

COMPANY	
AREA	
BLOCK	
LEASE	
FACILITY	
WELL	
COMPANY CONTACT	
TELEPHONE NO.	
REMARKS*	

DRAFT

Pending Approval

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2020		
2021		
2022		
2023		
2024		
2025		
2026		
2027		
2028		
2029		
2030		

* Indicate if the calculated projected emission estimates are for a facility, a temporary facility, or construction activities of a facility (including installation activities for lease-term pipelines).

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		Diesel Turbines		REF.	DATE	Reference Links
	SCF/HP-hr	9.524	SCF/HP-hr	7.143	GAL/HP-hr	0.0514	GAL/HP-hr	0.0514			
Equipment/Emission Factors	units	PM	SOx	NOx	VOC	Pb	CO	NH3			
Natural Gas Turbine	g/HP-hr		0.0026	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-14.3.1-2a	400	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/HP-hr		0.0020	6.5998	0.4082	N/A	1.2009	N/A	AP42 3.2-1	700	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/HP-hr		0.0020	2.8614	0.4014	N/A	1.8949	N/A	AP42 3.2-2	700	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s03.pdf
RECIP. 4 Cycle Rich Natural Gas	g/HP-hr		0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	700	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s04.pdf
Diesel Recip. < 600 hp	g/HP-hr	1	0.93	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	1096	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s05.pdf
Diesel Recip. > 600 hp	g/HP-hr	0.32	0.0056	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	1096	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s06.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0089	1.0080	0.0084	0.0001	0.2100	0.0336	AP42 1.3-6, Pb and NH3 WebFIRE (08/2018)	998 and 5/10	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s07.pdf
Diesel Turbine	g/HP-hr		0.0048	2.7941	0.0013	0.0000	0.0105	N/A	AP42 3.1-1 & 3.1-2a	400	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s08.pdf
Dual Fuel Turbine	g/HP-hr		0.0048	2.7941	0.0095	0.0000	0.3719	0.0000	AP42 3.1-14.3.1-2a, AP42 3.1-1 & 3.1-2a	400	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s09.pdf
Vessels – Propulsion	g/HP-hr	0.32	0.268452	12.6769	0.469791	2.2371E-05	1.0440	0.0022	EPA CMV model (2018). PM: refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inve
Vessels – Drilling Prime Engine, Auxiliary	g/HP-hr	0.32	0.313194	10.29056	0.313194	2.2371E-05	0.5711	0.0037	EPA CMV model (2018). PM: refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Diesel Boiler	g/HP-hr	0.32	0.438963	1.4214	0.02027	3.7285E-06	0.1491	0.0003	EPA CMV model (2018)	3/19	
Vessels – Well Stimulation	g/HP-hr	0.32	0.268452	12.6769	0.469791	2.2371E-05	1.0440	0.0022	EPA CMV model (2018). PM: refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	0.60	190.00	5.50	0.001	84.00	3.2	AP42 1.4-1 & 1.4-2, Pb and NH3 WebFIRE (08/2018)	7/98 and 9/18	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s10.pdf
Combustion Flare (no smoke)	lbs/MMscf		0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (light smoke)	lbs/MMscf		0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf		0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s11.pdf
Combustion Flare (heavy smoke)	lbs/MMscf		0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbscf/bbl	0.42	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	9/10	https://www3.epa.gov/ttn/chie1/ap42/ch03/final/c03s12.pdf
Storage Tank	tons/yr/tank				3.921				2014 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environmental-studies/2014-gulfwide-e
Fugitives	lbs/hr/component				0.0005				API Study	12/93	https://www.aip.org/
Glycol Dehydrator	tons/yr/dehydrator				16.706				2011 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2014	https://www.boem.gov/environmental-studies/2011-gulfwide-e
Cold Vent	tons/yr/vent				44.646				2014 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environmental-studies/2014-gulfwide-e
Noise Incinerator	lb/hr		2.500	2.000	N/A	N/A	20.000	N/A	AP-42 2.1-12	10/96	https://www3.epa.gov/ttn/chie1/ap42/ch02/final/c02s01.pdf
On-Ice – Loader	lbs/gal		0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model	2009	
On-Ice – Other Construction Equipment	lbs/gal		0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model	2009	
On-Ice – Other Survey Equipment	lbs/gal		0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model	2009	
On-Ice – Tractor	lbs/gal		0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model	2009	https://www.epa.gov/moves/nonroad2008a-installation-and-updates
On-Ice – Truck (for gravel island)	lbs/gal		0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model	2009	
On-Ice – Truck (for surveys)	lbs/gal		0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model	2009	
Man Camp – Operation (max people/day)	tons/person/day		0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014_1001	2014	https://www.boem.gov/sites/default/files/uploadedFiles/BOEM/BOEM_Newsro
Vessels – Ice Management Diesel	g/kW-hr		0.006	13.360	0.141	N/A	2.480	0.001	USEPA NEI 2014	2018	https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inve
Vessels – Hovercraft Diesel	g/kW-hr		0.006	13.360	0.141	N/A	2.480	0.001	USEPA NEI 2014	2018	https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inve

Sulphur Content Source	Value	Units
Fuel Gas	3.38	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.38	ppm
Produced Oil (Liquid Flaring)	1	% weight

Density and Heat Value of Diesel Fuel	
Density	7.65 lbs/gal
Heat Value	19,300 Btu/lb
Heat Value of Natural Gas	
Heat Value	1,050 MMBtu/MMscf

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.6816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

AIR EMISSIONS CALCULATIONS - 1ST YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS														
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	MAXIMUM POUNDS PER HOUR							ESTIMATED TONS								
							HP	GALHR	GALD	PM	SOx	NOx	VOC	Pb	CO	NH3	PM	SOx	NOx	VOC	Pb	CO
		Diesel Engines		MMBTUHR	SCFHR	SCFD	HR/D	D/YR	PM	SOx	NOx	VOC	Pb	CO	NH3	PM	SOx	NOx	VOC	Pb	CO	NH3
DRILLING	VESSLS - Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	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
	VESSLS - Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	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
	VESSLS - Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	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
	VESSLS - Diesel Boiler		0	0	0.00	0	0	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
	VESSLS - Drilling Prime Engine, Auxiliary		0	0	0.00	0	0	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
PIPELINE INSTALLATION	VESSLS - Pipeline Laying Vessel - Diesel		0	0	0.00	0	0	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
	VESSLS - Pipeline Burying - Diesel		0	0	0.00	0	0	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
FACILITY INSTALLATION	VESSLS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	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
PRODUCTION	RECP <800hp Diesel		0	0	0.00	0	0	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
	RECP >800hp Diesel		0	0	0.00	0	0	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
	VESSLS - Shuttle Tankers		0	0	0.00	0	0	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
	VESSLS - Well Stimulation		0	0	0.00	0	0	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
	Natural Gas Turbine		0	0	0.00	0	0	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
	Diesel Turbine		0	0	0.00	0	0	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
	Dual Fuel Turbine		0	0	0.00	0	0	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
	RECP - 2 Cycle Lean Natural Gas		0	0	0.00	0	0	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
	RECP - 4 Cycle Lean Natural Gas		0	0	0.00	0	0	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
	RECP - 4 Cycle Rich Natural Gas		0	0	0.00	0	0	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
	Diesel Boiler		0	0	0.00	0	0	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
	Natural Gas Heater/Boiler/Burner		0	0	0.00	0	0	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
	MISC	STORAGE TANK		BPD	SCFHR	COUNT																
COMBUSTION FLARE - no smoke			0	0	0	1	1	--	--	--	0.00	--	--	--	--	--	0.00	--	--	0.00	--	--
COMBUSTION FLARE - light smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
COMBUSTION FLARE - medium smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
COMBUSTION FLARE - heavy smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
COLD VENT			0	0	0	1	1	--	--	--	0.00	--	--	--	--	--	0.00	--	--	0.00	--	--
FUGITIVES			0	0	0	0	0	--	--	--	0.00	--	--	--	--	--	0.00	--	--	0.00	--	--
GLYCOL DEHYDRATOR			0	0	0	1	1	--	--	--	0.00	--	--	--	--	--	0.00	--	--	0.00	--	--
WASTE INCINERATOR			0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
Liquid Flaring			0	0	0.00	0	0	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
DRILLING	COMBUSTION FLARE - no smoke		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
WELL TEST	COMBUSTION FLARE - heavy smoke		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - no smoke		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	VESSLS - Ice Management Diesel		0	0	0.00	0	0	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
	2020 Facility Total Emissions							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
	EXEMPTION CALCULATION															0.00	0.00	0.00	0.00			0.00
DRILLING	VESSLS - Crew Diesel		0	0	0.00	0	0	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
	VESSLS - Supply Diesel		0	0	0.00	0	0	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
	VESSLS - Tug Diesel		0	0	0.00	0	0	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
	VESSLS - Support Diesel, Laying		0	0	0.00	0	0	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
	VESSLS - Support Diesel, Burying		0	0	0.00	0	0	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
PIPELINE INSTALLATION	VESSLS - Crew Diesel		0	0	0.00	0	0	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
	VESSLS - Supply Diesel		0	0	0.00	0	0	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
	VESSLS - Support Diesel		0	0	0.00	0	0	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	
FACILITY INSTALLATION	VESSLS - Crew Diesel		0	0	0.00	0	0	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
	VESSLS - Material Tug Diesel		0	0	0.00	0	0	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
	VESSLS - Crew Diesel		0	0	0.00	0	0	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	
PRODUCTION	VESSLS - Supply Diesel		0	0	0.00	0	0	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
	VESSLS - Support Diesel		0	0	0.00	0	0	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
	VESSLS - Support Diesel		0	0	0.00	0	0	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
ALASKA-SPECIFIC SOURCES	On-ice Equipment																					
	Man Camp - Operation (maximum people per day)		PEOPLE/DAY																			
	VESSLS - Loader		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	On-ice - Other Construction Equipment		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	On-ice - Other Survey Equipment		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00	0.00	0.00	--	0.00	--
	On-ice - Tractor		0	0	0	0	0	0.00	0.00	0.00	0.00	--	--	--	--	0.00	0.00					

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
0						
Year	Facility Emitted Substance					
	PM	SOx	NOx	VOC	Pb	CO
2020	0.00	0.00	0.00	0.00	0.00	0.00
2021	0.00	0.00	0.00	0.00	0.00	0.00
2022	0.00	0.00	0.00	0.00	0.00	0.00
2023	0.00	0.00	0.00	0.00	0.00	0.00
2024	0.00	0.00	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00	0.00	0.00
2027	0.00	0.00	0.00	0.00	0.00	0.00
2028	0.00	0.00	0.00	0.00	0.00	0.00
2029	0.00	0.00	0.00	0.00	0.00	0.00
Allowable	0.00	0.00	0.00	0.00		0.00