DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONTROL MINOR PERMIT

Minor Permit: AQ0111MSS11, Revision 1 **Final Date – May 20, 2020**
Rescinds Permit: AQ0111MSS11

The Alaska Department of Environmental Conservation (Department), under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit AQ0111MSS11 to the Permittee listed below.

Permittee:	**Coeur Alaska, Inc.** 3031 Clinton Dr., Suite 202 Juneau, AK 99801
Stationary Source:	**Kensington Mine**
Location:	Northing: 6,522,789, Easting: 497,129, Zone: 8
Project:	Revisions To Permit AQ0111MSS10
Permit Contact:	Kevin Eppers (907) 523-3328 keppers@coeur.com

This project is classified under 18 AAC 50.508(6) for revising or rescinding the terms and conditions of a Title I permit.

This permit satisfies the obligation of the Permittee to obtain a minor permit under 18 AAC 50. As required by AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this permit.

Aaron Simpson
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for: James R. Plosay, Manager
Air Permits Program

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Abbreviations and Acronyms

AAC.....Alaska Administrative Code
ADEC.....Alaska Department of Environmental Conservation
AOS.....Air Online Services
AS.....Alaska Statutes
ASTM.....American Society for Testing and Materials
BACT.....best available control technology
bhp.....brake horsepower
CDX.....Central Data Exchange
CEDRI.....Compliance and Emissions Data Reporting Interface
C.F.R. .....Code of Federal Regulations
CAA.....Clean Air Act
CO .....carbon monoxide
Department.....Alaska Department of Environmental Conservation
dscf .....dry standard cubic foot
EPA .....US Environmental Protection Agency
EU.....emissions unit
gr/dscf.....grain per dry standard cubic foot (1 pound = 7000 grains)
gph.....gallons per hour
HAPs .....hazardous air pollutants [as defined in AS 46.14.990]
hp.....horsepower
ID.....emissions unit identification number
kPa.....kiloPascals
LAER.....lowest achievable emission rate
MACT .....maximum achievable control technology [as defined in 40 C.F.R. 63]
MMBtu/hr.....million British thermal units per hour
MMSCF.....million standard cubic feet
MR&R.....monitoring, recordkeeping, and reporting
NESHAPs.....National Emission Standards for Hazardous Air Pollutants [as contained in 40 C.F.R. 61 and 63]
NOx.....nitrogen oxides
NRE.....nonroad engine
NSPS .....New Source Performance Standards [as contained in 40 C.F.R. 60]
O & M .....operation and maintenance
O_2.....oxygen
PAL .....plantwide applicability limitation
PM-10.....particulate matter less than or equal to a nominal 10 microns in diameter
PM-2.5.....particulate matter less than or equal to a nominal 2.5 microns in diameter
ppm .....parts per million
ppmv, ppmvd.....parts per million by volume on a dry basis
psia .....pounds per square inch (absolute)
PSD .....prevention of significant deterioration
PTE.....potential to emit
SIC.....Standard Industrial Classification
SIP.....State Implementation Plan
SPC.....Standard Permit Condition or Standard Operating Permit Condition
SO_2 .....sulfur dioxide
The Act.....Clean Air Act
TPH .....tons per hour
tpy.....tons per year
VOC .....volatile organic compound [as defined in 40 C.F.R. 51.100(s)]
VOL.....volatile organic liquid [as defined in 40 C.F.R. 60.111b, Subpart Kb]
vol% .....volume percent
wt% .....weight percent
$wt\%S_{fuel}$ .....weight percent of sulfur in fuel

Section 1. Emission Units

The Permittee is authorized to install, modify, and operate the emission units listed in Table 1 in accordance with the terms and conditions of this permit. Emission units listed in Table 1 have specific monitoring, record keeping, or reporting conditions in this permit. Except as noted elsewhere in the permit, the information in Table 1 is for information purposes only. The specific unit descriptions do not restrict the Permittee from replacing an emission unit identified in Table 1. The Permittee shall comply with all applicable provisions of AS 46.14 and 18 AAC 50 when installing a replacement emission unit, including any applicable minor or construction permit requirements.

Table 1 - Minor Permit Emission Unit Inventory[1]

ID	Description	Make/Model	Rating/Size	Fuel Type	Install Date
1	Heater (Mine Portal)	TBD	500,000 gal/yr	Propane	TBD
3	Material Transfer (Jualin Process Site)	N/A	730,000 tons/year	N/A	TBD
4a	Jaw Crusher (Jualin Process Site)	TBD	730,000 tons/year	N/A	TBD
6	Baghouse (Jualin Process Site)	TBD	730,000 tons/year	N/A	TBD
14a	Generator (Slate Cove Dock) Serial #280MSL0079	Isuzu 3CD1-GZG01 Lima Mac	12 kW-e	Distillate	February 2006
15b	Backup Generator (Comet Water Treatment Plant) Serial # T1237M36	Detroit	1640 kW-e @ 1800 RPM	Distillate	TBD
16	Incinerator (Jualin Process Site) Serial #A0-XM-001	Advanced Combustion Systems CA-500	2,000 lbs/day	Solid Waste/ Distillate	December 7, 2007
17a	Fuel Tank (Jualin Process Site)	N/A	30,000 Gallons	Distillate	TBD
18	Baghouse (Jualin Process Site-Limestone loading/discharge)	TBD	467 tons/year	N/A	TBD
19	Baghouse (Jualin Service Site-Laboratory Crusher)	Donaldson Torit	1,401 tons/year	N/A	TBD
21	Explosives Detonation (Underground)	N/A	2,190 blasts/year	N/A	N/A
22	Material Transfer (Below Ground-all locations Kensington Mine Project)	N/A	N/A	N/A	N/A
23	Road System (Kensington Mine Project Roadways)	N/A	N/A	N/A	N/A
24	Material Transfer (Development Rock Stockpiles)	N/A	250,000 tons/year	N/A	N/A
25	Fire Water Pump Engine (Jualin Process Site)	VM Motori / Clarke 91B	165 hp	Distillate	August 2007

[1] All emission units were authorized under previous permit actions.

31	Material Transfer Fabric Filter (Underground Mine – Cement Silo Loading)	TBD	38,388 tons/year	N/A	TBD
32	Material Transfer Enclosure (Underground Mine – Cement Silo Transfer)	N/A	38,388 tons/year	N/A	TBD
33	Material Transfer Enclosure (Jualin Process Site)	TBD	730,000 tons/year	N/A	TBD
34	Baghouse (Jualin Service Site-Assay Furnace)	Donaldson Torit	1,401 tons/year	N/A	TBD
35	Portable Rock Crusher	N/A	250 tons/hour	N/A	TBD
36	Portable Screen	N/A	250 tons/hour	N/A	N/A
37	Portable Screen	N/A	250 tons/hour	N/A	N/A
38	Belt Conveyor	N/A	250 tons/hour	N/A	N/A
39	Belt Conveyor	N/A	250 tons/hour	N/A	N/A
40	Belt Conveyor	N/A	250 tons/hour	N/A	N/A
41	Belt Conveyor	N/A	250 tons/hour	N/A	N/A
42[2]	Generator (Portable Rock Crusher) Serial #. LGK09184	Caterpillar C13	415 hp	Diesel	TBD
43[2]	Generator (Portable Screen) Serial # 35604086	Caterpillar 3056E DITA	182 hp	Diesel	TBD
44[2]	Portable Generator Serial # 5300798339	Volvo Penta TAD720GE	87 hp	Diesel	TBD
45	Material Transfer (Portable Rock Crushers)	N/A	400 tons/hr	N/A	TBD
46	Portable Cone Crusher	Atlas PC3 Impact Cone Crusher	400 tons/hr	N/A	TBD
47	Portable Powercrusher Screen	Atlas HS1	400 tons/hr	N/A	TBD
48	Portable Screen	N/A	400 tons/hr	N/A	TBD
49	Portable Belt Conveyor	N/A	400 tons/hr	N/A	TBD
50	Generator (Portable Crusher & Screen)	TBD	287 kW	Diesel	TBD
51[2]	Generator (TTF Emergency Generator)	Caterpiller 3456 DITA	500 kW	Diesel	TBD
52	Generator (Camp Facility Emergency Generator)	Caterpiller XQ45	45 kW	Diesel	TBD
53	Fuel Tank (Comet Beach)	N/A	10,000 gal.	Diesel	TBD
54	Generator (Jualin Process Site)	EMD 20-710G4C-T2	3,728 kW	Diesel	TBD
55	Generator (Jualin Process Site)	EMD 20-710G4C-T2	3,728 kW	Diesel	TBD
56	Generator (Jualin Process Site)	EMD 20-710G4C-T2	3,728 kW	Diesel	TBD
57	Generator (Jualin Process Site)	EMD 20-710G4C-T2	3,728 kW	Diesel	TBD
58	Material Transfer (Aggregate Conveyor)	N/A	250 tons/day	N/A	TBD

[2] Units 42-44 and 51 are non-road units. Non-Road Units and the fuel burning portions emissions do not count towards permit applicability determinations, or assessable emissions, unless the unit loses its non-road status.

59	Material Transfer (ARD Conveyor)	N/A	500 tons/day	N/A	TBD
60	Material Transfer Fabric Filter (Cement Silo Loading)	N/A	60 tons/day	N/A	TBD
61	Material Transfer (Hopper Loading)	N/A	750 tons/day	N/A	TBD
62	Material Transfer (Aggregate Truck Loading)	N/A	250 tons/day	N/A	TBD
63	Material Transfer (ARD Truck Loading)	N/A	500 tons/day	N/A	TBD
64	Material Transfer (Cement Truck Loading)	N/A	60 tons/day	N/A	TBD
65[3]	XQ400 Generator (Jualin Process Site)	Caterpillar C15 ATAAC	400 kW	Diesel	TBD

1. **Maintenance Requirements.** For Emission Units 35 through 41 and 46 through 49; the Permittee shall:

   1.1 perform regular maintenance considering the manufacturer's or the operator's maintenance procedures;

   1.2 keep records of any maintenance that would have a significant effect on emissions; the records may be kept in an electronic format; and

   1.3 keep a copy of either the manufacturer's or the operator's maintenance procedures.

[3] EU 65 is a new unit.

Section 2. Emission Fees

2. **Assessable Emissions.** The Permittee shall pay to the Department an annual emission fee based on the stationary source's assessable emissions as determined by the Department under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410. The Department will assess fees per ton of each air pollutant that the stationary source emits or has the potential to emit in quantities 10 tons per year or greater. The quantity for which fees will be assessed is the lesser of

   2.1 the stationary source's assessable potential to emit of 399 tpy; or

   2.2 the stationary source's projected annual rate of emissions that will occur from July 1 to the following June 30, based upon credible evidence of actual annual emissions emitted during the most recent calendar year or another 12 month period approved in writing by the Department, when demonstrated by the most representative of one or more of the following methods:

      a. an enforceable test method described in 18 AAC 50.220;

      b. material balance calculations;

      c. emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035;

      d. other methods and calculations approved by the Department, including appropriate vendor-provided emissions factors when sufficient documentation is provided.

3. **Assessable Emission Estimates.** Emission fees will be assessed as follows:

   3.1 no later than March 31 of each year, the Permittee may submit an estimate of the stationary source's assessable emissions via the Department's AOS System at http://dec.alaska.gov/applications/air/airtoolsweb using the Permittee Portal option and filling out the Emission Fee Estimate form. Alternatively, the report may be submitted by:

      a. Email under a cover letter using dec.aq.airreports@alaska.gov; or

      b. hard copy to the following address: ADEC, Air Permits Program, ATTN: Assessable Emissions Estimate, 555 Cordova Street, Anchorage, Alaska 99501.

   3.2 The Permittee shall include with the assessable emissions report all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the Department can verify the estimates.

   3.3 If no estimate is submitted on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit set out in Condition 2.1.

Section 3. State Emission Standards

4. **Visible Emissions.** The Permittee shall not cause or allow visible emissions (VE), excluding condensed water vapor, emitted from EUs 1, 6, 14a, 15b, 18, 19, 21, 25, 31, 34, 35, 46, 50, 52, 54 through 57, 60 and 65 listed in Table 1 to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.

4.1 For EU 1 (liquefied petroleum gas (LPG)-fired units), burn only LPG (includes propane) as fuel. Monitor by certifying in each operating report under Condition 25 that the emission unit burned only LPG. Report under Condition 24 if any fuel is burned other than LPG.

4.2 For EUs 50, 52, 54 through 57, and 65 (diesel-fired generators), verify compliance using either Condition 4.2a or 4.2b.

a. Prior to unit installation, obtain a certified manufacturer guarantee that each emission unit will comply with the visible emission standard and attach a copy of the guarantee to the next operating report required under Condition 25; or

b. Conduct a VE source test on each unit as set out in 40 C.F.R. 60, Appendix A, Reference Method 9, within 60 days of initial start-up. Attach a copy of the surveillance records to the next operating report required under Condition 25.

4.3 For EUs 35 and 46 (Portable Rock Crushers) conduct visible emission surveillance as follows.

a. Observe exhaust following 40 C.F.R. 60, Appendix A, Reference Method 9 for 18 minutes to obtain 72 consecutive 15-second opacity observations, and as follows.

(i) Select an observer position that is a minimum of 15 feet from the emission unit.

(ii) When possible, select an observer position that minimizes interference from other fugitive emissions sources, while maintaining the observer position relative to the sun required by Method 9.

(iii) If water mist is present, make the observation at a point in the plume where the mist is no longer visible.

b. Conduct the observation at a load typical of the maximum operation during the reporting period described in Condition 25.

c. Conduct the observations

(i) within two days of initial startup;

(ii) within two days after start up at each new location; and

(iii) at least once in every 30 days of operation at the same location.

d. Include results of visible emissions observations with the operating report described in Condition 25.

5. **Particulate Matter (PM).** The Permittee shall not cause or allow PM emitted from EUs 1, 6, 14a, 15b, 18, 19, 21, 25, 31, 34, 35, 50, 52, 54 through 57, 60, and 65 listed in Table 1 to exceed 0.05 grains per cubic foot (gr./dscf) of exhaust gas corrected to standard conditions and averaged over three hours.

6. **Fugitive Dust**. The Permittee shall take reasonable precautions to prevent the release of airborne PM and fugitive dust from the rock crusher operations.

   6.1 Reasonable precautions for rock crushers to prevent PM from becoming airborne include, but are not limited to:

      a. clean-up of loose material on work surfaces; and

      b. minimizing drop distances on conveyor systems and lowering loader buckets to be in contact with the surface of the soil or ground before dumping.

   6.2 The Permittee shall only crush high moisture ore with 4 weight percent average material moisture content.

   6.3 During the material transfer to storage piles, when visual observations indicate the presence of fugitive dust, the Permittee shall use watering and/or chemical wetting agents to control fugitive dust.[4] These activities include:

      a. loading of aggregate onto storage piles (batch or continuous drop operation);

      b. equipment traffic in storage area;

      c. wind erosion of pile surfaces and ground areas around piles; and

      d. load out of aggregate for shipment or for return to the process stream (batch or continuous drop operation).

   6.4 Monitor using visual observations to ensure that dust is continuously controlled (i.e. apply more water if rock crusher operations are generating dust at any time). The Permittee shall record and report visible emissions under Condition 4.

7. **Sulfur Compound Emissions.** The Permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, from EUs 1, 14a through 16, 25, 54 through 57, and 65 as listed in Table 1 to exceed 500 ppm averaged over three hours.

   7.1 The Permittee shall comply with Condition 7 by complying with Condition 10.

8. **Incinerator Visible Emissions**. The Permittee shall not cause or allow VE excluding condensed water vapor, through the exhaust of EU 16 listed in Table 1 to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.

9. **Air Pollution Prohibited.** No person may permit 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.

[4] Application of water and/or chemical wetting agents shall not be required when freezing conditions exist.

Section 4. Owner Requested Limit to Avoid Project Classification[5]

10. **Sulfur Dioxide (SO_2) Emissions.** To avoid project classification under 18 AAC 50.326 as a Title V source and 18 AAC 50.306 as a Prevention of Significant Deterioration (PSD) major source, the Permittee shall limit the SO_2 emissions from EUs 1, 14a, 15b, 25, 50, 52, 54 through 57, and 65 to 0.88 tpy. Monitor and report the sulfur content of the fuel burned in emission units as follows:

    10.1 For EU 1, use only liquefied petroleum gas (LPG) as fuel. Monitor by certifying in each operating report required by Condition 25 that the emission unit fired only LPG during the reporting period. Report under Condition 24 if any fuel is burned other than LPG.

    10.2 For EUs 14a, 15b, 25, 50, 52, 54 through 57, and 65, use only ultra-low sulfur diesel fuel (ULSD) with sulfur content not exceeding 0.0015 percent by weight (15 parts per million (ppm) by weight).

        a. For distillate fuel, obtain a statement or receipt from the fuel supplier certifying the maximum sulfur content of the fuel for each shipment of fuel delivered to the stationary source. If a certificate is not available from the supplier, analyze a representative sample of the fuel to determine the sulfur content using ASTM Method D-129, D 4294, or an alternative method approved by the Department.

        b. Include in the operating report required under Condition 25, a list of the fuel sulfur contents for each shipment of distillate fuel received at the stationary source during the reporting period.

11. **NO_x Limits:** To avoid an operating permit and classification as a PSD major stationary source, the Permittee shall limit NO_x emissions from EUs 1, 14a, 15b, 16, 25, 52, 54 through 57, and 65 to no greater than 89.9 tons per twelve-month rolling period as follows:

    11.1 Limit NO_x emissions from EUs 54 through 57 to no greater than 72.5 tons per 12-month rolling period by using Selective Catalytic Reduction (SCR) controls as described in Condition 12 to actively reduce NO_x emissions and as set out in Conditions 11.1a through 11.1g.

        a. Monitor and record the daily hours of engine operation for each of EUs 54 through 57 when in operation and in accordance with Condition 12.6a as follows:

            (i) Before initial start-up of EUs 54 through 57, equip each unit with a dedicated engine hour meter with accuracy of ± 0.02 percent or better over the entire range; and

        b. Calculate and record the monthly hours of operation for each of EUs 54 through 57 by summing the daily hours of operation recorded under Condition 11.1a.

[5] This ORL to avoid PSD review and Title V permitting was originally established in previous permits.

c. By the 15th of each month, calculate and record the monthly NO_x emissions for the prior month for each of EUs 54 through 57 in tons per month using Equation 1 below.

Equation 1 $$NO_X = FH \times EF \times \frac{1\,ton}{2000\,lb}$$

Where: NO_x = NO_x emissions in tons per month

FH = Hours of operation per month as set out in Condition 11.1b

EF = NO_x emission factor in pounds per hour using the values in Table 2 below. If a site specific NO_x emission factor is derived from a Department approved source test (e.g. source test under Condition 12) use that emission factor retroactive to the date of the source test for all the units rather than the values in Table 2.

Calculate NO_x emissions as follows:

d. For operation of EUs 54 through 57, use NO_x emission factors set forth in Table 2 below.

Table 2 – NO_x Emission Factors for Generators

Emission Units	Type	NO_x Emission Factor
54 through 57	New Main Generators with SCR (90% control efficiency)	5.52 lb/hr each emission unit
54 through 57	New Main Generators with SCR (51% control efficiency)	27.02 lb/hr each emission unit
54 through 57	New Main Generators without SCR	55.15 lb/hr each emission unit

Note: Refer to description of *EF* above for exceptions to the listed emission rates.

e. By the 15th of each month, calculate and record the twelve-month rolling total NO_x emissions for the combined EUs 54 through 57, by summing the monthly NO_x emissions in Condition 11.1c.

f. Report as excess emissions under Condition 24 if the NO_x emissions calculated under Condition 11.1e exceed 72.5 tons per twelve-month rolling period.

g. Include in the operating report as required under Condition 25, the monthly and the 12-month rolling total NO_x emissions for the combined EUs 54 through 57 calculated under Conditions 11.1c and 11.1e.

11.2 Limit NO_x emissions from EUs 1, 14a, 15b, 16, 25, 52, and 65 to no greater than 17.2 tons per 12-month rolling period. For EUs 1 and 14a this is the PTE from these emission units and therefore no additional monitoring or reporting is necessary. The Permittee shall limit operation of EUs 15b, 16, 25, 52 and 65 as follows:

a. The Permittee shall not operate EUs 15b, 25, 52, and 65 more than 500 hours per unit in any 12-month rolling period.

(i) Before initial start-up of EUs 15b, 25, 52, and 65 equip each unit with a dedicated engine hour meter with accuracy of at least ± 0.02 % over the entire range.

(ii) Monitor and record the monthly engine hours of operation for EUs 15b, 25, 52, and 65 at a consistent time each month. Calculate the twelve-month rolling period total hours of operation for each of the EUs 15b, 25 52, and 65 by summing the monthly hours of operation.

(iii) Include in the operating report required under Condition 25, the 12-month rolling total hours of operation for each of the EUs 15b, 25, 52, and 65.

(iv) Report in accordance with Condition 24 when the 12-month rolling hours of operation for EUs 15b, 25, 52, or 65 exceeds 500 hours.

b. The Permittee shall combust in the incinerator (EU 16):

(i) A fuel feed stream, 10 percent or less of the weight of which is comprised, in aggregate, of hospital waste and medical/infectious waste as measured on a calendar quarter basis.

(ii) Incinerator shall not operate on a rolling 12-month average for more than 4,380 hours.

(iii) Monitor and record the following on a calendar quarter basis:

(A) the daily hours of operation;

(B) the weight of hospital waste and medical/infectious waste combusted; and

(C) the weight of all other fuels and wastes combusted.

(iv) Include in the operating report required under Condition 25 the records kept in accordance with Condition 11.2b(iii).

12. **SCR Requirements.** Install, maintain, and operate a dedicated NO_x control SCR system for each of EUs 54 through 57, and comply with the following:

12.1 The SCR control system shall have a NO_x removal/destruction efficiency of at least

a. 90 percent as described in Conditions 11.1d and 12.4b; or

b. 51 percent as described in Conditions 11.1d and 12.4b.

12.2 Limit the emissions of ammonia (NH_3) to no greater than 0.56 lbs/hour (10 ppmv);

12.3 Maintain the manufacturer-recommended spare parts (spray nozzles, lance, pumps, seals, switches, sensors and solenoids) on-site.

12.4 **SCR NO_x Emission Testing and Sampling.** If the NOx emissions calculated under Condition 11.1c exceed 65 tons per 12 consecutive months, conduct a NOx emission source test on two representative internal combustion engines within 90 operating days, unless a source test has been conducted within the previous 5 years. The emission units shall be tested on a rotating basis. Do not repeat this source test on a particular emission unit until the other emission units have been subjected to the source test. Conduct the tests using the procedures set out in Conditions 33 through 39 and determine the SCR effectiveness as follows:

a. For EUs 54 through 57, with the dedicated SCR systems, conduct source test in accordance with Section 9 as follows:

(i) Test two representative units of EU group 54 through 57 operating with SCR to determine NO_x and O_2 emissions upstream of the SCR system; and to determine NO_x, O_2 and NH_3 emissions downstream of the SCR to ascertain compliance with Conditions 12.1 and 12.2.

(ii) Each source test shall include the 100 percent engine load, and no less than two additional load points representing the diesel engine operating range.

(iii) For NH_3 emissions testing, at maximum achievable engine load, the ammonia slip rate in parts per million by volume (ppmv) using the U.S. EPA Method 320 or ASTM D6348 for Fourier Transform Infrared Spectroscopy (FTIR), CTM-027, or Bay Area Source Test Procedure ST-1B, as applicable, and test concurrently with the NO_x test.

(iv) Calculate NO_x emission rates using Method 19.

(v) Determine the NO_x emission rate (lb/hr), the injection rate (gal/hr)/load curve (SCR map), the urea reagent concentration (percent/gal), fuel consumption rate (gal/hr) and the NH_3 slip (ppm and lb/hr) for each run, as applicable.

(vi) Immediately after each source test run, determine the portable diesel exhaust gas test instrument accuracy by measuring NO_x emissions upstream and downstream of the SCR system concurrently and compare to source test NO_x results. Portable instrument measurements shall be taken at each sampling port at no less than three points to ensure representative sampling as determined through exhaust traverse, and in accordance with Condition 12.4b.

(vii) Report all elements in accordance with Section 9. After Department approval of the source test, use these emission factors rather than those listed in Table 2 retroactive to the date of the source test.

b. Conduct NO_x emission effectiveness samplings using the portable instrument on each of 54 through 57 at least once per 750 hours of operation to determine

the percent SCR NO_x emission removal efficiency and to ensure compliance with Condition 12.1 as follows:

(i) Measure the NO_x concentration, O_2 concentration, and stack temperature at sampling ports upstream and downstream of the SCR control at each traverse point at no less than three points representative of the exhaust flow.

(ii) Record the results from each traverse point, calculate, and record the average percent NO_x removal from the SCR control.

(iii) Sum the results from each traverse point and calculate the average NO_x concentration upstream and downstream of SCR unit.

(iv) Calculate and record the percentage SCR efficiency as set out in Equation 2.

Equation 2

$$eff = \frac{NO_X(in) - NO_X(out)}{NO_X(in)} \times 100$$

Where:

eff = SCR effectiveness in percent

$NO_X in$ = NO_x concentration in ppm before SCR (post combustion engine)

$NO_X out$ = NO_x concentration in ppm after SCR

c. Conduct additional NO_x emission effectiveness sampling in accordance with Condition 12.4b within 24 hours after catalyst bed replacement, catalyst elements exchange, and changes in the SCR control system, set points, load curve (mapping), changes in urea reagent solution and urea injection rate.

12.5 In case of SCR malfunction, contact the SCR manufacturer or certified technician and implement their prescribed corrective actions, and record

a. a complete description of the corrective action;

b. the date the corrective action was completed;

c. the technician's contact information (if the corrective action was prescribed by an SCR manufacturer or certified technician); and

d. if applicable, a description of how any corrective actions completed differed from what was prescribed by the SCR manufacturer or certified technician and the basis for the difference.

12.6 Keep records of the following:

a. The daily engine operating hours as set out in Condition 11.1a, including the SCR start-up and SCR shutdown times and dates, including engine start-up and shutdown date and time. SCR start-up means that the catalyst bed temperature is within the manufacturer's recommended temperature set points for optimal NO_x removal and reagent injection is at a rate consistent with the programmable logic controller setting for the operating engine's load setting. SCR shut down means that the engine is no longer running or one of the above parameters is out of bounds.

b. All SCR system repairs, maintenance, and SCR control system adjustments, including time and date.

c. The injection rate of SCR reagent in gal/hr and the concentration of SCR reagent in lb/gal for each batch prepared.

d. The receipts for all urea purchases with dates and quantities.

e. The system alarm logs including time and date of occurrence.

f. The date and time of every NO_x emission effectiveness test conducted under Conditions 12.4a(vi), 12.4b and 12.4c, and the results of those tests.

12.7 Include in the operating report under Condition 25:

a. Records of each NO_x emission effectiveness conducted in accordance with Conditions 12.4b and 12.4c; and

b. Records of SCR malfunction in accordance with Condition 12.5.

12.8 Report as an excess emission or permit deviation under Condition 24 if:

a. the NO_x measurements demonstrate that the SCR is achieving less than the NO_x removal percentages set forth in Conditions 12.1a and 12.1b; or

b. the NO_x emissions effectiveness testing is not done in accordance with Condition 12.4b or 12.4c.

13. **Portable Instrument Engine Exhaust NO_x Analyzer.** The Permittee shall maintain exhaust gas NO_x analyzer onsite capable of measuring NO_x concentrations of one to 1,000 ppmv and accurate to five percent in accordance with the instrument manufacturer Quality Assurance/Quality Control Plan. Comply with the following for the analyzer required under this condition.

13.1 Relative Accuracy Requirements.

a. Keep calibration gas available onsite at all times.

b. Before each SCR effectiveness test required by Conditions 12.4b and 12.4c, test the analyzer's relative accuracy using NO_x calibration gas as follows:

(i) Measure and record the:

(A) date;

(B) certified NO_x concentration of the calibration gas ($NO_{x\ certified}$); and

(C) measured NO_x concentration of the calibration gas ($NO_{x\ measured}$).

(ii) Calculate and record the relative accuracy using **Equation 3**.

Equation 3 $$RA = \left| \frac{NO_{x certified} - NO_{x measured}}{NO_{x certified}} \right|$$

Where: RA = Relative Accuracy

c. Recalibrate or repair the analyzer if relative accuracy exceeds five percent, and no less than once each year. The recalibration must be performed by the manufacturer or a trained technician.

d. Keep records of each relative accuracy test. Notify the Department's Fairbanks office within seven days of the audit date if any analyzer's relative accuracy calculation conducted under Condition 13.1b results in a relative accuracy greater than five percent.

e. Include with the operating report under Condition 25 the following:

(i) a copy of the receipt for any recalibration following return of the recalibrated analyzer required under Condition 13.1c; and

(ii) a copy of any records and notifications required under Condition 13.1d.

14. **Nonroad Engines.** EU 51 is classified as a nonroad engine as long as it meets the definition of nonroad engine in 40 C.F.R. 89.2. Maintain a nonroad engine log for EU 51. Unless recorded in the log, EU 51 will be considered as a stationary emission unit for permit applicability purposes.

14.1 Record in the nonroad engine log each time EU 51 is relocated and include the date, new location, and reason for relocation.

14.2 Report in each operating report required under Condition 25, the nonroad engine log for EU 51, for the period covered by that report.

14.3 Report as an excess emission or permit deviation under Condition 24 if at any time EU 51 no longer meets the definition of nonroad engine in 40 C.F.R. 89.2, or if the nonroad engine log is not maintained.

Section 5. Ambient Air Quality Protection Requirements

15. **General Ambient Air Quality Provisions.** Comply with the following provisions to protect the NO_2, SO_2 and PM-10 air quality standards:

    15.1 **Air Quality Boundary:** Establish and maintain the ambient boundaries used in the ambient air compliance demonstration, using the procedures described in Condition 16.

    15.2 **Stack Configuration:**

        a. For EU 16 install and maintain the exhaust stacks with uncapped, vertical outlets. Flapper valves, or similar, are allowed for these units as long as they do not hinder the vertical momentum of the exhaust plume; and

        b. Provide as-built drawings and/or photographs of the exhaust stacks for EU 16 in the initial operating report required under Condition 25.

16. **Public Access Control Management Plan (Access Plan).** Establish and maintain the ambient air boundaries as follows:

    16.1 Comply with the provisions contained in the May 6, 2005 Public Access Control Management Plan, or a subsequent written version approved by the Department that contains at least the following elements:

        a. A topographic map (or maps) that clearly shows the ambient air boundaries, road-ways and permit-related facilities/areas;

        b. Ambient air boundaries that are consistent with the applicable land owner's authorization to preclude public access from the area within the boundaries;

        c. Defined methods of establishing and maintaining the boundary, such as surveillance and the posting of strategically located warning signs (provide size, wording, and inspection/repair schedule);

        d. The date of the Access Plan; and

        e. The procedure for approaching members of the public who have crossed the ambient air boundary.

    16.2 Post and maintain all warning signs described in the approved Access Plan as follows:

        a. post all signs as stated in the Access Plan;

        b. use a font, font size and contrast coloring that makes all lettering easy to read;

        c. inspect and repair the signs according to the schedule described in the Access Plan; and

        d. keep all signs free of nearby visible obstructions.

16.3 Maintain a hard-copy of the approved Access Plan for public access review at the Permittee's Juneau Office and/or electronically on the world-wide-web.

16.4 Do not revise the ambient air boundary without Department approval. If requested by the Department, submit a revised ambient air impact analysis that demonstrates the permitted emission activities will not cause or contribute to ambient air violations when using the proposed boundary.

16.5 Submit all proposed revisions to the ambient boundary and/or Access Plan to the Department's Juneau and Fairbanks Office's. Do not implement any change without written Department approval.

17. **NO_2 Ambient Air Quality Protection.** Protect the NO_2 ambient air quality standard by complying with Conditions 11, 12, and 15.

18. **SO_2 Ambient Air Quality Protection.** Protect the SO_2 ambient air quality standard by complying with Conditions 10 and 15.

19. **PM-10 Ambient Air Quality Protection.** Protect the PM-10 ambient quality standard as follows:

19.1 Comply with Conditions 15 and 29; and

19.2 Limit the maximum design rating of EU 16 to 2,000 pounds per day.

Section 6. General Recordkeeping Requirements

20. **Recordkeeping Requirements.** The Permittee shall keep all records required by this permit for at least five years after the date of collection, including:

    20.1 copies of all reports and certifications submitted pursuant to this section of the permit; and

    20.2 records of all monitoring required by this permit, and information about the monitoring including:

        a. the date, place, and time of sampling or measurements;

        b. the date(s) analyses were performed;

        c. the company or entity that performed the analyses;

        d. the analytical techniques or methods used;

        e. the results of such analyses; and,

        f. the operating conditions as existing at the time of sampling or measurement.

21. **Certification.** The Permittee shall certify any permit application, report, affirmation, or compliance certification submitted to the Department and required under the permit by including the signature of a responsible official for the permitted stationary source following the statement: "Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete." Excess emission reports must be certified, either upon submittal or with an operating report required for the same reporting period. All other reports and other documents must be certified upon submittal.

    21.1 The Department may accept an electronic signature on an electronic application or other electronic record required by the Department if

        a. a certifying authority registered under AS 09.25.510 verifies that the electronic signature is authentic; and

        b. the person providing the electronic signature has made an agreement, with the certifying authority described in Condition 21.1a, that the person accepts or agrees to be bound by an electronic record executed or adopted with that signature.

22. **Information Requests.** The Permittee shall furnish to the Department, within a reasonable time, any information the Department requests in writing to determine whether cause exists to modify, revoke and reissue, or terminate the permit or to determine compliance with the permit. Upon request, the Permittee shall furnish to the Department copies of records required to be kept by the permit. The Department may require the Permittee to furnish copies of those records directly to the federal administrator.

23. **Submittals.** Unless otherwise directed by the Department or this permit, the Permittee shall submit reports, compliance certifications, and/or other submittals required by this permit, via the Department's AOS System at http://dec.alaska.gov/applications/air/airtoolsweb using the Permittee Portal option.

23.1 Upon approval by the Department, the Permittee can submit reports by alternative methods, certified in accordance with Condition 21, and submitted by email under a cover letter using dec.aq.airreports@alaska.gov; or by letter, or form if the Permittee does not have the technical ability to submit the records using the Department's website.

24. **Excess Emissions and Permit Deviation Reports.**

24.1 The Permittee shall report all emissions or operations that exceed or deviate from the requirements of this permit as follows:

a. in accordance with 18 AAC 50.240(c), as soon as possible after the event commenced or is discovered, report

(i) emissions that present a potential threat to human health or safety; and

(ii) excess emissions that the Permittee believes to be unavoidable;

b. in accordance with 18 AAC 50.235(a), within two working days after the event commenced or was discovered, report an unavoidable emergency, malfunction, or non-routine repair that causes emissions in excess of a technology based emission standard;

c. report all other excess emissions and permit deviations

(i) within 30 days of the end of the month in which the emissions or deviation occurs, except as provided in Conditions 24.1c(ii) and 24.1c(iii);

(ii) if a continuous or recurring excess emissions is not corrected within 48 hours of discovery, within 72 hours of discovery unless the Department provides written permission to report under Condition 24.1c(i); and

(iii) for failure to monitor, as required in other applicable conditions of this permit.

24.2 When reporting either excess emissions or permit deviations, the Permittee shall report using either the Department's on-line form, which can be found at http://dec.alaska.gov/applications/air/airtoolsweb or http://dec.alaska.gov/media/6687/sciv-notform-rev-9-27-10.pdf, or if the Permittee prefers, the form contained in Attachment 2 of this permit. The Permittee must provide all information called for by the form that is used.

24.3 If requested by the Department, the Permittee shall provide a more detailed written report as requested to follow up an excess emissions report.

25. **Operating Reports.** The Permittee shall submit to the Department an original and one copy of an operating report by August 1 for the period January 1 to June 30 of the current year, and by February 1 for the period July 1 to December 31 of the previous year.

25.1 The operating report must include all information required to be in operating reports by other conditions of this permit.

25.2 If excess emissions or permit deviations that occurred during the reporting period are not reported under Condition 25.1, either

a. The Permittee shall identify

(i) the date of the deviation;

(ii) the equipment involved;

(iii) the permit condition affected;

(iv) a description of the excess emissions or permit deviation; and

(v) any corrective action or preventive measures taken and the date of such actions; or

b. When excess emissions or permit deviations have already been reported under Condition 24 the Permittee may cite the date or dates of those reports.

25.3 Include in the report any NSPS reports submitted to the EPA for the current operating period.

26. **Periodic Affirmation:**

Each year by February 1st, the Permittee shall submit to the Department an original and one copy of a written affirmation stating:

26.1 Whether the stationary source is still accurately described by the application and minor permit, and

26.2 Whether the owner or operator has made changes that would trigger the requirement for a new permit under 18 AAC 50.

26.3 The Permittee, at their discretion, may submit one copy in electronic format (PDF or other Department compatible image format).

Section 7. Standard Conditions

27. **Good Air Pollution Control Practice.** The Permittee shall do the following for all emission units listed Table 1:

    27.1 perform regular maintenance considering the manufacturer's or the operator's maintenance procedures;

    27.2 keep records of any maintenance that would have a significant effect on emissions; the records may be kept in electronic format; and

    27.3 keep a copy of either the manufacturer's or the operator's maintenance procedures.

28. **Reasonable Precautions to Prevent Fugitive Dust.** The Permittee shall take reasonable precautions to prevent particulate matter from being emitted into the ambient air as follows:

    28.1 Keep records of:

        a. complaints received by the Permittee and complaints received by the Department and conveyed to the Permittee; and

        b. any additional precautions that are taken:

            (i) to address complaints described in Condition 28.1a or to address the results of Department inspections that found potential problems; and

            (ii) to prevent future dust problems.

29. **Stationary Source-Specific Fugitive Dust Requirements.** In addition to the general requirements for controlling fugitive dust, the Permittee shall comply with the following requirements specific to the Kensington Mine Project:

    29.1 Perform a daily inspection of all unpaved roads (Emission Unit 23) for fugitive dust from May 1st through November 30th. If dust is present, and the road is unfrozen, apply water as needed on the roads. Maintain a log of daily inspection and actions to keep dust down. Keep the records for five years as set out by Condition 20;

    29.2 Perform a daily inspection of temporary ore stockpiles and rock storage areas, stack tailings facility, and gravel pits for fugitive dust year round. If dust is present, and the stockpile is unfrozen, apply water as needed on the stockpiles or cover the stockpiles. Maintain a log of daily inspection and actions to keep dust down. Keep the records for five years as set out by Condition 20;

29.3 For the baghouses on EUs 6, 18, 19, and 34:

a. Monitor the pressure drop across each baghouse daily to ensure that it is within the limits recommended by the manufacturer.

b. Inspect each baghouse prior to initial start-up, whenever the pressure drop across the baghouse is not within the limits recommended by the manufacturer, and every 180 days of operation. Replace worn or damaged bags prior to restarting the baghouse or within 72 hours of discovery, whichever occurs later.

c. Maintain maintenance logs detailing pressure drop across baghouse, baghouse inspections and bag replacements. Keep records for five years.

29.4 Use and maintain the enclosures of EUs 3, 4, 18, 32, and 33 to control fugitive dust.

29.5 Use and maintain a fabric filter at outlet on EUs 31 and 60 to control fugitive dust.

30. **Air Pollution Prohibited.** No person may permit 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.

30.1 If emissions present a potential threat to human health or safety, the Permittee shall report any such emissions according to Condition 24.

30.2 As soon as practicable after becoming aware of a complaint that is attributable to emissions from the facility, the Permittee shall investigate the complaint to identify emissions that the Permittee believes have caused or are causing a violation of Condition 30.

30.3 The Permittee shall initiate and complete corrective action necessary to eliminate any violation identified by a complaint or investigation as soon as practicable if:

a. after an investigation because of a complaint or other reason, the Permittee believes that emissions from the facility have caused or are causing a violation of Condition 30; or

b. the Department notifies the Permittee that it has found a violation of Condition 30.

30.4 The Permittee shall keep records of the following:

a. the date, time and nature of all emissions complaints received;

b. the name of the person or persons that complained, if known;

c. a summary of any investigation, including reasons the Permittee does or does not believe the emissions have caused a violation of Condition 30; and

d. any corrective actions taken or planned for complaints attributable to emissions from the facility.

30.5 With each operating report under Condition 25, the Permittee shall include a brief summary report which must include the following:

a. the number of complaints received;

b. the number of times the Permittee or the Department found corrective action necessary;

c. the number of times action was taken on a complaint within 24 hours; and

d. the status of corrective actions the Permittee or Department found necessary that were not taken within 24 hours.

31. The Permittee shall notify the Department of a complaint that is attributable to emissions from the facility within 24 hours after receiving the complaint, unless the Permittee has initiated corrective action within 24 hours of receiving the complaint.

Section 8. Compliance Requirements

32. The Permittee shall allow the Department or an inspector authorized by the Department, upon presentation of credentials and at reasonable times with the consent of the owner or operator to

    32.1 enter upon the premises where a source subject to the permit is located or where records required by the permit are kept;

    32.2 have access to and copy any records required by the permit;

    32.3 inspect any stationary source, equipment, practices, or operations regulated by or referenced in the permit; and

    32.4 sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

Section 9. General Source Test and Monitoring Requirements

33. **Requested Source Tests.** In addition to any source testing explicitly required by this permit, the Permittee shall conduct source testing as requested by the Department to determine compliance with applicable permit requirements.

34. **Test Deadline Extension.** The Permittee may request an extension to a source test deadline established by the Department. The Permittee may delay a source test beyond the original deadline only if the extension is approved in writing by the Department's appropriate division director or designee.

35. **Test Plans.** Except as provided in Condition 40, before conducting any source tests, the Permittee shall submit a plan to the Department. The plan must include the methods and procedures to be used for sampling, testing, and quality assurance, and must specify how the emission unit will operate during the test and how the Permittee will document that operation. The Permittee shall submit a complete plan within 60 days after receiving a request under Condition 33 and at least 30 days before the scheduled date of any test unless the Department agrees in writing to some other time period. Retesting may be done without resubmitting the plan.

36. **Operating Conditions.** Unless otherwise specified by an applicable requirement or test method, the Permittee shall conduct source testing as follows:

    36.1 at a point or points that characterize the actual discharge into the ambient air; and

    36.2 at the maximum rated burning or operating capacity of the source or another rate determined by the Department to characterize the actual discharge into the ambient air.

37. **Excess Air Requirements.** To determine compliance with this permit, standard exhaust gas volumes must include only the volume of gases formed from the theoretical combustion of the fuel, plus the excess air volume normal for the specific source type, corrected to standard conditions (dry gas at 68° F and an absolute pressure of 760 millimeters of mercury).

38. **Test Notification.** Except as provided in Condition 40, at least 10 days before conducting a source test, the Permittee shall give the Department written notice of the date and the time the source test will begin.

39. **Test Reports.** Except as provided in Condition 40, within 60 days after completing a source test, the Permittee shall submit two copies of the results in the format set out in the Source Test Report Outline, adopted by reference in 18 AAC 50.030. The Permittee shall certify the results in the manner set out in Condition 21. If requested in writing by the Department, the Permittee must provide preliminary results in a shorter period than specified by the Department.

40. **Test Exemption.** The Permittee is not required to comply with Conditions 35, 38, and 39 (Test Plans, Test Notification and Test Reports) when exhaust is observed for visible emissions using Method 9.

41. **Particulate Matter Calculations.** In source testing for compliance with the particulate matter standards in Condition 5, the three-hour average is determined using the average of three one-hour test runs.

Section 10. Standard Permit Conditions

42. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 46.14, 18 AAC 50, and, except for those terms or conditions designated in the permit as not federally enforceable, the Clean Air Act, and is grounds for

    42.1 an enforcement action; or

    42.2 permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280.

43. It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.

44. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of the permit.

45. Compliance with permit terms and conditions is considered to be compliance with those requirements that are

    45.1 included and specifically identified in the permit; or

    45.2 determined in writing in the permit to be inapplicable.

46. The permit may be modified, reopened, revoked, and reissued, or terminated for cause. A request by the Permittee for modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

47. The permit does not convey any property rights of any sort, nor any exclusive privilege.

Section 11. Permit Documentation

Date	Document Details
June 27, 2019	Application Received

Section 12. Complaint Form

Complaint Form

Date Time:

Activities Involved:

Provide a description of reported complaint. Attach sheets as necessary.

If applicable, operational conditions which contributed to the complaint:

If applicable, ambient conditions which contributed to the complaint:

If applicable, describe measures taken to immediately address the complaint.

If applicable, describe measures taken to address preventing the condition which generated the complaint.

If applicable, describe any reason that you feel the complaint may not be a violation:

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate and complete.

_____ _____ _____

Printed Name	Signature	Date

Attachment 1 – Visible Emissions Form

VISIBLE EMISSION OBSERVATION FORM

This form is designed to be used in conjunction with EPA Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources." Temporal changes in emission color, plume water droplet content, background color, sky conditions, observer position, etc. should be noted in the comments section adjacent to each minute of readings. Any information not dealt with elsewhere on the form should be noted under additional information. Following are brief descriptions of the type of information that needs to be entered on the form: for a more detailed discussion of each part of the form, refer to "Instructions for Use of Visible Emission Observation Form."

- Source Name: full company name, parent company or division or subsidiary information, if necessary.
- Address: street (not mailing or home office) address of facility where VE observation is being made.
- Phone (Key Contact): number for appropriate contact.
- Source ID Number: number from NEDS, agency file, etc.
- Process Equipment, Operating Mode: brief description of process equipment (include type of facility) and operating rate, % capacity, and/or mode (e.g. charging, tapping, shutdown).
- Control Equipment, Operating Mode: specify type of control device(s) and % utilization, control efficiency.
- Describe Emission Point: for identification purposes, stack or emission point appearance, location, and geometry; and whether emissions are confined (have a specifically designed outlet) or unconfined (fugitive).
- Height Above Ground Level: stack or emission point height relative to ground level; can use engineering drawings, Abney level, or clineometer.
- Height Relative to Observer: indicate height of emission point relative to the observation point.
- Distance from Observer: distance to emission point; can use rangefinder or map.
- Direction from Observer: direction plume is traveling from observer.
- Describe Emissions and Color: include physical characteristics, plume behavior (e.g., looping, lacy, condensing, fumigating, secondary particle formation, distance plume visible, etc.), and color of emissions (gray, brown, white, red, black, etc.). Note color changes in comments section.
- Visible Water Vapor Present?: check "yes" if visible water vapor is present.
- If Present, is Plume…: check "attached" if water droplet plume forms prior to exiting stack, and "detached" if water droplet plume forms after exiting stack.
- Point in Plume at Which Opacity was Determined: describe physical location in plume where readings were made (e.g., 1 ft above stack exit or 10 ft. after dissipation of water plume).
- Describe Plume Background: object plume is read against, include texture and atmospheric conditions (e.g., hazy).
- Background Color: sky blue, gray-white, new leaf green, etc.
- Sky Conditions: indicate cloud cover by percentage or by description (clear, scattered, broken, overcast).
- Wind Speed: record wind speed; can use Beaufort wind scale or hand-held anemometer to estimate.
- Wind Direction From: direction from which wind is blowing; can use compass to estimate to eight points.
- Ambient Temperature: in degrees Fahrenheit or Celsius.
- Wet Bulb Temperature: can be measured using a sling psychrometer
- RH Percent: relative humidity measured using a sling psychrometer; use local US Weather Bureau measurements only if nearby.
- Source Layout Sketch: include wind direction, sun position, associated stacks, roads, and other landmarks to fully identify location of emission point and observer position.
- Draw North Arrow: to determine, point line of sight in direction of emission point, place compass beside circle, and draw in arrow parallel to compass needle.
- Sun's Location: point line of sight in direction of emission point, move pen upright along sun location line, mark location of sun when pen's shadow crosses the observer's position.
- Observation Date: date observations conducted.
- Start Time, End Time: beginning and end times of observation period (e.g., 1635 or 4:35 p.m.).
- Data Set: percent opacity to nearest 5%; enter from left to right starting in left column. Use a second (third, etc.) form, if readings continue beyond 30 minutes. Use dash (-) for readings not made; explain in adjacent comments section.
- Comments: note changing observation conditions, plume characteristics, and/or reasons for missed readings.
- Range of Opacity: note highest and lowest opacity number.
- Observer's Name: print in full.
- Observer's Signature, Date: sign and date after performing VE observation.
- Organization: observer's employer.
- Certified By, Date: name of "smoke school" certifying observer and date of most recent certification.

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY DIVISION - VISIBLE EMISSIONS OBSERVATION FORM

Page No._____

Source Name		Type of Source			Observation Date		Start Time		End Time
Address					Sec / Min	0	15	30	45	Comments
City	State	Zip			1					
Phone # (Key Contact)		Source ID Number			2					
Process Equipment		Operating Mode			3					
Control Equipment		Operating Mode			4					
Describe Emission Point					5					
Height above ground level	Height relative to observer	Inclinometer Reading			6					
Distance From Observer		Direction From Observer Start	End		7					
Describe Emissions & Color Start		End			8					
Visible Water Vapor Present? No	Yes	If yes, determine approximate distance from the stack exit to where the plume was read			9					
Point in Plume at Which Opacity Was Determined					10					
Describe Plume Background		Background Color Start			11					
Start		Start			12					
End		End			13					
Sky Conditions: Start					14					
Wind Speed		Wind Direction From Start	End		15					
Ambient Temperature		Wet Bulb Temp	RH percent		16					
NOTES: 1 Stack or Point Being Read		2 Wind Direction From			17					
3 Observer Location	4 Sun Location	5 North Arrow	6 Other Stacks		18					
					19					
					20					
					21					
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					
					Range of Opacity					
					Minimum			Maximum		
I have received a copy of these opacity observations					Print Observer's Name					
Print Name:					Observer's Signature			Date		
Signature:										
Title		Date			Organization					
					Certified By:			Date		

Attachment 2 - ADEC Notification Form

Excess Emissions and Permit Deviation Reporting
State of Alaska Department of Environmental Conservation
Division of Air Quality

Kensington Mine	AQ0111MSS11
Stationary Source Name	**Air Quality Permit**
Coeur Alaska, Inc.	
Company Name	**Date**

When did you discover the Excess Emissions/Permit Deviation?
Date: _____ / _____ / _____ Time: _____ :/ _____

When did the event/deviation?
Begin Date: _____ / _____ / _____ Time: _____ : _____ (Use 24-hr clock.)
End Date _____ / _____ / _____ Time: _____ : _____ (Use 24-hr clock.)

What was the duration of the event/deviation? ____ : ____ (hrs:min) or _____ days
(total # of hrs, min, or days, if intermittent then include only the duration of the actual emissions/deviation)

Reason for notification: (please check only 1 box and go to the corresponding section)
☐ Excess Emissions Complete Section 1 and Certify
☐ Deviation from permit conditions complete Section 2 and certify
☐ Deviation from COBC, CO, or Settlement Agreement Complete Section 2 and certify

Section 1. Excess Emissions

(a) **Was the exceedance** ☐ Intermittent or ☐ Continuous

(b) **Cause of Event (Check one that applies):**

☐ Start Up/Shut Down ☐ Natural Cause (weather/earthquake/flood)
☐ Control Equipment Failure ☐ Scheduled Maintenance/Equipment Adjustments
☐ Bad fuel/coal/gas ☐ Upset Condition ☐ Other

(c) **Description**

Describe briefly, what happened and the cause. Include the parameters/operating conditions exceeded, limits, monitoring data and exceedance.

(d) **Emission unit(s) Involved:**

Identify the emission units involved in the event, using the same identification number and name as in the permit. Identify each emission standard potentially exceeded during the event and the exceedance.

EU	EU Name	Permit Condition Exceeded/Limit/Potential Exceedance

(e) **Type of Incident** (please check only one):

☐ Opacity %	☐ Venting (gas/scf)	☐ Control Equipment Down
☐ Fugitive Emissions	☐ Emission Limit Exceeded	☐ Record Keeping Failure
☐ Marine Vessel Opacity	☐ Failure to monitor/report	☐ Flaring
☐ Other:		

(f) **Unavoidable Emissions:**

Do you intend to assert that these excess emissions were unavoidable?	☐ YES	☐ NO
Do you intend to assert the affirmative defense of 18 AAC 50.235?	☐ YES	☐ NO

Certify Report (go to end of form)

Section 2. Permit Deviations

(a) **Permit Deviation Type** (check only one box corresponding with the section in the permit)
☐ Emission Unit Specific
☐ General Source Test/Monitoring Requirements
☐ Recordkeeping/Reporting/Compliance Certification
☐ Standard Conditions Not Included in Permit
☐ Generally Applicable Requirements
☐ Reporting/Monitoring for Diesel Engines
☐ Insignificant Emission Unit
☐ Stationary Source-Wide
☐ Other Section: (title of section and section # of your permit)

(b) **Emission unit(s) Involved:**
Identify the emission unit involved in the event, using the same identification number and name as in the permit. List the corresponding Permit condition and the deviation.

EU	Emission Unit Name	Permit Condition /Potential Deviation

(c) **Description of Potential Deviation:**
Describe briefly, what happened and the cause. Include the parameters/operating conditions and the potential deviation.

(d) **Corrective Actions:**
Describe actions taken to correct the deviation or potential deviation and to prevent future recurrence.

Certification:
Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.

Printed Name: _____ Title: _____ Date: _____

Signature: _____ Phone Number: _____

NOTE: *This document must be certified in accordance with 18 AAC 50.345(j)*

To submit this report:

1. Department's Air Online Services using the Permittee Portal option:
   http://dec.alaska.gov/applications/air/airtoolsweb
   If submitted online, report must be submitted by an authorized E-Signer for the stationary source.

Or

2. Fax to: 907-451-2187

Or

3. Email to: DEC.AQ.Airreports@alaska.gov

Or

4. Mail to: ADEC
   Air Permits Program
   610 University Avenue
   Fairbanks, AK 99709-3643

Or

5. Phone Notifications: 907-451-5173
   Phone notifications require a written follow-up report.

Technical Analysis Report
for the terms and conditions of
Permit AQ0111MSS11

Issued to:

Coeur Alaska, Inc.

for the:

Kensington Mine

Alaska Department of Environmental Conservation
Air Permits Program

Prepared by Grace Petersen

Reviewed by Aaron Simpson

Final – October 17, 2019

1. INTRODUCTION

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Permit AQ0111MSS11, Revision 1 to Coeur Alaska, Inc. (Coeur) for the Kensington Mine. Their application is classified under 18 AAC 50.508(6) due to their request to revise terms or conditions previously established in a Title I Permit. This minor permit incorporates changes requested by Coeur and rescinds Minor Permit AQ0111MSS10.

2. STATIONARY SOURCE DESCRIPTION

The Kensington Mine, an existing stationary source, is an underground gold mine and surface ore processing facility located in the Berners Bay Mining District approximately 45 miles northwest of Juneau. The project consists of blasting, ore and waste rock handling, waste rock and tailings disposal, truck loading/unloading, haul roads, etc. The emissions unit (EU) inventory consists of diesel-electric generator sets, fuel tanks, distillate-fired heaters and a solid waste incinerator. Coeur currently operates under Minor Permit AQ0111MSS10.

3. APPLICATION DESCRIPTION

Coeur submitted their application on June 27, 2019. The requested changes are as follows:

- Add a "black start" diesel-fired generator with limited operation hours
- Increase hours of operation for the Camp Facility 45 kilowatt (kW) Emergency Generator (EU 52)
- Remove the Tailings Treatment Facility (TTF) 500 kW Emergency Generator from the permit as a stationary unit

4. CLASSIFICATION FINDINGS

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

1. This project is classified under 18 AAC 50.508(6) because Coeur requested revisions to Minor Permit AQ0111MSS10.
2. Minor Permit AQ0111MSS011 did not trigger permitting under 18 AAC 50.502(c)(3) or 502(c)(4) because the changes in emissions were below the applicable permitting thresholds, as shown in Table 5.

5. APPLICATION REVIEW FINDINGS

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

1. Coeur's application for a minor permit for the Kensington Mine contains the elements listed in 18 AAC 50.540.
2. Coeur's application requested that the Department provide additional details on the fugitive emission calculations from AQ0111MSS10 so that Coeur's emissions may be aligned with the Department's calculations. See Appendix A, Table 6 – Fugitive Total PM Calculations.

3. Coeur requested the removal of EU IDs 7a through 12c. These emission units were retained in AQ0111MSS10 to allow Coeur to continue operating them until the commissioning of EU IDs 54 through 57. The Department imposed requirements to prohibit concurrent operation of the two sets of engines, and require EU IDs 7a through 12c to be decommissioned upon start-up of 54 through 57. Coeur satisfied the decommissioning requirements, therefore the Department removed EUs 7a through 12c from AQ0111MS11.

6. DEPARTMENT FINDINGS

1. The Department included periodic NOx source testing requirements on the diesel generators, EUs 54 through 57 to ensure compliance with the NOx Title V avoidance ORL. If combined emissions from EUs 54 through 57 exceed 90 percent of the limit in Condition 11.1 and a source test has not been performed in the previous 5 years, a new source test on two of the engines will be required.
2. The Department included a nonroad engine log for EU 51 as required by Condition 14 in order for compliance staff to ensure the engine maintains its nonroad engine status under 40 C.F.R. 89.2.

7. EMISSIONS SUMMARY AND PERMIT APPLICABILITY

Table 3 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 3 below.

Table 3 – Emissions Summary and Permit Applicability, tons per year (tpy)

Parameter	NO_X	CO	VOC	PM	PM-2.5	PM-10	SO_2
PTE before Modification[a]	91.2	32.0	13.0	39.8	13.7	16.6	4.6
PTE after Modification	89.9	32.8	13.0	48.0	16.0	24.8	4.6
Change in PTE	-1.3	0.8	0	8.2	2.3	8.2	0
18 AAC 50.502(c)(3) Permit Thresholds [b]	10	N/A	N/A	N/A	10	10	N/A
502(c)(3) Applicable?	No	N/A	N/A	N/A	No	No	N/A
18 AAC 50.502(c)(4) Permit Thresholds [b]	N/A	N/A	N/A	N/A	N/A	N/A	40
502(c)(3) Applicable?	N/A	N/A	N/A	N/A	N/A	N/A	No
Title V Permit Thresholds	100	100	100	N/A	100	100	100
Title V Permit Required?	No	No	No	N/A	No	No	No
Fugitive Emissions	8.8	43.7	0	162.2	13.5	90.2	1.0
Assessable Emissions [c] [d]	99	77	13	210	N/A	N/A	0
Total Assessable		399					

Table Notes:

[a] – PTE before modification is from the Technical Analysis Report for Permit AQ0111MSS10

[b] – The thresholds in 18 AAC 50.502(c)(4) applies if source PTE currently not greater than 18 AAC 50.502(c)(1) threshold for that pollutant, otherwise 18 AAC 50.502(c)(3) applies.

[c] – Assessable emissions include fugitive emissions. PM-10 and PM-2.5 are included in PM assessable emissions.

[d] – Assessable emissions include any pollutant greater than or equal to 10 tpy.

8. REVISIONS TO PERMIT CONDITIONS

Table 4 below lists the requirements carried over from Minor Permit AQ0111MSS10 into Minor Permit No. AQ0111MSS11.

Table 4 – Comparison of AQ0111MSS11 to AQ0111MSS10 Conditions[6]

Permit No. AQ0111MSS11 Condition No.	Description of Requirement	Permit AQ0111MSS10 Condition No.	How Condition was Revised
1	Emission Unit Inventory	1	Removed EUs 7a, 8a, 9a, 10a, 11a, 12b, 12c, and 51. Added EU 65 to Table 1, removed Condition 1.1
3	Assessable Emission	3	Updated to reflect new assessable emissions, including fugitive emissions.
4	Assessable Emission Estimates	4	Updated submittal language to include the online Permittee Portal option
5	Visible Emissions State Standards	5	Removed EUs 7a, 8a, 9a, 10a, 11a, 12b, 12c and 51. Added EU 65.
6	PM State Emission Standards	6	Removed EUs 7a, 8a, 9a, 10a, 11a, 12b, 12c and 51. Added EU 65.
8	Sulfur State Emission Standard	8	Removed EUs 7a, 8a, 9a, 10a, 11a, 12b, 12c and 51. Added EU 65.
11	ORL SO_2 limit	11	Removed EUs 7a, 8a, 9a, 10a, 11a, 12b, 12c and 51. Added EU 65.
12	ORL NOx limit	12	Removed EUs 7a, 8a, 9a, 10a, 11a, 12b, 12c and 51. Added EU 65. Revised the NOx limit to 89.9 tons per twelve-month rolling period.
12.2	ORL NOx limit	12.2	Added EU 52 and 65
-	ORL NOx operation limit	12.2(b)	Removed the condition limiting EU 52 to 100 hours in a 12-month rolling period. EU 52 was added to Condition 12.2.
12.2(d) - Table 2	NOx Emission Factors for Generators	12.2(d) - Table 2	Removed EUs 7a through 12c.
13	SCR Requirements	13	Removed EUs 7a through 12c.
-	SCR Requirements	13.1	Removed the commissioning allowance for 72 hours of operation for EUs 54 through 57 without SCR activated.
13.4	SCR NOx Emission Testing and Sampling	13.5	Added periodic source testing requirement if 90% of the NOx limit for EUs 54 through 57 is exceeded.
15	Nonroad Engine Log	15	Removed condition to require decommissioning of EU IDs 7a through 12c. Replaced Condition 15 with requirements for a nonroad engine log for EU 51.
16.2 & 16.3	Ambient Air Quality Provisions	-	Removed Concurrent Operation limitations and reporting, EUs 7a through 12c

[6] This table does not include all standard and general conditions.

24	Submittals	24	Updated submittal language to include the online Permittee Portal option.
25.2	Excess Emission and Permit Deviation Reporting	25.2	Updated language to include an on-line form.

Included a list of Abbreviations and Acronyms

9. PERMIT CONDITIONS

The bases for the conditions imposed in Minor Permit AQ0111MSS10 are described below.

Cover Page

18 AAC 50.544(a)(1) requires the Department to identify the stationary source, Permittee, and contact information.

Section 1: Emissions Unit Inventory

The EUs authorized and/or restricted by this permit are listed in The Permittee is authorized to install, modify, and operate the emission units listed in Table 1 in accordance with the terms and conditions of this permit. Emission units listed in Table 1 have specific monitoring, record keeping, or reporting conditions in this permit. Except as noted elsewhere in the permit, the information in Table 1 is for information purposes only. The specific unit descriptions do not restrict the Permittee from replacing an emission unit identified in Table 1. The Permittee shall comply with all applicable provisions of AS 46.14 and 18 AAC 50 when installing a replacement emission unit, including any applicable minor or construction permit requirements.

of the permit. Unless otherwise noted in the permit, the information in The Permittee is authorized to install, modify, and operate the emission units listed in Table 1 in accordance with the terms and conditions of this permit. Emission units listed in Table 1 have specific monitoring, record keeping, or reporting conditions in this permit. Except as noted elsewhere in the permit, the information in Table 1 is for information purposes only. The specific unit descriptions do not restrict the Permittee from replacing an emission unit identified in Table 1. The Permittee shall comply with all applicable provisions of AS 46.14 and 18 AAC 50 when installing a replacement emission unit, including any applicable minor or construction permit requirements.

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: Emission Fees

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 I language for Minor Permit AQ0111MSS09. However, the Department included a web address for submitting emission estimates through the Air Online Services (AOS) System. The Department also updated its mailing/delivery addresses. The Department is in the process of incorporating these updates into SPC I.

Section 3: State Emission Standards

Condition 4: 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).

The Department has included monitoring, recordkeeping, and reporting requirements to ensure continued compliance with the VE standards. Diesel fired engines and rock crushers have the tendency to exceed the VE standards. As such, the Department has included a requirement to perform initial Method 9 testing for EUs 50 through 56, and ongoing Method 9 testing for EUs 35 through 46. The monitoring, recordkeeping and reporting requirements in Conditions 4.2, 4.3 and 4.3d demonstrate continued compliance with the standard.

Condition 5: 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. 20 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. The Department has included an initial compliance demonstration for those opacity limits under Condition 4.

Condition 7: 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).

Calculation show that fuel oil with sulfur content less than 0.74 percent by weight will comply with the state emissions standard.

Diesel fuel grades that requires less than 0.5 percent fuel sulfur will meet the state emissions standard.

Condition 8: Incinerator Visible Emissions

Visibility through the exhaust effluent of an incinerator, including an air curtain incinerator, may not be more than 20 percent averaged over any six consecutive minutes, under 18 AAC 50.055(a)(1).

Section 4: Owner Requested Limits (ORLs) to Avoid Title V and PSD Classification

Conditions 10 through 13: SO_2 and NOx Limits

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.

The permit contains ORLs restricting the sulfur content of fuel, requiring the use of selective catalytic reduction controls, and limiting hours of operation to avoid a PSD permit under 18

AAC 50.306 and a Title V permit under 18 AAC 50.326. EU 51 was removed from these conditions. EUs 52 and 65 was added to these conditions with a 500 hour annual operating limit.

These conditions includes both a ton per year limit and an operational limit consistent with EPA policy on limiting PTE.

Condition 14: Nonroad Engines

The permit contains a requirement to maintain a nonroad engine log for EU 51 to ensure that it maintains its status as a nonroad engine under 40 C.F.R. 89.2.

Section 5: Ambient Air Quality Protection Requirements

Conditions 15 - 19, 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 NO_2, SO_2 and PM-10 AAAQS for the reasons described in Appendix B of the TAR of AQ0111MSS01.

Section 6: General Recordkeeping, Reporting, and Certification Requirements

Condition 20, 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 an evidence of compliance with this requirement.

Condition 21, Certification

18 AAC 50.205 requires the Permittee to certify any permit application, report, affirmation, or compliance certification submitted to the Department. This requirement is reiterated as a standard permit condition in 18 AAC 50.345(j). Minor Permit AQ0111MSS10 uses the standard condition language, but also expands it by allowing the Permittee to provide electronic signatures.

Condition 22, 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 AQ0111MSS10.

Condition 23, Submittals

Condition 23 clarifies where the Permittee should send their reports, certifications, and other submittals required by the permit. The Department included this condition from a practical perspective rather than a regulatory obligation.

Condition 24, Excess Emission and Permit Deviation Reports

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 Standard Condition III language, adopted under 18 AAC 50.346(b)(2), but with updated web-links.

Condition 25, Operating Reports

The Department mostly used the Standard Operating Permit Condition VII language adopted under 18 AAC 50.346(b)(6) 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 26, Periodic Affirmation

The Permittee shall submit to the Department by March 31 of each year an affirmation certified according to Condition 26 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.

Section 7 and Section 8: Standard Permit Conditions

Conditions 27 - 32, 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 AQ0111MSS10. The Department incorporated these standard conditions as follows:

- 18 AAC 50.345(c)(1) and (2) is incorporated as Condition 44 of Section 10 (Standard Permit Conditions);
- 18 AAC 50.345(d) through (h) is incorporated as Conditions 43 through 47 of Section 10 (Standard Permit Conditions) and Condition 32 of Section 8, respectively;
- As previously discussed, 18 AAC 50.345(i) is incorporated as Condition 22 and 18 AAC 50.345(j) is incorporated as Condition 21 of Section 6 (General Recordkeeping Requirements); and
- 18 AAC 50.345(k) through (o) is incorporated as Conditions 33 through 39 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 36 requires the Permittee to conduct their source tests under conditions that reflects the actual discharge to ambient air; and
- Condition 35 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.

Condition 30, 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 9 reiterates this prohibition as a permit condition. The Department used the Standard Permit Condition II language, adopted under 18 AAC 50.346(a), for Minor Permit AQ0111MSS10.

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 5 – Emissions Summary, in Tons Per Year (TPY)

EU ID	Operating Limits		Maximum Rating or Capacity		NO_X EF Units	NO_X		VOC and PM-2.5 /PM-10 Emission Factor Units	VOC		PM-10		PM-2.5		SO_2
						EF	PTE (tpy)		EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE[8] (tpy)
1	8760	hr/yr	500,000	gal/yr	lb/gal	.013	3.25	lb/gal	.001	0.25	.0007	0.175	.0007	0.175	4.5E-3
3	8760	hr/yr	730,000	tons/yr	-	-	0	lb/ton	-	0	.00008	2.8E-4	.0002	4.14E-5	0
4a	8760	hr/yr	730,000	tons/yr	-	-	0	lb/ton	-	0	0.009	3.29E-2	.00135	4.93E-3	0
6	8760	hr/yr	730,000	tons/yr	-	-	0	lb/ton	-	0	1.15E-4	4.20E-3	1.74E-5	6.35E-7	0
14a	8760	hr/yr	12	kW-e	g/kW-hr	6.91	0.80	g/kW-hr	0.59	0.068	0.8	0.093	0.8	0.093	.0019
15b	500	hr/yr	1640 (1800 rpm)	kW-e	g/hp-hr	5.7	6.91	g/hp-hr	0.45	0.55	0.11	0.133	0.11	0.133	.0035
16	4380	hr/yr	2000	lb/day	lb/ton	3.16	0.14	lb/hr	0	0	1	2.19	1	2.19	4.16
17a	-	-	30000	Gal	-	-	0	-	-	0.013	-	-	-	-	-
18	8760	hr/yr	467	tons/yr	-	-	0	lb/ton	-	0	0.626	0.019	0.493	0.004	0
19	8760	hr/yr	1401	tons/yr	-	-	0	lb/ton	-	0	0.16	0.011	0.16	0.011	0
21	8760	hr/yr	2190	blasts/yr	lb/ton	17.5	8.753	lb/blast	-	0	4.508	3.46	0.260	0.199	1.008
22	8760	hr/yr	2685	tons/day	-	-	0	lb/ton	-	0	-	0.0797	-	0.009	0
23	8760	hr/yr	-	-	-	-	0	lb/vmt	-	0	-	30.577	-	3.061	0
24	8760	hr/yr	250000	tons/yr	-	-	0	-	-	0	.00013	0.0166	.00002	0.0025	0
25	500	hr/yr	165	hp	g/hp-hr	4.1005	0.37	g/hp-hr	0.0907	0.008	0.2223	0.020	0.2223	0.020	4.55E-4
31	8760	hr/yr	38388	tons/yr	-	-	0	lb/ton	-	0	.00034	0.007	.00034	0.007	0
32	8760	hr/yr	38388	tons/yr	-	-	0	lb/ton	-	0	0.0055	0.106	.00083	0.016	0

EU ID	Operating Limits		Maximum Rating or Capacity		NO_X EF Units	NO_X		VOC and PM-2.5 /PM-10 Emission Factor Units	VOC		PM-10		PM-2.5		SO_2
						EF	PTE (tpy)		EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE[8] (tpy)
33	8760	hr/yr	730000	tons/yr	-	-	0	lb/ton	-	0	0.0294	0.113	.00441	0.0169	0
34	8760	hr/yr	1401	tons/yr	-	-	0	gr/scf	-	0	0.0025	0.310	0.0025	0.310	0
35	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	0.0090	0.99	0.0014	0.15	0
36	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	0.0040	0.44	0.0006	0.07	0
37	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	0.0040	0.44	0.0006	0.07	0
38	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	.00019	0.208	.00003	0.03	0
39	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	.00019	0.21	.00003	0.03	0
40	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	.00019	0.21	.00003	0.03	0
41	8760	hr/yr	250	tons/hr	-	-	0	lb/ton	-	0	.00019	0.21	.00003	0.03	0
42	8760	hr/yr	415	hp	g/hp-hr	2.8	11.22	g/hp-hr	0.2	0.8	0.15	0.6	0.15	0.6	0.02
43	8760	hr/yr	182	hp	g/hp-hr	4.5	7.91	g/hp-hr	0.4	0.7	0.22	0.39	0.22	0.39	0.01
44	8760	hr/yr	87	Hp	lb/hr	2.67	11.69	lb/hr	0.14	0.613	0.021	0.092	0.021	0.092	0.0066
45	8760	hr/yr	400	tons/hr	-	-	0	lb/ton	-	0	.00019	0.021	.00003	0.0032	0
46	8760	hr/yr	400	tons/hr	-	-	0	lb/ton	-	0	0.0090	0.990	0.0014	0.1485	0
47	8760	hr/yr	400	tons/hr	-	-	0	lb/ton	-	0	0.0040	0.440	0.0006	0.0660	0
48	8760	hr/yr	400	tons/hr	-	-	0	lb/ton	-	0	0.0040	4.400	0.0006	0.6600	0
49	8760	hr/yr	400	tons/hr	-	-	0	lb/ton	-	0	.00019	0.209	.00003	0.0316	0
50	8760	hr/yr	287	kW	g/hp-hr	1.342	4.989	g/hp-hr	0.045	0.17	0.0015	0.006	0.0015	0.006	0.019
52	500	hr/yr	45	kW	g/hp-hr	3.36	0.112	g/hp-hr	0.15	0.005	0.30	0.010	0.30	0.010	2.24E-4
53	-	-	10000	gal	-	-	0	-	-	0.004	-	0	-	0	0
54	8760	hr/yr	4101	kW	g/kW-hr	0.61	72.47	g/kW-hr	0.1	11.88	0.09	10.69	0.09	10.69	0.37
55	8760	hr/yr	4101	kW	g/kW-hr	0.61		g/kW-hr	0.1		0.09		0.09		
56	8760	hr/yr	4101	kW	g/kW-hr	0.61		g/kW-hr	0.1		0.09		0.09		
57	8760	hr/yr	4101	kW	g/kW-hr	0.61		g/kW-hr	0.1		0.09		0.09		
58	8760	hr/yr	250	tons/day	-	-	0	lb/ton	-	0	0.0021	0.095	0.00032	0.014	0

EU ID	Operating Limits		Maximum Rating or Capacity		NO_X EF Units	NO_X		VOC and PM-2.5 /PM-10 Emission Factor Units	VOC		PM-10		PM-2.5		SO_2
						EF	PTE (tpy)		EF	PTE (tpy)	EF	PTE (tpy)	EF	PTE (tpy)	PTE[8] (tpy)
59	8760	hr/yr	500	tons/day	-	-	0	lb/ton	-	0	0.0006	0.057	0.00009	0.009	0
60	8760	hr/yr	60	tons/day	-	-	0	lb/ton	-	0	4.7E-5	0.001	4.7E-5	0.001	0
61	8760	hr/yr	750	tons/day	-	-	0	lb/ton	-	0	0.0028	0.383	0.00042	0.057	0
62	8760	hr/yr	250	tons/day	-	-	0	lb/ton	-	0	0.011	0.503	0.0061	0.277	0
63	8760	hr/yr	500	tons/day	-	-	0	lb/ton	-	0	0.0097	0.886	0.0059	0.536	0
64	8760	hr/yr	60	tons/day	-	-	0	lb/ton	-	0	0.0139	0.152	0.0065	0.071	0
65	500	hr/yr	400	kW	g/hp-hr	2.78	0.822	g/hp-hr	0.20	0.06	0.15	0.044	0.15	0.044	0.002

Table 6 – Fugitive Emission Calculations

Fugitive Total PM Calculations - MSS11

KEN ID	Materials Handling/Stockpiles	Throughput	U	M	k	Escape	Control	E	TPY	Reference
1.3	Ore/Waste Loading	980000	2.6	5	0.74	0.7	-	0.000281	0.096242	1
1.4	Ore Chute	146183	2.6	5	0.74	0.7	-	0.000281	0.014356	1
3.2	Transfer to Development Rock Stockpile	250000	2.6	5	0.74	1	-	0.000281	0.035074	1
1.6	U/G Cement Silo Loading	38388	-	-	-	-	-	0.000990	0.019002	2
1.7	U/G Cement Transfer to Mixer	38388	-	-	-	-	-	0.018400	0.35317	2
5.3a	Lime Loading/Discharge	467	-	-	-	-	99	0.730000	0.001705	2
5.3b	Lime Loading/Discharge	467	-	-	-	-	50	0.572000	0.066781	2
KEN ID	**Ore Handling/Processing**	**Throughput**	**U**	**M**	**k**	**Control**	**Enclosure**	**E**	**TPY**	**Reference**
2.3	Transfer to Feed Hopper	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.4	Grizzly to Jaw Crusher	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.5	Jaw Crusher	730,000	-	-	-	0	99	0.02	7.30E-02	3
2.6	Jaw Crusher to Discharge Conveyor	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.7	Discharge Conveyor to Double Deck Screen	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.8	Double Deck Screen to Belt	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.9	Belt to Cone Crusher	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.10	Cone Crusher	730,000	-	-	-	0	99	0.02	7.30E-02	3
2.11	Cone Crusher to Discharge Conveyor	730,000	1	5	0.74	0	99	8.102E-05	2.96E-04	1
2.12	Screened Product Conveyor to Crushed Ore Silo	730,000	1	5	0.74	99	99	8.102E-05	2.96E-06	1
2.13	Screened Product Conveyor to Crushed Matl Stkpl	730,000	1	5	0.74	56.7	0	8.102E-05	1.28E-02	1
2.14	Crushed Ore Silo to Belt	730,000	1	5	0.74	99	99	8.102E-05	2.96E-06	1
2.15	Belt to Ball Mill Feed Conveyor	730,000	1	5	0.74	99	99	8.102E-05	2.96E-06	1
2.16	Portable Jaw Crusher System	2,190,000	-	-	-	90	0	0.02	2.19E+00	3
2.17	Portable Screen	2,190,000	-	-	-	90	0	0.01	1.10E+00	3
2.18	Portable Screen	2,190,000	-	-	-	90	0	0.01	1.10E+00	3
2.19	Belt Conveyor Transfer	2,190,000	2.6	4	0.74	-	-	0.0003835	4.20E-01	1
2.20	Belt Conveyor Transfer	2,190,000	2.6	4	0.74	-	-	0.0003835	4.20E-01	1
2.21	Belt Conveyor Transfer	2,190,000	2.6	4	0.74	-	-	0.0003835	4.20E-01	1
2.22	Belt Conveyor Transfer	2,190,000	2.6	4	0.74	-	-	0.0003835	4.20E-01	1
2.23	Transfer of Material into Hopper	2,200,000	2.6	4	0.74	-	90	0.0003835	4.22E-02	1
2.24	Atlas PC3 Impact Cone Crusher	2,200,000	-	-	-	-	90	0.02	2.20E+00	3
2.25	Atlas HS1 Powercrusher Screen	2,200,000	-	-	-	-	90	0.01	1.10E+00	3
2.26	Portable Screen	2,200,000	-	-	-	-	0	0.01	1.10E+01	3
2.27	Belt Conveyor Transfer	2,200,000	2.6	4	0.74	-	0	0.0003835	4.22E-01	1
5.4	Laboratory Crusher	1,401	-	-	-	90	0	2.7	1.89E-01	3
KEN ID	**Road Emissions**	**Ann VMT**	**Silt**	**W**	**k**	**a**	**Control**	**E**	**TPY**	**Reference**
2.1	Coarse Ore Haul to Stockpile	876	7.5	66.35	4.9	0.7	0	8.0558881	3.528479	4
2.2	FEL Travel Stockpile to Feed Hopper	8109	7.5	29.7	4.9	0.7	0	5.610808	22.74902	4
3.1	Development Rock Haul to Stockpile	375	7.5	66.35	4.9	0.7	0	8.0558881	1.510479	4
3.3	Development Rock Stockpile Dozer	7300	7.5	20	4.9	0.7	0	4.6962208	17.14121	4
5.7	Bus Travel	20914.5	5.8	14.5	4.9	0.7	50	1.6971777	17.74781	4
5.8	Cement Transport Truck Travel	29338	5.8	18	4.9	0.7	50	1.8706147	27.44005	4
5.9	Supply Truck Travel	16731.6	5.8	30	4.9	0.7	50	2.3540533	19.69354	4
5.10	Grader Travel	4800	5.8	18	4.9	0.7	50	1.8706147	4.489475	4
KEN ID	**Drilling**	**Throughput**				**Escape**		**E**	**TPY**	**Reference**
1.1	Wet Drilling	980000				0.7		0.00008	0.02744	5
KEN ID	**Blasting**	**Blast Area**	**Blast/Yr**			**Escape**		**E**	**TPY**	**Reference**
1.2	Blasting	7265	2190			0.7		8.6692487	6.644979	6
							FUGITIVE PM PTE:		**142.73**	
	REFERENCES:						**COMBUSTION PM10:**		**16.984**	
	Note: When AP-42 factors for total PM not given, largest available PM diameter used as surrogate.						**TOTAL:**		**159.72**	
	1. AP-42 13.2.4 (PM-30)									
	2. AP-42 11.12-2 (Total PM)									
	3. AP-42 11.24-2 (PM)									
	4. AP-42 13.2.2 (PM-30)	Equations (1a) and (2)								
	5. AP-42 11.19.2 (PM-10)									
	6. AP-42 11.9-1 (PM-30)									