	2.05E-07	9.13E-04	4.19E-04	2.50E-05	4.22E-04	2.52E-05
	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00
	0.00E+00	0.00E+00	2.13E-05	9.77E-06	5.84E-07	9.77E-06	5.84E-07
5.40E-06	6.29E-05	3.76E-06		1.67E-04	9.97E-06	2.30E-04	1.37E-05
3.99E-05	4.65E-04	2.78E-05		0.00E+00	0.00E+00	4.65E-04	2.78E-05
2.14E-04	2.49E-03	1.49E-04	1.39E-04	6.38E-05	3.81E-06	2.56E-03	1.53E-04
8.08E-05	9.41E-04	5.62E-05		0.00E+00	0.00E+00	9.41E-04	5.62E-05
2.07E-03	2.41E-02	1.44E-03	1.29E-04	5.92E-05	3.54E-06	2.42E-02	1.44E-03
3.35E-05	3.90E-04	2.33E-05	3.97E-05	1.82E-05	1.09E-06	4.08E-04	2.44E-05
3.35E-05	7.46E-04	4.45E-05	1.52E-04	6.97E-05	4.17E-06	8.15E-04	4.87E-05
6.40E-05	0.00E+00	0.00E+00	2.47E-03	1.13E-03	6.77E-05	1.13E-03	6.77E-05
	0.00E+00	0.00E+00	9.28E-04	4.26E-04	2.54E-05	4.26E-04	2.54E-05
5.60E-05	6.52E-04	3.90E-05	1.40E-04	6.42E-05	3.84E-06	7.17E-04	4.28E-05
4.01E-06	4.67E-05	2.78E-06	4.45E-04	2.04E-04	1.22E-05	2.51E-04	1.50E-05
1.81E-04	2.11E-03	1.23E-04	3.83E-05	1.76E-05	1.05E-06	2.13E-03	1.27E-04
6.05E-06	7.05E-05	4.21E-06	3.08E-04	1.41E-04	8.44E-06	2.12E-04	1.27E-05
	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emission Rate (g/mi)						lb/year	lb/year
2.30E-06	1.61E-08	9.63E-10				1.61E-08	9.63E-10
1.20E-08	8.41E-11	5.03E-12				8.41E-11	5.03E-12
1.33E-06	9.32E-09	5.57E-10				9.32E-09	5.57E-10
1.20E-07	8.43E-10	5.04E-11				8.43E-10	5.04E-11
1.50E-06	1.05E-08	6.28E-10				1.05E-08	6.28E-10
8.27E-13	5.80E-15	3.46E-16				5.80E-15	3.46E-16
9.70E-13	2.59E-15	1.55E-16				2.59E-15	1.55E-16
3.87E-13	2.71E-15	1.62E-16				2.71E-15	1.62E-16
7.92E-13	5.55E-15	3.32E-16				5.55E-15	3.32E-16
4.93E-13	3.46E-15	2.07E-16				3.46E-15	2.07E-16
5.95E-12	4.17E-14	2.49E-15				4.17E-14	2.49E-15
4.70E-11	3.29E-13	1.97E-14				3.29E-13	1.97E-14
2.76E-12	1.93E-14	1.16E-15				1.93E-14	1.16E-15
9.68E-13	6.79E-15	4.05E-16				6.79E-15	4.05E-16
1.32E-12	9.25E-15	5.53E-16				9.25E-15	5.53E-16
1.09E-12	7.64E-15	4.57E-16				7.64E-15	4.57E-16
1.16E-12	8.13E-15	4.86E-16				8.13E-15	4.86E-16
3.17E-13	2.22E-15	1.33E-16				2.22E-15	1.33E-16
1.36E-12	9.53E-15	5.70E-16				9.53E-15	5.70E-16
1.21E-11	8.48E-14	5.07E-15				8.48E-14	5.07E-15
3.87E-13	2.71E-15	1.62E-16				2.71E-15	1.62E-16
1.37E-11	9.60E-14	5.74E-15				9.60E-14	5.74E-15

Other Vehicle Toxic
Exxon - SYU
Interim Trucking Project

Device Desc			Employee Onsite Transport	Employee Offsite Transport	Device Desc			Employee Onsite Transport	Employee Offsite Transport	Employee Onsite Transport	Employee Offsite Transport
Device ID			Device ID			234050			234051		
Vehicle Type			LDA	LDA	Vehicle Type			LDA	LDA		
Location			Onsite	within 1000 ft	Location			Onsite	within 1000 ft		
Max Vehicles Per Hour			100	100	Max Vehicles Per Hour			100.00	100.00		
Trips Per Day			100	100	Trips Per Day			100.00	100.00		
Round Trip Length (miles)			3.18	0.19	Round Trip Length (miles)			3.18	0.19		
Round Trip Miles/Hour			318.00	19.00	Round Trip Miles/Hour			318.00	19.00		
Road Type			Local	Local	Road Type			Local	Local		
Running Exhaust (lb/hr)			0.0319	0.0019	Running Exhaust (lb/hr)			0.0013	0.0001		
Idle Exhaust (lb/hr)					Idle Exhaust (lb/hr)						
Total VOC (lb/hour)			0.0319	0.0019	Total PM10 (lb/hour)			0.0013	0.0001	Total	
CAS #	AB2588 No.		VOC Toxic Fraction (E10)	lb/hr	lb/hr				lb/hr	lb/hr	
106-99-0	106990	1,3-Butadiene	1.00E-01	0.00E+00	0.00E+00				0.00E+00	0.00E+00	
540-84-1	540841	2,2,4-Trimethylpentane (isooctane)	1.85E-02	5.90E-04	3.53E-05				5.90E-04	3.53E-05	
75-07-0	75070	Acetaldehyde	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	
107-02-9	107028	Acrolein	6.28E-04	2.00E-05	1.20E-06				2.00E-05	1.20E-06	
71-43-2	71432	Benzene	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	
100-41-4	100414	Ethylbenzene	1.93E-02	6.17E-04	3.68E-05				6.17E-04	3.68E-05	
50-00-0	50000	Formaldehyde	0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	
110-54-3	110543	Hexane (-n)	1.59E-02	5.08E-04	3.04E-05				5.08E-04	3.04E-05	
100-42-5	100425	Styrene	9.70E-04	3.10E-05	1.85E-06				3.10E-05	1.85E-06	
108-98-3	108883	Toluene	8.66E-02	2.76E-03	1.65E-04				2.76E-03	1.65E-04	
1330-20-7	1330207	Xylenes (mixed isomers)	7.03E-02	2.24E-03	1.34E-04				2.24E-03	1.34E-04	
123-38-6	123386	Propionaldehyde	8.60E-04	2.74E-05	1.64E-06				2.74E-05	1.64E-06	
CAS #	AB2588 No.		PAH Gaseous Phase (PAH/VOC)	lb/hr	lb/hr	Particulate Phase (PAH/OC2.5)			lb/hr	lb/hr	
50-32-9	50329	Benzo[a]pyrene [PAH, POM]	2.94E-07	9.38E-09	5.61E-10	9.13E-04	1.15E-06	6.85E-08	1.16E-06	6.91E-08	
205-99-2	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00	0.00E+00	2.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
53-70-3	53703	Dibenz[a,h]anthracene [PAH, POM]	0.00E+00	0.00E+00	0.00E+00	2.68E-08	1.60E-09	2.68E-08	1.60E-09	2.68E-08	
56-55-3	56553	Benzo[g]anthracene [PAH, POM]	5.40E-06	1.72E-07	1.03E-08	3.64E-04	4.57E-07	2.73E-08	6.30E-07	3.76E-08	
83-32-9	83329	Acenaphthene [PAH, POM]	3.99E-05	1.27E-06	7.61E-08	0.00E+00	0.00E+00	0.00E+00	1.27E-06	7.61E-08	
85-01-8	85018	Phenanthrene	2.14E-04	6.83E-06	4.08E-07	1.39E-04	1.75E-07	1.04E-08	7.00E-06	4.18E-07	
86-73-7	86737	Fluorene [PAH, POM]	8.08E-05	2.58E-06	1.54E-07	0.00E+00	0.00E+00	0.00E+00	2.58E-06	1.54E-07	
91-20-3	91203	Naphthalene	2.07E-03	6.61E-05	3.95E-06	1.29E-04	1.62E-07	9.68E-09	6.62E-05	3.96E-06	
120-12-7	120127	Anthracene [PAH, POM]	3.35E-05	1.07E-06	6.39E-08	3.97E-05	4.99E-08	2.98E-09	1.12E-06	6.69E-08	
129-00-0	129000	Pyrene [PAH, POM]	6.40E-05	2.04E-06	1.22E-07	1.52E-04	1.91E-07	1.14E-08	2.23E-06	1.33E-07	
191-24-2	191242	Benzo[ghi]perylene	0.00E+00	0.00E+00	0.00E+00	2.47E-03	3.10E-06	1.85E-07	3.10E-06	1.85E-07	
193-39-5	193395	Indeno[1,2,3-cd]pyrene [PAH, POM]	0.00E+00	0.00E+00	0.00E+00	9.28E-04	1.17E-06	6.97E-08	1.17E-06	6.97E-08	
206-44-0	206440	Fluoranthene [PAH, POM]	5.60E-05	1.79E-06	1.07E-07	1.40E-04	1.76E-07	1.05E-08	1.96E-06	1.17E-07	
207-09-9	207099	Benzo[k]fluoranthene [PAH, POM]	4.01E-06	1.28E-07	7.65E-09	4.45E-04	5.59E-07	3.34E-08	6.87E-07	4.11E-08	
208-96-8	208968	Acenaphthylene [PAH, POM]	1.81E-04	5.78E-06	3.46E-07	3.83E-05	4.81E-08	2.88E-09	5.82E-06	3.48E-07	
218-01-9	218019	Chrysene [PAH, POM]	6.05E-06	1.93E-07	1.15E-08	3.08E-04	3.87E-07	2.31E-08	5.80E-07	3.47E-08	
CAS #	AB2588 No.		Emission Rate (g/mi)	lb/hr	lb/hr				lb/hr	lb/hr	
N020	7440382	Arsenic Compounds	2.30E-06	1.61E-06	9.63E-08				1.61E-06	9.63E-08	
N090	7440473	Chromium Compounds		0.00E+00	0.00E+00				0.00E+00	0.00E+00	
N450	7439965	Manganese Compounds	1.33E-06	9.32E-07	5.57E-08				9.32E-07	5.57E-08	
N458	7439976	Mercury Compounds	1.20E-07	8.43E-08	5.04E-09				8.43E-08	5.04E-09	
N495	7440020	Nickel Compounds	1.50E-06	1.05E-06	6.28E-08				1.05E-06	6.28E-08	
1746-01-6	1746016	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	8.27E-13	5.80E-13	3.46E-14				5.80E-13	3.46E-14	
40321-76-4	40321764	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	3.70E-13	2.59E-13	1.55E-14				2.59E-13	1.55E-14	
39227-29-6	39227296	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	3.87E-13	2.71E-13	1.62E-14				2.71E-13	1.62E-14	
57653-85-7	57653857	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	7.92E-13	5.55E-13	3.32E-14				5.55E-13	3.32E-14	
19408-74-3	19408743	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	4.93E-13	3.46E-13	2.07E-14				3.46E-13	2.07E-14	
35822-46-9	35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	5.95E-12	4.17E-12	2.49E-13				4.17E-12	2.49E-13	
3268-87-9	3268879	Octachlorodibenzo-p-dioxin	4.70E-11	3.29E-11	1.97E-12				3.29E-11	1.97E-12	
5120-73-19	51207319	2,3,7,8-Tetrachlorodibenzofuran	2.76E-12	1.93E-12	1.16E-13				1.93E-12	1.16E-13	
57117-41-6	57117416	1,2,3,7,8-Pentachlorodibenzofuran	9.68E-13	6.79E-13	4.05E-14				6.79E-13	4.05E-14	
57117-31-4	57117314	1,2,3,4,7,8-Pentachlorodibenzofuran	1.32E-12	9.25E-13	5.53E-14				9.25E-13	5.53E-14	
70648-26-9	70648269	1,2,3,4,7,8-Hexachlorodibenzofuran	1.09E-12	7.64E-13	4.57E-14				7.64E-13	4.57E-14	
57117-44-9	57117449	1,2,3,6,7,8-Hexachlorodibenzofuran	1.16E-12	8.13E-13	4.86E-14				8.13E-13	4.86E-14	
72918-21-9	72918219	1,2,3,7,8,9-Hexachlorodibenzofuran	3.17E-13	2.22E-13	1.33E-14				2.22E-13	1.33E-14	
60851-34-5	60851345	2,3,4,6,7,8-Hexachlorodibenzofuran	1.36E-12	9.53E-13	5.70E-14				9.53E-13	5.70E-14	
67562-39-4	67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.21E-11	8.49E-12	5.07E-13				8.49E-12	5.07E-13	
55673-89-7	55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.87E-13	2.71E-13	1.62E-14				2.71E-13	1.62E-14	
39001-02-0	39001020	Octachlorodibenzofuran	1.37E-11	9.60E-12	5.74E-13				9.60E-12	5.74E-13	

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Vents
Exxon - SYU
Interim Trucking Project

			Device Desc	SOV Distance Piece Vent -- Compressor A	SOV Distance Piece Vent -- Compressor B	SOV Distance Piece Vent -- Compressor C	VRU Distance Piece Vent -- Compressor A	VRU Distance Piece Vent -- Compressor B
			Device ID	113011	113012	113013	113020	113030
			ROC (lb/hr)	0.10	0.10	0.10	0.10	0.10
			Annual Hours of Operation	8760	8760	8760	8760	8760
			Speciation	757	757	757	757	757
CAS #	AB2588 No.		lb/year					
71-43-2	71432	Benzene	lb/year	2.84	2.84	2.84	2.84	2.84
110-54-3	110543	Hexane (-n)	lb/year	147.90	147.90	147.90	147.90	147.90

			Device Desc	SOV Distance Piece Vent -- Compressor A	SOV Distance Piece Vent -- Compressor B	SOV Distance Piece Vent -- Compressor C	VRU Distance Piece Vent -- Compressor A	VRU Distance Piece Vent -- Compressor B
			Device ID	113011	113012	113013	113020	113030
			ROC (lb/hr)	0.10	0.10	0.10	0.10	0.10
			Max Hour	1	1	1	1	1
			Speciation	757	757	757	757	757
CAS #	AB2588 No.		lb/hr					
71-43-2	71432	Benzene	lb/hr	3.25E-04	3.25E-04	3.25E-04	3.25E-04	3.25E-04
110-54-3	110543	Hexane (-n)	lb/hr	1.69E-02	1.69E-02	1.69E-02	1.69E-02	1.69E-02

**Welding
Exxon - SYU
Interim Trucking Project**

				Device Desc	Maintenance Shop -- Welding – SMAW
				Device ID	318021
				Lb Rod/Year	60
				Speciation	SMAW - E7018
CAS #	AB2588 No.		EF Source	lb/year	
N090	7440473	Chromium Compounds	AP-42	lb/year	3.60E-04
18540-29-9	18540299	Hexavalent Chromium	APCD	lb/year	2.17E-04
7440-48-4	7440484	Cobalt	APCD	lb/year	0.00E+00
N450	7439965	Manganese Compounds	AP-42	lb/year	6.18E-02
N495	7440020	Nickel Compounds	AP-42	lb/year	1.20E-04
N420	7439921	Lead Compounds	APCD	lb/year	0.00E+00
7440-62-2	7440622	Vanadium (fume or dust)	APCD	lb/year	0.00E+00
N100	7440508	Copper Compounds		lb/year	0.00E+00

			Device Desc	Maintenance Shop -- Welding – TIG
			Device ID	318022
			Lb Rod/Year	10
			Speciation	TIG - UnspER70S-6
			EF Source	
	Specification	lb/year		7.79E-05
	Specification	lb/year		4.10E-06
	Specification	lb/year		0.00E+00
	Specification	lb/year		1.01E-03
	Specification	lb/year		8.20E-05
	Specification	lb/year		0.00E+00
	Specification	lb/year		1.64E-05
	Specification	lb/year		2.73E-04

				Device Desc	Maintenance Shop -- Welding – SMAW
				Device ID	318021
				Lb Rod/Hr	1
				Speciation	SMAW - E7018
CAS #	AB2588 No.		EF Source	lb/hr	
N090	7440473	Chromium Compounds	AP-42	lb/hr	6.00E-06
18540-29-9	18540299	Hexavalent Chromium	APCD	lb/hr	3.61E-06
7440-48-4	7440484	Cobalt	APCD	lb/hr	0.00E+00
N450	7439965	Manganese Compounds	AP-42	lb/hr	1.03E-03
N495	7440020	Nickel Compounds	AP-42	lb/hr	2.00E-06
N420	7439921	Lead Compounds	APCD	lb/hr	0.00E+00
7440-62-2	7440622	Vanadium (fume or dust)	AP-42	lb/hr	0.00E+00
N100	7440508	Copper Compounds		lb/hr	0.00E+00

			Device Desc	Maintenance Shop -- Welding – TIG
			Device ID	318022
			Lb Rod/Hr	1
			Speciation	TIG - UnspER70S-6
			EF Source	
	Specification	lb/hr		7.79E-06
	Specification	lb/hr		4.10E-07
	Specification	lb/hr		0.00E+00
	Specification	lb/hr		1.01E-04
	Specification	lb/hr		8.20E-06
	Specification	lb/hr		0.00E+00
	Specification	lb/hr		1.64E-06
	Specification	lb/hr		2.73E-05

APPENDIX J. ELECTRONIC FILES

Appendix B.4

Estimated Fuel Use Calculations

Estimated Fuel Use Calculations

Truck Fuel Use Estimates

Item	SMPS	Plains Pentland Terminal
Miles (Round Trip)	108	280
Round Trips per Day	70	68
Trips per year	25,550	24,820
Annual Miles	2,759,400	6,949,600
Gallons of Fuel per Year	389,288	980,428
Gallons of Fuel per Year with Mitigation	323,062	813,638
Gallons of Fuel per Day	1,067	2,686
Gallon of Fuel per Day with Mitigation	885	2,229

Fuel Use Estimates

Fuel Use Case	Fuel Use (mpg)
Base Fuel Use for HHD Trucks	6.5
Project Fuel Use for 2017 Trucks	7.1
Mitigated Fuel Use for Trucks	8.5

Fuel Reduction Measures	% Reduction
Newer Trucks	8.30%
Speed limiters	10.4%
Driver Training	3.1%
GPS	2.1%

Source: A Survey of Fuel Economy and Fuel Use by Heavy-Duty Truck Fleets. University of Mic

Estimated Fuel Use Calculations

Estimated Construction Fuel Use

Representative Equipment Model	Number of Units	Load Factor	Number of Days	Hours/Day	Fuel Use (gals/hr)	Fuel Use (gals)
Smooth Drum Roller	1	0.38	5	10	4.5	225
Cat 950H Loader	1	0.37	2	10	5.3	106
Case 570 NXT	1	0.37	4	10	3.2	128
CAT 325 Excavator	1	0.38	7	10	7.4	518
Cat Skid Steer	1	0.36	1	10	3.2	32
Cat 950H Loader	1	0.37	1	10	5.3	53
Case 570 NXT	1	0.37	4	10	3.2	128
CAT 430 Backhoe	1	0.37	2	10	6.0	120
Sullair 185 Air Comp	1	0.48	1	10	2.7	27
Cat 950H Loader	1	0.37	1	10	5.3	53
CAT 430 Backhoe	1	0.37	5	10	6.0	300
Cranes	1	0.29	1	10	5.5	55
Case 570 NXT	1	0.37	2	10	3.2	64
CAT 430 Backhoe	1	0.37	5	10	6.0	300
Sullair 185 Air Comp	1	0.48	2	10	2.7	54
Cranes	1	0.29	1	10	5.5	55
CAT TH360B Variable Reach Forklift	1	0.2	4	10	4.5	180
Cat Skid Steer	1	0.36	2	10	3.2	64
CAT 430 Backhoe	1	0.37	2	10	6.0	120
Cranes	1	0.29	10	10	5.5	550
CAT TH360B Variable Reach Forklift	1	0.2	10	10	4.5	450
Welders	2	0.45	5	10	2.0	200
Cranes	1	0.29	5	10	5.5	275
CAT TH360B Variable Reach Forklift	1	0.2	10	10	4.5	450
CAT 430 Backhoe	1	0.37	10	10	6.0	600
Welders	2	0.45	5	10	2.0	200
Cranes	1	0.29	10	10	5.5	550
CAT TH360B Variable Reach Forklift	1	0.2	10	10	4.5	450
Cranes	1	0.29	10	10	5.5	550
CAT TH360B Variable Reach Forklift	1	0.2	5	10	4.5	225
Sullair 185 Air Comp	1	0.48	1	10	2.7	27
CAT 430 Backhoe	1	0.37	5	10	6.0	300
CAT TH360B Variable Reach Forklift	1	0.2	2	10	4.5	90
CAT TH360B Variable Reach Forklift	1	0.2	2	10	4.5	90
Sullair 185 Air Comp	1	0.48	2	10	2.7	54
CAT 325 Excavator	1	0.38	2	10	7.4	148
CAT TH360B Variable Reach Forklift	1	0.2	2	10	4.5	90
CASE 650L DOZER	1	0.4	0	0	15.8	0
Cat Skid Steer	1	0.36	0	0	3.2	0
Cat 950H Loader	1	0.37	0	0	5.3	0
Case 570 NXT	1	0.37	3	10	3.2	96
CAT 430 Backhoe	1	0.37	5	10	6.0	300
Cat Skid Steer	1	0.36	2	10	3.2	64
Cat 950H Loader	1	0.37	4	10	5.3	212
Case 570 NXT	1	0.37	2	10	3.2	64
CAT 430 Backhoe	1	0.37	2	10	6.0	120
Total Fuel Use						8,737

Estimated Fuel Use Calculations

Construciton Equipment Fuel Use by Load Factor Range

Representative Equipment Model	Fuel Use (Gals/hr)			Load Factor
	Low	Medium	High	
Case 570 NXT	2.0	2.6	3.2	0.37
CASE 650L DOZER	8.9	12.1	15.8	0.4
CAT 325 Excavator	4.8	6.1	7.4	0.38
CAT 430 Backhoe	3.9	5.5	6.0	0.37
Cat 950H Loader	3.1	4.6	5.3	0.37
Cat Skid Steer	2.0	2.6	3.2	0.36
CAT TH360B Variable Reach Forklift	1.8	3.7	4.5	0.2
Cranes	2.4	4.5	5.5	0.29
Smooth Drum Roller	4.5	5.0	6.0	0.38
Sullair 185 Air Comp	2.7	2.7	2.7	0.48
Welders	2.0	2.0	2.0	0.45
Max Load Factor	0.4	0.6	1	

Source: Caterpillar Performance Handbook Edition 44

Welder based upon Bobcat Welder Series

Sullair 185 Air Comp based upon equipment handbook.