Alaska Department of Environmental Conservation
Air Permits Program

TECHNICAL ANALYSIS REPORT

For the terms and conditions of
Minor Permit AQ0406MSS08

Issued to Northern Star (Pogo) LLC
For the Pogo Mine

Preliminary – July 18, 2024

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1. INTRODUCTION

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Permit AQ0406MSS08 to Northern Star (Pogo) LLC for the Pogo Mine. The permit application is classified under 18 AAC 50.508(6) in order to revise and rescind terms and conditions previously established in Minor Permit AQ0406MSS07 Revision 1 and under 18 AAC 50.508(5) to establish owner requested limits (ORLs).

2. STATIONARY SOURCE DESCRIPTION

The Pogo Mine is an underground gold mine and mill in central Alaska, located approximately 135 miles southeast of Fairbanks and 38 miles northeast of Delta Junction. The property consists of 1,281 state mining claims covering an area approximately 41,880 acres.

The permitted mine footprint is approximately 426 acres with 386 acres currently disturbed. An additional 440 acres of disturbance are associated with the Pogo access road (214 acres for public portion of the road, 221 acres for private portion of the road, and 5 acres for communication site access) and 651 acres with the Pogo transmission line.

The mine began operations in 2006. The mine utilizes a cut and fill drift method to mine sulfide ore hosted in a large quartz vein system, with low-grade gold present in quartz stockworks. The mine complex includes the mine; a surface mill; tailings preparation facilities, including cyanide detoxification and filtration to produce paste backfill for the underground mine workings and dewatered tailings directed to a surface dry-stack tailings facility; a water management system; two camps; and associated support facilities. The mill processes up to 146 tons of ore hourly, 3,500 tons of ore per day, and 1,277,500 tons of ore annually to produce approximately 380,000 to 400,000 ounces of gold annually.

The milling operation includes grinding, gravity recovery, froth flotation of gold and sulfide minerals, and cyanide leaching of the flotation concentrate. The cyanide slurry is detoxified, and the residual cyanide-contacted material is contained underground in the paste backfill.

Northern Star (Pogo) LLC currently operates under Title I Minor Permit AQ0406MSS07 Revision 1 (which will be replaced by this Minor Permit AQ0406MSS08) and Operating Permit AQ0406TVP02 (issued in accordance with 40 C.F.R. 63.11640(d) of NESHAP Subpart EEEEEEE). Operating Permit AQ0406TVP02 will expire upon issuance of the pending renewal Operating Permit AQ0406TVP03.

3. PERMIT HISTORY RELEVANT TO PROJECT[19]

Minor Permit No. AQ0406MSS04 increased the owner requested limit (ORL) to 185,000 gallons/year (gal/yr) from 96,831 gal/yr of distillate fuel consumed for EU IDs 208 through 210, combined. The ORL pertaining to the combined propane fuel consumption for EU IDs 414 and 415 was decreased from 6,060,197 gal/yr to 3,000,000 gal/yr. Both ORLs in AQ0406MSS04 were in place to avoid Title V major permitting, as well as for NO_x AAAQS protection (for the distillate fuel consumption ORL). The permit also revised the emissions unit inventory.

[19] Permit actions related to project before September 29, 2010, pertain to Teck-Pogo, Inc. Permit actions related to project between September 29, 2010, and October 5, 2018 pertain to Sumitomo Metal Mining Pogo LLC.

On September 29, 2010, the Department issued Minor Permit AQ0406MSS04 Revision 1 as an administrative revision to transfer ownership from Teck-Pogo, Inc to Sumitomo Metal Mining Pogo LLC.

The Department issued Minor Permit No. AQ0406MSS05 to authorize the installation of a new generator set and a new compressor engine, noted as Emission Unit (EU) IDs 220 and 221, respectively, and revise the permit to include these EUs as part of the 185,000 gallons/yr (gal/yr) ORL. New heaters were added (noted as EU ID 418), and a sulfur limit of 0.3% weight by sulfur was established to maintain Title V permitting avoidance.

Minor Permit No. AQ0406MSS06 authorized the addition of the direct-drive compressor, designed as EU ID 222 and included the EU into the previous ORL limit of 185,000 gallons/yr (gal/yr) in Minor Permit AQ0406MSS05, and added a second incinerator (EU ID 412).

Minor Permit No. AQ0406MSS07 authorized the installation of a heater rated at 42.2 million British thermal units per hour (MMBtu/hr) as EU ID 419, two associated vaporizers (EU IDs 546 and 547), each rated at 1.0 MMBtu/hr. This permit also established the propane fuel consumed by EU IDs 419, 546, and 547 in the ORL of 3,000,000 gal/yr for EU IDs 414, 415, and associated vaporizers (EU IDs 542 through 545).

On October 5, 2018, the Department issued Minor Permit No. AQ0406MSS07 Revision 1 as an administrative revision to transfer ownership from Sumitomo Metal Mining Pogo LLC to Northern Star (Pogo) LLC.

4. APPLICATION DESCRIPTION

Northern Star (Pogo) LLC submitted a minor permit application on November 2, 2023 requesting to revise and rescind terms and conditions of Title I Minor Permit AQ0406MSS07 Revision 1 and to establish an ORL. The requested changes are as follows:

- Update the emission unit inventory, removing EUs that are no longer in service and adding new EUs used to support the camp;
- Make minor corrections to the rated capacity for certain EUs;
- Update certain permit conditions to reflect changes in the EU inventory;
- Delete Condition 5 (state visible emission standard for the incinerator, EU ID 412, that has been removed from the site);
- Delete Condition 6 (diesel fuel consumption limit for EU IDs 208, 221, and 222 (engines that have been removed from the site) and EU IDs 209, 210, and 220 (emergency engines with potential emissions based on 500 hour-per-year operation per US EPA guidance);
- Remove EU IDs 208, 221, and 222 (EUs that are no longer in service) from Condition 13.1 (ORL to Protect the Nitrogen Dioxide Increment);
- Revise Condition 7 by reducing the existing combined fuel consumption limit from 3,000,000 gal/yr to 2,000,000 gal/yr to account for the EUs that have been removed from the site;
- Replace EU ID 218 with EU ID 218A in Condition 8; and
- Add a new ORL for the cumulative rated capacity of the portable heaters under EU ID 420, for the stationary source to continue to avoid Title V major classification.

On March 12, 2024, the Department received an application addendum from the Permittee to request the following revisions:

- Reinstate EU IDs 419, 546, and 547 (since these EUs are planned to be repurposed in the future);
- Revert the fuel limit ORL from 2,000,000 gal/yr back to 3,000,000 gal/yr from AQ0406MSS07 Revision 1 due to the planned repurpose of EU IDs 419, 546, and 547;
- Incorporate additional emission units (noted as EU IDs 629 through 637), consisting of heaters and air units not included in previous emission inventories;
- Add an additional ORL to restrict the sulfur content of liquid fuel combusted in EU IDs 104, 110 (noted as 110a and 110b in Table 1), 111, 113, 114, 116, 118, 119, 209, 210, 220, 420, and 623 through 626 to no more than 15 ppmw (ULSD) to continue to avoid Title V major classification; and
- Remove EU IDs 112, 208, 218, 221, and 222 (EUs that are no longer in service) and add EU IDs 420 and 623 through 626, 636, and 637 in Condition 9.1 of Minor Permit AQ0406MSS07 Revision 1 (ORL for 0.3 wt%S_{fuel}).

5. CLASSIFICATION FINDINGS

Based on the review of the application, the Department finds that:

1. Minor Permit AQ0406MSS08 is classified under 18 AAC 50.508(5) for Owner Requested Limits to avoid classification as a Title V major source under 18 AAC 50.326.
2. Minor Permit AQ0406MSS08 is classified under 18 AAC 50.508(6) to revise or rescind terms and conditions of a Title I permit.

6. APPLICATION REVIEW FINDINGS

Based on the review of the application, the Department finds that:

1. Northern Star (Pogo) LLC's minor permit application for the Pogo Mine contains the elements listed in 18 AAC 50.540.
2. Pogo is proposing an ORL for the addition of the portable heaters (EU ID 420) by limiting the total rated capacity to no more than 14 MMBtu/hr and an ORL to limit the fuel sulfur content of EU IDs 104, 110, 111, 113, 114, 116, 118, 119, 209, 210, 220, 420, and 623 through 626 to no more than 15 ppmw (ULSD).
3. In the application addendum, EU IDs 420 and 623 through 626 SO_2 PTE are based on firing ULSD. However, this contradicts the ORL for 0.3 wt%S_{fuel} that was requested in Table D.1 of the addendum. Therefore, the Department used the provided SO_2 PTE calculations based on ULSD.
4. Under the proposed ORLs, the source will continue to avoid classification as a Title V major source, in addition to the existing ORLs requested to be revised in the application. See Conditions 24 through 28.
5. EU IDs 218A, 223, and 224 are assumed to fire ULSD to comply with NSPS Subpart IIII fuel requirements under 40 C.F.R. 60.4207. The SO_2 PTE are based on firing ULSD and are therefore subject to the ULSD requirement in Condition 28.1b
6. Pogo is requesting the recission of the 185,000 gal/yr fuel ORL for Title V major avoidance, established in Minor Permit AQ0406MSS04 (Condition 6 in Minor Permit AQ0406MSS07 Revision 1). This recission is requested because EU IDs 208, 221, and 222 were removed from the site and because EU IDs 209, 210, and 220 are emergency

diesel engines. PTE calculations for these EUs are based on the 500 hours per year (hr/yr) default operational hours for emergency diesel engines in accordance with U.S. EPA guidance (Seitz Memo, September 6, 1995).

However, the EPA guidance is intended only to establish a default worst-case operational hours for the purposes of PTE calculations, given the engines limited use for emergency purposes only. According to the memorandum, the guidance *"is not intended to be used as the basis to rescind any such restrictions already in place."* The Department asserts that to make the Title V major avoidance effective, an enforceable limit has to be in place. Northern Star (Pogo) LLC also requests that this limit be retained for EU IDs 209, 210, and 220 for the protection of AAAQS (see item 7). Therefore, the Department is revising this Title V major avoidance limit from 185,000 gal/yr to 153,311 gal/yr, to account for the worst-case assumed default 500-hr/yr operations of each of the remaining EU IDs 209, 210, and 220 that are still in service (see Condition 25 and note 15 to Table A-1 of Appendix A). The current limit of 185,000 gal/yr would result into the stationary source's exceedance of the Title V major threshold of 100 TPY for NO_x PTE.

7. As part of the requirements to protect the AAAQS for Nitrogen Dioxide (NO_2) Increment, Condition 13.1 of Minor Permit AQ0406MSS07 Revision 1 requires complying with the fuel consumption limit of 185,000 gal/yr for EU IDs 208 through 210 and 220 through 222 as required for Title V major avoidance. The application requested only the removal of EU IDs 208, 221, and 222 (EUs that are no longer in service) from the condition. Although the Permittee also requested the recission of the fuel limit for the remaining EU IDs 209, 210, and 220 for Title V major avoidance (see item 6 above), the Department agrees that the requirements for NO_x AAAQS protection remain applicable to the remaining EU IDs 209, 210, and 220. See Condition 22.1. Compliance with the AAAQS protection for NO_2 Increment is achieved through compliance with the more stringent Title V major avoidance ORL in Condition 25.
8. Pogo initially requested that the ORL limiting the fuel consumption from 3,000,000 gal/yr for EU IDs 414, 415, and 542 through 545 be reduced to 2,000,000 gal/yr as a result of EU IDs 419, 546, and 547 being removed from the site. However, Pogo requested in an addendum to revert the fuel consumption limit back to 3,000,000 gal/yr as a result of EU IDs 419, 546, and 547 being repurposed in the future. See Condition 26 and Note 5 to Table 1 (EU Inventory).
9. The new diesel engine (EU ID 218A) is subject to the same 200-hr limit per 12 rolling-consecutive months of operation as the replaced EU ID 218. See Condition 27.
10. The Department has determined that with the revised ORLs and the proposed ORLs requested by Pogo, the source will continue to avoid classification as a Title V major source.
11. Particulate matter emission factors for EU IDs 223, 224, and 420A were assumed as 0.3 g/kW-hr, 0.4 g/kW-hr, and 0.5 g/kW-hr, respectively. These EFs are derived from 40 C.F.R. 60.4202(a)(1), Table 2 to NSPS Subpart IIII (for EU IDs 223 and 224) and Table 2 to Appendix I of 40 C.F.R. 1039 (Tier 2) for EU 420A (in accordance with 40 C.F.R. 60.4201(a). Upon receiving the application addendum from the Permittee, the

Department verified the emission factors for EU IDs 223 and 224, and used the Department EF value of 1.0 g/kW-hr calculated for EU ID 420A.

12. As requested in the application and the addendum, the Department has updated the emissions unit inventory in Table 1, reflecting the current EUs operating at the stationary source. This EU inventory table replaces Table 1 from Minor Permit AQ0406MSS07 Revision 1.

13. The conditions requested to be revised in the application will not conflict with the current Title V permit under shield or the pending Title V renewal. Therefore, Pogo may operate under Minor Permit AQ0406MSS08 upon issuance.

7. EMISSIONS SUMMARY AND PERMIT APPLICABILITY

Table 2 shows the emissions summary and permit applicability with assessable emissions from the stationary source. Emission factors and detailed calculations are provided in Appendix A.

A summary of the potential to emit (PTE) and assessable PTE, as determined by the Department, is shown in Table 2 below.

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

Parameter	NO_x	CO	VOC	$PM_{2.5}$[5]	PM_{10}[5]	SO_2
PTE before AQ0406MSS08[1]	88.30	45.10	37.50	48.40	48.40	86.10
PTE after AQ0406MSS08	91.02	31.88	4.85	37.60	37.60	53.29
Change in PTE	+2.72	-13.22	-32.65	-10.80	-10.80	-32.81
18 AAC 50.502(c)(3) Minor Permit Thresholds	10	N/A	N/A	10	10	10
502(c)(3) Applicable?	No	N/A	N/A	No	No	No
Title V Permit Thresholds	100	100	100	100	100	100
Title V Permit Required?[2]	No	No	No	No	No	No
Assessable Emissions[3]	92.92[4]	193.21[4]	4.85	70.12[4]	70.12[4]	58.03
Total Assessable[3]	419.13					

Notes:

N/A means Not Applicable.

1. PTE values are from the Technical Analysis Report for Minor Permit AQ0406MSS07, after error corrections provided in the application.
2. Although the Title V major source PTE threshold of 100 TPY is not triggered for any of the criteria pollutants, NESHAP Subpart EEEEEEE requires the stationary source to have a Title V permit for gold and metal mining operations in accordance with 40 C.F.R. 63.11640(d).
3. Assessable emissions include fugitive emissions but do not include nonroad engines emissions.
4. Includes fugitive emissions from EU ID 302 (Explosives [underground]), EU IDs 535 – 539 (Roads), and EU IDs CP and CG).
5. $PM_{2.5}$ is conservatively assumed equal to PM_{10}. PM_{10} emissions include $PM_{2.5}$ emissions. Therefore, $PM_{2.5}$ is not counted in total assessable emissions.

8. REVISIONS TO PERMIT CONDITIONS

Table 3 below lists the requirements from Minor Permit AQ0406MSS07 Revision 1 that are revised in Minor Permit AQ0406MSS08.

Table 3 – Comparison of AQ0406MSS07 Revision 1 to AQ0406MSS08 Conditions[1]

Permit AQ0406MSS07 Rev. 1 Condition No.	Description of Requirement	Permit AQ0406MSS08 Condition No.	How Condition was Revised
Table 1	Emissions unit inventory	Table 1	Updated EU inventory, as noted in Notes 1 through 8 to Table 1.
2	Visible Emissions for Industrial Process and Fuel-Burning Equipment.	5	Removed EU IDs 102, 112, 208, 218, 221, 222, 411, 412, and 528 (including sub-conditions). Added EU IDs 218A, 223, 224, 420, 532, and 601 through 637 (including applicable sub-conditions). Separated EU ID 110 into 110a and 110b to denote insignificant and significant heaters, respectively. Added Conditions 5.1 and 5.2 to address requirements for EUs that may have actual emissions below the 18 AAC 50.326(c) significant thresholds. Added Condition 5.3 to address VE requirements for EU ID 532, insignificant baghouse EU. Added Condition 5.5 to address visible emission monitoring requirements for insignificant EUs and any significant heater under EU ID 420. Added footnote 5 for fuel-gas fired EU IDs 414, 415, 542 through 545, 601 through 622, and 627 through 635 to clarify why monitoring requirements for propane are similar to fuel-gas fired EUs specified in SPC IX.
3	Particulate Matter (PM) Emission Standards	9	Removed EU IDs 102, 112, 208, 218, 221, 222, 411, 412, and 528 (including sub-conditions). Added EU IDs 218A, 223, 224, 420, 532, and 601 through 637 (including applicable sub-conditions). Separated EU ID 110 into 110a and 110b to denote insignificant and significant heaters, respectively. Added Conditions 9.1 and 9.2 to address requirements for EUs that may

Permit AQ0406MSS07 Rev. 1 Condition No.	Description of Requirement	Permit AQ0406MSS08 Condition No.	How Condition was Revised
			have actual emissions below the 18 AAC 50.326(c) significant thresholds. Added Condition 9.3 for EU ID 532 to address PM requirements for insignificant baghouse EU. Added Condition 9.5 for significant heater EU ID 110b and any significant individual heater under EU ID 420. Added Condition 9.6 to address PM emission monitoring requirements for insignificant EUs.
4	Sulfur Compound Emission Standards	19	Removed EU IDs 102, 112, 208, 218, 221, 222, 411, 412, and 528. Added EU IDs 218A, 223, 224, 420, and 601 through 637. Separated EU ID 110 into 110a and 110b to denote insignificant and significant heaters, respectively. Condition 19.1 – Streamlined MR&R by cross-referencing more stringent requirements and corresponding MR&R in Condition 28. Condition 19.2 – Streamlined propane requirement from sulfur dioxide ORL, same requirement.
5	Incinerator Visible Emissions	None	Rescinded. EU IDs 411 and 412 (incinerators) have been permanently removed from service.
6	Fuel Limit for EU IDs 208 through 210, and 220 through 222.	25	Deleted EU IDs 208, 221, and 222; EUs have been permanently removed from the stationary source. Changed "Install" to "Operate" and added gap-fill operating report requirement as Condition 25.2. Revised combined diesel fuel limit from 185,000 gal/yr to 153,311 gal/yr. See item 6 in APPLICATION REVIEW FINDINGS section of this TAR.
7	Propane Fuel Limit	26	Same limit and MR&R. Changed "Install" to "Operate" and added gap-fill operating report requirement as Condition 26.2.

Permit AQ0406MSS07 Rev. 1 Condition No.	Description of Requirement	Permit AQ0406MSS08 Condition No.	How Condition was Revised
8	Operational Hour Limit, EU ID 218	27	Removed EU ID 218 and replaced with EU ID 218A (new engine). Added "non-resettable" in Condition 27.1 for clarity. Added "monthly" to hours of operation in Condition 27.3 to make rolling cumulative 12-months hours of operation verifiable. Added gap-fill EE/PD reporting requirement as Condition 27.4.
9.1	Diesel Sulfur Content Limit (0.3 wt%)	28.1a	Removed EU IDs 112, 208, 218, 221, 222, 411, and 412. Added EU IDs 636 and 637. Removed EU IDs 104, 106 through 108, 110 (now 110a and 110b), 111, 113, 114, 116, 118, 119, 209, 210, and 220. These EUs are now subject to ULSD.
None	Diesel Sulfur Content Limit (15 ppmw, ULSD)	28.1b	New ULSD ORL added for EU IDs 104, 106 through 108, 110a, 110b, 111, 113, 114, 116, 118, 119, 209, 210, 218A, 220, 223, 224, 420, and 623 through 626 to maintain Title V major classification avoidance.
9.1a & 9.1b	Diesel Sulfur Content Monitoring & Reporting	28.2 & 28.3	Specified which methods to use for testing sulfur content.
9.2	Propane Requirement	28.4	Removed EU ID 102. Added EU IDs 601 through 622, and 627 through 635. Streamlined by cross-referencing Condition 19.2.
None	Diesel Sulfur Content Excess Emissions and Permit Deviation reporting.	28.5	Added gap-fill Excess Emissions and Permit Deviation reporting requirements as Condition 28.5.
11	Public Access Control Plan	20	No change.
12	General Ambient Air Requirements	None	Deleted condition - redundant. Condition 21.4 already specifies water suppression after blasting for EU ID 302.
13.1	Specific Requirements to Protect the Nitrogen Dioxide Increment, EU IDs 208 through 210 and 220 through 222	22.1	Deleted EU IDs 208, 221, and 222; EUs have been permanently removed from the stationary source. Revised combined diesel fuel limit from 185,000 gal/yr to 153,311 gal/yr. See item 7 in APPLICATION REVIEW FINDINGS section of this TAR.

Permit AQ0406MSS07 Rev. 1 Condition No.	Description of Requirement	Permit AQ0406MSS08 Condition No.	How Condition was Revised
13.2	Specific Requirements to Protect the Nitrogen Dioxide Increment, EU IDs 414, 415, 419 and 542 through 547	22.2	No change.
14	Sulfur Dioxide Standards and Increments	23	No change.
Section 5	VE MR&R affected EUs list sub-heading title	None	Not carried forward. Affected EUs are identified in each specific set of MR&R under Conditions 6 through 18.
15 through 17 (Section 5)	Visible Emissions MR&R	6 through 8	Incorporated under Section 3 (State Emission Standards) for better organization. Removed EU IDs 208, 221, 222, 411, and 412. Added EU IDs 218A, 223, 224, 420, and 601 through 637. Separated EU ID 110 into 110a and 110b to denote insignificant and significant heaters, respectively. Added visible emissions monitoring for dust emissions from explosives (EU ID 302) since it does not have a stack exhaust. Updated MR&R using the Standard Permit Condition (SPC) IX language, except for the following: Added new Condition 6.5c(iii) to clarify actions for EUs without exhaust stacks (where M9 is not ideal), or EUs allowed to continue S/NS monitoring.
18 through 20	PM MR&R for diesel fired engines	10 through 12	Removed EU IDs 208, 221, and 222. Added EU IDs 218A, 223, and 224. Rearranged to closely match SPC IX language.
21 through 23	PM MR&R for baghouse and scrubber emission units.	13 through 15	Added EU IDs 532A, 533, 534. Added gap-fill Excess Emissions and Permit Deviation reporting requirements in Condition 15.2.
None	PM MR&R for heaters	16 through 18	Added PM MR&R for significant heater EU ID 110b and any significant heater under EU ID 420.

Permit AQ0406MSS07 Rev. 1 Condition No.	Description of Requirement	Permit AQ0406MSS08 Condition No.	How Condition was Revised
35	Assessable Emissions	3	Updated assessable PTE from 404 TPY to 419.13 TPY. Deleted the phrase "in quantities greater than 10 tpy" to match the revision made in 18 AAC 50.410 effective September 7, 2022.
36	Assessable Emissions Estimates	4	Updated to incorporate latest updates to SPC I.
Section 9	General Requirements	Section 6	Removed exemption from GAPCP for EU IDs 102, 414, 415, 533, and 533A through 533E in Condition 29, since NSPS Subpart A requirements for these EUs were removed back in AQ0406MSS04. "Generally Applicable Requirements" renamed to "General Conditions" and relocated before "General Recordkeeping, Reporting, and Certification Requirements," except for MSS07 Rev 1 Condition 39 (Fugitive Dust Requirements), for better organization.
39	Fugitive Dust Requirements	21	Relocated under Section 4 (Ambient Air Quality Protection Requirements). Added CG (cement guppies) under Condition 21.4 to clarify fugitive dust control method for the EU.

Notes:

1. This table does not contain all of the standard permit conditions.

9. PERMIT ADMINISTRATION

Minor Permit AQ0406MSS08 does not contradict any conditions in the Title V operating permit issued to Pogo Mine. Northern Star (Pogo) LLC may therefore operate in accordance with Minor Permit AQ0406MSS08 upon issuance.

10. PERMIT CONDITIONS

The bases for the standard and general conditions imposed in Minor Permit AQ0406MSS08 are described below.

Cover Page

18 AAC 50.544(a)(1) requires the Department to identify the stationary source, Permittee, and contact information. The Department provided this information on the cover page of the permit.

Section 1: Emissions Unit Inventory

The EUs authorized and/or restricted by this permit are listed in Table 1 of the permit. Unless otherwise noted in the permit, the information in Table 1 is for identification purposes only. Condition 1 is a general requirement to comply with AS 46.14 and 18 AAC 50 when installing a replacement EU.

Section 2: Fee Requirements

18 AAC 50.544(a)(2) requires the Department to include a requirement to pay fees in accordance with 18 AAC 50.400 – 18 AAC 50.499 in each minor permit issued under 18 AAC 50.542. The Department used the Standard Permit Condition (SPC) I language for Minor Permit AQ0406MSS08. Since this minor permit is revising Minor Permit AQ0406MSS07 Revision 1, the Department is replacing the old SPC I language with the latest updates to SPC I as Conditions 3 and 4.

Section 3: State Emission Standards

Conditions 5 through 8, Visible Emissions

Visible emissions, excluding condensed water vapor, from an industrial process or fuel-burning equipment may not reduce visibility through the effluent by more than 20 percent averaged over six consecutive minutes, under 18 AAC 50.055(a)(1). Per 18 AAC 50.990(39), "fuel-burning equipment" does not include mobile internal combustion engines (e.g., NREs).

The Department has included monitoring, recordkeeping, and reporting requirements to ensure continued compliance with the VE standards using the Standard Permit Condition (SPC) IX language, except as follows: The Department added Condition 6.5c(iii) to clarify actions for EUs without exhaust stacks (where Method 9 monitoring is not ideal), or EUs allowed to continue S/NS monitoring. This is a stationary-source specific requirement not currently addressed in SPC IX.

Diesel fired engines and boilers have the tendency to exceed the VE standards. As such, the Department has included a requirement to perform Method 9 testing as well as recordkeeping and reporting requirements in Condition 5 to demonstrate continued compliance with the standard.

SPC IX also provides specific monitoring exemptions, as well as monitoring triggers, for emissions units that are potentially insignificant due to actual or potential emissions but are significant per 18 AAC 50.326(d)(1), as indicated in Conditions 5.1 through 5.3 and 5.5.

EU IDs 302, CP, and CG are considered industrial processes under 18 AAC 50.055(a) and are not fuel burning. Therefore, monitoring requirements for these EUs without exhausts use Dust/No Dust Plan to demonstrate compliance with the visible emissions standard.

For the LPG (propane)-fired EUs, the monitoring for visible emissions is waived; i.e., no Method 9 or Smoke/No Smoke Observations is required. The Department has found that natural gas fuel burning equipment inherently has negligible visible emissions. However, the Department can request a source test for PM emissions from any smoking equipment.

The Permittee must state in each operating report whether only LPG were used in the equipment during the period covered by the report.

Conditions 9 through 18, Particulate Matter (PM)

Particulate Matter emitted from an industrial process or fuel burning equipment may not exceed 0.05 grains per cubic foot of exhaust gas (gr/dscf), averaged over three hours, under 18 AAC 50.055(b).

Experience has shown there is a correlation between opacity and particulate matter. Twenty percent visible emissions would normally comply with the 0.05 gr/dscf. As such, compliance with opacity limits is included as a surrogate method of assuring compliance with the PM standards.

For the LPG-fired EUs, the monitoring for PM emissions is waived; i.e., no source testing will be required. The Department has found that natural gas fuel burning equipment inherently has negligible PM emissions. However, the Department can request a source test for PM emissions from any smoking equipment.

The Permittee must state in each operating report whether only LPG were used in the equipment during the period covered by the report.

Conditions 9 through 18 are updated to include changes in the emissions inventory. As indicated in Conditions 10 through 12 and Conditions 16 through 18, the PM MR&R requirements for the emergency diesel-fired engines and diesel-fired heaters, respectively, reflect the corresponding MR&R language in the SPC IX for Liquid Fuel-Burning Engines and Heaters. These conditions have been adopted into regulations under 18 AAC 50.346. Condition 11.1 is a source-specific SPC IX modification for recording the stack diameters for EU IDs 218A, 223, and 224, since these EUs are already operating. Conditions 13 through 15 are PM MR&R conditions for the baghouses and scrubbers carried over from Minor Permit AQ0406MSS07 Revision 1.

The Permittee must establish by visual observations, which may be supplemented by other means (e.g., a defined stationary source operation and maintenance program), that the stationary source is in continuous compliance with the state's emission standards for PM. PM source testing is triggered if the result of any Method 9 observation results in an 18-minute average opacity greater than 20 percent opacity, as specified in Conditions 10.1, 13.1, and 16.1. No source testing will be required as long as a PM source test on the affected EU has shown compliance with the PM standard during this permit term or corrective action was taken to reduce visible emissions and succeeding Method 9 observations show compliance with the visible emission standard of no more than 20 percent opacity, as specified in Conditions 10.3, 13.3, and 16.3.

Condition 19, Sulfur Compound Emissions

Sulfur compound emissions from an industrial process or fuel burning equipment may not exceed 500 ppm averaged over a period of three hours, under 18 AAC 50.055(c).

Calculations show that fuel oil with sulfur content less than 0.74 percent by weight will comply with the state emissions standard. Calculations show that fuel gas with sulfur content less than 4,000 parts per million by volume will comply with the state standards.

Diesel fuel grades that requires less than 0.5 percent fuel sulfur will meet the state emissions standard. Since pipeline quality gas contains less than 100 ppmv, burning pipeline quality

gas would comply with the standard. The permit contains appropriate monitoring for compliance with the standard.

The MR&R requirements for compliance with the state sulfur compound emissions are streamlined by requiring compliance with the more stringent H_2S limits in Condition 28.1 for protection of the SO_2 ambient air quality standards and associated MR&R requirements in Conditions 28.2 through 28.5 rather than have two sets of MR&R.

Section 4: Ambient Air Quality Protection Requirements

18 AAC 50.544(a)(3) and 18 AAC 50.544(a)(6) require the Department to include conditions to protect air quality, when warranted. The Department determined that conditions are warranted to protect the annually averaged NO_2, annually averaged, 24-hour, PM_{10}, annual $PM_{2.5}$, and 1-hour, 3-hour, 24-hour, and annual SO_2 AAAQS.

Conditions 20 through 23 carry over these requirements that are still in effect from Minor Permit AQ0406MSS07 Revision 1.

Condition 21 contains source-specific fugitive dust requirements that is carried over from Minor Permit AQ0406MSS07 Revision 1. The requirements from this condition involves only the EUs that are authorized under this minor permit.

Section 5: Owner Requested Limits (ORLs) to Avoid Title V Major Permitting

18 AAC 50.544(h) describes the requirements for a permit classified under 18 AAC 50.508(5). This permit describes the ORL, including specific testing, monitoring, recordkeeping, and reporting requirements; it lists all equipment covered by the ORL; and describes the classification that the limit allows the applicant to avoid.

Condition 24, Rated Capacity Limit

The permit contains an ORL restricting the rated capacity of EU ID 420 to no more than 14 MMBtu/hr and associated MR&R requirements. In addition to the ORLs in Conditions 26 through 28, compliance with this condition ensures that the source remains below the thresholds for classification as a Title V major source.

Condition 25, Diesel Fuel Limit

This ORL imposes a 153,311 gal/yr diesel fuel limit on EU IDs 209, 210, and 220 to avoid Title V major classification under 18 AAC 50.326. The combined fuel consumption limit is derived from the default 500 hours of operations for each EU in accordance with EPA guidance (Seitz Memo, September 6, 1995). The memorandum is intended only to establish a default worst-case operational hours for emergency engines for PTE purposes. An enforceable limit is required for the stationary source continue to avoid Title V major classification and to protect the NO_2 AAAQS increment, hence, the revised fuel limit from 185,000 gal/yr to 153,311 gal/yr.

Condition 26, Propane Fuel Limit

This is an ORL that imposes a combined 3,000,000 gal/yr propane fuel limit on EU IDs 414, 415, 419, and 542 through 547. The Permittee must comply with this ORL to avoid Title V major source classification under 18 AAC 50.326.

Condition 27, Hour Limit

This ORL limits the operational hours of the new engine (EU ID 218A) to no more than 200 hours per 12 consecutive months as part of the requirements for Title V major source classification avoidance. EU ID 218A replaced EU ID 218, therefore the same MR&R requirements for compliance are imposed.

Condition 28, Fuel Sulfur Content Limits

This condition contains ORLs requiring diesel fuel burned in EU IDs 106 through 108, 636, and 637 to not exceed sulfur content of 0.3 wt percent and in EU IDs 104, 110a, 110b, 111, 113, 114, 116, 118, 119, 209, 210, 218A, 220, 223, 224, 420, and 623 through 626 to not exceed 15 ppmw (ULSD). EU IDs 218A, 223, and 224 are included in the ULSD ORL because SO_2 PTE for these EUs are based on the ULSD fuel requirements in NSPS Subpart IIII that the EUs are subject to.

This condition also requires EU IDs 414, 415, 542 – 545, 601 – 622, 627, and 628 to burn only liquified petroleum gas (propane) as fuel (cross-referenced Condition 19.2).

These limits allow the stationary source to operate without triggering the 100-TPY Title V major source classification threshold for SO_2.

Section 6: General Conditions

Condition 29, Good Air Pollution Control Practice (GAPCP)

Conditions 29 and 30 are carried over from Minor Permit AQ0406MSS07 Revision 1 that incorporate the latest updates to SPC VI and X, respectively.

Condition 29 (Good Air Pollution Control Practice) requires the Permittee to maintain and operate equipment in good working order which is fundamental to preventing unnecessary or excess emissions. Standard conditions for monitoring compliance with emission standards are based on the assumption that good maintenance is performed. Without appropriate maintenance, equipment can deteriorate more quickly than with appropriate maintenance. If appropriate maintenance is not applied to the equipment, the Department may have to apply more frequent periodic monitoring requirements (unless the monitoring is already continuous) to ensure that the monitoring results are representative of actual emissions.

The Permittee is required to keep maintenance records to show that proper maintenance procedures were followed, and to make the records available to the Department. The Department may use these records as a trigger for requesting source testing if the records show that an adequate maintenance schedule is not maintained.

Condition 30, Reasonable Precautions to Prevent Fugitive Dust

Condition 30 reiterates 18 AAC 50.045(a), which prohibits the Permittee from using dilution as an emission control strategy. 18 AAC 50.045 is included in the SIP approved by EPA and, therefore, is an applicable requirement, per 40 C.F.R. 71.2.

Condition 31, Air Pollution Prohibited

18 AAC 50.110 prohibits any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment

of life or property. Condition 31 reiterates this prohibition as a permit condition. The Department used the SPC II language for Minor Permit AQ0406MSS08.

Section 7: General Recordkeeping, Reporting, and Certification Requirements

Condition 32, Recordkeeping Requirements

The condition restates the regulatory requirements for recordkeeping, and supplements the recordkeeping defined for specific conditions in the permit. The records being kept provide evidence of compliance with this requirement.

Condition 33, Certification

18 AAC 50.205 requires the Permittee to certify any permit application, report, affirmation, or compliance certification submitted to the Department. The Department used the language in Standard Permit Condition (SPC) XVII. This requirement is reiterated as a standard permit condition in 18 AAC 50.345(j).

Condition 34, Submittals

Condition 34 clarifies where the Permittee should send their reports, certifications, and other submittals required by the permit. The Department used the language in SPC XVII. The Department included this condition from a practical perspective rather than a regulatory obligation.

Condition 35, Information Requests

AS 46.14.020(b) allows the Department to obtain a wide variety of emissions, design and operational information from the owner and operator of a stationary source. This statutory provision is reiterated as a standard permit condition in 18 AAC 50.345(i). The Department used the standard language in Minor Permit AQ0406MSS08.

Condition 36 and Section 13, Excess Emission and Permit Deviation Reports and Notification Form

This condition reiterates the notification requirements in 18 AAC 50.235(a)(2) and 18 AAC 50.240 regarding unavoidable emergencies, malfunctions, and excess emissions. Also, the Permittee is required to notify the Department when emissions or operations deviate from the requirements of the permit. The Department used the language in SPCs III and IV, except as follows:

The Department has modified Condition 36.3 and the Notification Form in Section 13 to reflect the electronic submittal requirements in 18 AAC 50.270 using the Department's online form to submit notification of excess emissions and permit deviations beginning September 7, 2023. The electronic notification form is found at the Division of Air Quality's Air Online Services (AOS) system webpage http://dec.alaska.gov/applications/air/airtoolsweb using the Permittee Portal option. Submittal through other methods may be allowed only upon written Department approval. Beyond as noted, the Department has determined that the standard conditions adequately meet the requirements of 40 C.F.R. 71.6(a)(3).

Condition 37, Operating Reports

The Department mostly used the SPC VII language for the operating report condition. However, the Department modified or eliminated the Title V only aspects in order to make the language applicable for a minor permit.

Condition 38, Annual Affirmation

The Permittee shall submit to the Department by March 31 of each year an affirmation certified according to Condition 32 of whether the stationary source is still accurately described by the application and this permit, and whether any changes have been made to the stationary source that would trigger the requirement for a new permit under 18 AAC 50.

Condition 39, Emission Inventory Reporting

This condition requires the Permittee to submit emissions data to the state so the state is able to satisfy the federal requirement to submit emission inventory data from point sources to the EPA as required under 40 C.F.R. 51.15 and 51.321. The federal emission inventory requirement applies to sources defined as point sources in 40 C.F.R. 51.50. Under 18 AAC 50.275, the state also requires reporting of emissions triennially for stationary sources with an air quality permit, regardless of permit classification. This includes sources that do not meet the federal emission thresholds in Table 1 to Appendix A of 40 C.F.R. 51 Subpart A. The state must report emissions data as described in 40 C.F.R. 51.15 and the data elements in Tables 2a and 2b to Appendix A of 40 C.F.R. 51 Subpart A to EPA.

The Department used the language in SPC XV for the permit condition, except as modified as follows: The Department revised the condition by lowering the thresholds that require reporting to include all stationary sources regardless of permit classification (excluding ORLs and PAELs) to capture the new requirements found in 18 AAC 50.275, effective September 7, 2022.

As of the issue date of this permit, the Pogo Mine is required to report triennially.

Condition 40, Consistency of Reporting Methodologies

Condition 40, is from 18 AAC 50.275(a) and requires all stationary sources, regardless of permit classification (with the exception of owner requested limits (ORLs) issued under 18 AAC 50.225 and preapproved emission limits (PAELs)) issued under 18 AAC 50.230), to report actual emissions to the state so that the state can meet its obligation under 40 C.F.R. 51. Condition 40.1 is from 18 AAC 50.275(b) and requires consistency on the stationary sources' actual emissions reports submitted for NEI and the state's assessable emissions.

The regulation was added to 18 AAC 50 on September 7, 2022, to include all stationary sources required to report actual emissions for the purpose of federal emissions inventory and to avoid inconsistencies in actual emissions reports submitted. When reporting actual emissions under Condition 39 or assessable emissions under Condition 3.2, consistent emission factors and calculation methods shall be used for all reporting requirements for the stationary source.

Section 8: Standard Permit Conditions

Conditions 41 – 46, Standard Permit Conditions

18 AAC 50.544(a)(5) requires each minor permit issued under 18 AAC 50.542 to contain the standard permit conditions in 18 AAC 50.345, as applicable. 18 AAC 50.345(a) clarifies that subparts (c)(1) and (2), and (d) through (o), may be applicable for a minor permit.

The Department included all of the minor permit-related standard conditions of 18 AAC 50.345 in Minor Permit AQ0406MSS08. The Department incorporated these standard conditions as follows:

- 18 AAC 50.345(c)(1) and (2) is incorporated as Condition 41 of Section 8 (Standard Permit Conditions);
- 18 AAC 50.345(d) through (h) is incorporated as Conditions 42 through 46, respectively, of Section 8 (Standard Permit Conditions);
- As previously discussed, 18 AAC 50.345(i) is incorporated as Condition 35 and 18 AAC 50.345(j) is incorporated as Condition 32 of Section 7 (Recordkeeping, Reporting, and Certification Requirements); and
- 18 AAC 50.345(k) is incorporated as Condition 47, and 18 AAC 50.345(l) through (o) is incorporated as Conditions 50 through 55, respectively, of Section 9 (General Source Testing Requirements). See the following discussion.

Section 9: General Source Test Requirements

AS 46.14.180 states that monitoring requirements must be, “based on test methods, analytical procedures, and statistical conventions approved by the federal administrator or the department or otherwise generally accepted as scientifically competent.” The Department incorporated this requirement as follows:

- Condition 48 requires the Permittee to conduct their source tests under conditions that reflects the actual discharge to ambient air; and
- Condition 49 requires the Permittee to use specific EPA reference methods when conducting a source test.

Section 9 also includes the previously discussed standard conditions for source testing.

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)[9]

EU ID	EU Description	Rating		Max Allowable Operation		NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
							EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
104	Water Treatment Plant Heaters	2.97	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	1.90	0.005	0.47	lb/gal	0.00034	0.03	lb/gal	0.0024	0.23	0.02
106	Mill Building Heaters	20.51	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	13.12	0.005	3.28	lb/gal	0.00034	0.22	lb/gal	0.0024	1.57	27.93
107	Filter/Backfill Plant Heaters	9.23	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	5.90	0.005	1.48	lb/gal	0.00034	0.10	lb/gal	0.0024	0.71	12.57
108	Permanent Camp Heaters	6.0	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	3.85	0.005	0.96	lb/gal	0.00034	0.07	lb/gal	0.0024	0.46	8.17
110a	Truck Shop Complex Heaters	2.67	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	1.70	0.005	0.43	lb/gal	0.00034	0.03	lb/gal	0.0024	0.20	0.02
110b	Truck Shop Complex Heater	3.93	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	2.51	0.005	0.63	lb/gal	0.00034	0.04	lb/gal	0.0024	0.30	0.03
111	Sewage Treatment Plant Heater	1.7	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	1.09	0.005	0.27	lb/gal	0.00034	0.02	lb/gal	0.0024	0.13	0.01
113	Lower Warehouse Heaters	0.9	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	0.58	0.005	0.14	lb/gal	0.00034	0.01	lb/gal	0.0024	6.91E-02	6.04E-03
114	Redpath Construction Office Heaters	0.25	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	0.16	0.005	0.04	lb/gal	0.00034	2.72E-03	lb/gal	0.0024	1.92E-02	1.68E-03
116	Lower Warehouse Mattress Ranch Heater	0.2	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	0.12	0.005	0.03	lb/gal	0.00034	2.01E-03	lb/gal	0.0024	1.42E-02	1.24E-03
118	1875 Portal Shop Heaters	0.7	MMBtu/hr	8,760	hrs/yr	lb/gal	0.02	0.47	0.005	0.12	lb/gal	0.00034	0.01	lb/gal	0.0024	5.68E-02	4.97E-03

EU ID	EU Description	Rating	Max Allowable Operation	NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
					EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
119	Mill Bench Maintenance Office Heaters	0.8 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.49	0.005	0.12	lb/gal	0.00034	0.01	lb/gal	0.0024	5.92E-02	5.18E-03
209	Cummins QST30-G5 Emergency Generator Engine	1,111.1 kWm	153,311[15] gal/yr (500 hrs per EU)[6]	kg/MW-hr	10.004	6.13	3.345	2.05	kg/MW-hr	0.760	0.47	kg/MW-hr	0.426	0.26	4.13E-03
210	Mill Bench Bank Unit No. 2 - GEN-02	1,111.1 kWm		kg/MW-hr	10.004	6.13	3.345	2.05	kg/MW-hr	0.760	0.47	kg/MW-hr	0.426	0.26	4.13E-03
220	Lower Camp Emergency Engine - GEN-04	2,145.0 kWm		kg/MW-hr	6.6	7.80	0.362	0.43	kg/MW-hr	0.174	0.21	kg/MW-hr	0.033	0.04	7.84E-03
218A	Fire Water Pump Building Emergency Engine	147 kWm	200[6] hrs/yr	g/kW-hr	5.0[5]	0.16	4.4[5]	0.14	g/kW-hr	5.0[5]	0.16	g/kW-hr	0.3[5]	0.01	2.18E-04
223	Server Emergency Engine GEN-06	35 kWm	500[6] hrs/yr	g/kW-hr	9.4[5]	0.18	6.9[5]	0.13	g/kW-hr	9.4[5]	0.18	g/kW-hr	0.4[5]	0.01	1.30E-04
224	Mill Bench Bank Emergency Engine GEN-07	11.8 kWm	500[6] hrs/yr	g/kW-hr	9.4[5]	0.06	8.3[5]	0.05	g/kW-hr	9.4[5]	0.06	g/kW-hr	0.5[5]	3.25E-03	4.37E-05
420	Various Portable Heaters	14.0 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	8.95	0.005	2.24	lb/gal	0.00034	0.15	lb/gal	0.0024	1.07	9.40E-02
420A	Portable Heater Blower Engine (NRE)	198 kWm[7]	8,760 hrs/yr	g/kW-hr	9.4[5]	17.98	8.25[5]	15.78	lb/hp-hr	0.0025	2.87	g/kW-hr	1.0[5]	1.91	1.29E-02
623	Core Shack Maintenance Shop Heater	0.1 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.06	0.005	0.02	lb/gal	0.00034	1.09E-03	lb/gal	0.0024	7.67E-03	6.71E-04

EU ID	EU Description	Rating	Max Allowable Operation	NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
					EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
624	Core Shack South Tent Heater	0.1 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.06	0.005	0.02	lb/gal	0.00034	1.09E-03	lb/gal	0.0024	7.67E-03	6.71E-04
625	Swick Shop Heater	0.6 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.36	0.005	0.09	lb/gal	0.00034	0.01	lb/gal	0.0024	0.04	3.76E-03
626	Yurt Heater	0.04 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.03	0.005	0.01	lb/gal	0.00034	4.35E-04	lb/gal	0.0024	3.0E-03	2.69E-04
636	Kitchen Water Heater	0.6 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.38	0.005	0.10	lb/gal	0.00034	6.52E-03	lb/gal	0.0024	4.60E-02	8.17E-01
637	Kitchen and Bathroom Water Heater	0.2 MMBtu/hr	8,760 hrs/yr	lb/gal	0.02	0.13	0.005	0.03	lb/gal	0.00034	2.17E-03	lb/gal	0.0024	1.53E-02	2.72E-01
302	Exhaust from 1690 Portal (Explosives)[10]	26,000 lb/day	365 days/yr	lb/ton	0.8[10]	1.90	68.0	161.33	N/A	N/A	0	lb/ton	0.0013	0.003	4.75
414	1525 Mine Air Heater	42.4 MMBtu/hr	3,000,000 gal/yr	lb/gal	0.013	19.50	0.0075	11.25	lb/gal	0.0010	1.50	lb/gal	0.0007	1.05	2.25
415	1875 Mine Air Heater	42.4 MMBtu/hr													
419	2150 Mine Air Heater	42.2 MMBtu/hr													
542	1875 Portal	1.0 MMBtu/hr													
543	1875 Portal	1.0 MMBtu/hr													
544	1525 Portal	1.0 MMBtu/hr													
545	1525 Portal	1.0 MMBtu/hr													
546	2150 Portal	1.0 MMBtu/hr													
547	2150 Portal	1.0 MMBtu/hr													
601	D600A Water Heater	0.25 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.16	0.0075	0.09	lb/gal	0.0010	0.01	lb/gal	0.0007	8.4E-03	1.8E-02
602	D600A Heaters	0.48 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.30	0.0075	0.17	lb/gal	0.0010	0.02	lb/gal	0.0007	1.6E-02	3.4E-02
603	D700A Water Heater	0.25 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.16	0.0075	0.09	lb/gal	0.0010	0.01	lb/gal	0.0007	8.4E-03	1.8E-02
604	D700A Heaters	0.48 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.30	0.0075	0.17	lb/gal	0.0010	0.02	lb/gal	0.0007	1.6E-02	3.4E-02

EU ID	EU Description	Rating		Max Allowable Operation		NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
							EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
605	D700B Water Heater	0.25	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.16	0.0075	0.09	lb/gal	0.0010	0.01	lb/gal	0.0007	8.4E-03	1.8E-02
606	D700B Heaters	0.48	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.30	0.0075	0.17	lb/gal	0.0010	0.02	lb/gal	0.0007	1.6E-02	3.4E-02
607	Thunderdome Heaters	0.525	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.33	0.0075	0.19	lb/gal	0.0010	0.03	lb/gal	0.0007	1.8E-02	3.8E-02
608	Thunderdome Heaters	0.35	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.22	0.0075	0.13	lb/gal	0.0010	0.02	lb/gal	0.0007	1.2E-02	2.5E-02
609	D600B Water Heater	0.25	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.16	0.0075	0.09	lb/gal	0.0010	0.01	lb/gal	0.0007	8.4E-03	1.8E-02
610	D600B Heaters	0.48	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.30	0.0075	0.17	lb/gal	0.0010	0.02	lb/gal	0.0007	1.6E-02	3.4E-02
611	Laundry Cart Water Heaters	0.15	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.09	0.0075	0.05	lb/gal	0.0010	0.01	lb/gal	0.0007	5.0E-03	1.1E-02
612	Laundry Cart Dryers	0.35	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.22	0.0075	0.13	lb/gal	0.0010	0.02	lb/gal	0.0007	1.2E-02	2.5E-02
613	KDR Water Heater	0.08	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.05	0.0075	0.03	lb/gal	0.0010	3.59E-03	lb/gal	0.0007	2.5E-03	5.4E-03
614	KDR Makeup Air Unit	0.5	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.31	0.0075	0.18	lb/gal	0.0010	0.02	lb/gal	0.0007	1.7E-02	3.6E-02
615	Dry Locker Water Heater	0.27	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.17	0.0075	0.10	lb/gal	0.0010	0.01	lb/gal	0.0007	9.0E-03	1.9E-02
616	Dry Locker Water Heater	0.27	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.17	0.0075	0.10	lb/gal	0.0010	0.01	lb/gal	0.0007	9.0E-03	1.9E-02
617	Dry Laundry Room Dryer	0.02	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.01	0.0075	0.01	lb/gal	0.0010	7.18E-04	lb/gal	0.0007	5.0E-04	1.1E-03
618	Dry Laundry Room Dryer	0.02	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.01	0.0075	0.01	lb/gal	0.0010	7.18E-04	lb/gal	0.0007	5.0E-04	1.1E-03
619	Water Ops Shack Heater	0.1	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.06	0.0075	0.04	lb/gal	0.0010	4.8E-03	lb/gal	0.0007	3.35E-03	7.18E-03
620	Thunderdome Makeup Air Unit	1.14	MMBtu/hr[8]	8,760	hrs/yr	lb/gal	0.013	0.71	0.0075	0.41	lb/gal	0.0010	0.05	lb/gal	0.0007	0.04	8.2E-02
621	D400 Heaters	0.53	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.35	0.0075	0.20	lb/gal	0.0010	0.03	lb/gal	0.0007	1.9E-02	4.0E-02
622	D400 Water Heaters	0.30	MMBtu/hr	8,760	hrs/yr	lb/gal	0.013	0.19	0.0075	0.11	lb/gal	0.0010	0.01	lb/gal	0.0007	1.0E-02	2.2E-02

EU ID	EU Description	Rating	Max Allowable Operation	NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
					EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
627	Water Treatment Plant #3 Heaters	4.22 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	2.62	0.0075	1.51	lb/gal	0.0010	0.20	lb/gal	0.0007	0.14	0.30
628	Kitchen Dining Makeup Air Unit	1.18 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.73	0.0075	0.42	lb/gal	0.0010	0.06	lb/gal	0.0007	0.04	8.5E-02
629	Makeup Air Unit 2012 D Wing Addition	0.30 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.19	0.0075	0.11	lb/gal	0.0010	0.01	lb/gal	0.0007	1.01E-02	2.15E-02
630	Original D Wing Dry Heater – Mens	0.40 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.25	0.0075	0.14	lb/gal	0.0010	0.02	lb/gal	0.0007	1.34E-02	2.87E-02
631	D Wing Addition 2012 Dry Heater	0.13 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.08	0.0075	0.04	lb/gal	0.0010	0.01	lb/gal	0.0007	4.19E-03	8.98E-03
632	Original D Wing Dry Heater – Womens	0.10 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.06	0.0075	0.04	lb/gal	0.0010	4.79E-03	lb/gal	0.0007	3.35E-03	7.18E-03
633	Dry Locker Water Heater Room Heater	0.13 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.08	0.0075	0.04	lb/gal	0.0010	0.01	lb/gal	0.0007	4.19E-03	8.98E-03
634	Original D Wing Dry Mens	0.40 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.25	0.0075	0.14	lb/gal	0.0010	0.02	lb/gal	0.0007	1.34E-02	2.87E-02
635	Original D Wing Dry Womens	0.40 MMBtu/hr	8,760 hrs/yr	lb/gal	0.013	0.25	0.0075	0.14	lb/gal	0.0010	0.02	lb/gal	0.0007	1.34E-02	2.87E-02
532	Backfill Plant Cement Silo	750 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	0.56	0
532A	Cement Screw Conveyor	3000 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	2.25	0

EU ID	EU Description	Rating	Max Allowable Operation	NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
					EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
533	Conveyor to Surface Coarse Ore Bin/Above ground	5000 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	3.75	0
534	Surface Coarse Ore Bin Apron Feeder/Above ground	5000 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	3.75	0
534A	Surface Course Ore Bin	1000 tph	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	0[11]	0
534B	Convey to SAG Mill/Above ground	150 tph	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	0[11]	0
534C	Gravity Feed Screens (Two)	500 tph	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	0[11]	0
534D	Trash Screen	15 tph	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	0[11]	0
534E	Safety Screen	15 tph	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	0[11]	0
535	Haul Truck-BF Plant to Drystack	N/A	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	21.7	0
536	Haul Truck-Waste Stockpile to Drystack	N/A	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0				0
537	Misc. Pickup Truck Trips	N/A	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0				0
538	Misc. Cargo Truck Trips	N/A	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0				0
539	Misc. Bus Trips	N/A	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0				0

EU ID	EU Description	Rating	Max Allowable Operation	NO_x, CO EF Units	NO_x		CO		VOC EF Units	VOC		$PM_{2.5}$, PM_{10} EF Units	$PM_{2.5}$ / PM_{10}		SO_2[13]
					EF[1]	PTE	EF[1]	PTE		EF[2]	PTE		EF[3]	PTE	PTE[4]
540	Ducon Venturi Packed Tower Scrubber	2,500 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	1.88[11]	0
541A	Duall Ceco Environmental Company Scrubber	800 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	N/A	0.60[11]	0
ALAB	Assay Lab	8,500 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	6.38	0
ALAB2	Assay Lab	4,000 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	3.00	0
ALAB3	Assay Lab	1,000 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	0.75	0
ALAB4	Assay Lab	10,000 cfm	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	gr/scf	0.02	7.51	0
CG	Cement Guppies	22 tpd	365 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	lb/ton	0.47	1.89	0
CP	Portable Crusher[12]	145 tph	8,760 hrs/yr	N/A	N/A	0	N/A	0	N/A	N/A	0	N/A	Various	8.93	0
Total Emissions by Pollutant (TPY) with Fugitives[14]						**92.92**		**193.21**			**4.85**			**70.12**	**58.03**
Total Emissions by Pollutant (TPY) for Title V Applicability[14]						**91.02**		**31.88**			**4.85**			**37.60**	**53.29**
Total Assessable Emissions (TPY)[14]				**419.13**											

Notes:

1 NOx and CO Emissions Factors (EFs) are from the following: a) EPA AP-42 Table 1.3-1 for EU IDs 104 through 119, 420, 623 through 626, 636, and 637; b) EPA AP-42 Table 1.5-1 for EU IDs 414, 415, 419, 542 through 547, and 601 through 622, and 627 through 635; c) Vendor data for EU IDs 209, 210, and 220; d) Table 3 to Appendix I 40 C.F.R. 1039 (Tier 3) for EU ID 218A; e) 40 C.F.R. 60.4202(a)(1), Table 2 for EU IDs 223 and 224; f) 40 C.F.R. 60.4202(a)(1), 1039.101 for EU ID 420A; and g) Australian 2016 Explosives NPI Tables 7 & 8 for EU ID 302.

2 VOC EFs are from the following: a) EPA AP-42 Table 1.3-3 for EU IDs 104 through 119, 420, 623 through 626, 636, and 637; b) EPA AP-42 Table 1.5-1 for EU IDs 414, 415, 419, 542 through 547, 601 through 622, and 627 through 635; c) Vendor data for EU IDs 209, 210, and 220; d) Table 3 to Appendix I 40 C.F.R. 1039 (Tier 3) for EU ID 218A; e) 40 C.F.R. 4202(a)(1), Table 2 for EU IDs 223 and 224; and f) EPA AP-42 Table 3.3-1 for EU ID 420A.

3 $PM_{10}/PM_{2.5}$ EFs are from the following: a) EPA AP-42 Table 1.3-2 (Condensable PM, No. 2 oil – 0.0013 lb/gal), 7 (Filterable PM, Distillate Oil – 0.00108 lb/gal) for EU IDs 104 through 119, 420, 623 through 626, 636, and 637; b) EPA AP-42 Table 1.5-1 for EU IDs 414, 415, 419, 542 through 547, 601 through 622, and 627 through 635; c) EPA AP-42 Table 3.4-1 for EU IDs 209 and 210; d) Vendor data for EU ID 220, 532, 532A, 533, 534, 541, and ALAB through ALAB4; e) Table 3 to Appendix I 40 C.F.R. 1039 (Tier 3) for EU ID 218A; 40 C.F.R. 4202(a)(1), Table 2 to NSPS Subpart IIII for EU IDs 223 and 224; f) Table 2 to Appendix I 40 CFR 1039 (Tier 2) for EU ID 420A; g) Pogo Engineering for EU ID 302; h) EPA AP-42 13.2.2 (TAR) for EU IDs 535 through 539; i) EPA AP-42 Table 11.12-2 for EU ID CG; and j) Various EFs from EPA AP-42 Section 11.19.2, Table 11.19.2-2 for EU ID CP, using EPA AP-42 Table 11.12-2 and the ratio increase from 125 tph to 145 tph.

4 SO_2 EFs are from the following: a) EPA AP-42 Table 1.3-1 (15 ppmw S) for EU IDs 104, 110a through 119, 420, and 623 through 626; b) EPA AP-42 Table 1.3-1 (0.3 wt%S) for EU IDs 106 through 108, 636, and 637; c) EPA AP-42 Table 1.5-1 (propane sulfur content of 15 gr/100 cf) for EU IDs 414, 415, 542 through 545, and 601 through 622, and 627 through 635; d) Mass balance (15 ppmw S) for EU IDs 209, 210, 220, 218A, 223, 224, and 420A; and e) EPA AP-42 Table 13.3-1 for EU ID 302.

5 Not to exceed (NTE) factor of 1.25 was used for all emission units using a tier emission factor per 40 C.F.R. 60.4212(c).

6 PTE for emergency engines based on EPA's guidance of 500 hrs/yr, except for EU ID 218A, which has an operating limit of 200 hrs/yr.

7 Portable heater engines rating based on 14 portable engines each rated at 19 bhp (14.17 kWm).

8 Based on heat output rating and 85% efficiency.

9 The following fuel assumptions were used for PTE calculations:

- Propane heat content: 0.0915 MMBtu/gal
- Propane sulfur content: 15 gr/100 cf
- Diesel heat content: 0.1370 MMBtu/gal
- Diesel engine heat rate: 7,000 Btu/hp-hr
- Diesel fuel density: 7 lb/gal
- Diesel (Non-ULSD) sulfur content: 0.3 weight percent
- ULSD sulfur content: 0.0015 weight percent
- ULSD heat content: 0.133 MMBtu/gal

10 EFs for EU ID 302 were calculated using Australian Government National Pollutant Inventory Emission Estimation Technique Manual for Explosives Detonation and Firing Ranges, Version 3.1. Assumes Emulsion (Water Based Gel) EF adjustment of 2.0.

11 Emissions are included in the following: a) For EU IDs 534A through 534E, EU ID 534; and b) For EU IDs 540 and 541A, EU IDs 5 and 6, respectively.

12 Tons per year emissions for the portable crusher (EU ID CP) determined by ratio increase of 125 tph to 145 tph (ratio of 1.16).

13 Diesel fuel sulfur content cannot exceed 0.3 weight percent in EU IDs 106 – 108, 636, and 637, and 15 ppmw (ULSD) in EU IDs 104, 110a, 110b, 111, 113, 114, 116, 118, 119, 209, 210, 218A, 220, 223, 224, 420, and 623 – 626, per Condition 19.

14 Emissions totals do not include non-road engines.

15 The maximum allowable fuel consumption of 153,311 gallons for EU IDs 209, 210, and 220 (the sum of 39,332 gal each for EU IDs 209 and 210, and 74,646 gal for EU ID 220) are based on 500 hours of operation for each EU, given the fuel consumption rates of 70.8 gal/MW-hr for EU IDs 209 and 210, and 69.6 gal/MW-hr for EU ID 220 (from AQ0406MSS07 Revision 1), and the rated capacity of the EUs.