

13 October 2022

Submitted Electronically

Joshua Klina  
Alaska Department of Environmental Conservation  
PO Box 111800  
Juneau, AK 99811

**RE: Comments Addressing Preliminary Air Quality Minor Permit No. AQ1564MSS02 for the Oil Search (Alaska), LLC Nanushuk Drillsite B**

Dear Mr. Klina,

Oil Search (Alaska), LLC, a subsidiary of Santos Limited, is submitting to the Alaska Department of Environmental Conservation the enclosed comments addressing preliminary Air Quality Minor Permit No. AQ1564MSS02 and associated preliminary Technical Analysis Report during the public notice period.

If you have any questions or require additional information concerning the comments, please contact me at (907) 375-4667 or by email at [Ryan.French@santos.com](mailto:Ryan.French@santos.com).

Sincerely,



**Ryan French**  
Environmental Coordinator  
[ryan.french@santos.com](mailto:ryan.french@santos.com)

Enclosure

cc: Joshua Klina, ADEC (electronic)

**Oil Search (Alaska), LLC  
Nanushuk Drillsite B**

**Comments Regarding Preliminary Minor Air Quality Permit No. AQ1564MSS02  
and the Associated Preliminary Technical Analysis Report (TAR)**

Suggested language to be included is underlined. Suggested language to be removed is crossed out. Please note that condition numbers may need to be updated for proposed edits that affect numbering within the permit.

**Comments Regarding Preliminary Minor Air Quality Permit No. AQ1564MSS02**

1. Permit Cover Page, Permit Contact – Please correct the permit contact email address to “Ryan.French@santos.com”.
2. Permittee and Stationary Source Names – Please correct the name of the Permittee to “Oil Search (Alaska), LLC” and the name of the permitted stationary source to “Nanushuk Drillsite B”, respectively, throughout Permit No. AQ1564MSS02 and the associated TAR for accuracy and clarity.
3. Table 1, Page 1 – Please expand the width of the “Description” column of Table 1 to clearly show the description of each emissions unit (EU). For example, the description of EUs 204 and 205 should show “Drill Rig Move/Emergency Engine No. 1” and “Drill Rig Move/Emergency Engine No. 2”, respectively.
4. Table 1, Page 2 – Please amend the maximum rating of EU 213 Construction Well Test Flare Pilot to 0.010 Mscf/hr, in Table 1 for accuracy. Additionally, please amend the maximum rating of EU 261 (20) Various Portable Heaters to 19.3 MMBtu/hr, total. These requested changes are consistent with the information provided in the application for Permit No. AQ1564MSS02.
5. Condition 10.1a(i), Page 9 – Please amend this condition as follows. Per ADEC Policy 04.02.105, Intermittently Used Oilfield Support Equipment, “*applicants using intermittent internal combustion units rated at less than 400 bhp or intermittent boilers/heaters with a heat input rating of less than 2.8 MMBtu/hr, who agree to use fuel with a sulfur content listed below, do not need to include these emissions units in a modeling analysis.*” The referenced sulfur content “*listed below*” in ADEC Policy 04.02.105 is less than or equal to 15 parts per million by weight (ppmw). Oil Search (Alaska), LLC has agreed to fire only ultra-low sulfur diesel (ULSD) in EUs 228-230, 240, 244-245, and 261-264 in Table 1 of Permit No. AQ1564MSS02, so this modeling exemption is applicable to these EUs. Additionally, other EUs in Table 1 or Permit No. AQ1564MSS02, such as storage tanks, were not included in the dispersion modeling analysis provided in the application for Permit No. AQ1564MSS02. These EUs should not be required to maintain vertical and uncapped stacks because dispersion modeling of these EUs is not required.

10.1 **Stack Configuration.**

- a. Construct and maintain vertical, uncapped exhaust stacks for all fuel-fired EUs listed in Table 1, except as follows:
  - (i) EUs 208-212, ~~224-230~~~~227~~, ~~240-242~~, ~~and 246~~ 244-248, and ~~261-264~~ may use capped or horizontal releases; and

6. Condition 10.6b, Page 11 – Please revise this condition as follows for clarity.

- b. Record the monthly volume of gas flared for EU 213 by recording the fuel gas flow meter reading each time upon arrival at the ND-B and on the last day of each calendar month at the ND-B;

7. Condition 11.1a, Page 12 – Please revise this condition as follows to allow for other types of records that can be obtained and submitted in the applicable operating report to demonstrate EUs 206 and 207 will comply with EPA Tier 3 emissions standards for nonroad engines.

- a. Verify initial compliance with the NO<sub>x</sub> + NMHC, PM-2.5, and PM-10 emission factors for EUs 246 and 247 by using one of the following methods~~either~~:
  - (i) ~~Obtain~~~~ing~~ a certified manufacturer's guarantee that each diesel engine will comply with EPA's Nonroad Tier 3 emission standards ~~for NO<sub>x</sub> + NMHC, PM-10, and PM-2.5~~. Submit the emissions data to the Department in the first operating report required by Condition 22 after each of EUs 246 and 247 become fully operational;~~or~~
  - (ii) Obtain a photograph of the engine nameplate(s) that includes the emissions certification for the engine that demonstrates the engine will comply with EPA's Nonroad Tier 3 emission standards. Submit a copy of the photograph to the Department in the first operating report required by Condition 22 after each of EUs 246 and 247 becomes fully operational;
  - (iii) Obtain a copy of the Certificate of Conformity that EPA issued to the engine manufacturer that demonstrates the engine will comply with EPA Nonroad Tier 3 emission standards. Submit a copy of the Certificate of Conformity to the Department in the first operating report required by Condition 22 after each of EUs 246 and 247 becomes fully operational; or
  - (iv) ~~Conduct~~~~ing~~ a source test for NO<sub>x</sub> + NMHC, PM-10, and PM-2.5 within 180 days of each of EUs 246 and 247 becoming fully operational, in accordance with Section 8.

8. Condition 12, Page 12 – Please revise Condition 12 as follows. As described in Comment No. 5, dispersion modeling of intermittently used ULSD-fired nonroad engines (NRE) with a rating less than 400 bhp, each, was not required per ADEC Policy No. 04.02.105. Because dispersion modeling of smaller, intermittently used engines is not required, limiting the number of these types of EUs that could be on the ND-B Pad is not necessary. The cumulative rating of the NRE with a capacity greater than or equal to 400 bhp, each, in the permitted EU inventory is 27,319 bhp.

12. **Nonroad engines.** The Permittee shall limit the cumulative brake horsepower (bhp) of nonroad engines with a maximum rated capacity greater than or equal to 400 bhp, each, to no greater than ~~29,780~~27,319 bhp.

9. Condition 16, Page 13 – Please revise Condition 16 for clarity and to allow for the use of additional methods for demonstrating compliance with the applicable fuel use limits as follows. Please note that the proposed monitoring options are consistent with monitoring methods that ADEC has included in other air quality permits, such as Minor General Permit 2 (MG2) for portable oil and gas operations, Permit No. AQ1651MSS01, and Permit No. AQ1661MSS01, Revision 1.

16. **Drill Rig Camp Generators.** The Permittee shall limit the emissions of NO<sub>x</sub> from EUs 206 and 207 to no more than 52.8 tpy as follows:

16.1 Limit the combined fuel combusted in EUs 206 and 207 to 436,989 gallons for any consecutive 12-month period.

*Monitor, record, and report as follows:*

16.2 Monitor the fuel consumption of EUs 206 and 207 using one of the following methods:

a. Install, maintain, and operate a non-resettable fuel flow meter(s), or fuel flow meters, capable of recording the total fuel consumed accurate to within  $\pm 5$  percent; or

b. Install, maintain, and operate a non-resettable hour meter, or non-resettable hour meters capable of recording the total hours of operation.

16.3 Monitor and record the total monthly fuel consumption for ~~in~~ EUs 206 and 207 combined, by the end of each calendar month for the previous month, using one of the following methods:

a. record the fuel flow meter reading(s) for EUs 206 and 207 on the last day of each month; or

b. record the runtime (hours) and full load fuel consumption rate in gallons per hour provided by the manufacturer or back-calculation from the rated capacity using standard engineering techniques.

16.4 Calculate and record, ~~for the set of EUs listed in Condition 16.3~~ for EUs 206 and 207, the sum of the last 12 consecutive month records obtained in accordance with Condition 16.3, by the end of each calendar month.

16.5 Report in the operating report as described in Condition 22 the ~~records obtained~~ monthly and 12 month fuel consumption totals calculated in accordance with Conditions 16.3 and 16.4.

16.6 Report as excess emissions and permit deviation as described in Condition 21, if the limits in Conditions 16 or 16.1 are exceeded, or if Conditions 16.2 through 16.5 are not met.

10. Condition 21, Page 15 – Please amend Condition 21 (Excess Emissions and Permit Deviations Reports). As written, Condition 21 only includes reporting requirements for excess emissions and does not include reporting requirements for permit deviations. For consistency with other Oil Search (Alaska), LLC air quality permits, please amend Condition 21 to be consistent with Condition 26 of Permit No. AQ1661MSS01, Revision 1 and Condition 20 of Permit No. AQ1651MSS01.

11. Condition 23, Page 16 – Please amend Condition 23 as follows to clarify that the requirement to submit a complete and timely Title V operating permit application does not apply to commencing operation of nonroad engines. Pursuant to 18 AAC 50.100, actual and potential emissions of nonroad engines are not included when determining the classification of a stationary source or modification under Alaska Statute 46.14.130.

23. **Title V Major Source Application Submittal Date.** For a stationary source that directly emits, or has the potential to emit, 100 TPY or more of any air pollutant subject to regulation, the Permittee shall file a complete application to obtain the part 70 Title V Operating Permit within 12 months after commencing operation of any of the emissions units, excluding nonroad engines, identified in Table 1 or exceeding the 100 TPY threshold.

### **Comments Regarding the Associated Preliminary TAR for Permit No. AQ1564MSS02**

12. Section 6, Table 2, Page 4 – Please revise Table 2 – Emissions Summary and Permit Applicability Table and the associated footnotes as follows to correct the stationary source potential to emit (PTE) values for volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>). Comment No. 14 provides the basis for the requested amendment.

Footnote [a] to Table 2 should be removed because recent revisions to 18 AAC 50 removed this provision.

**Table 2 – Emissions Summary and Permit Applicability, tons per year (tpy)**

Parameter	NO <sub>x</sub>	CO	VOC	PM-2.5	PM-10	SO <sub>2</sub>
PTE	200.7	133.9	<del>81.9</del> <u>82.3</u>	9.8	10.3	<del>27.9</del> <u>27.8</u>
18 AAC 50.502(c)(1) Permit Thresholds	40	N/A	N/A	10	15	40
18 AAC 50.502(c)(1) Applicable?	Yes	N/A	N/A	No	No	No
Title V Permit Thresholds	100	100	100	100	100	100
Title V Permit Required?	Yes	Yes	No	No	No	No
PSD Applicability Threshold	250	250	250	250	250	250
PSD Applicability Triggered?	N/A	N/A	N/A	N/A	N/A	N/A
Assessable Emissions <del>[a]</del>	201	134	82	-	10	28
Total Assessable <del>[b]</del> <u>[a]</u>	455					

Table Notes:

~~[a]~~ — Assessable emissions include any pollutant greater than or equal to 10 tpy.

~~[b]~~ [a] – PM-10 emissions include PM-2.5 emissions. Therefore, PM-2.5 is not counted in total assessable emissions.

- Section 8, Permit Administration, Page 9 – Please amend this section of the TAR as follows. Pursuant to 18 AAC 50.100, actual and potential emissions of nonroad engines are not included when determining the classification of a stationary source or modification under Alaska Statue 46.14.130. Therefore, Oil Search (Alaska), LLC will be required to submit a complete Title V permit application no later than 12 months after any of the EUs, excluding nonroad engines, listed in Table 1 of Minor Permit AQ1564MSS02, commences operation.

OSA may proceed with construction of the stationary source upon the issuance of this minor permit. The stationary source has the potential to emit more than 100 tpy of one or more criteria pollutants. Therefore, the stationary source is required to obtain a Title V operating permit. A timely Title V application for the stationary source is due no later than 12 months after the stationary source commences operation. The Department is interpreting ‘commences operation’ as ‘starting to operate any of the emissions units, excluding nonroad engines, listed in Table 1 of Minor Permit AQ1564MSS02’. The Department based its decision on a reasonable interpretation of 40 CFR 71.5(a)(1)(ii).

- Appendix A, Table A-1 Emissions Calculations, Page 10 – Please correct the emissions factors and/or PTE values for certain EUs for accuracy and consistency with the information in the application for Permit No. AQ1564MSS02. Recommended changes to

the information in Appendix A, Table A-1 and the table footnotes are provided in Attachment A of these comments.

15. ADEC Modeling Report, Section 3.6.1, Page 6 – Please amend the paragraph in Section as follows. Comment No. 8 provides the rationale in support of the requested change.

The total rated capacity of the ND-B NRE EUs is approximately 29,780 horsepower (hp). OSA did not model the impacts from certain NRE EUs citing the use of Department policy; see Section 3.6.2 for detail. The total rated capacity of OSA’s NRE inventory is a key aspect of their ambient demonstration. Therefore, the Department is including the total rated capacity of the NREs with a maximum rated capacity greater than or equal to 400 bhp, each, of this inventory as an enforceable permit condition to protect the annually averaged NO<sub>2</sub>; annually averaged PM-2.5; 24-hour PM-10; and annually averaged, 24-hour, three-hour, and one-hour SO<sub>2</sub> AAAQS.

16. ADEC Modeling Report, Section 5, Page 15 – Please amend the limit of the combined rating of the ND-B NRE EU inventory from 29,780 hp to no greater than 27,319 hp. Comment No. 8 provides the rationale in support of the requested change.

- limit the combined rating of the ND-B NRE EU inventory to no greater than ~~29,780 hp~~ 27,319 hp;

17. ADEC Modeling Report, Section 5, Page 15 – Please amend the requirement to construct all EUs using vertical and uncapped exhaust releases to also exclude the small intermittently used equipment (i.e., EUs 228-230, 240, 244-245, and 261-264). Comment No. 5 provides the rationale in support of the requested change.

## **Attachment A**

**Recommended Changes to Permit No. AQ1564MSS02, Appendix A, Table A-1**



## APPENDIX A: EMISSIONS CALCULATIONS

Table A-1 presents details of the EUs, their characteristics, and emissions. Potential emissions are estimated using maximum annual operation for all fuel burning equipment as defined in 18 AAC 50.990(39) subject to any operating limits.

**Table A-1 – Emissions Summary, in Tons Per Year (tpy)**

EU ID <sup>1</sup>	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	NO <sub>x</sub>		CO		VOC		PM-10		SO <sub>2</sub>
				EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE (tpy)
1	Production Heater No. 1	30 MMBtu/hr	8,760 hr/yr	100 lb/MMscf	12.9	84 lb/MMscf	10.8	5.5 lb/MMscf	0.7	7.6 lb/MMscf	1.0	10.86
2	Power Generator Engine No. 1	4,000 Bhp	8,760 hr/yr	8.8 lb/hr	38.5	2.62 lb/hr	11.5	0.10 lb/hr	0.4	0.19 lb/hr	0.8	0.20
3	Power Generator Engine No. 2	4,000 Bhp	8,760 hr/yr	8.8 lb/hr	38.5	2.62 lb/hr	11.5	0.10 lb/hr	0.4	0.19 lb/hr	0.8	0.20
4	Injection Skid Engine No. 1	600 Bhp	8,760 hr/yr	<del>0.40</del> g/kW-hr <sup>2</sup> <u>0.60</u>	2.6	<del>3.5</del> g/kW-hr <sup>2</sup> <u>4.4</u>	18.9	<del>0.19</del> g/kW-hr <sup>2</sup> <u>0.285</u>	<del>1.02</del>	<del>0.02</del> g/kW-hr <u>0.03</u>	0.1	0.03
5	Injection Skid Engine No. 2	600 Bhp	8,760 hr/yr	<del>0.40</del> g/kW-hr <sup>2</sup> <u>0.60</u>	2.6	<del>3.5</del> g/kW-hr <sup>2</sup> <u>4.4</u>	18.9	<del>0.19</del> g/kW-hr <sup>2</sup> <u>0.285</u>	<del>1.02</del>	<del>0.02</del> g/kW-hr <u>0.03</u>	0.1	0.03
6	Scale <del>Inhibitor</del> -Inhibitor Tank	135 bbl	8,760 hr/yr	NA	-	NA	-	0.14 lb/yr	7.0E-05	NA	-	-
7	Corrosion Inhibitor Tank	135 bbl	8,760 hr/yr	NA	-	NA	-	114.6 lb/yr	0.1	NA	-	-
8	Emulsion Breaker Tank	135 bbl	8,760 hr/yr	NA	-	NA	-	26.8 lb/yr	0.01	NA	-	-
9	Antifoam Tank	50 bbl	8,760 hr/yr	NA	-	NA	-	0.1 lb/yr	<del>5.0E-05</del> <u>4.1E-05</u>	NA	-	-
10	Diesel Tank	480 bbl	8,760 hr/yr	NA	-	NA	-	5.1 lb/yr	2.6E-03	NA	-	-
11	Diesel Tank	480 bbl	8,760 hr/yr	NA	-	NA	-	5.1 lb/yr	2.6E-03	NA	-	-
12	Methanol Tank	480 bbl	8,760 hr/yr	NA	-	NA	-	416.1 lb/yr	0.2	NA	-	-
<b>Grind and Inject Equipment</b>												
101	G&I Emergency Firewater Pump Engine	125 bhp	500 hr/yr	<del>4.5</del> g/kW-hr <sup>2</sup>	0.3	<del>5.625</del> g/kW-hr <sup>2</sup>	0.3	<del>4.5</del> g/kW-hr <sup>2</sup>	0.3	<del>0.3</del> g/kW-hr <sup>2</sup> <u>0.375</u>	0.02	3.5E-04
102	G&I Train Shaker No. 1	50 tph	8,760 hr/yr	NA	-	NA	-	NA	-	NA	-	-
	G&I Train Shaker No. 2	50 tph	8,760 hr/yr	NA	-	NA	-	NA	-	NA	-	-
	G&I Train Shaker No. 3	50 tph	8,760 hr/yr	NA	-	NA	-	NA	-	NA	-	-
103	G&I Train Hammer Mill	50 tph	8,760 hr/yr	NA	-	NA	-	NA	-	NA	-	-
104	G&I Train Conical Ball Mill	50 tph	8,760 hr/yr	NA	-	NA	-	NA	-	NA	-	-

EU ID <sup>1</sup>	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	NO <sub>x</sub>		CO		VOC		PM-10		SO <sub>2</sub>
				EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE (tpy)
105	G&I Diesel Fuel Storage Tank	400 bbl	8,760 hr/yr	NA	-	NA	-	4.2 lb/yr	2.1E-03	NA	-	-
106	G&I Tank Farm Fluids Tank No. 1	1,000 bbl	8,760 hr/yr	NA	-	NA	-	88.6 lb/yr	0.04	NA	-	-
107	G&I Tank Farm Fluids Tank No. 2	1,000 bbl	8,760 hr/yr	NA	-	NA	-	88.6 lb/yr	0.04	NA	-	-
108	G&I Tank Farm Fluids Tank No. 3	1,000 bbl	8,760 hr/yr	NA	-	NA	-	88.6 lb/yr	0.04	NA	-	-
109	G&I Tank Farm Fluids Tank No. 4	1,000 bbl	8,760 hr/yr	NA	-	NA	-	88.6 lb/yr	0.04	NA	-	-
110	G&I Tank Farm Fluids Tank No. 5	1,000 bbl	8,760 hr/yr	NA	-	NA	-	88.6 lb/yr	0.04	NA	-	-
111	Multi-Purpose Fluids Tank	1,000 bbl	8,760 hr/yr	NA	-	NA	-	7,490.2 lb/yr	3.7	NA	-	-
<b>Drill Rig Equipment</b>												
201	Drill Rig Generator Engine No. 1	2,150 bhp	8,760 hr/yr	5.05 g/hp-hr	104.8	0.41 g/hp-hr	8.5	0.1 g/hp-hr	2.1	0.036 g/hp-hr	0.7	0.1
202	Drill Rig Generator Engine No. 2	2,150 bhp	8,760 hr/yr	5.05 g/hp-hr	104.8	0.41 g/hp-hr	8.5	0.1 g/hp-hr	2.1	0.036 g/hp-hr	0.7	0.1
203	Drill Rig Generator Engine No. 3	2,150 bhp	8,760 hr/yr	5.05 g/hp-hr	104.8	0.41 g/hp-hr	8.5	0.1 g/hp-hr	2.1	0.036 g/hp-hr	0.7	0.1
204	Drill Rig Move/Emergency Engine No. 1	1,502 bhp	8,760 hr/yr	5.76 g/hp-hr	83.5	0.25 g/hp-hr	3.6	0.01 g/hp-hr	0.1	0.02 g/hp-hr	0.3	0.07
205	Drill Rig Move/Emergency Engine No. 2	1,502 bhp	8,760 hr/yr	5.76 g/hp-hr	83.5	0.25 g/hp-hr	3.6	0.01 g/hp-hr	0.1	0.02 g/hp-hr	0.3	0.07
206	Drill Rig Camp Generator Engine No. 1	900 bhp	9,260 hr/yr	5.75 g/hp-hr	52.8	0.46 g/hp-hr	4.2	0.02 g/hp-hr	0.2	0.06 g/hp-hr	0.6	0.05
207	Drill Rig Camp Generator Engine No. 2	900 bhp						0.02 g/hp-hr		0.06 g/hp-hr		
208	Rig Boiler No. 1	200 boiler hp	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	5.5	5 lb/10 <sup>3</sup> gal	1.4	0.34 lb/10 <sup>3</sup> gal	0.09	2.38 lb/10 <sup>3</sup> gal	0.7	1.9
209	Rig Boiler No. 2	200 boiler hp	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	5.5	5 lb/10 <sup>3</sup> gal	1.4	0.34 lb/10 <sup>3</sup> gal	0.09	2.38 lb/10 <sup>3</sup> gal	0.7	1.9
210	Rig Heater No. 1	4.2 MMBtu/hr	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	2.8	5 lb/10 <sup>3</sup> gal	0.7	0.34 lb/10 <sup>3</sup> gal	0.05	2.38 lb/10 <sup>3</sup> gal	0.3	1.0
211	Rig Heater No. 2	4.2 MMBtu/hr	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	2.8	5 lb/10 <sup>3</sup> gal	0.7	0.34 lb/10 <sup>3</sup> gal	0.05	2.38 lb/10 <sup>3</sup> gal	0.3	1.0
212	Rig Heater No. 3	4.2 MMBtu/hr	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	2.8	5 lb/10 <sup>3</sup> gal	0.7	0.34 lb/10 <sup>3</sup> gal	0.05	2.38 lb/10 <sup>3</sup> gal	0.3	1.0
<b>Drilling Support Equipment</b>												
213	Construction Well Test Flare - Upset	24 MMscf/day	160 MMscf/yr	100 lb/MMBtu	8.0	0.31 lb/MMBtu	25.3	0.66 lb/MMBtu	53.9	40 mg/L	1.8	6.7
	Construction Well Test Flare - Pilot	0.01 Mscf/hr	0.1 MMscf/yr	0.068 lb/MMBtu	0.009	0.31 lb/MMBtu	0.04	0.66 lb/MMBtu	<del>0.03</del> 0.07	40 mg/L	0.001	<del>0.6</del> 0.5

EU ID <sup>1</sup>	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	NO <sub>x</sub>		CO		VOC		PM-10		SO <sub>2</sub>
				EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE (tpy)
214	Tank Farm Mud Product Storage Tank No. 1	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
215	Tank Farm Mud Product Storage Tank No. 2	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
216	Tank Farm Mud Product Storage Tank No. 3	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
217	Tank Farm Mud Product Storage Tank No. 4	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
218	Tank Farm Mud Product Storage Tank No. 5	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
219	Tank Farm Mud Product Storage Tank No. 6	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
220	Tank Farm Mud Product Storage Tank No. 7	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
221	Tank Farm Mud Product Storage Tank No. 8	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
222	Tank Farm Mud Product Storage Tank No. 9	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
223	Tank Farm Mud Product Storage Tank No. 10	600 bbl	8,760 hr/yr	NA	-	NA	-	55 lb/yr	0.03	NA	-	-
224	Tank Farm Generator Engine No. 1	350 bhp	8,760 hr/yr	0.6 g/kW-hr <sup>2</sup>	1.5	4.375 g/kW-hr <sup>2</sup>	11.0	0.285 g/kW-hr <sup>2</sup>	0.7	0.03 g/kW-hr <sub>2</sub>	0.1	0.02
225	Tank Farm Generator Engine No. 2	350 bhp	8,760 hr/yr	0.6 g/kW-hr <sup>2</sup>	1.5	4.375 g/kW-hr <sup>2</sup>	11.0	0.285 g/kW-hr <sup>2</sup>	0.7	0.03 g/kW-hr <sub>2</sub>	0.1	0.02
226	Tank Farm Boiler No. 1	2.5 MMBtu/hr	164,045 gal/yr	20 lb/103 gal	1.6	5 lb/103 gal	0.4	0.34 lb/10 <sup>3</sup> gal	0.03	2.38 lb/10 <sup>3</sup> gal	0.2	0.02
227	Tank Farm Boiler No. 2	2.5 MMBtu/hr	164,045 gal/yr	20 lb/103 gal	1.6	5 lb/103 gal	0.4	0.34 lb/10 <sup>3</sup> gal	0.03	2.38 lb/10 <sup>3</sup> gal	0.2	0.02
228	Cement Pump Engine No. 1	325 bhp	8,760 hr/yr	0.031 lb/hp-hr	44.1	0.0067 lb/hp-hr	9.5	0.00251 lb/hp-hr	3.6	0.0022 lb/hp-hr	3.1	0.02
229	Cement Pump Engine No. 2	325 bhp	8,760 hr/yr	0.031 lb/hp-hr	44.1	0.0067 lb/hp-hr	9.5	0.00251 lb/hp-hr	3.6	0.0022 lb/hp-hr	3.1	0.02
230	Cement Pump Engine No. 3	325 bhp	8,760 hr/yr	0.031 lb/hp-hr	44.1	0.0067 lb/hp-hr	9.5	0.00251 lb/hp-hr	3.6	0.0022 lb/hp-hr	3.1	0.02

EU ID <sup>1</sup>	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	NO <sub>x</sub>		CO		VOC		PM-10		SO <sub>2</sub>
				EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE (tpy)
<b>Well Servicing Equipment</b>												
231	Super Pump Engine No. 1	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
232	Super Pump Engine No. 2	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
233	Super Pump Engine No. 3	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
234	Super Pump Engine No. 4	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
235	Super Pump Engine No. 5	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
236	Super Pump Engine No. 6	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
237	Super Pump Engine No. 7	2,250 bhp	8,760 hr/yr	6.4 g/kW-hr	103.7	3.5 g/kW-hr	56.7	6.4 g/kW-hr	103.7	0.2 g/kW-hr	3.2	0.11
238	POD IV Road/Deck Engine	410 bhp	8,760 hr/yr	4 g/kW-hr	11.8	3.5 g/kW-hr	10.3	4 g/kW-hr	11.8	0.2 g/kW-hr	0.6	0.02
239	POD IV Deck Engine	400 bhp	8,760 hr/yr	4 g/kW-hr	11.5	3.5 g/kW-hr	10.1	4 g/kW-hr	11.5	0.2 g/kW-hr	0.6	0.02
240	Treatment Van Engine	25 kW <sup>3</sup>	8,760 hr/yr	5.875 g/kW-hr <sup>2</sup>	1.4	6.875 g/kW-hr <sup>2</sup>	<del>4.5</del> 1.7	5.875 g/kW-hr <sup>2</sup>	<del>1.3</del> 1.4	0.045 g/kW-hr <sub>2</sub>	0.0 <sub>1</sub>	0.00
241	Sand Chief Engine	135 kW	8,760 hr/yr	4 g/kW-hr	5.7	5 g/kW-hr	<del>6.1</del> 7.1	4 g/kW-hr	4.9	0.3 g/kW-hr	<del>0.3</del> 0.4	0.01
242	Van 35 Engine	35 bhp	8,760 hr/yr	7.5 g/kW-hr	1.9	5.5 g/kW-hr	<del>4.5</del> 1.4	7.5 g/kW-hr	1.9	0.6 g/kW-hr	0.2	0.00
243	PCM Engine	475 bhp	8,760 hr/yr	0.6 g/kW-hr <sup>2</sup>	2.1	4.375 g/kW-hr <sup>2</sup>	15.0	0.285 g/kW-hr <sup>2</sup>	1.0	0.03 g/kW-hr <sub>2</sub>	0.1	0.02
244	Liquid Add Engine	300 bhp	8,760 hr/yr	4 g/kW-hr	8.6	3.5 g/kW-hr	7.6	4 g/kW-hr	8.6	0.2 g/kW-hr	0.4	0.01
245	Liquid Add Engine	300 bhp	8,760 hr/yr	4 g/kW-hr	8.6	3.5 g/kW-hr	7.6	4 g/kW-hr	8.6	0.2 g/kW-hr	0.4	0.01
246	Coiled Tubing Unit Power Pack Engine	400 bhp	8,760 hr/yr	0.031 lb/hp-hr	54.3	6.7E-03 lb/hp-hr	11.7	2.5E-03 lb/hp-hr	4.4	2.2E-03 lb/hp-hr	3.9	0.02
247	Coiled Tubing Unit Tractor Pump Engine	430 bhp	8,760 hr/yr	0.031 lb/hp-hr	58.4	6.7E-03 lb/hp-hr	12.6	2.5E-03 lb/hp-hr	4.7	2.2E-03 lb/hp-hr	4.1	0.02
248	Hot Oil Boiler/Heater	623,371 gal/year	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	6.2	5 lb/10 <sup>3</sup> gal	1.6	0.34 lb/10 <sup>3</sup> gal	0.1	2.38 lb/10 <sup>3</sup> gal	0.7	2.21
249	Diesel Fuel Storage Tank	105 bbl	8,760 hr/yr	NA	-	NA	-	0.1 lb/yr	<del>5.0E-05</del> 3.2E-05	NA	-	-
250	Bleed Off/Pop Off Tank	500 bbl	8,760 hr/yr	NA	-	NA	-	3831.3 lb/yr	1.9	NA	-	-
251	Portable Well Flowback Storage Tank No. 1	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-

EU ID <sup>1</sup>	Unit ID/ Description	Maximum Rating or Capacity	Operating Limits	NO <sub>x</sub>		CO		VOC		PM-10		SO <sub>2</sub>
				EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE (tpy)
252	Portable Well Flowback Storage Tank No. 2	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
253	Portable Well Flowback Storage Tank No. 3	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
254	Portable Well Flowback Storage Tank No. 4	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
255	Portable Well Flowback Storage Tank No. 5	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
256	Portable Well Flowback Storage Tank No. 6	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
257	Portable Well Flowback Storage Tank No. 7	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
258	Portable Well Flowback Storage Tank No. 8	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
259	Portable Well Flowback Storage Tank No. 9	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
260	Portable Well Flowback Storage Tank No. 10	400 bbl	8,760 hr/yr	NA	-	NA	-	3056.0 lb/yr	1.5	NA	-	-
<b>Miscellaneous Equipment</b>												
261	(20) Various Portable Heaters	1,263,141 gal/year	8,760 hr/yr	20 lb/10 <sup>3</sup> gal	12.6	5 lb/10 <sup>3</sup> gal	3.2	0.34 lb/10 <sup>3</sup> gal	0.2	2.38 lb/10 <sup>3</sup> gal	1.5	0.13
		<del>19.3</del> MMBtu/hr, total										
		160 kW, total <sup>3</sup>	8,760 hr/yr	0.031 lb/hp-hr	29.1	6.7E-03 lb/hp-hr	6.3	0.00251 lb/hp-hr	2.4	2.2E-03 lb/hp-hr	2.1	0.01
262	(20) Various Light Plants	220 bhp, total <sup>3</sup>	8,760 hr/yr	0.031 lb/hp-hr	29.9	6.7E-03 lb/hp-hr	6.4	0.00251 lb/hp-hr	<del>3.2</del> 2.4	2.2E-03 lb/hp-hr	2.1	0.01
263	Mixed Use Generator Engine	100 bhp <sup>3</sup>	8,760 hr/yr	0.031 lb/hp-hr	13.6	6.7E-03 lb/hp-hr	2.9	0.00251 lb/hp-hr	<del>1.5</del> 1.1	2.2E-03 lb/hp-hr	1.0	0.005
264	Mixed Use Generator Engine	100 bhp <sup>3</sup>	8,760 hr/yr	0.031 lb/hp-hr	13.6	6.7E-03 lb/hp-hr	2.9	0.00251 lb/hp-hr	<del>1.5</del> 1.1	2.2E-03 lb/hp-hr	1.0	0.005
<b>Total Potential to Emit</b>					<b>1791.0</b>				<b>694.6</b>		<b>61.9</b>	<b>29.4 29.3</b>
<b>Total Stationary Source Potential to Emit Emissions</b>					<b>200.7</b>				<b>695.6</b>		<b>62.1</b>	<b>27.9 27.8</b>

**Item**

- 1 EU ID #
- 2 Not-to-exceed multiplier of 1.25 or 1.5 applied to emission rates, per Eq. 1 of 40 CFR 60.4212(c) or 40 CFR 1039.101(e)(3).
- 3 ~~Per 18 AAC 50.990(107), construction activities are considered temporary construction activities if they are completed within 24 months from the date construction begins. Per 40 CFR 52.21(b)(4), secondary emissions;~~
- 4 ~~Operational limits (gal/yr, hr/yr, MMBtu/yr, etc.)~~
- 5 ~~Use EPA's AP-42, vendor, manufacturer, or source test EFs~~
- 6 ~~PM 2.5 and PM 10 may need to be split and may contain different EFs~~

