Jennifer Campbell, Acting Associate Vice Chancellor

(907) 474-6265

(907) 474-7284 fax

jlcampbell@alaska.edu

www.uaf.edu/fs

803 Alumni Drive, PO Box 757380, Fairbanks, Alaska 99775-7380

August 31, 2020

VIA CERTIFIED MAIL 7018 1130 0002 0650 4963

Air Permit Program Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501

Subject: Title I Application to Revise Air Quality Control Permit No. AQ0316MSS05 for the University of Alaska Fairbanks Campus Stationary Source per Fairbanks $PM_{2.5}$ Serious SIP

Dear Compliance Technician:

The University of Alaska Fairbanks (UAF) respectfully submits the enclosed Title I air quality permit application for the University of Alaska Fairbanks Campus stationary source to establish permit conditions as required by the Fairbanks $PM_{2.5}$ Serious State Implementation Plan (Serious SIP), adopted November 19, 2019 by the Alaska Department of Environmental Conservation (ADEC). UAF requests that ADEC issue a separate Title I air quality permit which revises Air Quality Minor Permit No. AQ0316MSS05 by incorporating the applicable SIP limits and SIP Best Available Control Technology (BACT) limits as requested in the permit application. This application is being submitted in accordance with 18 Alaska Administrative Code, Chapter 50 (18 AAC 50) section 50.508(6) and as required by the Serious SIP.

If you have any questions or need additional information, please contact Russ Steiger at 907-474-5812 or by email at rhsteiger@alaska.edu.

"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."

Sincerely,

DocuSigned by:
Jennifer Campbell
915F516DEE9D481
Jennifer Campbell
Acting Associate Vice Chancellor for Facilities Services

Enclosure

cc: R. Steiger, UAF
C. Kimball, SLR

Request to Revise Title I Air Quality Minor Permit No. AQ0316MSS05

University of Alaska Fairbanks Campus

August 2020

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Request to Revise Title I Air Quality Minor Permit No. AQ0316MSS05

Prepared for:
University of Alaska Fairbanks
P.O. Box 751845
Fairbanks, Alaska 99775

Prepared by:
SLR International Corporation
543 3rd Ave,
Suite 235
Fairbanks, Alaska 99701

August 2020

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Required Elements for Minor Permit Application under 18 AAC 50.508(6)

The following table provides a summary of the required elements for a minor permit establishing for revising or rescinding permit conditions under 18 AAC 50.508(6).

Minor Permit Application Elements

Regulatory Citation	Requirement	Location
18 AAC 50.540(b)	General Information	SSID Form
18 AAC 50.540(k)(1)	Copy of Title I permit	Attachment C
18 AAC 50.540(k)(2)	Explanation of why permit term or condition should be revised or rescinded	Attachment A
18 AAC 50.540(k)(3)	Effect of revising or revoking the permit term or condition on emissions, other permit terms, the underlying ambient demonstration, and compliance monitoring	Attachments A and B
18 AAC 50.540(k)(4)	For a condition that allows an owner or operator to avoid a permit classification, the information required of an applicant for that type of permit, unless the revised condition would also allow the owner or operator to avoid the classification.	Attachment A

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Alaska Department of Environmental Conservation
Air Quality Minor Permit Application

STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Name: University of Alaska Fairbanks Campus			SIC: 8221
Project Name (if different): Serious $PM_{2.5}$ SIP Requirements	Contact: Russ Steiger		
Physical Address:802 Alumni Drive	City: Fairbanks	State: AK	Zip: 99775
	Telephone (907) 474-5812		
	E-Mail Address: rsteiger@alaska.edu		
UTM Coordinates (m) or Latitude/Longitude:	Northing:	Easting:	Zone:
	Latitude: 64° 51' North	Longitude: 147° 51' West	

Section 2 Legal Owner

Name: University of Alaska		
Mailing Address: P.O. Box 757920		
City: Fairbanks	State: AK	Zip: 99775
Telephone #:(907) 474-7351		
E-Mail Address:		

Section 3 Operator *(if different from owner)*

Name:		
Mailing Address:		
City:	State:	Zip:
Telephone #:		
E-Mail Address:		

Section 4 Designated Agent *(for service of process)*

Name: Jennifer Campbell		
Mailing Address: P.O. Box 757380		
City: Fairbanks	State: AK	Zip:99775
Telephone #: (907) 474-6265		
E-Mail Address: jlcampbell@alaska.edu		

Section 5 Billing Contact Person *(if different from owner)*

Name: Accounts Payable, Administrative Service Center		
Mailing Address: P.O. Box 757920		
City: Fairbanks	State: AK	Zip: 99775
Telephone #:		
E-Mail Address:		

Section 6 Application Contact

Name: Russ Steiger			
Mailing Address: P.O. Box 751845	City: Fairbanks	State: AK	Zip: 99775
	Telephone: (907) 474-5812		
	E-Mail Address: rsteiger@alaska.edu		

Section 7 Desired Process Method *(Check only one – see 18 AAC 50.542(a) for process descriptions and restrictions)*

☐ Fast track for a permit classification under 18 AAC 50.502 [18 AAC 50.542(b)]

☒ Public comment [18 AAC 50.542(d)]

Section 8 Source Classification(s) *(Check all that apply)*

[18 AAC 50.502(b)]

- ☐ Asphalt Plant [≥ 5 ton per hour]
- ☐ Thermal Soil Remediation Unit [≥ 5 ton per hour]
- ☐ Rock Crusher [≥ 5 ton per hour]
- ☐ Incinerator(s) [total rated capacity ≥ 1000 lb/hour]
- ☐ Coal Preparation Plant
- ☐ Port of Anchorage Facility

If you checked any of the above, is (are) the emission unit(s) ☐ new, ☐ relocated*, or ☐ existing?

[18 AAC 50.502(c)(1)]

New or relocated* stationary source with potential emissions greater than:

- ☐ 40 tons per year (tpy) NOx
- ☐ 40 tpy SO_2
- ☐ 15 tpy PM-10
- ☐ 10 tpy PM-2.5
- ☐ 0.6 tpy lead
- ☐ 100 tpy CO in a nonattainment area

[18 AAC 50.502(c)(2)]

Construction or relocation* of a:

- ☐ Portable oil and gas operation
- ☐ ≥ 10 MMBtu/hr fuel burning equipment in a SO_2 special protection area

* *Relocation does NOT include moving equipment from one place to another within your current stationary source boundary.*

Section 9 Modification Classification(s) (*Check all that apply)*

[18 AAC 50.502(c)(3)]

- ☐ NOx Increase > 10 tpy [and existing PTE > 40 tpy]
- ☐ SO_2 Increase > 10 tpy [and existing PTE > 40 tpy]
- ☐ PM-10 Increase > 10 tpy [and existing PTE > 15 tpy]
- ☐ PM-2.5 Increase > 10 tpy [and existing PTE > 10 tpy]
- ☐ CO Increase > 100 tpy [and existing PTE > 100 tpy in a nonattainment area]

[18 AAC 50.502(c)(4)]

- ☐ NOx Increase > 40 tpy [and existing PTE ≤ 40 tpy]
- ☐ SO_2 Increase > 40 tpy [and existing PTE ≤ 40 tpy]
- ☐ PM-10 Increase > 15 tpy [and existing PTE ≤ 15 tpy]
- ☐ PM-2.5 Increase > 10 tpy [and existing PTE ≤ 10 tpy]
- ☐ CO Increase > 100 tpy [and Existing PTE ≤ 100 tpy in a nonattainment area]

Basis for calculating modification:

- ☐ Projected actual emissions minus baseline actual emissions
- ☐ New potential emissions minus existing potential emissions

Section 10 Permit Action Request (*Check all that apply)*

[18 AAC 50.508]

- ☐ Establish Plant-wide Applicability Limitation (PAL)
- ☐ Establish emission reductions to offset nonattainment pollutant
- ☐ Owner Requested Limit* (ORL)
- ☒ Revise or Rescind Title I Permit Conditions *
  Permit Number: AQ0316MSS05 Condition No. N/A
  Date: August 4, 2016

**Which to use? See* http://www.dec.state.ak.us/air/ap/docs/orlrtc.pdf

Section 11 Existing Permits and Limits

For an existing stationary source, do you have an existing:
(Check all that apply)

- ☒ Air quality permit Number(s)*: AQ0316TVP02, Rev. 1
  AQ0316MSS03
  AQ0316MSS04
  AQ0316MSS05
  AQ0316MSS06, Rev 2
- ☐ Owner Requested Limit(s) Permit Number(s):
- ☐ Pre-Approved Emission Limit (PAEL) Number(s)**:

** All active construction, Title V, and minor permit numbers.*
***Optional. Please provide this number if possible.*
http://dec.alaska.gov/Applications/Air/airtoolsweb/

Section 12 Project Description

Provide a short narrative describing the project. Discuss the purpose for conducting this project, what emission units/activities will be added/modified under this project (i.e., project scope), and the project timeline. If the project is a modification to an existing stationary source, describe how this project will affect the existing process. Include any other discussion that may assist the Department in understanding your project or processing your application. Include a schedule of construction.

Please use additional copies of this sheet if necessary.

The University of Alaska Fairbanks (UAF) requests a revision to Title I Air Quality Permit No. AQ0316MSS05 under 18 AAC 50.508(6) for the University of Alaska Fairbanks Campus stationary source to establish permit conditions as required in the Fairbanks $PM_{2.5}$ Serious State Implementation Plan (Serious SIP), adopted November 19, 2019 by the Alaska Department of Environmental Conservation (ADEC). UAF requests that ADEC issue a separate Title I air quality permit which revises Permit No. AQ0316MSS05 by incorporating the applicable SIP limits and SIP Best Available Control Technology (BACT) limits as requested in Attachment A.

Provided below is a summary of the requested limits to be established as permit conditions. Attachment A also provides the requested monitoring, recordkeeping, and reporting requirement for the proposed limits and permit conditions.

- Limit the sulfur content of the coal received at the facility to 0.25 percent sulfur by weight (wt. pct.) beginning June 9, 2021.
- Limit the sulfur content of the liquid fuel burned in EU IDs 8, 23, 24, and 26 through 29 (diesel-fired engines) and EU 9A (Pathogenic Incinerator) to 15 ppmw sulfur (ULSD) beginning June 9, 2021.
- Limit the sulfur content burned in EU IDs 3 and 4 to 1,000 ppmw sulfur for liquid fuel between October 1 and March 31 and 0.6 lb/MMscf sulfur for natural gas, beginning October 1, 2020. EU IDs 19 through 21 are required to burn ULSD in accordance with Permit No. AQ0316MSS04, Condition 9. As a result, the 1,000 ppmw sulfur limit is not requested for EU IDs 19 through 21.
- Limit the sulfur content of the liquid fuel burned in EU IDs 3, 4, 8, 19 through 21, 23, 24, and 26 through 29 (diesel-fired boilers) to 15 ppmw sulfur (ULSD) between October 1 through March 31 beginning October 1, 2023.
- Limit the $PM_{2.5}$ emitted from EU ID 9A to 4.67 pound per ton (lb/ton) beginning June 9, 2021.
- Beginning June 9, 2021, limit the $PM_{2.5}$ emitted from the various material handling units as follows:
    - Limit the $PM_{2.5}$ emissions from EU IDs 105, 107, 109, 110, and 128 through 130 (material handling units) to 0.003 grains per dry standard cubic feet (g/dscf), each;
    - Limit the $PM_{2.5}$ emissions from EU ID 111 (ash loadout truck) to 5.5E-05 lb/ton; and
    - Limit the $PM_{2.5}$ emissions from EU ID 114 (dry sorbent handling vent filter exhaust) to 0.050 g/dscf.

Section 12 Project Description Continued

For **PALs under Section 10** of this application, include the information listed in 40 C.F.R. 52.21(aa)(3), adopted by reference in 18 AAC 50.040 [18 AAC 50.540(h)].

Not Applicable

For a **limit to establish offsetting emissions under Section 10** of this application, specify the physical or operational limitations necessary to provide actual emission reductions of the nonattainment air pollutant; including [18 AAC 50.540(i)]:

- A calculation of the expected reduction in actual emissions; and

  Not Applicable

- The emission limitation representing that quantity of emission reduction.

  Not Applicable

Section 12 Project Description Continued

For **ORLs under Section 10** of this application [18 AAC 50.540(j)], include:

A description of each proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's potential to emit and the allowable emissions [18 AAC 50.225(b)(4)];

Not Applicable

A description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements [18 AAC 50.225(b)(5)];

Not Applicable

Citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement [18 AAC 50.225(b)(6)];

Not Applicable

A statement that the owner or operator of the stationary source will be able to comply with each limit [18 AAC 50.225(b)(8)];

Not Applicable

Section 12 Project Description Continued

For **revising or rescinding Title I permit conditions under Section 10** of this application [18 AAC 50.540(k)], include:

An explanation of why the permit term or condition should be revised or rescinded [18 AAC 50.540(k)(2)];

Provided in Attachment A

The effect of revising or revoking the permit term or condition on [18 AAC 50. 540 (k)(3)]:

- Emissions;
  Provided in Attachment A

- Other permit terms;
  Provided in Attachment A

- The underlying ambient demonstration, if any;
  Not Applicable (no underlying ambient demonstration exists)

- Compliance monitoring; and
  Provided in Attachment A

For revising a condition that allows avoidance of a permit classification, the information required for that type of permit, unless the revised condition would also allow the owner or operator to avoid the classification. [18 AAC 50.540(k)(4)]

Information required under 18 AAC 50.540(k)(4) is not applicable to this permit application because the requested permit conditions do not avoid a permit classification or request revision of an existing permit condition that avoids a permit classification.

Section 13 Other Application Material

The information listed below must be included in your air quality control minor permit application. *Note: These must be attached in order for your application to be complete.*

If required to submit an analysis of ambient air quality under 18 AAC 50.540(c)(2), or if otherwise requested by the Department:

☐ Attached are maps, plans, and/or aerial photographs as necessary to show the locations and distances of
- emissions units, buildings, emitting activities and boundaries of the associated with the stationary source, and
- nearby or adjacent residences, roads, other occupied structures and general topography within 15 kilometers.

(Indicate compass direction and scale on each.)

☐ Attached is a document (e.g., spreadsheet) showing coordinates and elevations of each modeled unit, along with parameters necessary to characterize each unit for dispersion modeling.

☐ Attached is an electronic copy of all modeling files.

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the University of Alaska Fairbanks Campus (Stationary Source Name)

submitted to the Department on: August 2020.

Type of Application

☒ Initial Application

☐ Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the signature of a **Responsible Official**. Responsible Official is defined in 18 AAC 50.990. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

"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."

Signature:	Date:
Printed Name: Jennifer Campbell	Title: Acting Associate Vice Chancellor for Facilities Services

Section 15 Attachments

☒ Attachments Included. List attachments:

Attachment A – Permit Revision Requests
Attachment B – Emissions Unit Inventory and Emissions Calculations
Attachment C – Copy of Title I Permit

Section 16 Mailing Address

Submit the minor permit application to the Permit Intake Clerk in the Department's Anchorage office. Submitting to a different office will delay processing. The mailing address and phone number for the Anchorage office is:

Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-6881

Attachment A

Title I Permit Revision Request under 18 AAC 50.508(6)

Attachment A-1: Title I Permit Revision Request under 18 AAC 50.508(6)

Attachment A-2: EU 113 SO_2 SIP Emissions Limit

Attachment A-3: EU IDs 8, 9A, 23, 24, and 26 through 29 Sulfur Content for Diesel Fuel SIP Limit No Later Than June 9, 2021

Attachment A-4: Sulfur Content for Diesel Fuel SIP Limit No Later Than October 1, 2020

Attachment A-5: Sulfur Content for Diesel Fuel SIP Limit No Later Than October 1, 2023

Attachment A-6: $PM_{2.5}$ SIP Limit for EU ID 9A

Attachment A-7: $PM_{2.5}$ SIP Limit for Material Handling Units

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Attachment A-1
University of Alaska Fairbanks Campus
Title I Permit Revision Request under 18 AAC 50.508(6)

Under 18 Alaska Administrative Code (AAC) 50.540(k), an application for a minor air quality permit to rescind or revise a Title I permit must address certain elements. Each of the required elements is addressed below. Because the state regulations do not provide a clear framework to apply for this Title I permit as required by the $PM_{2.5}$ Nonattainment Serious State Implementation Plan (SIP), the University of Alaska Fairbanks (UAF) is submitting a Title I application under 18 AAC 50.508(6). UAF requests that the Alaska Department of Environmental Conservation (ADEC) issue a separate minor permit as a revision to Permit No. AQ0316MSS05 which incorporates the requirements presented in Attachment A-2 through A-7.

18 AAC 50.540(k)(1)

Per 18 AAC 50.540(k)(1), a copy of Title I Air Quality Permit No. AQ0316MSS05 is provided in Attachment C.

18 AAC 50.540(k)(2)

UAF is not requesting changes to existing permit terms. UAF is requesting a new Title I minor permit containing conditions which incorporate the limits adopted in the SIP for the emissions units at the University of Alaska Fairbanks Campus. Provided in Attachment A-2 through A-7 are proposed permit conditions to be incorporated into the new permit for the stationary source to comply with the SIP limits and SIP Best Available Control Technology (BACT) limit requirements summarized in the Fairbanks particulate matter less than 2.5 microns ($PM_{2.5}$) Serious SIP Vol. II:III.D.7.7 control strategies document.

18 AAC 50.540(k)(3)

Per 18 AAC 50.540(k)(3), the effects on the stationary source's emissions due to the requested permit terms are presented in Attachment B. Attachment B provides the sulfur dioxide (SO_2) and the $PM_{2.5}$ potential to emit (PTE) calculations under currently permitted requirements and the SO_2 and $PM_{2.5}$ PTE calculations which incorporate the Fairbanks $PM_{2.5}$ Serious SIP limits as directed in the SIP. The requested permit conditions do not have other effects on other permit terms, underlying ambient demonstration, or the existing compliance monitoring of the existing permit terms due to the proposed changes.

18 AAC 50.540(k)(4)

Information required under 18 AAC 50.540(k)(4) is not applicable to this permit application because the requested permit conditions do not avoid a permit classification.

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Attachment A-2
University of Alaska Fairbanks Campus
EU ID 113 SO_2 SIP Emissions Limit

UAF is requesting a new permit condition to limit the sulfur content of coal received at the stationary source beginning on June 9, 2021, in accordance with the limits summarized in Vol. II: III.D.7.7 Section 7.7.8.6, Table 7.7-16 of the SIP. Calculations demonstrating the effect the SIP limit will have on the stationary source's potential to emit and the allowable emissions are provided in Attachment B. UAF will demonstrate compliance with the proposed limit through the monitoring, recordkeeping, and reporting requirements proposed below as a new permit condition.

1. Beginning June 9, 2021, the Permittee shall limit the sulfur content of coal received at the stationary source to no greater than 0.25 percent sulfur by weight.

    1.1 Upon receipt of each shipment of coal at the stationary source, the Permittee shall determine the sulfur content, beginning June 9, 2021.

        a) Obtain a signed statement from the supplier with the following information:

            i) The percent sulfur by weight of the coal;

            ii) The method of analysis; and

            iii) A statement that the analysis was representative of the coal shipped.

        b) If valid representative results are not available from the supplier, analyze a representative sample of the coal to determine the sulfur content using an appropriate method listed in 18 AAC 50.035(c) or another method approved in writing by the Department.

    1.2 The Permittee shall keep records of the sulfur contents of each shipment of coal under Condition 1.1a and 1.1b.

    1.3 Coal present on site before June 9, 2021 may be combusted in EU ID 113 at any time, at the discretion of the Permittee.

    1.4 Include a summary of the sulfur content for each shipment of coal, received on or after June 9, 2021, in the applicable operating report in accordance with the Operating Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

1.5 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the sulfur content of a shipment of coal, received on or after June 9, 2021, is more than 0.25 percent sulfur by weight.

Attachment A-3
University of Alaska Fairbanks Campus
Sulfur Content for Diesel Fuel SIP Limit No Later Than June 9, 2021
EU IDs 8, 9A, 23, 24, and 26 through 29

UAF is requesting a new permit condition to limit the sulfur content of liquid fuel burned in EU IDs 8, 9A, 23, 24, and 26 through 29 to 15 parts per million by weight (ppmw) which is the equivalent of 0.0015 weight percent (wt. pct.) sulfur, effective June 9, 2021, in accordance with the limits summarized in Vol. II: III.D.7.7 Section 7.7.8.6, Table 7.7-16 of the SIP. Calculations demonstrating the effect the limit will have on the stationary source's potential to emit and the allowable emissions are provided in Attachment B. UAF will demonstrate compliance with the requested limit through monitoring, recordkeeping, and reporting requirements proposed below as a new permit condition.

2. Starting June 9, 2021, the Permittee shall only fire ULSD in EU IDs 8, 23, 24, 26 through 29 and in 9A when combusting liquid fuel.
    2.1 For each shipment of ULSD, either obtain a signed statement from the fuel supplier or refinery that confirm diesel fuel delivered meets the specifications of ULSD or analyze a representative sample of ULSD and determine the sulfur content using an appropriate method listed in 18 AAC 50.035 or another approved method from the Department.

    2.2 The Permittee shall keep copies of the fuel sulfur content records required under Condition 2.1.

    2.3 Include copies of the records required by Condition 2.2 in the operating report in accordance with the Operating Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

    2.4 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if any diesel fuel fired in EU IDs 8, 9A, 23, 24, and 26 through 29 does not meet the ULSD specification.

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Attachment A-4
University of Alaska Fairbanks Campus
Sulfur Content for Diesel Fuel SIP Limit No Later Than October 1, 2020

UAF is requesting new permit conditions beginning October 1, 2020 for EU IDs 3 and 4 to limit the sulfur content of natural gas burned to 0.06 lb/MMscf and from October 1 through March 31 the sulfur content of liquid fuel to 1,000 ppmw (i.e., 0.1 wt pct.), in accordance with the limits summarized in Vol. II: III.D.7.7 Section 7.7.8.6, Table 7.7-16 of the Serious SIP. The Serious SIP also requires limiting the sulfur content of the liquid fuel to 1,000 ppmw for EU IDs 19 through 21. Because EU IDs 19 through 21 have an existing requirement to only burn ULSD, in accordance with Condition 9 of Permit No. AQ0316MSS04, and the existing permit condition is more stringent than the limit for liquid fuel identified for these units in the Serious SIP, a limit for EU IDs 19 through 21 to limit sulfur content of liquid fuel to 1,000 ppmw is not requested.

In addition, EU IDs 19 through 21 do not burn natural gas. As a result, a natural gas sulfur content limit for EU IDs 19 through 21 is not requested. Calculations demonstrating the effect the limit will have on the stationary source's potential to emit and the allowable emissions are provided in Attachment B. UAF will demonstrate compliance with the requested limit through monitoring, recordkeeping, and reporting requirements proposed below as a new permit condition.

3. Between October 1 through March 31, beginning October 1, 2020, the Permittee shall limit the sulfur content of diesel fuel combusted in EU IDs 3 and 4 to no greater than 1,000 ppmw or 0.1 wt. pct.

    3.1 For each shipment of diesel fuel, either obtain a signed statement from the fuel supplier or refinery confirming the diesel fuel meets the requirement of Condition 3, indicating the fuel sulfur content results are representative of the fuel shipment received; or analyze a representative sample of fuel sulfur content using an appropriate method listed in 18 AAC 50.035 or another approved method from the Department.

    3.2 The Permittee shall keep copies of the fuel sulfur content records required under Condition 3.1.

    3.3 Include copies of the records required by Condition 3.2 in the operating report in accordance with the Operating Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

3.4 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the sulfur content of the liquid fuel burned in any of EU IDs 3 and 4 exceeds 1,000 ppmw S (i.e., 0.1 wt. pct.) between October 1 through March 31 in calendar years 2020, 2021, or 2022.

4. Beginning October 1, 2020, the Permittee shall limit the sulfur content of natural gas burned in EU IDs 3 and 4 to no greater than 0.6 lb/MMscf SO_2, which is the equivalent of 3.5 ppmv H_2S.

4.1 Obtain a semiannual statement from the supplier of the natural gas providing the H_2S concentration in ppmv or analyze a representative sample of the fuel semiannually to determine the sulfur content using ASTM Method 4810, D4913, or Gas Processors Association 2377-86, an appropriate alternative method adopted in 18 AAC 50.035, or another method approved by the Department.

4.2 The Permittee shall keep copies of the natural gas H_2S content records required under Condition 4.1.

4.3 Include copies of the records required by Condition 4.2 in the operating report in accordance with the Operating Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

4.4 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the sulfur content of the natural gas burned in EU ID 3 or 4 exceeds 3.5 ppmv H_2S.

Attachment A-5
University of Alaska Fairbanks Campus
Sulfur Content for Diesel Fuel SIP Limit No Later Than October 1, 2023

UAF is requesting a new permit condition for EU IDs 3 and 4 (when firing liquid fuel) and EU IDs 19 through 21 to limit the sulfur content of liquid fuel to 15 ppmw (i.e., 0.0015 wt. pct.) from October 1 through March 31, beginning October 1, 2023, in accordance with the limits summarized in Vol. II: III.D.7.7 Section 7.7.8.6, Table 7.7-16 of the SIP. EU IDs 19 through 21 have an existing requirement to only burn ULSD in accordance with Condition 9 of Permit No. AQ0316MSS04 and is requested to be referenced as shown below in requested permit condition 6. Calculations demonstrating the effect the limit will have on the stationary source's potential to emit and the allowable emissions are provided in Attachment B. UAF will demonstrate compliance with the requested limit through monitoring, recordkeeping, and reporting requirements proposed below as a new permit condition.

Table 7.7-16 of the Control Strategies document identifies the natural gas sulfur content limit of 0.6 lb/MMscf for natural gas combusted in EU IDs 3 and 4 which are to be effective October 1, 2020 and October 1, 2023. Because the natural gas sulfur content limit of 0.6 lb/MMscf of fuel combusted in EU IDs 3 and 4 will already be in effect October 1, 2020, a duplicate emission limit is not requested.

5. Between October 1 and March 31, beginning October 1, 2023, the Permittee shall only fire ULSD in EU IDs 3 and 4 (when firing liquid fuel) and EU IDs 19 through 21.

    5.1 For each shipment of ULSD, either obtain a signed statement from the fuel supplier or refinery that confirm diesel fuel delivered meets the specifications of ULSD or analyze a representative sample of ULSD and determine the sulfur content using an appropriate method listed in 18 AAC 50.035 or another method approved by the Department.

    5.2 The Permittee shall keep copies of the ULSD sulfur content records required under Condition 5.1.

    5.3 Include copies of the records required by Condition 5.2 in the operating report in accordance with the Operating Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

5.4 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the sulfur content of the liquid fuel burned in any of EU IDs 3 and 4 exceeds 15 ppmw S (i.e., 0.0015 wt. pct.) between October 1 through March 31, starting October 1, 2023.

6. Between October 1 and March 31, beginning October 1, 2023, comply with Condition 9 in Permit No. AQ0316MSS04 by firing only ULSD in EU IDs 19 through 21.

Attachment A-6
University of Alaska Fairbanks Campus
$PM_{2.5}$ SIP Limit for EU ID 9A

UAF is requesting a new permit condition for EU ID 9A to limit the $PM_{2.5}$ emissions, beginning June 9, 2021 in accordance with the limits summarized in Vol. II: III.D.7.7 Section 7.7.8.6, Table 7.7-16 of the SIP. Calculations demonstrating the effect the limit will have on the stationary source's potential to emit and the allowable emissions are provided in Attachment B. UAF will demonstrate compliance with the requested limit through monitoring, recordkeeping, and reporting requirements proposed below as a new permit condition.

7. No later than June 9, 2021, limit the $PM_{2.5}$ emissions from EU ID 9A to 4.67 pounds per ton. The Permittee shall comply with the following:

    7.1 Control $PM_{2.5}$ emissions from EU ID 9A by using a multiple chamber designed incinerator.

    7.2 Comply with Condition 8 in Permit No. AQ0316MSS04 by limiting the amount of waste combusted in EU ID 9A to no more than 109 tons of waste per 12-month rolling period.

    7.3 Monitor and record the total weight of all the waste incinerated in EU ID 9A each month in accordance with the Incinerator Limit and Prohibition condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

    7.4 The permittee shall maintain good combustion practices at all times of operation by following the manufacturer's operating and maintenance procedures.

    7.5 Report in accordance with the Excess Emission and Permit Deviation condition in the applicable the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the requirements in Condition 7 are not met.

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Attachment A-7
University of Alaska Fairbanks Campus
$PM_{2.5}$ SIP Limit for Material Handling Units

UAF is requesting new permit conditions for EU IDs 105, 107, 109 through 111, 114, and 128 through 130 to limit the $PM_{2.5}$ emissions, beginning June 9, 2021 in accordance with the limits summarized in Vol. II: III.D.7.7 Section 7.7.8.6, Table 7.7-16 of the SIP. Calculations demonstrating the effect the limit will have on the stationary source's potential to emit and the allowable emissions are provided in Attachment B. UAF will demonstrate compliance with the requested limit through monitoring, recordkeeping, and reporting requirements proposed below as new permit conditions.

8. No later than June 9, 2021, the Permittee shall limit $PM_{2.5}$ emissions from EU IDs 105, 107, 109, 110, and 128 through 130 to not exceed 0.003 grains per dry standard cubic feet (gr/dscf), each, and limit $PM_{2.5}$ emissions from EU ID 114 to 0.050 gr/dscf.

    8.1 Install, operate, maintain fabric filters and vents at all times while EU IDs 105, 107, 109, 110, 114, and 128 through 130 are operating.

    8.2 Operate EU IDs 105, 107, 109, 110, 114, and 128 through 130 in an enclosure.

    8.3 Keep records of the date and time identifying each time period that EU IDs 105, 107, 109, 110, 114, and 128 through 130 are not operated in an enclosure or when a fabric filter or vent on these emissions units is not operated or maintained according to manufacturer specifications.

    8.4 By June 9, 2021 for each EU ID 105, 107, 109, 110, 114, 128 through 130, the Permittee shall either:

        a. Provide vendor data documenting EU ID 105, 107, 109, 110, 114, 128 through 130 meet the emission limit of Condition 8; or

        b. Perform an initial Method 9. For all 18-minutes observations in this plan, observe exhaust, following 40 CFR 60, Appendix A-4, Method 9, adopted by reference in 18 AAC 50.040(a), for 18 minutes to obtain 72 consecutive 15-second opacity observations.

    8.5 If the 18 consecutive minutes of the initial Method 9 observations result in an 18-minute average opacity greater than 20 percent, the Permittee shall conduct a $PM_{2.5}$ source test in accordance with the methods and procedures specified in 40 CFR 60 Appendix A to determine the $PM_{2.5}$ emission rate.

8.6 The Permittee shall report the results of the source test(s) in accordance with the Test Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.

8.7 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the requirements in Condition 8 are not met.

9. No later than June 9, 2021, the Permittee shall limit $PM_{2.5}$ emissions from EU ID 111 to not exceed 5.50E-05 lb/ton.

9.1 Operate EU ID 111 in an enclosure during all ash loadout operations.

9.2 Keep records of the date and time identifying each time period that EU ID 111 was not enclosed during ash loadout operations.

9.3 Report in accordance with the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 if the requirements in Condition 9 are not met.

Attachment B

Potential to Emit SO_2 and $PM_{2.5}$ Calculation Tables

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Table B-1. Air Quality Minor Permit Emissions Summary
University of Alaska Fairbanks Campus

Pollutant[1]	Existing Potential to Emit (PTE)[2]	PTE Beginning October 1, 2020 [3,4]	PTE Beginning June 9, 2021 [5,6,7]	PTE Beginning October 1, 2023 [8,9]
SO_2	720.3 tpy	559.7 tpy	553.2 tpy	513.6 tpy
$PM_{2.5}$	36.6 tpy	No change	34.0 tpy	No change

Notes:

[1] The permit conditions requested in this minor permit application do not change the NO_X, CO, PM_{10}, HAPs, and greenhouse gas emissions potential to emit calculations previously submitted.

[2] The detailed existing PTE calculations are provided in Table B-3 for SO_2 and Table B-7 for $PM_{2.5}$.

[3] The detailed PTE calculations beginning October 1, 2020 are provided in Table B-4 for SO_2.

[4] The PTE beginning October 1, 2020 incorporates the SO_2 SIP requirements which limit the sulfur content of the liquid fuel combusted in EU IDs 3 and 4 to 1,000 ppmw during the months of October through March. In addition, the SO_2 content of natural gas combusted in EU IDs 3 and 4 is limited to 0.6 lb SO_2/MMscf (i.e., 3.5 ppmv H_2S).

[5] The detailed PTE calculations beginning June 9, 2021 are provided in Table B-5 for SO_2 and Table B-9 for $PM_{2.5}$.

[6] The PTE beginning June 9, 2021 incorporates the following SO_2 requirements:

a. Limit the coal sulfur content received at the facility to 0.25 wt.pct.
b. Require EU IDs 8, 23, 24, 26 though 29, and 9A to burn ULSD.

[7] The PTE for $PM_{2.5}$ emissions limits beginning June 9, 2021 incorporates the SIP $PM_{2.5}$ emissions limit requirements for EU ID 9A and EU IDs 105, 107, 109, 110, 111, 114 and 128 through 130.

[8] The detailed PTE calculations beginning October 1, 2023 are provided in Table B-6 for SO_2.

[9] The PTE beginning October 1, 2023 incorporates SO_2 requirements which limits the sulfur content of the fuel combusted in EU IDs 3, 4, and 19 through 21 to 15 ppmw (ultra low sulfur diesel (ULSD)) during the months of October through March.

Table B-2a. Emissions Unit Inventory - Significant Emissions Units
University of Alaska Fairbanks Campus

Emissions Unit				Installation Date	Fuel Type	Rating/Capacity	Maximum Operation
ID	Description	Make/Model	Bldg. No.				
Significant Emissions Units							
Emissions Units other than CHPP Emissions Units							
3	Dual-Fired Boiler No. 1	Zurn	FS802	1970	Diesel	180.9 MMBtu/hr	8,760 hr/yr
4	Dual-Fired Boiler No. 2	Zurn	FS802	1987	Diesel	180.9 MMBtu/hr	140,105 MMBtu/yr[1]
8	Peaking/Backup Generator (DEG) Engine	Fairbanks Morse Colt-Pielstick PC2.6	FS817	1999	Diesel [2]	13,266 hp	140,105 gal/yr [3]
9A	BiRD Incinerator	Therm-Tec/G-30P-1H	FS919	2006	Medical/Infectious Waste	83 lb/hr[4]	109 ton/yr[5]
10	AFES Boiler No.1	Burnham/V9OGA	AF256	2000	Diesel	1.08 MMBtu/hr[6]	8,760 hr/yr
11	AFES Boiler No. 2	Burnham/V9OGA	AF256	2000	Diesel	1.08 MMBtu/hr[6]	8,760 hr/yr
12	Harper Boiler No. 1	Weil McLain/BL776-S-W	FS420	1985	Diesel	0.64 MMBtu/hr[6]	8,760 hr/yr
13	Harper Boiler No. 2	Weil McLain/BL776-S-W	FS420	1985	Diesel	0.64 MMBtu/hr[6]	8,760 hr/yr
16	Copper Lane (Honor's House) Boiler	Weil McLain/P-WGO-5	FS520	2005	Diesel	0.233 MMBtu/hr[6]	8,760 hr/yr
17	West Ridge Research Building Boiler No. 1	Weil McLain/BL1688w-GPr10	FS909	2003	ULSD	4.93 MMBtu/hr[7]	8,760 hr/yr
18	West Ridge Research Building Boiler No. 2	Weil McLain/BL1688w-GPr10	FS909	2003	ULSD	4.93 MMBtu/hr[7]	8,760 hr/yr
19	BiRD RM 100U3 Boiler No. 1	Weil McLain/2094W	FS919	2004	ULSD	6.13 MMBtu/hr[6]	19,650 hr/yr[8]
20	BiRD RM 100U3 Boiler No. 2	Weil McLain/2094W	FS919	2004	ULSD	6.13 MMBtu/hr[6]	
21	BiRD RM 100U3 Boiler No. 3	Weil McLain/2094W	FS919	2004	ULSD	6.13 MMBtu/hr[6]	
22	BiRD RM 100U3 Boiler No. 4	Bryan/EB200-S-150-FDGO	FS919	2005	ULSD	8.5 MMBtu/hr	8,760 hr/yr
23	Alaska Center for Energy and Power Generator Engine No. 1	Detroit Diesel/6043-TK35	FS814	2003	ULSD	235 kW	8,760 hr/yr
24	Old University Park Emergency Generator Engine	Cummins/4B3.9-G2	FS423	2001	Diesel	72 hp[9]	500 hr/yr[10]
25	AFES Grain Dryer	Unknown	AF108	1988	Diesel	2.430 MMBtu/hr[6]	8,760 hr/yr
26	Duckering Classroom Engine	Mitsubishi-Bosch	FS103	1987	Diesel	64 hp[9]	8,760 hr/yr
27	Alaska Center for Energy and Power Generator Engine No. 2	Caterpillar C-15	FS814	2013	ULSD	500 hp	4,380 hr/yr[11]
28	Alaska Earthquake Information Center Emergency Generator Engine	Detroit Diesel	FS903	1998	Diesel	120 hp	500 hr/yr[10]
29	Arctic Health Research Emergency Generator Engine	Cummins/QSB7-G6	FS901	2013	ULSD	314 hp	500 hr/yr[10]
34 [12]	BiRD Emergency Generator Engine No. 1	Cummins QSB7-G5 NR3	FS919	2015	ULSD	324 hp	500 hr/yr[10]
35 [12]	Butrovich Administrative Building Emergency Engine	Cummins QSK23-G7 NR2	SW910	2019	ULSD	1,220 hp	500 hr/yr[10]
36 [12]	BiRD Emergency Generator Engine No. 2	Cummins QSB7-G5 NR3	FS919	2020	ULSD	324 hp	500 hr/yr[10]
CHPP Emissions Units							
113	Dual Fuel-Fired CFB Boiler	N/A	FS840	2020	Coal/Woody Biomass	295.6 MMBtu/hr	8,760 hr/yr
114	Dry Sorbent Handling Vent Filter Exhaust	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
115	Unloading Hopper with Grizzly	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
116	Conveyor CNV-001	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
117	Magnetic Separator	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
118	Conveyor CNV-002	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
119	Surge Bin	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
120	Vibratory Feeder	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
121	Hammermill Crusher	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
122	Conveyor CNV-003	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
123	Diverter	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
124	Bucket Elevator CNV-004	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
125	Bucket Elevator CNV-005	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
126	Gate Chute	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
127	En-masse Drag Conveyor CNV-006	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
128	Coal Silo No. 1 with bin vent	N/A	FS840	2020	Not Fired	1,650 acfm	8,760 hr/yr
129	Coal Silo No. 2 with bin vent	N/A	FS840	2020	Not Fired	1,650 acfm	8,760 hr/yr
130	Coal Silo No. 3 with bin vent	N/A	FS840	2020	Not Fired	1,650 acfm	8,760 hr/yr
131	Feed Chute No. 1	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
132	Feed Chute No. 2	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
133	Feed Chute No. 3	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
134	Gravimetric Feeder No. 1	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
135	Gravimetric Feeder No. 2	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr
136	Gravimetric Feeder No. 3	N/A	FS840	2020	Not Fired	N/A	8,760 hr/yr

Notes:

[1] EU 4 is limited to a heat input of 158,468 MMBtu/yr by Permit AQ0316TVP02 Revision 1, Condition 17. A request to make this limit optional is included with this permit application.

[2] EU 8 is also authorized to combust coal slurry fuel. The unit has not operated on this fuel and will not do so in the future. Emissions estimates for this unit are based on diesel fuel combustion.

[3] The potential fuel use for EU ID 8 is calculated using maximum fuel use that would allow compliance with the NO_x emission limits in Permit AQ0316MSS05.

[4] The rating of EU 9A is listed incorrectly in the existing Title V permit. The correct rating is provided here.

[5] EU ID 9A is limited to 109 tons per year of waste burned by Permit AQ0316MSS04 Condition 8.

[6] These external combustion units have nameplates which list the ratings in gross output or do not specify whether the rating is output or input. A 75 percent efficiency has been assumed for these units to conservatively calculate the heat input rating.

[7] The previous Title V renewal application proposed a limit of 500 hours per year for EU 17 and 18. This limit was not incorporated into the permit. UAF has decided not to apply an operating hour limit to these emissions units.

[8] EU IDs 19 through 21 are limited to a combined total of 19,650 hours of operation per rolling 12-months by Permit AQ0316MSS04 Condition 10.

[9] Engine rating in hp is calculated from the electrical output assuming 95 pct. efficiency per ADEC (Alan Schuler) (hp = kW * 1.341/ 0.95).

[10] EU IDs 24, 28, and 29 are emergency engines. 500 annual operating hours are assumed in accordance with the 1995 Seitz memorandum.

[11] EU ID 27 is limited to a maximum of 4,380 hours of operation per rolling 12-months by Permit AQ0316MSS03 Condition 4.

[12] EU IDs 34 and 36 are new emissions units added with an Off Permit Change notification in January 2015. EU ID 35 is a new emissions unit added an Off-Permit Change notification in June 2020. These emissions units are not included in the BACT Determination. As a result, no BACT emission limits are requested for EU IDs 34, 35, and 36 in this minor permit application.

Table B-2b. Emissions Unit Inventory - Insignificant Emissions Units
University of Alaska Fairbanks Campus

Emissions Unit				Installation Date	Fuel Type	Maximum Rating/Capacity	Basis for Insignificance
ID	Description	Make/Model	Bldg. No.				
Insignificant Emissions Units							
None	AFES Greenhouse Furnace	Sunderman/L02OUF	AF117	1991	Diesel	0.209 MMBtu/hr[1]	18 AAC 50.326(g)(7)[2]
None	Skarland Cabin Furnace	Rheem/ROBC-084QPEB	FS712	2001 (est)	Diesel	0.140 MMBtu/hr[1]	18 AAC 50.326(g)(7)[2]
None	Harper Hot Water Heater	Bock	FS420	1985 (est)	Diesel	0.236 MMBtu/hr	18 AAC 50.326(g)(7)[2]
None	Fine Arts/Arts Wing Rm 302 Kiln	Alpine Kilns and Equipment/SBF-40	FS313	2009	Propane	1.81 MMBtu/hr, total	18 AAC 50.326(g)(5)
None	Fine Arts/Arts Wing Ceramic Rm 413 Kiln	Kilnmaster/constructed on-site	FS313	2009	Propane	0.53 MMBtu/hr[1]	18 AAC 50.326(g)(5)
None	Fine Arts/Arts Wing Ceramic Rm 413 Kiln	Geil Kilns/DLB2	FS313	2009	Propane	0.23 MMBtu/hr[1]	18 AAC 50.326(g)(5)
None	Wooded Area Kiln(s)	Hand-built	N/A	Various	Wood	3 cords/yr[3]	18 AAC 50.326(g)(5)
None	Facilities Services Paint Booth Exhaust Fan[4]	Unknown	FS803	2001	Various Paints	12,500 cfm	18 AAC 50.326(g)(5)
None	Museum Paint Booth Exhaust Fan	Greenheck/TAB-42-030T3	FS907	2006	Various Paints	5,480 cfm	18 AAC 50.326(e)
None	Laboratory Fume Hoods (campus-wide)[5]	N/A	Multiple	Various	N/A	Unknown	18 AAC 50.326(e)
None	Duckering Classroom Turbine	Cussons Two Shaft Gas Turbine Unit	FS103	1970 (est)	Propane	0.33 MMBtu/hr[6]	18 AAC 50.326(e)
None	Power Plant Field-Erected Tank	Vertical Fixed Roof	FS817	1969	Diesel	212,120 gallons	18 AAC 50.326(f)(10)
None	Graduation Flame	Custom-built	N/A	1975 (est)	Propane	5.0E-03 MMBtu/hr[7]	18 AAC 50.326(e)
None	SRC Pellet Stove	Avalon/AGP	N/A	2012	Wood Pellets	5 lb/hr[8]	18 AAC 50.326(e)
105	Limestone Handling System	None	FS840	2020	None	1,200 acfm	18 AAC 50.326(e)
107	Sand Handling System	None	FS840	2020	None	1,600 acfm	18 AAC 50.326(e)
109	Ash Handling System	None	FS840	2020	None	1,000 acfm	18 AAC 50.326(e)
110	Ash Handling System Vacuum	None	FS840	2020	None	2,000 acfm	18 AAC 50.326(e)
111	Ash Loadout to Truck	None	FS840	2020	None	N/A	18 AAC 50.326(e)

Notes:

[1] These external combustion units have nameplates which list the ratings in gross output or do not specify whether the rating is output or input. A 75 percent efficiency has been assumed for these units to conservatively calculate the heat input rating.

[2] ADEC advised UAF on April 30, 2013 that ADEC has classified these emissions units as insignificant.

[3] The CY 2018 actual fuel use of 3 cords of dry birchwood is used to estimate emissions.

[4] A paint booth was located at the Hutchison technical high school on campus. This emissions unit was removed in December 2012 because the program was relocated off-campus.

[5] The laboratory fume hoods are not required to be listed on the application per 18 AAC 50.326(d)(3). The units are listed to enable including VOC and HAP emissions in the assessable emission total.

[6] Rating calculated based on vendor data indicating that fuel consumption at 100 percent load is approximately 15 pounds of propane per hour.

[7] The graduation flame is a small propane flare that operates during graduation week. The rating is an estimate because the unit was hand-built by university personnel.

[8] The SRC pellet stove has a heat input rating of 0.041 MMBtu/hr. Wood pellets have a heating value of 8,200 Btu/lb.

Table B-3. Existing Potential to Emit Calculations - Sulfur Dioxide (SO_2) Emissions
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
ID	Description			Reference	Factor			
Significant Emissions Units								
3	Dual-Fired Boiler No. 1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	180.9 MMBtu/hr	8,760 hr/yr	404.8 tpy[3]
		Natural Gas	N/A	AP-42 Table 1.4-2	0.6 lb/MMscf			
4	Dual-Fired Boiler No. 2	Diesel	N/A	Permit AQ0316TVP02 Limit		180.9 MMBtu/hr	Not Applicable	40.0 tpy[4]
		Natural Gas	N/A					
8	Peaking/Backup Generator (DEG) Engine	Diesel	N/A			13,266 hp		
9A	BiRD Incinerator	Medical/Infectious Waste	N/A	AP-42 Table 2.3-1	2.17 lb/ton	83 lb/hr	109 ton/yr	0.1 tpy
10	AFES Boiler No.1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
11	AFES Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
12	Harper Boiler No. 1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
13	Harper Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
16	Copper Lane (Honor's House) Boiler	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.233 MMBtu/hr	8,760 hr/yr	0.5 tpy
17	West Ridge Research Building Boiler No. 1	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
18	West Ridge Research Building Boiler No. 2	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
19	BiRD RM 100U3 Boiler No. 1	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr	19,650 hr/yr	0.1 tpy
20	BiRD RM 100U3 Boiler No. 2	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
21	BiRD RM 100U3 Boiler No. 3	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
22	BiRD RM 100U3 Boiler No. 4	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	8.5 MMBtu/hr	8,760 hr/yr	0.1 tpy
23	Alaska Center for Energy and Power Generator Engine No. 1	ULSD	0.0015 wt. pct.[7]	Mass Balance	2.10E-04 lb/gal	235 kW	8,760 hr/yr	0.01 tpy
24	Old University Park Emergency Generator Engine	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	72 hp	500 hr/yr	0.1 tpy
25	AFES Grain Dryer	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	2.43 MMBtu/hr	8,760 hr/yr	5.4 tpy
26	Duckering Classroom Engine	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	64 hp	8,760 hr/yr	1.0 tpy
27	Alaska Center for Energy and Power Generator Engine No. 2	ULSD	0.0015 wt. pct.[8]	Mass Balance	2.10E-04 lb/gal	500 hp	4,380 hr/yr	0.01 tpy
28	Alaska Earthquake Information Center Emergency Generator Engine	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	120 hp	500 hr/yr	0.1 tpy
29	Arctic Health Research Emergency Generator Engine	ULSD	0.0015 wt. pct.[8]	Mass Balance	2.10E-04 lb/gal	314 hp	500 hr/yr	8.4E-04 tpy
34	BiRD Emergency Generator Engine No. 1	ULSD	0.0015 wt. pct.[8]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
35	Butrovich Administrative Building Emergency Engine	ULSD	0.0015 wt. pct.[8]	Mass Balance	2.10E-04 lb/gal	1,220 hp	500 hr/yr	9.5E-03 tpy
36	BiRD Emergency Generator Engine No. 2	ULSD	0.0015 wt. pct.[8]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
113	Dual Fuel-Fired CFB Boiler	Coal/Woody Biomass	Permit AQ0316MSS06 Rev. 2 Limit			295.6 MMBtu/hr	8,760 hr/yr	258.9 tpy
114	Dry Sorbent Handling Vent Filter Exhaust	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
115	Unloading Hopper with Grizzly	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
116	Conveyor CNV-001	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
117	Magnetic Separator	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
118	Conveyor CNV-002	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
119	Surge Bin	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
120	Vibratory Feeder	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
121	Hammermill Crusher	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
122	Conveyor CNV-003	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
123	Diverter	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
124	Bucket Elevator CNV-004	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
125	Bucket Elevator CNV-005	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
126	Gate Chute	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
127	En-masse Drag Conveyor CNV-006	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
128	Coal Silo No. 1 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
129	Coal Silo No. 2 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
130	Coal Silo No. 3 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
131	Feed Chute No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
132	Feed Chute No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
133	Feed Chute No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
134	Gravimetric Feeder No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
135	Gravimetric Feeder No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
136	Gravimetric Feeder No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
							Significant Emission Units Total Limited Potential to Emit - SO_2	**718.9 tpy**

Table B-3. Existing Potential to Emit Calculations - Sulfur Dioxide (SO_2) Emissions, Continued
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
ID	Description			Reference	Factor			
Insignificant Emissions Units								
None	AFES Greenhouse Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.209 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Skarland Cabin Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.140 MMBtu/hr	8,760 hr/yr	0.3 tpy
None	Harper Hot Water Heater	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.236 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Various Propane-Fired Kilns	Propane	0.2 gr/100 ft^3	AP-42 Table 1.5-1	0.1 *S lb/kgal	2.6 MMBtu/hr, total	8,760 hr/yr	2.5E-03 tpy
None	Wood-Fired Kilns	Wood	N/A	AP-42 Table 1.6-2	0.025 lb/MMBtu[9]	3 cord/yr	8,760 hr/yr	5.7E-04 tpy
None	Duckering Classroom Turbine	Propane	2.4E-02 wt. pct.	AP-42 Table 3.1-2a	9.4E-01 *S lb/MMBtu[10]	0.33 MMBtu/hr	8,760 hr/yr	0.03 tpy
None	Graduation Flame	Propane	0.2 gr/100 ft^3	Mass Balance	2.3E-04 lb/MMBtu	5.0E-03 MMBtu/hr	8,760 hr/yr	5.0E-06 tpy
None	Various Paint Booths	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Various Laboratory Fume Hoods	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Power Plant Field-Erected Tank	Diesel	0.5 wt. pct.	N/A	N/A	212,120 gallons	8,760 hr/yr	0 tpy
None	SRC Pellet Stove	Wood Pellets	N/A	AP-42 Table 1.10-1	0.4 lb/ton	5.0 lb/hr	8,760 hr/yr	4.4E-03 tpy
105	Limestone Handling System	None	N/A	N/A	N/A	1,200 acfm	8,760 hr/yr	0 tpy
107	Sand Handling System	None	N/A	N/A	N/A	1,600 acfm	8,760 hr/yr	0 tpy
109	Ash Handling System	None	N/A	N/A	N/A	1,000 acfm	8,760 hr/yr	0 tpy
110	Ash Handling System Vacuum	None	N/A	N/A	N/A	2,000 acfm	8,760 hr/yr	0 tpy
111	Ash Loadout to Truck	None	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
Insignificant Emissions Units Total Limited Potential to Emit - SO_2								**1.4 tpy**
Total Limited Potential to Emit - SO_2								**720.3 tpy**

Notes:

[1] Allowable annual operation for all units based on full-time operation or permit operating limits, as applicable.

[2] Conversion factors:

Diesel Heating Value	0.137	MMBtu/gal	
Coal Heating Value	15.3	MMBtu/ton	
Propane Heating Value	91.5	MMBtu/kgal	
Approximate wood heating value:	15.3	MMBtu/cord	*https://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf*
Natural Gas Heat Content	1,000	Btu/scf	
Density of Diesel	7.0	lb/gal	
Engine Heat Rate	7,000	Btu/hp-hr	
Engine horsepower	1.341	kW	
Maximum fuel consumption for EUs 34 and 36:	15	gal/hr - each	*Vendor Data*
Maximum fuel consumption for EU 35:	181	gal/hr	*Vendor Data*

[3] The higher potential emissions for natural gas or distillate firing is shown as the potential emissions for EU 3.

[4] The combined SO_2 emissions from EU 4 and EU 8 are limited to less than 40 tons per year, per Condition 2 of Permit AQ0316MSS05.

[5] UAF requested an Owner Requested Limit in the minor permit application submitted in 3rd quarter 2020 to require ULSD be combusted in EU IDs 17, 18, and 22.

[6] EU IDs 19 through 21 are required to burn only ULSD per Permit AQ0316MSS04, Condition 9.

[7] EU ID 23 is required to burn only ULSD by 40 CFR 63.6604(a), Subpart ZZZZ.

[8] EU IDs 27, 29, 34, 35, and 36 are required to burn only ULSD by 40 CFR 60 Subpart IIII.

[9] Emission factor for small pottery-firing wood-fired kilns are not available. Calculation assumes that combustion of wood in the kilns is similar to that in dry wood-fired boilers.

[10] Emission factors for a propane-fired turbine are not available. Emission factors for a natural gas-fired turbine are used.

Table B-4. Potential to Emit Calculations Effective October 1, 2020 - Sulfur Dioxide (SO_2) Emissions
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
ID	Description			Reference	Factor			
Significant Emissions Units								
3	Dual-Fired Boiler No. 1	Diesel - Oct 1- March 31	0.1 wt. pct.[3]	Mass Balance	1.40E-02 lb/gal	180.9 MMBtu/hr	8,760 hr/yr	244.2 tpy[4]
		Diesel - April 1 - Sept. 30	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal			
		Natural Gas	0.60 lb/MMscf[3]	AP-42 Table 1.4-2	0.60 lb/MMscf[3]			
4	Dual-Fired Boiler No. 2	Diesel - Oct 1- March 31	0.1 wt. pct.[3]	Permit AQ0316TVP02 Limit		180.9 MMBtu/hr	Not Applicable	40.0 tpy[5]
		Diesel - April 1 - Sept. 30	0.5 wt. pct.					
		Natural Gas	0.60 lb/MMscf[3]					
8	Peaking/Backup Generator (DEG) Engine	Diesel	N/A			13,266 hp		
9A	BiRD Incinerator	Medical/Infectious Waste	N/A	AP-42 Table 2.3-1	2.17 lb/ton	83 lb/hr	109 ton/yr	0.1 tpy
10	AFES Boiler No.1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
11	AFES Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
12	Harper Boiler No. 1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
13	Harper Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
16	Copper Lane (Honor's House) Boiler	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.233 MMBtu/hr	8,760 hr/yr	0.5 tpy
17	West Ridge Research Building Boiler No. 1	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
18	West Ridge Research Building Boiler No. 2	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
19	BiRD RM 100U3 Boiler No. 1	ULSD	0.0015 wt. pct.[7]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr	19,650 hr/yr	0.1 tpy
20	BiRD RM 100U3 Boiler No. 2	ULSD	0.0015 wt. pct.[7]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
21	BiRD RM 100U3 Boiler No. 3	ULSD	0.0015 wt. pct.[7]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
22	BiRD RM 100U3 Boiler No. 4	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	8.5 MMBtu/hr	8,760 hr/yr	0.1 tpy
23	Alaska Center for Energy and Power Generator Engine No. 1	ULSD	0.0015 wt. pct.[8]	Mass Balance	2.10E-04 lb/gal	235 kW	8,760 hr/yr	0.01 tpy
24	Old University Park Emergency Generator Engine	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	72 hp	500 hr/yr	0.1 tpy
25	AFES Grain Dryer	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	2.43 MMBtu/hr	8,760 hr/yr	5.4 tpy
26	Duckering Classroom Engine	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	64 hp	8,760 hr/yr	1.0 tpy
27	Alaska Center for Energy and Power Generator Engine No. 2	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	500 hp	4,380 hr/yr	0.01 tpy
28	Alaska Earthquake Information Center Emergency Generator Engine	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	120 hp	500 hr/yr	0.1 tpy
29	Arctic Health Research Emergency Generator Engine	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	314 hp	500 hr/yr	8.4E-04 tpy
34	BiRD Emergency Generator Engine No. 1	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
35	Butrovich Administrative Building Emergency Engine	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	1,220 hp	500 hr/yr	9.5E-03 tpy
36	BiRD Emergency Generator Engine No. 2	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
113	Dual Fuel-Fired CFB Boiler	Coal/Woody Biomass	Permit AQ0316MSS06 Rev. 2 Limit			295.6 MMBtu/hr	8,760 hr/yr	258.9 tpy
114	Dry Sorbent Handling Vent Filter Exhaust	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
115	Unloading Hopper with Grizzly	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
116	Conveyor CNV-001	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
117	Magnetic Separator	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
118	Conveyor CNV-002	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
119	Surge Bin	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
120	Vibratory Feeder	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
121	Hammermill Crusher	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
122	Conveyor CNV-003	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
123	Diverter	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
124	Bucket Elevator CNV-004	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
125	Bucket Elevator CNV-005	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
126	Gate Chute	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
127	En-masse Drag Conveyor CNV-006	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
128	Coal Silo No. 1 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
129	Coal Silo No. 2 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
130	Coal Silo No. 3 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
131	Feed Chute No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
132	Feed Chute No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
133	Feed Chute No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
134	Gravimetric Feeder No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
135	Gravimetric Feeder No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
136	Gravimetric Feeder No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
						Significant Emission Units Total Limited Potential to Emit - SO_2		**558.3 tpy**

Table B-4. Potential to Emit Calculations Effective October 1, 2020 - Sulfur Dioxide (SO_2) Emissions, Continued
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
ID	Description			Reference	Factor			
Insignificant Emissions Units								
None	AFES Greenhouse Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.209 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Skarland Cabin Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.140 MMBtu/hr	8,760 hr/yr	0.3 tpy
None	Harper Hot Water Heater	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.236 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Various Propane-Fired Kilns	Propane	0.2 gr/100 ft^3	AP-42 Table 1.5-1	0.1 *S lb/kgal	2.6 MMBtu/hr, total	8,760 hr/yr	2.5E-03 tpy
None	Wood-Fired Kilns	Wood	N/A	AP-42 Table 1.6-2	0.025 lb/MMBtu[10]	3 cord/yr	8,760 hr/yr	5.7E-04 tpy
None	Duckering Classroom Turbine	Propane	2.4E-02 wt. pct.	AP-42 Table 3.1-2a	9.4E-01 *S lb/MMBtu[11]	0.33 MMBtu/hr	8,760 hr/yr	0.03 tpy
None	Graduation Flame	Propane	0.2 gr/100 ft^3	Mass Balance	2.3E-04 lb/MMBtu	5.0E-03 MMBtu/hr	8,760 hr/yr	5.0E-06 tpy
None	Various Paint Booths	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Various Laboratory Fume Hoods	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Power Plant Field-Erected Tank	Diesel	0.5 wt. pct.	N/A	N/A	212,120 gallons	8,760 hr/yr	0 tpy
None	SRC Pellet Stove	Wood Pellets	N/A	AP-42 Table 1.10-1	0.4 lb/ton	5.0 lb/hr	8,760 hr/yr	4.4E-03 tpy
105	Limestone Handling System	None	N/A	N/A	N/A	1,200 acfm	8,760 hr/yr	0 tpy
107	Sand Handling System	None	N/A	N/A	N/A	1,600 acfm	8,760 hr/yr	0 tpy
109	Ash Handling System	None	N/A	N/A	N/A	1,000 acfm	8,760 hr/yr	0 tpy
110	Ash Handling System Vacuum	None	N/A	N/A	N/A	2,000 acfm	8,760 hr/yr	0 tpy
111	Ash Loadout to Truck	None	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
Insignificant Emissions Units Total Limited Potential to Emit - SO_2								**1.4 tpy**
Total Limited Potential to Emit - SO_2								**559.7 tpy**

Notes:

[1] Allowable annual operation for all units based on full-time operation or permit operating limits, as applicable.

[2] Conversion factors:

Diesel Heating Value	0.137	MMBtu/gal	
Coal Heating Value	15.3	MMBtu/ton	
Propane Heating Value	91.5	MMBtu/kgal	
Approximate wood heating value:	15.3	MMBtu/cord	*https://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf*
Natural Gas Heat Content	1,000	Btu/scf	
Density of Diesel	7.0	lb/gal	
Engine Heat Rate	7,000	Btu/hp-hr	
Engine horsepower	1.341	kW	
Maximum fuel consumption for EUs 34 and 36:	15	gal/hr - each	*Vendor Data*
Maximum fuel consumption for EU 35:	181	gal/hr	*Vendor Data*

[3] The PTE beginning October 1, 2020 includes the SO_2 SIP requirements which incorporate the following limits.

-Limit the sulfur content to 1,000 ppmw S when burning liquid fuel in EU IDs 3 and 4 from October 1 through March 31.

-Limit the SO_2 content of natural gas burned in EU IDs 3 and 4 to 0.6 lb/MMscf SO_2 (i.e., 3.5 ppmv H_2S).

[4] The higher potential emissions for natural gas or distillate firing is shown as the potential emissions for EU ID 3.

[5] The combined SO_2 emissions from EU 4 and EU 8 are limited to less than 40 tons per year, per Condition 2 of Permit AQ0316MSS05 and is also listed BACT for EU IDs 4 and 8 in Serious $PM_{2.5}$ SIP.

[6] UAF requested an Owner Requested Limit in the minor permit application submitted in 3rd quarter 2020 to require ULSD be combusted in EU IDs 17, 18, and 22.

[7] EU IDs 19 through 21 are required to burn only ULSD per Permit AQ0316MSS04, Condition 9.

[8] EU ID 23 is required to burn only ULSD by 40 CFR 63.6604(a), Subpart ZZZZ.

[9] EU IDs 27, 29, 34, 35, and 36 are required to burn only ULSD by 40 CFR 60 Subpart IIII.

[10] Emission factor for small pottery-firing wood-fired kilns are not available. Calculation assumes that combustion of wood in the kilns is similar to that in dry wood-fired boilers.

[11] Emission factors for a propane-fired turbine are not available. Emission factors for a natural gas-fired turbine are used.

Table B-5. Potential to Emit Calculations Effective June 9, 2021 - Sulfur Dioxide (SO_2) Emissions
University of Alaska Fairbanks Campus

Emissions Unit ID	Emissions Unit Description	Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor Reference	SO_2 Emission Factor Factor	Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
Significant Emissions Units								
3	Dual-Fired Boiler No. 1	Diesel - Oct 1- March 31	0.1 wt. pct.[3]	Mass Balance	1.40E-02 lb/gal	180.9 MMBtu/hr	8,760 hr/yr	244.2 tpy[4]
		Diesel - April 1 - Sept. 30	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal			
		Natural Gas	N/A	AP-42 Table 1.4-2	0.60 lb/MMscf[3]			
4	Dual-Fired Boiler No. 2	Diesel - Oct 1- March 31	0.1 wt. pct.[3]	Permit AQ0316TVP02 Limit		180.9 MMBtu/hr	Not Applicable	40.0 tpy[6]
		Diesel - April 1 - Sept. 30	0.5 wt. pct.					
		Natural Gas	N/A					
8	Peaking/Backup Generator (DEG) Engine	ULSD	0.0015 wt. pct.[5]			13,266 hp		
9A	BiRD Incinerator	Medical/Infectious Waste	N/A	AP-42 Table 2.3-1	2.17 lb/ton	83 lb/hr	109 ton/yr	0.1 tpy[8]
		ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	28.5 gallon/hr[7]	8,760 hr/yr	
10	AFES Boiler No.1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
11	AFES Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
12	Harper Boiler No. 1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
13	Harper Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
16	Copper Lane (Honor's House) Boiler	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.233 MMBtu/hr	8,760 hr/yr	0.5 tpy
17	West Ridge Research Building Boiler No. 1	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
18	West Ridge Research Building Boiler No. 2	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
19	BiRD RM 100U3 Boiler No. 1	ULSD	0.0015 wt. pct.[10]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr	19,650 hr/yr	0.1 tpy
20	BiRD RM 100U3 Boiler No. 2	ULSD	0.0015 wt. pct.[10]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
21	BiRD RM 100U3 Boiler No. 3	ULSD	0.0015 wt. pct.[10]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
22	BiRD RM 100U3 Boiler No. 4	ULSD	0.0015 wt. pct.[9]	Mass Balance	2.10E-04 lb/gal	8.5 MMBtu/hr	8,760 hr/yr	0.1 tpy
23	Alaska Center for Energy and Power Generator Engine No. 1	ULSD	0.0015 wt. pct.[5, 11]	Mass Balance	2.10E-04 lb/gal	235 kW	8,760 hr/yr	0.01 tpy
24	Old University Park Emergency Generator Engine	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	72 hp	500 hr/yr	1.9E-04 tpy
25	AFES Grain Dryer	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	2.43 MMBtu/hr	8,760 hr/yr	0.02 tpy
26	Duckering Classroom Engine	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	64 hp	8,760 hr/yr	3.0E-03 tpy
27	Alaska Center for Energy and Power Generator Engine No. 2	ULSD	0.0015 wt. pct.[5, 12]	Mass Balance	2.10E-04 lb/gal	500 hp	4,380 hr/yr	0.01 tpy
28	Alaska Earthquake Information Center Emergency Generator Engine	ULSD	0.0015 wt. pct.[5]	Mass Balance	2.10E-04 lb/gal	120 hp	500 hr/yr	3.2E-04 tpy
29	Arctic Health Research Emergency Generator Engine	ULSD	0.0015 wt. pct.[5, 12]	Mass Balance	2.10E-04 lb/gal	314 hp	500 hr/yr	8.4E-04 tpy
34	BiRD Emergency Generator Engine No. 1	ULSD	0.0015 wt. pct.[13]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
35	Butrovich Administrative Building Emergency Engine	ULSD	0.0015 wt. pct.[13]	Mass Balance	2.10E-04 lb/gal	1,220 hp	500 hr/yr	9.5E-03 tpy
36	BiRD Emergency Generator Engine No. 2	ULSD	0.0015 wt. pct.[13]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
113	Dual Fuel-Fired CFB Boiler	Coal	0.25 wt. pct.[5]	Permit AQ0316MSS06 Rev. 2 Limit		295.6 MMBtu/hr	8,760 hr/yr	258.9 tpy[13]
		Woody Biomass	N/A					
114	Dry Sorbent Handling Vent Filter Exhaust	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
115	Unloading Hopper with Grizzly	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
116	Conveyor CNV-001	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
117	Magnetic Separator	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
118	Conveyor CNV-002	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
119	Surge Bin	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
120	Vibratory Feeder	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
121	Hammermill Crusher	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
122	Conveyor CNV-003	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
123	Diverter	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
124	Bucket Elevator CNV-004	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
125	Bucket Elevator CNV-005	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
126	Gate Chute	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
127	En-masse Drag Conveyor CNV-006	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
128	Coal Silo No. 1 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
129	Coal Silo No. 2 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
130	Coal Silo No. 3 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
131	Feed Chute No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
132	Feed Chute No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
133	Feed Chute No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
134	Gravimetric Feeder No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
135	Gravimetric Feeder No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
136	Gravimetric Feeder No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
Significant Emission Units Total Limited Potential to Emit - SO_2								**551.8 tpy**

Table B-5. Potential to Emit Calculations Effective June 9, 2021 - Sulfur Dioxide (SO_2) Emissions, Continued
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
ID	Description			Reference	Factor			
Insignificant Emissions Units								
None	AFES Greenhouse Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.209 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Skarland Cabin Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.140 MMBtu/hr	8,760 hr/yr	0.3 tpy
None	Harper Hot Water Heater	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.236 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Various Propane-Fired Kilns	Propane	0.2 gr/100 ft^3	AP-42 Table 1.5-1	0.1 *S lb/kgal	2.6 MMBtu/hr, total	8,760 hr/yr	2.5E-03 tpy
None	Wood-Fired Kilns	Wood	N/A	AP-42 Table 1.6-2	0.025 lb/MMBtu[14]	3 cord/yr	8,760 hr/yr	5.7E-04 tpy
None	Duckering Classroom Turbine	Propane	2.4E-02 wt. pct.	AP-42 Table 3.1-2a	9.4E-01 *S lb/MMBtu[15]	0.33 MMBtu/hr	8,760 hr/yr	0.03 tpy
None	Graduation Flame	Propane	0.2 gr/100 ft^3	Mass Balance	2.3E-04 lb/MMBtu	5.0E-03 MMBtu/hr	8,760 hr/yr	5.0E-06 tpy
None	Various Paint Booths	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Various Laboratory Fume Hoods	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Power Plant Field-Erected Tank	Diesel	0.5 wt. pct.	N/A	N/A	212,120 gallons	8,760 hr/yr	0 tpy
None	SRC Pellet Stove	Wood Pellets	N/A	AP-42 Table 1.10-1	0.4 lb/ton	5.0 lb/hr	8,760 hr/yr	4.4E-03 tpy
105	Limestone Handling System	None	N/A	N/A	N/A	1,200 acfm	8,760 hr/yr	0 tpy
107	Sand Handling System	None	N/A	N/A	N/A	1,600 acfm	8,760 hr/yr	0 tpy
109	Ash Handling System	None	N/A	N/A	N/A	1,000 acfm	8,760 hr/yr	0 tpy
110	Ash Handling System Vacuum	None	N/A	N/A	N/A	2,000 acfm	8,760 hr/yr	0 tpy
111	Ash Loadout to Truck	None	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
Insignificant Emissions Units Total Limited Potential to Emit - SO_2								**1.4 tpy**
Total Limited Potential to Emit - SO_2								**553.2 tpy**

Notes:

[1] Allowable annual operation for all units based on full-time operation or permit operating limits, as applicable.

[2] Conversion factors:

Diesel Heating Value	0.137	MMBtu/gal	
Coal Heating Value	15.3	MMBtu/ton	
Propane Heating Value	91.5	MMBtu/kgal	
Approximate wood heating value:	15.3	MMBtu/cord	*https://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf*
Natural Gas Heat Content	1,000	Btu/scf	
Density of Diesel	7.0	lb/gal	
Engine Heat Rate	7,000	Btu/hp-hr	
Engine horsepower	1.341	kW	
Maximum fuel consumption for EUs 34 and 36:	15	gal/hr - each	*Vendor Data*
Maximum fuel consumption for EU 35:	181	gal/hr	*Vendor Data*

[3] Includes the SO_2 SIP requirements effective October 1, 2020.

[4] The higher potential emissions for natural gas or distillate firing is shown as the potential emissions for EU ID 3.

[5] The PTE beginning June 9, 2021 includes the SO_2 SIP requirements which incorporate the following limits.

-Limit the sulfur content of coal received at facility to 0.25 wt. pct. S.
-Limit the sulfur content to 15 ppmw S when burning liquid fuel in EU IDs 8, 9A, 23, 24, and 26 through 29.

[6] The combined SO_2 emissions from EU 4 and EU 8 are limited to less than 40 tons per year, per Condition 2 of Permit AQ0316MSS05 and is also listed BACT for EU IDs 4 and 8 in Serious $PM_{2.5}$ SIP.

[7] Fuel oil burner capacity for EU ID 9A is 28.5 gallons per hour according to Therm Tec Inc vendor specifications for G-30P-1H.

[8] The higher potential emissions for medical/infectious waste or ULSD firing is shown as the potential emissions for EU ID 9A.

[9] UAF requested an Owner Requested Limit in the minor permit application submitted in 3rd quarter 2020 to require ULSD be combusted in EU IDs 17, 18, and 22.

[10] EU IDs 19 through 21 are required to burn only ULSD per Permit AQ0316MSS04, Condition 9.

[11] EU ID 23 is required to burn only ULSD by 40 CFR 63.6604(a), Subpart ZZZZ.

[12] EU IDs 27, 29, 34, 35, and 36 are required to burn only ULSD by 40 CFR 60 Subpart IIII.

[13] Condition 13 of AQ316MSS06 Revision 2 limits SO_2 emissions of the exhaust gas to no more than 0.2 lb/MMBtu heat input and 258.9 tpy of SO_2 for EU ID 113. The existing limits are more restrictive than calculating SO_2 PTE emissions only based on the 0.25 wt. pct. coal sulfur content limit.

[14] Emission factor for small pottery-firing wood-fired kilns are not available. Calculation assumes that combustion of wood in the kilns is similar to that in dry wood-fired boilers.

[15] Emission factors for a propane-fired turbine are not available. Emission factors for a natural gas-fired turbine are used.

Table B-6. Potential to Emit Calculations Effective October 1, 2023 - Sulfur Dioxide (SO_2) Emissions
University of Alaska Fairbanks Campus

Emissions Unit ID	Emissions Unit Description	Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor Reference	SO_2 Emission Factor Factor	Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
Significant Emissions Units								
3	Dual-Fired Boiler No. 1	ULSD - Oct 1- March 31	0.0015 wt. pct.[3]	Mass Balance	2.10E-04 lb/gal	180.9 MMBtu/hr	8,760 hr/yr	204.7 tpy[5]
		Diesel - April 1 - Sept. 30	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal			
		Natural Gas	N/A	AP-42 Table 1.4-2	0.60 lb/MMscf[4]			
4	Dual-Fired Boiler No. 2	ULSD - Oct 1- March 31	0.0015 wt. pct.[3]	Permit AQ0316TVP02 Limit		180.9 MMBtu/hr	Not Applicable	40.0 tpy[7]
		Diesel - April 1 - Sept. 30	0.5 wt. pct.					
		Natural Gas	N/A					
8	Peaking/Backup Generator (DEG) Engine	ULSD	0.0015 wt. pct.[6]			13,266 hp		
9A	BiRD Incinerator	Medical/Infectious Waste	N/A	AP-42 Table 2.3-1	2.17 lb/ton	83 lb/hr	109 ton/yr	0.1 tpy[9]
		ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	28.5 gallon/hr[8]	8,760 hr/yr	
10	AFES Boiler No.1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
11	AFES Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	1.08 MMBtu/hr	8,760 hr/yr	2.4 tpy
12	Harper Boiler No. 1	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
13	Harper Boiler No. 2	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.64 MMBtu/hr	8,760 hr/yr	1.4 tpy
16	Copper Lane (Honor's House) Boiler	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.233 MMBtu/hr	8,760 hr/yr	0.5 tpy
17	West Ridge Research Building Boiler No. 1	ULSD	0.0015 wt. pct.[10]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
18	West Ridge Research Building Boiler No. 2	ULSD	0.0015 wt. pct.[10]	Mass Balance	2.10E-04 lb/gal	4.93 MMBtu/hr	8,760 hr/yr	0.03 tpy
19	BiRD RM 100U3 Boiler No. 1	ULSD	0.0015 wt. pct.[11]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr	19,650 hr/yr	0.1 tpy
20	BiRD RM 100U3 Boiler No. 2	ULSD	0.0015 wt. pct.[11]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
21	BiRD RM 100U3 Boiler No. 3	ULSD	0.0015 wt. pct.[11]	Mass Balance	2.10E-04 lb/gal	6.13 MMBtu/hr		
22	BiRD RM 100U3 Boiler No. 4	ULSD	0.0015 wt. pct.[10]	Mass Balance	2.10E-04 lb/gal	8.5 MMBtu/hr	8,760 hr/yr	0.1 tpy
23	Alaska Center for Energy and Power Generator Engine No. 1	ULSD	0.0015 wt. pct.[6, 12]	Mass Balance	2.10E-04 lb/gal	235 kW	8,760 hr/yr	0.01 tpy
24	Old University Park Emergency Generator Engine	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	72 hp	500 hr/yr	1.9E-04 tpy
25	AFES Grain Dryer	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	2.43 MMBtu/hr	8,760 hr/yr	0.02 tpy
26	Duckering Classroom Engine	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	64 hp	8,760 hr/yr	3.0E-03 tpy
27	Alaska Center for Energy and Power Generator Engine No. 2	ULSD	0.0015 wt. pct.[6, 13]	Mass Balance	2.10E-04 lb/gal	500 hp	4,380 hr/yr	0.01 tpy
28	Alaska Earthquake Information Center Emergency Generator Engine	ULSD	0.0015 wt. pct.[6]	Mass Balance	2.10E-04 lb/gal	120 hp	500 hr/yr	3.2E-04 tpy
29	Arctic Health Research Emergency Generator Engine	ULSD	0.0015 wt. pct.[6, 13]	Mass Balance	2.10E-04 lb/gal	314 hp	500 hr/yr	8.4E-04 tpy
34	BiRD Emergency Generator Engine No. 1	ULSD	0.0015 wt. pct.[13]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
35	Butrovich Administrative Building Emergency Engine	ULSD	0.0015 wt. pct.[13]	Mass Balance	2.10E-04 lb/gal	1,220 hp	500 hr/yr	9.5E-03 tpy
36	BiRD Emergency Generator Engine No. 2	ULSD	0.0015 wt. pct.[13]	Mass Balance	2.10E-04 lb/gal	324 hp	500 hr/yr	7.9E-04 tpy
113	Dual Fuel-Fired CFB Boiler	Coal	0.25 wt. pct.[6]	Permit AQ0316MSS06 Rev. 2 Limit		295.6 MMBtu/hr	8,760 hr/yr	258.9 tpy[14]
		Woody Biomass	N/A					
114	Dry Sorbent Handling Vent Filter Exhaust	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
115	Unloading Hopper with Grizzly	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
116	Conveyor CNV-001	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
117	Magnetic Separator	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
118	Conveyor CNV-002	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
119	Surge Bin	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
120	Vibratory Feeder	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
121	Hammermill Crusher	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
122	Conveyor CNV-003	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
123	Diverter	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
124	Bucket Elevator CNV-004	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
125	Bucket Elevator CNV-005	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
126	Gate Chute	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
127	En-masse Drag Conveyor CNV-006	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
128	Coal Silo No. 1 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
129	Coal Silo No. 2 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
130	Coal Silo No. 3 with bin vent	Not Fired	N/A	N/A	N/A	1,650 acfm	8,760 hr/yr	0 tpy
131	Feed Chute No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
132	Feed Chute No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
133	Feed Chute No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
134	Gravimetric Feeder No. 1	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
135	Gravimetric Feeder No. 2	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
136	Gravimetric Feeder No. 3	Not Fired	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
Significant Emission Units Total Limited Potential to Emit - SO_2								**512.3 tpy**

Table B-6. Potential to Emit Calculations Effective October 1, 2023 - Sulfur Dioxide (SO_2) Emissions, Continued
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	Fuel Sulfur Content	SO_2 Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential SO_2 Emissions[2]
ID	Description			Reference	Factor			
Insignificant Emissions Units								
None	AFES Greenhouse Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.209 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Skarland Cabin Furnace	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.140 MMBtu/hr	8,760 hr/yr	0.3 tpy
None	Harper Hot Water Heater	Diesel	0.5 wt. pct.	Mass Balance	7.00E-02 lb/gal	0.236 MMBtu/hr	8,760 hr/yr	0.5 tpy
None	Various Propane-Fired Kilns	Propane	0.2 gr/100 ft^3	AP-42 Table 1.5-1	0.1 *S lb/kgal	2.6 MMBtu/hr, total	8,760 hr/yr	2.5E-03 tpy
None	Wood-Fired Kilns	Wood	N/A	AP-42 Table 1.6-2	0.025 lb/MMBtu[15]	3 cord/yr	8,760 hr/yr	5.7E-04 tpy
None	Duckering Classroom Turbine	Propane	2.4E-02 wt. pct.	AP-42 Table 3.1-2a	9.4E-01 *S lb/MMBtu[16]	0.33 MMBtu/hr	8,760 hr/yr	0.03 tpy
None	Graduation Flame	Propane	0.2 gr/100 ft^3	Mass Balance	2.3E-04 lb/MMBtu	5.0E-03 MMBtu/hr	8,760 hr/yr	5.0E-06 tpy
None	Various Paint Booths	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Various Laboratory Fume Hoods	N/A	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Power Plant Field-Erected Tank	Diesel	0.5 wt. pct.	N/A	N/A	212,120 gallons	8,760 hr/yr	0 tpy
None	SRC Pellet Stove	Wood Pellets	N/A	AP-42 Table 1.10-1	0.4 lb/ton	5.0 lb/hr	8,760 hr/yr	4.4E-03 tpy
105	Limestone Handling System	None	N/A	N/A	N/A	1,200 acfm	8,760 hr/yr	0 tpy
107	Sand Handling System	None	N/A	N/A	N/A	1,600 acfm	8,760 hr/yr	0 tpy
109	Ash Handling System	None	N/A	N/A	N/A	1,000 acfm	8,760 hr/yr	0 tpy
110	Ash Handling System Vacuum	None	N/A	N/A	N/A	2,000 acfm	8,760 hr/yr	0 tpy
111	Ash Loadout to Truck	None	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
Insignificant Emissions Units Total Limited Potential to Emit - SO_2								**1.4 tpy**
Total Limited Potential to Emit - SO_2								**513.6 tpy**

Notes:

[1] Allowable annual operation for all units based on full-time operation or permit operating limits, as applicable.

[2] Conversion factors:

Diesel Heating Value	0.137	MMBtu/gal	
Coal Heating Value	15.3	MMBtu/ton	
Propane Heating Value	91.5	MMBtu/kgal	
Approximate wood heating value:	15.3	MMBtu/cord	*https://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf*
Natural Gas Heat Content	1,000	Btu/scf	
Density of Diesel	7.0	lb/gal	
Engine Heat Rate	7,000	Btu/hp-hr	
Engine horsepower	1.341	kW	
Maximum fuel consumption for EUs 34 and 36:	15	gal/hr - each	*Vendor Data*
Maximum fuel consumption for EU 35:	181	gal/hr	*Vendor Data*

[3] The PTE beginning October 1, 2023 includes the SIP SO_2 requirements which limits the sulfur content of liquid fuel combusted in EU IDs 3, 4, and 19 through 21 to 15 ppmw (i.e., ULSD) during the months of October through March. The sulfur content limit of 1,000 ppmw S for liquid fuel combusted for EU IDs 3 and 4 established October 1, 2020 is no longer in effect.

[4] Includes the SO_2 SIP requirements for EU IDs 3 and 4, when operating on natural gas, effective by October 1, 2020.

[5] The higher potential emissions for natural gas or distillate firing is shown as the potential emissions for EU ID 3.

[6] Includes the SO_2 SIP requirements effective by June 9, 2021.

[7] The combined SO_2 emissions from EU 4 and EU 8 are limited to less than 40 tons per year, per Condition 2 of Permit AQ0316MSS05 and is also listed BACT for EU IDs 4 and 8 in Serious $PM_{2.5}$ SIP.

[8] Fuel oil burner capacity for EU ID 9A is 28.5 gallons per hour according to Therm Tec Inc vendor specifications for G-30P-1H.

[9] The higher potential emissions for medical/infectious waste or ULSD firing is shown as the potential emissions for EU ID 9A.

[10] UAF requested an Owner Requested Limit in the minor permit application submitted in 3rd quarter 2020 to require ULSD be combusted in EU IDs 17, 18, and 22.

[11] EU IDs 19 through 21 are required to burn only ULSD per Permit AQ0316MSS04, Condition 9.

[12] EU ID 23 is required to burn only ULSD by 40 CFR 63.6604(a), Subpart ZZZZ.

[13] EU IDs 27, 29, 34, 35, and 36 are required to burn only ULSD by 40 CFR 60 Subpart IIII.

[14] Condition 13 of AQ316MSS06 Revision 2 limits SO_2 emissions of the exhaust gas to no more than 0.2 lb/MMBtu heat input and 258.9 tpy of SO_2 for EU ID 113. The existing limits are more restrictive than calculating SO_2 PTE emissions only based on the 0.25 wt. pct. coal sulfur content limit.

[15] Emission factor for small pottery-firing wood-fired kilns are not available. Calculation assumes that combustion of wood in the kilns is similar to that in dry wood-fired boilers.

[16] Emission factors for a propane-fired turbine are not available. Emission factors for a natural gas-fired turbine are used.

Table B-7. Existing Potential to Emit Calculations - Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$) Emissions
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	$PM_{2.5}$ Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential $PM_{2.5}$ Emissions[2]
ID	Description		Reference	Factor			
Significant Emissions Units							
3	Dual-Fired Boiler No. 1	Diesel	AP-42 Tables 1.3-2 and 1.3-7	0.016 lb/MMBtu	180.9 MMBtu/hr	8,760 hr/yr	12.3 tpy[3]
		Natural Gas	AP-42 Table 1.4-2	7.6 lb/MMscf			
4	Dual-Fired Boiler No. 2	Diesel	AP-42 Tables 1.3-2 and 1.3-7	0.016 lb/MMBtu	180.9 MMBtu/hr	8,760 hr/yr	0.5 tpy[4]
		Natural Gas	AP-42 Table 1.4-2	7.6 lb/MMscf			
8	Peaking/Backup Generator (DEG) Engine	Diesel	AP-42 Table 3.4-2	5.56E-02 lb/MMBtu	13,266 hp	140,105 gal/yr	
9A	BiRD Incinerator	Medical/Infectious Waste	AP-42 Table 2.3-2	4.67 lb/ton	83 lb/hr	109 ton/yr	0.3 tpy
10	AFES Boiler No.1	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	1.08 MMBtu/hr	8,760 hr/yr	0.1 tpy
11	AFES Boiler No. 2	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	1.08 MMBtu/hr	8,760 hr/yr	0.1 tpy
12	Harper Boiler No. 1	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.64 MMBtu/hr	8,760 hr/yr	0.04 tpy
13	Harper Boiler No. 2	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.64 MMBtu/hr	8,760 hr/yr	0.04 tpy
16	Copper Lane (Honor's House) Boiler	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.233 MMBtu/hr	8,760 hr/yr	0.02 tpy
17	West Ridge Research Building Boiler No. 1	ULSD	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	4.93 MMBtu/hr	8,760 hr/yr	0.3 tpy
18	West Ridge Research Building Boiler No. 2	ULSD	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	4.93 MMBtu/hr	8,760 hr/yr	0.3 tpy
19	BiRD RM 100U3 Boiler No. 1	ULSD	AP-42 Tables 1.3-2 and 1.3-7	0.016 lb/MMBtu	6.13 MMBtu/hr	19,650 hr/yr	0.9 tpy
20	BiRD RM 100U3 Boiler No. 2	ULSD	AP-42 Tables 1.3-2 and 1.3-7	0.016 lb/MMBtu	6.13 MMBtu/hr		
21	BiRD RM 100U3 Boiler No. 3	ULSD	AP-42 Tables 1.3-2 and 1.3-7	0.016 lb/MMBtu	6.13 MMBtu/hr		
22	BiRD RM 100U3 Boiler No. 4	ULSD	AP-42 Tables 1.3-2 and 1.3-7	0.016 lb/MMBtu	8.5 MMBtu/hr	8,760 hr/yr	0.0 tpy
23	Alaska Center for Energy and Power Generator Engine No. 1	ULSD	AP-42 Table 3.3-1	1.0 g/hp-hr	235 kW	8,760 hr/yr	3.0 tpy
24	Old University Park Emergency Generator Engine	Diesel	AP-42 Table 3.3-1	1.0 g/hp-hr	72 hp	500 hr/yr	0.04 tpy
25	AFES Grain Dryer	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	2.430 MMBtu/hr	8,760 hr/yr	0.2 tpy
26	Duckering Classroom Engine	Diesel	AP-42 Table 3.3-1	1.0 g/hp-hr	64 hp	8,760 hr/yr	0.6 tpy
27	Alaska Center for Energy and Power Generator Engine No. 2	ULSD	40 CFR Part 89 Tier 3 x 1.25 NTE[5]	0.19 g/hp-hr	500 hp	4,380 hr/yr	0.5 tpy
28	Alaska Earthquake Information Center Emergency Generator Engine	Diesel	AP-42 Table 3.3-1	1.0 g/hp-hr	120 hp	500 hr/yr	0.1 tpy
29	Arctic Health Research Emergency Generator Engine	ULSD	40 CFR Part 1039 Tier 4i x 1.5 NTE[5]	0.023 g/hp-hr	314 hp	500 hr/yr	3.89E-03 tpy
34	BiRD Emergency Generator Engine No. 1	ULSD	40 CFR Part 89 Tier 3 x 1.25 NTE[5]	0.25 g/kW-hr	324 hp	500 hr/yr	0.03 tpy
35	Butrovich Administrative Building Emergency Engine	ULSD	Manufacturer Data	0.05 g/hp-hr	1,220 hp	500 hr/yr	0.03 tpy
36	BiRD Emergency Generator Engine No. 2	ULSD	40 CFR Part 89 Tier 3 x 1.25 NTE[5]	0.25 g/kW-hr	324 hp	500 hr/yr	0.03 tpy
113	Dual Fuel-Fired CFB Boiler	Coal/Woody Biomass	Vendor Data	0.012 lb/MMBtu	295.6 MMBtu/hr	8,760 hr/yr	15.5 tpy
114	Dry Sorbent Handling Vent Filter Exhaust	Not Fired	Design Specification	0.050 gr/dscf	5.0 acfm	8,760 hr/yr	0.01 tpy
115	Unloading Hopper with Grizzly	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
116	Conveyor CNV-001	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
117	Magnetic Separator	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
118	Conveyor CNV-002	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
119	Surge Bin	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
120	Vibratory Feeder	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
121	Hammermill Crusher	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
122	Conveyor CNV-003	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
123	Diverter	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
124	Bucket Elevator CNV-004	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
125	Bucket Elevator CNV-005	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
126	Gate Chute	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
127	En-masse Drag Conveyor CNV-006	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
128	Coal Silo No. 1 with bin vent	Not Fired	Design Specification	0.003 gr/dscf	1,650 acfm	8,760 hr/yr	0.2 tpy
129	Coal Silo No. 2 with bin vent	Not Fired	Design Specification	0.003 gr/dscf	1,650 acfm	8,760 hr/yr	0.2 tpy
130	Coal Silo No. 3 with bin vent	Not Fired	Design Specification	0.003 gr/dscf	1,650 acfm	8,760 hr/yr	0.2 tpy
131	Feed Chute No. 1	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
132	Feed Chute No. 2	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
133	Feed Chute No. 3	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
134	Gravimetric Feeder No. 1	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
135	Gravimetric Feeder No. 2	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
136	Gravimetric Feeder No. 3	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
Significant Emissions Units Total Limited Potential to Emit - $PM_{2.5}$							**35.6 tpy**

Table B-7. Existing Potential to Emit Calculations - Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$) Emissions, Continued
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	$PM_{2.5}$ Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential $PM_{2.5}$ Emissions[2]
ID	Description		Reference	Factor			
Insignificant Emissions Units							
None	AFES Greenhouse Furnace	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.209 MMBtu/hr	8,760 hr/yr	0.01 tpy
None	Skarland Cabin Furnace	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.140 MMBtu/hr	8,760 hr/yr	0.01 tpy
None	Harper Hot Water Heater	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.236 MMBtu/hr	8,760 hr/yr	0.02 tpy
None	Various Propane-Fired Kilns	Propane	AP-42 Table 1.5-1	0.7 lb/kgal	2.6 MMBtu/hr, total	8,760 hr/yr	0.1 tpy
None	Wood-Fired Kilns	Wood	AP-42 Table 1.6-1	0.33 lb/MMBtu[6]	3 cords/yr	8,760 hr/yr	0.01 tpy
None	Duckering Classroom Turbine	Propane	AP-42 Table 3.1-2a	6.6E-03 lb/MMBtu[7]	0.33 MMBtu/hr	8,760 hr/yr	0.01 tpy
None	Graduation Flame	Propane	AP-42 Table 13.5-1	0.0 lb/MMBtu[8]	5.0E-03 MMBtu/hr	8,760 hr/yr	0 tpy
None	Facilities Services Paint Booth Exhaust Fan	Various Paints	N/A	70% capture	Unknown	131 gal/yr	0.1 tpy[9]
None	Museum Paint Booth Exhaust Fan	Various Paints	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Various Laboratory Fume Hoods	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Power Plant Field-Erected Tank	Diesel	N/A	N/A	212,120 gallons	8,760 hr/yr	0 tpy
None	SRC Pellet Stove	Wood Pellets	AP-42 Table 1.10-1	8.8 lb/ton	5.0 lb/hr	8,760 hr/yr	0.1 tpy
105	Limestone Handling System	None	Design Specification	0.003 gr/dscf	1,200 acfm	8,760 hr/yr	0.1 tpy
107	Sand Handling System	None	Design Specification	0.003 gr/dscf	1,600 acfm	8,760 hr/yr	0.2 tpy
109	Ash Handling System	None	Design Specification	0.003 gr/dscf	1,000 acfm	8,760 hr/yr	0.1 tpy
110	Ash Handling System Vacuum	None	Design Specification	0.003 gr/dscf	2,000 acfm	8,760 hr/yr	0.2 tpy
111	Ash Loadout to Truck	None	See detailed calculations in Table B-7				7.2E-04 tpy
						Insignificant Emissions Units Total Limited Potential to Emit - $PM_{2.5}$	**1.0 tpy**
						Total Limited Potential to Emit - $PM_{2.5}$	**36.6 tpy**

Notes:

[1] Allowable annual operation for all units based on full-time operation or permit operating limits, as applicable.

[2] Conversion factors:

Mass conversion	453.59 g/lb	
Diesel Heating Value	0.137 MMBtu/gal	
Coal Heating Value	15.3 MMBtu/ton	
Approximate wood heating value:	15.3 MMBtu/cord	*https://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf*
Engine Heat Rate	7,000 Btu/hp-hr	
Propane Heating Value	91.5 MMBtu/kgal	
Natural Gas Heat Content	1,000 Btu/scf	
Engine horsepower	1.341 kW	
lb =	7,000 gr	

[3] The higher potential emissions for natural gas or distillate firing is shown as the potential emissions for EU 3.

[4] The potential PM_{10} emissions for EU IDs 4 and 8 are calculated using the maximum fuel use by EU ID 8 that would allow the unit to meet the NOx emission limit under Permit AQ0316MSS05.

[5] The Tier 3 and Tier 4i weighted-cycle emission rates for PM have been multiplied by 1.25 or 1.5 to determine the Not-to-Exceed emission factor per 40 CFR 1039.101(e) and ADEC policy (see also 40 CFR 60.4212(c)).

[6] Emission factor for small pottery-firing wood-fired kilns are not available. Calculation assumes that combustion of wood in the kilns is similar to that in dry wood-fired boilers.

[7] Emission factors for a propane-fired turbine are not available. Emission factors for a natural gas-fired turbine are used.

[8] The graduation flame is best described as a non-smoking flare. Soot emissions are zero.

[9] Less than 131 gallons of paint are used on an annual basis in the facilities services paint booth. The density of paint is approximately 7 lb/gal. The facilities services paint booth has fiberglass paint arrestor pads. The calculation conservatively assumes that the entire volume of paint used is emitted as PM. Vendor data for the filters indicates an 70 pct. capture efficiency for particles with a diameter equal to or greater than 2.5 microns.

Table B-8. Existing Potential to Emit Calculations- EU ID 111 Ash Handling System $PM_{2.5}$ Potential Emission
University of Alaska Fairbanks Campus

Emissions Unit		Maximum Rating/Capacity	PM Emission Factor		Allowable Annual Operation	Potential $PM_{2.5}$ Emissions
Permit ID	Description		Reference	$PM_{2.5}$Factor		
111	Ash Loadout to Truck	N/A	AP-42, Section 13.2.4	5.5E-05 lb/ton	26,280 tpy	7.23E-04 tpy

Notes:

1. Ash loadout emission calculations:

Emission factor from AP-42, Section 13.2.4 based on empirical equation $E = k \times 0.0032 \times (U/5)^{1.3}/(M/2)^{1.4}$ lb/ton transferred where:
k = 0.053 for $PM_{2.5}$
U = mean wind speed = 5.4 mph in Fairbanks, per National Climactic Data Center (Value used in 2015 preliminary BACT PTE calculations)
M = ash moisture content = 4.8 percent (AP-42, page 13.2.4-4)

Ash loadout emissions based on maximum boiler (EU 113) total consumption capacity.
Ash content of coal = 8.5 pct. per Usibelli Coal Mine website in 2015 for BACT determination
Operations, ash tons/hr = (Σ coal capacity, ton/hr) x (0.085 ash content) + (captured sulfur, captured oxygen, and limestone inerts)= ton/hr per design engineers
Operations, ash tpy = (Σ coal capacity, 3 tons/hr) x (8,760 hr/yr) 26,280 tpy
Ash loadout emissions, tpy = (emission factor, lb/ton) x (ash loading, ton/yr) / (2,000 lb/ton)

Table B-9. Potential to Emit Calculations Effective June 9, 2021- Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$) Emissions
University of Alaska Fairbanks Campus

Emissions Unit		Fuel Type	$PM_{2.5}$ Emission Factor		Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential $PM_{2.5}$ Emissions[6]
ID	Description		Reference	Factor			
Significant Emissions Units							
3	Dual-Fired Boiler No. 1	Diesel	AP-42 Tables 1.3-2 and 1.3-6	0.012 lb/MMBtu[3]	180.9 MMBtu/hr	8,760 hr/yr	9.5 tpy[7]
		Natural Gas	AP-42 Table 1.4-2	0.0075 lb/MMBtu[4]			
4	Dual-Fired Boiler No. 2	Diesel	AP-42 Tables 1.3-2 and 1.3-6	0.012 lb/MMBtu[3]	180.9 MMBtu/hr	8,760 hr/yr	0.5 tpy[8]
		Natural Gas	AP-42 Table 1.4-2	0.0075 lb/MMBtu[4]			
8	Peaking/Backup Generator (DEG) Engine	Diesel	AP-42 Table 3.4-2	5.56E-02 lb/MMBtu	13,266 hp	140,105 gal/yr	
9A	BiRD Incinerator	Medical/Infectious Waste	AP-42 Table 2.3-2	4.67 lb/ton	83 lb/hr	109 ton/yr	0.3 tpy
10	AFES Boiler No.1	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	1.08 MMBtu/hr	8,760 hr/yr	0.1 tpy
11	AFES Boiler No. 2	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	1.08 MMBtu/hr	8,760 hr/yr	0.1 tpy
12	Harper Boiler No. 1	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.64 MMBtu/hr	8,760 hr/yr	0.04 tpy
13	Harper Boiler No. 2	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.64 MMBtu/hr	8,760 hr/yr	0.04 tpy
16	Copper Lane (Honor's House) Boiler	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.233 MMBtu/hr	8,760 hr/yr	0.02 tpy
17	West Ridge Research Building Boiler No. 1	ULSD	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	4.93 MMBtu/hr	8,760 hr/yr	0.3 tpy
18	West Ridge Research Building Boiler No. 2	ULSD	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	4.93 MMBtu/hr	8,760 hr/yr	0.3 tpy
19	BiRD RM 100U3 Boiler No. 1	ULSD	AP-42 Tables 1.3-2 and 1.3-6	0.012 lb/MMBtu[3]	6.13 MMBtu/hr	19,650 hr/yr	0.7 tpy
20	BiRD RM 100U3 Boiler No. 2	ULSD	AP-42 Tables 1.3-2 and 1.3-6	0.012 lb/MMBtu[3]	6.13 MMBtu/hr		
21	BiRD RM 100U3 Boiler No. 3	ULSD	AP-42 Tables 1.3-2 and 1.3-6	0.012 lb/MMBtu[3]	6.13 MMBtu/hr		
22	BiRD RM 100U3 Boiler No. 4	ULSD	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	8.5 MMBtu/hr	8,760 hr/yr	0.6 tpy
23	Alaska Center for Energy and Power Generator Engine No. 1	ULSD	AP-42 Table 3.3-1	1.0 g/hp-hr	235 kW	8,760 hr/yr	3.0 tpy
24	Old University Park Emergency Generator Engine	Diesel	AP-42 Table 3.3-1	1.0 g/hp-hr	72 hp	500 hr/yr	0.04 tpy
25	AFES Grain Dryer	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	2.430 MMBtu/hr	8,760 hr/yr	0.2 tpy
26	Duckering Classroom Engine	Diesel	AP-42 Table 3.3-1	1.0 g/hp-hr	64 hp	8,760 hr/yr	0.6 tpy
27	Alaska Center for Energy and Power Generator Engine No. 2	ULSD	40 CFR Part 89 Tier 3	0.15 g/hp-hr[5]	500 hp	4,380 hr/yr	0.4 tpy
28	Alaska Earthquake Information Center Emergency Generator Engine	Diesel	AP-42 Table 3.3-1	1.0 g/hp-hr	120 hp	500 hr/yr	0.1 tpy
29	Arctic Health Research Emergency Generator Engine	ULSD	40 CFR Part 1039 Tier 4i	0.015 g/hp-hr[5]	314 hp	500 hr/yr	2.60E-03 tpy
34	BiRD Emergency Generator Engine No. 1	ULSD	40 CFR Part 89 Tier 3 x 1.25 NTE[9]	0.25 g/kW-hr	324 hp	500 hr/yr	0.03 tpy
35	Butrovich Administrative Building Emergency Engine	ULSD	Manufacturer Data	0.05 g/hp-hr	1,220 hp	500 hr/yr	0.03 tpy
36	BiRD Emergency Generator Engine No. 2	ULSD	40 CFR Part 89 Tier 3 x 1.25 NTE[9]	0.25 g/kW-hr	324 hp	500 hr/yr	0.03 tpy
113	Dual Fuel-Fired CFB Boiler	Coal/Woody Biomass	Vendor Data	0.012 lb/MMBtu	295.6 MMBtu/hr	8,760 hr/yr	15.5 tpy
114	Dry Sorbent Handling Vent Filter Exhaust	Not Fired	Design Specification	0.050 gr/dscf	5.0 acfm	8,760 hr/yr	0.01 tpy
115	Unloading Hopper with Grizzly	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
116	Conveyor CNV-001	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
117	Magnetic Separator	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
118	Conveyor CNV-002	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
119	Surge Bin	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
120	Vibratory Feeder	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
121	Hammermill Crusher	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
122	Conveyor CNV-003	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
123	Diverter	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
124	Bucket Elevator CNV-004	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
125	Bucket Elevator CNV-005	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
126	Gate Chute	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
127	En-masse Drag Conveyor CNV-006	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
128	Coal Silo No. 1 with bin vent	Not Fired	Design Specification	0.003 gr/dscf	1,650 acfm	8,760 hr/yr	0.2 tpy
129	Coal Silo No. 2 with bin vent	Not Fired	Design Specification	0.003 gr/dscf	1,650 acfm	8,760 hr/yr	0.2 tpy
130	Coal Silo No. 3 with bin vent	Not Fired	Design Specification	0.003 gr/dscf	1,650 acfm	8,760 hr/yr	0.2 tpy
131	Feed Chute No. 1	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
132	Feed Chute No. 2	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
133	Feed Chute No. 3	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
134	Gravimetric Feeder No. 1	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
135	Gravimetric Feeder No. 2	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
136	Gravimetric Feeder No. 3	Not Fired	None Enclosed	None	N/A	8,760 hr/yr	0 tpy
Significant Emissions Units Total Limited Potential to Emit - $PM_{2.5}$							**33.0 tpy**

Table B-9. Potential to Emit Calculations Effective June 9, 2021- Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$) Emissions, Continued
University of Alaska Fairbanks Campus

Emissions Unit ID	Emissions Unit Description	Fuel Type	$PM_{2.5}$ Emission Factor Reference	$PM_{2.5}$ Emission Factor Factor	Maximum Rating/Capacity	Allowable Annual Operation[1]	Potential $PM_{2.5}$ Emissions[2]
Insignificant Emissions Units							
None	AFES Greenhouse Furnace	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.209 MMBtu/hr	8,760 hr/yr	0.01 tpy
None	Skarland Cabin Furnace	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.140 MMBtu/hr	8,760 hr/yr	0.01 tpy
None	Harper Hot Water Heater	Diesel	AP-42 Tables 1.3-2 and 1.3-7	2.13 lb/kgal	0.236 MMBtu/hr	8,760 hr/yr	0.02 tpy
None	Various Propane-Fired Kilns	Propane	AP-42 Table 1.5-1	0.7 lb/kgal	2.6 MMBtu/hr, total	8,760 hr/yr	0.1 tpy
None	Wood-Fired Kilns	Wood	AP-42 Table 1.6-1	0.33 lb/MMBtu[10]	3 cords/yr	8,760 hr/yr	0.01 tpy
None	Duckering Classroom Turbine	Propane	AP-42 Table 3.1-2a	6.6E-03 lb/MMBtu[11]	0.33 MMBtu/hr	8,760 hr/yr	0.01 tpy
None	Graduation Flame	Propane	AP-42 Table 13.5-1	0.0 lb/MMBtu[12]	5.0E-03 MMBtu/hr	8,760 hr/yr	0 tpy
None	Facilities Services Paint Booth Exhaust Fan	Various Paints	N/A	70% capture	Unknown	131 gal/yr	0.1 tpy[13]
None	Museum Paint Booth Exhaust Fan	Various Paints	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Various Laboratory Fume Hoods	N/A	N/A	N/A	N/A	8,760 hr/yr	0 tpy
None	Power Plant Field-Erected Tank	Diesel	N/A	N/A	212,120 gallons	8,760 hr/yr	0 tpy
None	SRC Pellet Stove	Wood Pellets	AP-42 Table 1.10-1	8.8 lb/ton	5.0 lb/hr	8,760 hr/yr	0.1 tpy
105	Limestone Handling System	None	Design Specification	0.003 gr/dscf	1,200 acfm	8,760 hr/yr	0.1 tpy
107	Sand Handling System	None	Design Specification	0.003 gr/dscf	1,600 acfm	8,760 hr/yr	0.2 tpy
109	Ash Handling System	None	Design Specification	0.003 gr/dscf	1,000 acfm	8,760 hr/yr	0.1 tpy
110	Ash Handling System Vacuum	None	Design Specification	0.003 gr/dscf	2,000 acfm	8,760 hr/yr	0.2 tpy
111	Ash Loadout to Truck	None	See detailed calculations in Table B-7				7.2E-04 tpy
						Insignificant Emissions Units Total Limited Potential to Emit - $PM_{2.5}$	**1.0 tpy**
						Total Limited Potential to Emit - $PM_{2.5}$	**34.0 tpy**

Notes:

1. Allowable annual operation for all units based on full-time operation or permit operating limits, as applicable.
2. UA has identified SIP limit errors in the Serious SIP which are indicated in the footnotes 2 through 5 below. UA anticipates ADEC will correct these identified inconsistencies with the SIP limits in the future.
3. $PM_{2.5}$ emissions SIP limit of 0.012 lb/MMBtu for EU IDs 3, 4, and 19 though 21 is based on emission factors from AP-42 Tables 1.3-2 (condensable PM EF) and 1.3-6 ($PM_{2.5}$ EF for industrial boilers). UA believes the $PM_{2.5}$ EF for industrial boilers is the incorrect EF. The $PM_{2.5}$ SIP limit for these boilers should be updated use the particle size distribution of filterable $PM_{2.5}$ for commercial boilers in AP-42 1.3-7, which is more appropriate. The revised SIP limit should be 0.016 lb/MMBtu (i.e., 2.13 lb/1000 gal) based on AP-42 Tables 1.3-2 and 1.3-7.
4. ADEC developed the $PM_{2.5}$ SIP limit using the PM emission factor of 7.6 lb/MMscf (AP-42 Table 1.4-2) and a high heat value of 1,020 Btu/scf. UA air quality permits have used a high heat content of 1,000 Btu/scf. Using natural gas high heat content of 1,000 Btu/scf and the PM emission factor from AP-41 Table 1.4-2 of 7.6 lb/MMscf, the appropriate SIP limit is 0.0076 lb/MMBtu.
5. ADEC has established a policy that all engines should apply the 40 CFR 1039 not to exceed (NTE) multiplier if using engine tier emission standards to calculate potential emissions. The existing $PM_{2.5}$ SIP limits for EU IDs 27, 0.15 g/hp-hr, and EU ID 29, 0.015 g/hp-hr, do not include the 1.25 and 1.5 NTE multipliers. Based on ADEC policy, UA believes the $PM_{2.5}$ SIP limit for EU ID 27 should be updated to 0.2 g/hp-hr and the $PM_{2.5}$ SIP limit for EU ID 29 should be updated to 0.023 g/hp-hr.
6. Conversion factors:

Mass conversion	453.59	g/lb	
Diesel Heating Value	0.137	MMBtu/gal	
Coal Heating Value	15.3	MMBtu/ton	
Approximate wood heating value:	15.3	MMBtu/cord	*https://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf*
Engine Heat Rate	7,000	Btu/hp-hr	
Propane Heating Value	91.5	MMBtu/kgal	
Natural Gas Heat Content	1,000	Btu/scf	
Engine horsepower	1.341	kW	
lb =	7,000	gr	

7. The higher potential emissions for natural gas or distillate firing is shown as the potential emissions for EU 3.
8. The potential PM_{10} emissions for EU IDs 4 and 8 are calculated using the maximum fuel use by EU ID 8 that would allow the unit to meet the NOx emission limit under Permit AQ0316MSS05.
9. The Tier 3 and Tier 4i weighted-cycle emission rates for PM have been multiplied by 1.25 or 1.5 to determine the Not-to-Exceed emission factor per 40 CFR 1039.101(e) and ADEC policy (see also 40 CFR 60.4212(c)).
10. Emission factor for small pottery-firing wood-fired kilns are not available. Calculation assumes that combustion of wood in the kilns is similar to that in dry wood-fired boilers.
11. Emission factors for a propane-fired turbine are not available. Emission factors for a natural gas-fired turbine are used.
12. The graduation flame is best described as a non-smoking flare. Soot emissions are zero.
13. Less than 131 gallons of paint are used on an annual basis in the facilities services paint booth. The density of paint is approximately 7 lb/gal. The facilities services paint booth has fiberglass paint arrestor pads. The calculation conservatively assumes that the entire volume of paint used is emitted as PM. Vendor data for the filters indicates an 70 pct. capture efficiency for particles with a diameter equal to or greater than 2.5 microns.

Table B-10. Potential to Emit Calculations Effective June 9, 2021 - EU ID 111 Ash Handling System $PM_{2.5}$ Potential Emission
University of Alaska Fairbanks Campus

Emissions Unit		Maximum Rating/Capacity	PM Emission Factor		Allowable Annual Operation	Potential $PM_{2.5}$ Emissions
Permit ID	Description		Reference	$PM_{2.5}$ Factor		
111	Ash Loadout to Truck	N/A	AP-42, Section 13.2.4	5.5E-05 lb/ton	26,280 tpy	7.23E-04 tpy

Notes:

1. Ash loadout emission calculations:

Emission factor from AP-42, Section 13.2.4 based on empirical equation $E = k \times 0.0032 \times (U/5)^{1.3}/(M/2)^{1.4}$ lb/ton transferred where:
k = 0.053 for $PM_{2.5}$

U = mean wind speed = 5.4 mph in Fairbanks, per National Climactic Data Center (Value used in 2015 preliminary BACT PTE calculations)
M = ash moisture content = 4.8 percent (AP-42, page 13.2.4-4)

Ash loadout emissions based on maximum boiler (EU 113) total consumption capacity.
Ash content of coal = 8.5 pct. per Usibelli Coal Mine website in 2015 for BACT determination
Operations, ash tons/hr = (Σ coal capacity, ton/hr) x (0.085 ash content) + (captured sulfur, captured oxygen, and limestone inerts)= ton/hr per design engineers
Operations, ash tpy = (Σ coal capacity, 3 tons/hr) x (8,760 hr/yr) 26,280 tpy
Ash loadout emissions, tpy = (emission factor, lb/ton) x (ash loading, ton/yr) / (2,000 lb/ton)

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Attachment C
Copy of Title I Permit No. AQ0316MSS05

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DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONTROL MINOR PERMIT

Minor Permit AQ0316MSS05 Final – **August 4, 2016**
Rescinds Minor Permit AQ0316MSS02

The Alaska Department of Environmental Conservation (Department), under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit AQ0316MSS05 to the Permittee listed below.

Permittee:	**University of Alaska** P.O. Box 75920 Fairbanks, AK 99775
Stationary Source:	**University of Alaska Fairbanks Campus**
Project:	**Removal of Coal Water Slurry Fuel Requirements**
Permit Contact:	Frances M. Isgrigg, P.E. (907) 474-5487

This project is classified under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit. This permit satisfies the obligation of the Permittee to obtain a minor permit under these provisions. As required by AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this minor permit.

The Permittee may not operate under the terms and conditions of this permit until they have been incorporated into an operating permit issued to the stationary source under AS 46.14 and 18 AAC 50. Minor Permit AQ0316MSS02 remains effective until that action occurs.

for John F. Kuterbach, Manager
Air Permits Program

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Section 1 Emission Unit Inventory

Emission Unit Description. The emission units (EUs) listed in Table 1 have Title I related restrictions within this permit. Except as noted elsewhere in this permit, the information in Table 1 is for identification purposes only. The specific emission unit descriptions do not restrict the Permittee from replacing an EU identified in Table 1.

Table 1 - Emission Units Inventory

EU #	EU Description	Make/Model	Fuel	Rating/Maximum Capacity	Installation Date
3	Dual-fired Boiler	Zurn	Dual (gas/diesel)	180.9 MMBtu/hr	1970
4	Dual-fired Boiler	Zurn	Dual (gas/diesel)	180.9 MMBtu/hr	1987
8	Peaking/Backup Generator	Fairbanks Morse Colt-Pielstick PC2.6	Diesel	13,266 hp	1999

Table Note: See the current Operating Permit for a comprehensive list of the EUs that the Permittee may operate at the University of Alaska Fairbanks Campus.

1. The Permittee shall comply with all applicable provisions of AS 46.14 and 18 AAC 50 when installing a replacement EU, including any applicable minor or construction permit requirements**.**

Section 2 State PSD Avoidance Requirements

2. The Permittee shall limit the combined sulfur dioxide (SO_2) emissions from EUs 4 and 8 to less than 40 tons per year. Monitor, record, and report as follows:

   2.1 Measure and record the monthly fuel consumption of diesel fuel in EUs 4 and 8 using a totalizing fuel meter accurate to within one percent or using delivery receipts and change in inventory.

   2.2 No later than the 15th day of each month, calculate and record the previous month's SO_2 emissions using Equation 1.

Equation 1 $$SO_2 = \left[(FC_4 + FC_8)(\rho)(\%S/100)(2)\right](1/2000)$$

where:
- SO_2 = SO_2 emissions (ton/month)
- FC_4 = Diesel fuel consumption for EU 4 (gal/month), recorded under the provisions described in Condition 2.1
- FC_8 = Diesel fuel consumption for EU 8 (gal/month), recorded under the provisions described in Condition 2.1
- ρ = Density of the diesel fuel (lb/gal)
- $\%S$ = Most recent sulfur content of the diesel fuel, percent by weight, recorded under the provisions described in the sulfur compound emission standards requirements in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50.
- *100* = Conversion factor from percent to a fraction
- *2* = Molecular weight ratio of SO_2 to S
- *2000* = Conversion factor from lbs to tons

   2.3 Report as described in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50, the 12 consecutive month rolling total fuel consumption and SO_2 emissions (tpy) for each 12 month period ending during the reporting period.

   2.4 Report as described in the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 when the combined 12 consecutive month rolling total SO_2 emissions for EUs 4 and 8 equals or exceeds 40 tons.

3. The Permittee shall limit the combined NO_X emissions from EUs 4 and 8 to less than 40 tons per year.

   3.1 Install low NO_X burners on EUs 3 and 4 prior to operating with natural gas fuel.

   3.2 Measure and record the monthly natural gas consumption of EU 4 in million standard cubic feet per month (mmscf/month) by using a totalizing fuel flow meter certified accurate to within ± one percent.

3.3 No later than the 15th day of each month, calculate the previous month's total NO_X emissions as follows:

a. For EU 8 diesel fuel operation without NO_X controls, calculate and record the monthly total uncontrolled NO_X emissions using Equation 2.[1]

Equation 2 $NO_X = (UFC_8 \times 0.571) \times (1/2000)$

where:
- NO_X = Uncontrolled NO_X emissions (tons/month)
- UFC_8 = Diesel fuel consumption for EU 8 (gal/month) while operating without NOx controls, recorded under the provisions described in Condition 2.1
- *0.571* = Uncontrolled NO_X emission factor for EU 8 (lb/gal) while firing diesel, based on emission factors provided in the February 1, 2002 source test report and assuming a 90 percent reduction in NOx emission from the NOx SCR system in use during source testing. If a subsequent source test without NO_X controls is conducted and approved by the Department, the Permittee shall use the emission factor in lb/gal from the subsequent source test upon the approval date of the source test.
- *2000* = Conversion factor from lbs to tons

b. For EU 8 diesel operation with NO_X controls, calculate and record the monthly total controlled NO_X emissions using Equation 3.

Equation 3 $NO_X = (CFC_8 \times 0.057) \times (1/2000)$

where:
- NO_X = Controlled NO_X emissions (tons/month)
- CFC_8 = Diesel fuel consumption for EU 8 (gal/month) while operating with NOx controls, recorded under the provisions described in Condition 2.1
- *0.057* = Controlled NO_X emission factor for EU 8 (lb/gal) while firing diesel, based on emission factors provided in the February 1, 2002 source test report. If a subsequent source test is conducted with NO_X controls and approved by the Department, the Permittee shall use the emission factor in lb/gal from the subsequent source test upon the approval date of the source test
- *2000* = Conversion factor from lbs to tons

[1] The Permittee has installed a selective catalytic reduction (SCR) control system on EU 8. Therefore, the term "with NO_X controls" refers to those periods when the SCR system is operational, and the term "without NO_X controls" refers to those periods when the SCR system is not operational.

c. For EU 4, calculate and record the monthly total NO_X emissions using Equation 4.

Equation 4 $$NO_X = \left[(LFC_4) \times 0.024) + (GFC_4) \times 140)\right](1/2000)$$

where:

NO_X	=	NO_X emissions (tons/month)
LFC_4	=	Diesel consumption for EU 4 (gal/month), recorded under the provisions described in Condition 2.1
0.024	=	NO_X (fuel oil) combustion emission factor for EU 4 (lb/gal), based on emission factor listed in AP-42, Table 1.3-1.
GFC_4	=	Natural gas consumption for EU 4 (mmscf/month)
140	=	NO_X (natural gas) combustion emission factor for EU 4 (lb/mmscf), based on AP-42 Table 1.4-1 for Low NO_X burner technology. If a source test is conducted and approved by the Department, the Permittee shall use the emission factor in lb/mmscf from the source test upon the approval date
2000	=	Conversion factor from lbs to tons

3.4 No later than the 15th day of each month, add the monthly NO_X emissions calculated under Condition 3.3 to obtain the monthly total for EUs 4 and 8, combined. Add this monthly total to the total for the previous 11 months for EUs 4 and 8, combined, to determine the 12 consecutive month total.

3.5 Record and report as described in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50, the 12 consecutive month rolling total fuel consumption and NO_X emissions (tpy) for each 12 month period ending during the reporting period.

3.6 Report as described in the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 when the combined 12 consecutive month rolling total NO_X emissions for EUs 4 and 8 equals or exceeds 40 tons.

Section 3 Terms to Make Permit Enforceable

4. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 16.14, 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

    4.1 an enforcement action; or

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

5. 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.

6. 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.

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

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

Section 4 Permit Documentation

August 20, 2014 Minor permit application received.