Technical Analysis Report

for the terms and conditions of
Minor Permit AQ0316MSS08 Revision 1

Issued to:
University of Alaska Fairbanks

for
University of Alaska Fairbanks Campus

Prepared by:
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Preliminary Date – September 23, 2024

1. INTRODUCTION

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Minor Permit AQ0316MSS08 Revision 1 to University of Alaska Fairbanks (UAF) for the UAF Campus. On September 8, 2017, the US Environmental Protection Agency (EPA) reclassified the Fairbanks North Star Borough (FNSB) area as a Serious Nonattainment Area (NAA) effective June 9, 2017, with regard to nonattainment of the 2006 24-hour $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS).[6] According to 40 C.F.R. 51.1010, the state shall identify, adopt, and implement best available control measures (BACM) and best available control technology (BACT) on sources of direct $PM_{2.5}$ emissions and sources of emissions of $PM_{2.5}$ plan precursors (NO_x, SO_2, NH_3, VOCs) located in any Serious $PM_{2.5}$ nonattainment area. Major stationary sources[7] are subject to site-specific review for BACT. Those emission sources that are not classified as major stationary sources and subject to BACT are subject to BACM requirements.

The UAF Campus is a major stationary source located within the FNSB. UAF submitted an application for Minor Permit AQ0316MSS08 on September 1, 2020, under AS 46.14.130(c)(2), because the Department found that public health or air quality effects provide a reasonable basis to regulate the stationary source. The Department issued AQ0316MSS08 on May 5, 2021, which focused primarily on fuel sulfur content limits to control SO_2 emissions, along with $PM_{2.5}$ limits for the incinerator and material handling units.

On July 30, 2024, the Department sent UAF a notice of intent to revoke and reissue Minor Permit AQ0316MSS08 (and AQ0316TVP03) under AS 46.14.280(a)(2). With the re-issuance as Minor Permit AQ0316MSS08 Revision 1, the Department maintains AS 46.14.130(c)(2) as the basis for the permit issuance, because the Department finds that public health or air quality effects still provide a reasonable basis to regulate the stationary source. This finding for the FNSB NAA SIP is contained in the State Air Quality Control Plan adopted on November 19, 2019, with amendments adopted on November 18, 2020.[8]

The Department is preparing a new comprehensive SIP with a new determination that SO_2 BACT limits for major stationary sources are, at this point, not required to satisfy the State's obligations under the Clean Air Act requirements for stationary sources in the NAA. This new determination is predicated on the SO_2 precursor demonstration allowed under 40 C.F.R. 51.1010(a)(2)(iii).

Given that Minor Permit AQ0316MSS08 contains SO_2 controls identified in the FNSB NAA SIP for the UAF Campus, The Department now finds no underlying basis for those conditions being included in the permit. Additionally, the EPA's *Air Plan Partial Approval and Partial Disapproval; AK, Fairbanks North Star Borough; 2006 24-hour $PM_{2.5}$ Serious Area and 189(d) Plan*[9] published in the *Federal Register* on December 5, 2023 (88 *Fed. Reg.* 84658) disapproved the lack of monitoring, recordkeeping, and reporting (MR&R) initially proposed by the Department for $PM_{2.5}$ emissions from the UAF Campus.

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[6] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

[7] Per 40 C.F.R. 51.165(a)(1)(iv)(A)(1)(vii) and (viii), a major stationary sources is any stationary source with emissions greater than 70 TPY of $PM_{2.5}$ or any individual $PM_{2.5}$ precursor.

[8] See Footnote 6.

[9] The EPA's Air Plan Partial Approval and Partial Disapproval; AK, Fairbanks North Star Borough; 2006 24-hour $PM_{2.5}$ Serious Area and 189(d) Plan can be found at https://www.regulations.gov/document/EPA-R10-OAR-2022-0115-0426.

Therefore, with the issuance of Minor Permit AQ0316MSS08 Rev. 1, the Department has rescinded all of the previous BACT/BACM SO_2 requirements in Section 3 of Minor Permit AQ0316MSS08 that originated from the FNSB NAA SIP, and has replaced them with the $PM_{2.5}$ requirements from Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.07 - Control Strategies Chapter and from the Final UAF BACT Determination[10] (located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020. Additionally, On August 23, 2024, EPA's NAA Project Lead Matt Jentgen sent the Department a letter recommending certain requirements be contained in the Department's NAA minor permit for the Zehnder Facility in order to satisfy certain Clean Air Act requirements. The EPA letter recommended that Minor Permit AQ0109MSS01 Rev. 1 be revised to contain conditions to ensure that the reporting obligations of the minor permit are independent of the operating permit. In light of the EPA's disapproval comments and August 23, 2024 letter, the Department has also included additional MR&R requirements to make the SIP requirements enforceable. These additional MR&R requirements will be included in the Department's upcoming SIP submittal as an appendix to the control strategies chapter. Section 3 of this minor permit will be incorporated into the Department's upcoming final SIP submittal as an appendix to the Control Strategies Chapter.

With the issuance of Minor Permit AQ0316MSS08 Rev. 1, UAF's potential SO_2 emissions will revert to the levels in place prior to the issuance of AQ0316MSS08, before the October 1, 2020 SO_2 limits went into effect. The Department does not consider this change to be a potential or actual emissions increase under 18 AAC 50.502(c)(3), or a potential or net emissions increase under 40 C.F.R. 52.21(b).

2. STATIONARY SOURCE DESCRIPTION

The UAF Campus is an existing stationary source owned and operated by the UAF. The stationary source is currently operating under Operating Permit AQ0316TVP03 and Minor Permit Nos. AQ0316MSS03, AQ0316MSS04, AQ0316MSS05, AQ0316MSS06 Revision 2, AQ0316MSS07, and AQ0316MSS09. The SIC code for this stationary source is 8221 – Educational Services / Colleges, Universities, and Professional Schools. The stationary source is located within a nonattainment area for $PM_{2.5}$.

The UAF Campus operates a power plant consisting of two dual (diesel and gas) fuel-fired boilers, and seven diesel-fired power generator engines with ratings ranging from 64 Hp to 13,266-Hp installed in 1970 through 2019. It also operates six small diesel-fired boilers installed in 2003 through 2005, one incinerator installed in 2006, and one grain dryer installed in 1988. Additionally, in 2018, UAF installed a circulating fluidized bed (CFB) dual fuel-fired boiler (EU ID 113) and associated limestone, sand, coal, and ash handling systems, replacing the two old 1962 coal-fired boilers (EU IDs 1 and 2). EU IDs 1 and 2 were taken out of service on December 19, 2019 and EU ID 113 became fully operational on February 25, 2020.

3. APPLICATION DESCRIPTION

The Department is processing Minor Permit AQ0316MSS08 Rev. 1 under the Department's revoke and reissuance procedures under AS 46.14.280(a)(2), and therefore no permit application was submitted by the Permittee. The Department sent UAF a notice of intent to revoke and reissue Minor Permit AQ0316MSS08 and AQ0316TVP03 under AS 46.14.280(a)(2), on July 30, 2024. Minor Permit AQ0316MSS08 Rev. 1 includes the $PM_{2.5}$ requirements from the FNSB Serious NAA SIP.

[10] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

4. CLASSIFICATION FINDINGS

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

1. Minor Permit AQ0316MSS08 Revision 1 is classified under AS 46.14.130(c)(2) because of a finding by the Department that public health or air quality effects provide a reasonable basis to regulate the stationary source. This finding is contained in the State Air Quality Control Plan adopted on November 19, 2019[11], with amendments adopted on November 18, 2020.

5. POTENTIAL AND ASSESSABLE EMISSIONS SUMMARY

Table 10 presents the updated Potential-to-Emit (PTE) and assessable emissions for the stationary source based on the issuance of AQ0316MSS08 (before October 1, 2020), the limits that took effect on October 1, 2020, the limits that took effect on June 9, 2021, and October 1, 2023, and upon AQ0316MSS08 Rev. 1 becoming effective.[12] Emission factors and detailed calculations for the affected EUs are provided in Appendix A.

Table 10 – PTE Summary and Assessable Emissions[1]

Description	PTE, TPY						
	NOx	CO	PM_{10}	$PM_{2.5}$[2]	SO_2[3]	VOC	Total[2]
Prior to October 1, 2020							
Stationary Source PTE	488	403	40.5	**38.9**	**761**	23.3	**1,715.8**
Assessable Emissions	488	403	40.5	**38.9**	**761**	23.3	**1,715.8**
October 1, 2020							
Stationary Source PTE	488	403	40.5	**38.9**	**601**	23.3	**1,555.8**
Assessable Emissions	488	403	40.5	**38.9**	**601**	23.3	**1,555.8**
Emissions Reduction	0.0	0.0	0.0	**0.0**	**(160)**	0.0	**(160)**
June 9, 2021							
Stationary Source PTE	488	403	40.5	**35.9**	**600**	23.3	**1,554.8**
Assessable Emissions	488	403	40.5	**35.9**	**600**	23.3	**1,554.8**
Emissions Reduction	0.0	0.0	0.0	**(3.0)**	**(1)**	0.0	**(1)**
October 1, 2023							
Stationary Source PTE	488	403	40.5	**35.9**	**560**	23.3	**1,514.8**
Assessable Emissions	488	403	40.5	**35.9**	**560**	23.3	**1,514.8**
Emissions Reduction	0.0	0.0	0.0	**0.0**	**(40)**	0.0	**(40)**
Issuance of AQ0316MSS08 Rev. 1							
Stationary Source PTE	488	403	40.5	**35.9**	**761**	23.3	**1,715.8**
Assessable Emissions	488	403	40.5	**35.9**	**761**	23.3	**1,715.8**
Emissions Increase	0.0	0.0	0.0	**0.0**	**(241)**	0.0	**(241)**

Notes:

1 The SIP BACT limits to reduce SO_2 and $PM_{2.5}$ in this minor permit have no effect on the stationary source's PTE for NO_x, CO, and VOCs.

2 Totals for PTE and assessable emissions do not include $PM_{2.5}$ emissions to avoid double counting. $PM_{2.5}$ is part of PM_{10}.

3 Note that with the issuance of Minor Permit AQ0316MSS08 Rev. 1, the source's SO_2 PTE reverts to the original PTE in place prior to the issuance of AQ0316MSS08 before the SO_2 limits went into effect on October 1, 2020. The

[11] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

[12] Note that because Minor Permit AQ0316MSS08 Rev. 1 contradicts conditions in Operating Permit AQ0316TVP03, the new potential emissions will only become effective once the revised minor permit is incorporated into the operating permit.

Department does not consider this permitting action to be a potential or actual emissions increase under 18 AAC 50.502(c)(3), or a potential or net emissions increase under 40 C.F.R. 52.21(b). See Part 1 of the TAR for further details.

6. REVISIONS TO PERMIT CONDITIONS

Table 11 below lists the requirements carried over from Minor Permit AQ0316MSS08 into Minor Permit AQ0316MSS08 Rev. 1.

Table 11 - Comparison of AQ0316MSS08 to AQ0316MSS08 Revision 1 Conditions[13]

Permit AQ0110MSS01 Condition No.	Description of Requirement	Permit AQ0110MSS01 Rev. 1 Condition No.	How Condition was Revised
Section 1	Emissions Unit Inventory	Section 1	Updated Table 1 to include new EU IDs 17, 18, 22, 34, and 35 and remove EU IDs 23 and 28 that have been permanently removed from the stationary source.
2 - 4	Fee Requirements & SPC I – Emission Fees (Fee Requirements & Assessable Emissions)	2 - 4	Updated Condition 2 to the current Fee Requirements condition in the Department's template, which requires all fees be paid as set out in 18 AAC 50.400-499. Modified Standard Permit Condition (SPC) I – Emission Fees, Condition 3, to remove the language for paying emissions "in quantities 10 tons per year or greater" to match the revision made in 18 AAC 50.410, effective September 7, 2022. The assessable potential to emit in Condition 3 has been updated to the value in Table 10 above, to reflect this permit issuance. Condition 4.3 was amended to read "If no estimate or waiver letter is submitted on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit set forth in Condition 3.1."
5 - 11	FNSB NAA SIP SO_2 Requirements: Emission Limits on EU IDs 3, 4, 8, 9A, 24, 19 – 21, 26 – 29, and 113	None	The existing SO_2 limits whose basis stemmed from the FNSB NAA SIP were removed in their entirety because the Department has rescinded the previous SO_2 BACT section from this SIP and is now relying on a precursor demonstration to show that SO_2 controls are not needed for attaining the standard, as allowed under the $PM_{2.5}$ NAAQS Final SIP Requirements Rule.[14]

[13] This table does not include all standard and general conditions.
[14] https://www.gpo.gov/fdsys/pkg/FR-2016-08-24/pdf/2016-18768.pdf.

None	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU IDs 113	5	Included new $PM_{2.5}$ requirements for EU IDs 113 from Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.7 - Control Strategies Chapter, and from the Final UAF Power Plant BACT Determination (located on PDF pages located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020.[15] Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
None	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU IDs 3 & 4	6	Included new $PM_{2.5}$ requirements for EU IDs 3 & 4 from Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.7 - Control Strategies Chapter, and from the Final UAF Power Plant BACT Determination (located on PDF pages located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020.[16] Condition 6.2 adopts Conditions 3 through 3.6 of Minor Permit AQ0316MSS05 issued on August 4, 2016, into this permit revision. Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.

[15] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

[16] See Footnote 15

None	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU ID 17 through 22	7	Included new $PM_{2.5}$ requirements for EU IDs 17 through 22 from Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.7 - Control Strategies Chapter, and from the Final UAF Power Plant BACT Determination (located on PDF pages located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020.[17] Condition 7.2 adopts Conditions 7.1 through 7.2 of Minor Permit AQ0316MSS07 issued on August 10, 2021, into this permit revision. Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
None	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU IDs 8 & 35	8	Included new $PM_{2.5}$ requirements for EU IDs 8 & 35 from Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.7 - Control Strategies Chapter, and from the Final UAF Power Plant BACT Determination (located on PDF pages located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020.[18]Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.

[17] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

[18] See Footnote 17

None	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU IDs 24, 26, 27, 29 and 34	9	Included new $PM_{2.5}$ requirements for EU IDs 24, 26, 27, 29 and 34 from Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.7 - Control Strategies Chapter, and from the Final UAF Power Plant BACT Determination (located on PDF pages located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020.[19] Condition 9.2 adopts Conditions 4 through 4.1 of Minor Permit AQ0316MSS03 issued on January 16, 2013, into this permit revision. Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
12	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU ID 9A	10	Format of emission limit was re-written in table format. Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
13	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU ID 105, 107, 109, 110, 114 and 128 through 130	11	Format of emission limit was re-written in table format. Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
14	FNSB NAA SIP $PM_{2.5}$ Requirements: Emission Limits on EU ID 111	12	Format of emission limit was re-written in table format. Also included MR&R requirements to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
15 - 20	Recordkeeping, Reporting, and Certification Requirements	13 - 18	Update to Condition 17.3 to reflect changes in submittal requirements that commenced on September 7, 2023.

[19] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

None	Annual Compliance Certification	19	Included the annual compliance certification condition from the Department's Title V template as new Condition 19 in order to add reporting requirements into the minor permit to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
None	General Source Test Requirements	Section 6	Included the general source test requirement conditions from the Department's Title V template as new Conditions 26 through 33 in order to add source testing requirements into the minor permit to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.
Section 6: Notification Form	EE/PD Notification Form	Section 7	Updated the reporting instruction at the end of the notification form to reflect changes in submittal requirements that commenced on September 7, 2023.

7. PERMIT ADMINISTRATION

Minor Permit AQ0316MSS08 Rev. 1 contradicts conditions in the Title V operating permit AQ0316TVP03 issued to the UAF Campus. Therefore, UAF may not operate under the terms and conditions of Minor Permit AQ0316MSS08 Rev. 1 until Operating Permit AQ0316TVP03 Rev.1 becomes effective.

8. PERMIT CONDITIONS

The bases for the standard and general conditions imposed in Minor Permit AQ0316MSS08 Revision 1 are described below.

Cover Page

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

> The Department's Standard Permit Condition XIII – Coal Fired Boilers (as adopted July 22, 2020) and the Department's Default COMs Audit Procedures (as adopted August 20, 2008), have both been adopted into this minor permit.
>
> The following conditions have been adopted into this permit revision: 3 through 3.6 of Minor Permit AQ0316MSS05 issued on August 4, 2016, 7.1 through 7.2 of Minor Permit AQ0316MSS07 issued on August 10, 2021, and 4 through 4.1 of Minor Permit AQ0316MSS03 issued on January 16, 2013.

Section 1: Emissions Unit Inventory

The EUs authorized and/or restricted by this permit are listed in Table 1 of the permit. Unless otherwise noted in the permit, the information in Table 1 is for identification purposes only.

Condition 1 is a general requirement to comply with AS 46.14 and 18 AAC 50 when installing a replacement EU.

Section 2: Fee Requirements

18 AAC 50.544(a)(2) requires the Department to include a requirement to pay fees in accordance with 18 AAC 50.400 – 18 AAC 50.499 in each minor permit issued under 18 AAC 50.542. The Department used the Standard Permit Condition (SPC) I language for Minor Permit AQ0316MSS08 Revision 1. However, the Department modified the condition by removing the requirement to only pay for emissions of each air pollutant in quantities of 10 tons per year or greater, to be consistent with the updates to the emission fees in 18 AAC 50.410(a) that went into effect September 7, 2022. The Department is in the process of incorporating these updates into SPC I.

Section 3: State Implementation Plan (SIP) Requirements

Conditions 5 through 12 reflect the limits and MR&R required for the University of Alaska Fairbanks Campus to meet the goals of the Fairbanks $PM_{2.5}$ SIP control strategies. The $PM_{2.5}$ requirements are contained in Table 7.7-16 of the State Air Quality Control Plan Vol. II: III.D.7.07 - Control Strategies Chapter and from the Final UAF BACT Determination[20] (located on PDF pages 78 through 143 of Part 3b of Appendix III.D.7.07 Control Strategies Chapter), adopted November 19, 2019, amendments adopted November 19, 2020.

The following permit conditions have been adopted into this Minor Permit: Conditions 3 through 3.6 of Minor Permit AQ0316MSS05 issued on August 4, 2016, Conditions 7.1 and 7.2 of Minor Permit AQ0316MSS07 issued on August 10, 2021, and Conditions 4 through 4.1 of Minor Permit AQ0316MSS03 issued on January 16, 2013.

Condition 5 and Table 2 provide the $PM_{2.5}$ BACT control and emissions limit identified in the FNSB NAA SIP for the dual fuel-fired boiler EU ID 113. This includes an emissions limit of 0.012 lb/MMBtu over a 3-hour avering period, and the requirements to maintain good combustion practices and a full stream baghouse system at all times the EUs are in operation. The Department included a one-time source test on EU ID 13 in Condition 5.1a to demonstrate compliance with the $PM_{2.5}$ emissions limit in Table 2, as well as, to establish combustion settings that demonstrate compliance with the BACT $PM_{2.5}$ emissions limit.

Condition 5.1b requires the Permittee to report the compliance status with the $PM_{2.5}$ emissions limit in Table 2 with each annual compliance certification described in Condition 19. Condition 5.1c requires the Permittee to operate the EU with fabric filters and maintain good combustion practices at all times of operation. The condition also requires the Permittee to perform regular maintenance according to the manufacturer's and the operator's maintenance procedures and keep records of the maintenance performed. The Department included additional reporting beyond Standard Permit Condition 6 – Good Air pollution Control, in order to satisfy additional SIP requirements requested by EPA. Condition 5.1d requires the Permittee to monitor visible emissions to ensure compliance

[20] Background and detailed information regarding Fairbanks $PM_{2.5}$ State Implementation Plan (SIP) can be found at http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/.

with the State Visible Emissions Standard in Table 2 using a Continuous Opacity Monitoring System (COMS) and Condition 5.1e(ii) requires reporting of the highest 6-minute average opacity.

Conditions 6 through 9 provide the $PM_{2.5}$ BACT control and emissions limit identified in the FNSB NAA SIP for the mid and small-sized diesel-fired boilers as well as the large and small diesel-fired engines. These conditions contain additional MR&R in order to satisfy additional SIP requirements requested by EPA.

Conditions 10 through 12 provides the $PM_{2.5}$ limits and associated MR&R required for EU ID 9A, EU IDs 105, 107, 109, 110, 114, and 128 through 130, and EU ID 111. For the incinerator, EU ID 9A, the $PM_{2.5}$ SIP control strategies include using a multiple chamber and good combustion practices, as well as limiting emissions by adhering to the existing ORL for the amount of waste combusted in the EU (limited to 109 tons per rolling 12-month period). For the coal and ash handling equipment, EU IDs 105, 107, 109, 110, 114, and 128 through 130 (associated with EU ID 113), they are limited to $PM_{2.5}$ short-term emissions limits, as shown in Table 8. In addition to installing control devices (fabric filters and vents) and operating within an enclosure, for compliance demonstration, EU IDs 105, 107, 109, 110, 114, and 128 through 130 are required to either provide vendor data documenting that the EUs meet the emission limits, or conduct an initial Method 9 observation for 18 minutes. The EUs are required to perform $PM_{2.5}$ source tests if the results of the Method 9 observations show 10 percent (for EU IDs 105, 107, 109, 110, and 128 through 130, which are subject to a more stringent $PM_{2.5}$ limit of 0.003 gr/dscf) and 20 percent (for EU ID 114, which is subject to 0.05 gr/dscf, same as the state PM emission standard) average opacities. For the Ash Loadout to Truck, EU ID 111, the Permittee is required to conduct all ash loadout operations within an enclosure.

Section 4: General Recordkeeping, Reporting, and Certification Requirements

Condition 13, Recordkeeping Requirements

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

Condition 14, Certification

18 AAC 50.205 requires the Permittee to certify any permit application, report, affirmation, or compliance certification submitted to the Department. This requirement is reiterated as a standard permit condition in 18 AAC 50.345(j). Minor Permit AQ0316MSS08 Rev. 1 uses the standard permit condition language in SPC XVII, adopted by reference under 18 AAC 50.346(b)(10)

Condition 15, Submittals

Condition 15 clarifies where the Permittee should send their reports, certifications, and other submittals required by the permit. The Department used the language in SPC XVII, adopted by reference under 18 AAC 50.346(b)(10), for the permit condition.

Condition 16, Information Requests

AS 46.14.020(b) allows the Department to obtain a wide variety of emissions, design and operational information from the owner and operator of a stationary source. This statutory provision is reiterated as a standard permit condition in 18 AAC 50.345(i). The Department used the standard language in Minor Permit AQ0316MSS08 Revision 1.

Condition 17 and Section 7, Excess Emission and Permit Deviation Reports and Notification Form

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

The Department has modified Condition 17.3 and the Notification Form in Section 7 to reflect the electronic submittal requirements in 18 AAC 50.270 using the Department's online form to submit notification of excess emissions and permit deviations beginning September 7, 2023. The electronic notification form is found at the Division of Air Quality's Air Online Services (AOS) system webpage http://dec.alaska.gov/applications/air/airtoolsweb using the Permittee Portal option. Submittal through other methods may be allowed only upon written Department approval. Beyond as noted, the Department has determined that the standard conditions adequately meet the requirements of 40 C.F.R. 71.6(a)(3).

Condition 18, Operating Reports

The Department used the SPC VII language for the operating report condition, except that the condition was modified to eliminate the Title V-only aspects to make the language applicable for a minor permit.

Condition 19, Annual Compliance Certification

This condition specifies the periodic compliance certification requirements and specifies a due date for the annual compliance certification. No format is specified. The Permittee may provide one report certifying compliance with each permit term or condition for each of the effective permits during the certification period, or may choose to provide two reports: one certifying compliance with permit terms and conditions from January 1 until the date of expiration of the old permit, and a second report certifying compliance with terms and conditions in effect from the effective date of the renewal permit until December 31.

The Permittee is required to submit to the Department an annual compliance certification report. The Permittee may submit the required report electronically at their discretion.

The Department included Condition 19 in order to add reporting requirements into the minor permit to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.

Section 5: Standard Permit Conditions

Conditions 20 – 25, Standard Permit Conditions

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

The Department included all of the minor permit-related standard conditions of 18 AAC 50.345 in Minor Permit AQ0316MSS08 Revision 1. The Department incorporated these standard conditions as follows:

- 18 AAC 50.345(c)(1) and (2) is incorporated as Condition 20 of Section 5 (Standard Permit Conditions); and

- 18 AAC 50.345(d) through (h) is incorporated as Conditions 21 through 25, respectively, of Section 5 (Standard Permit Conditions).

Section 6: General Source Test Requirements

Conditions 26 – 33, General Source Test Requirements

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

- Condition 27 requires the Permittee to conduct their source tests under conditions that reflect the actual discharge to ambient air; and
- Condition 28 requires the Permittee to use specific EPA reference methods when conducting a source test.

Section 6 also includes the previously discussed standard conditions for source testing.

The Department included Section 6 in order to add source testing requirements into the minor permit to satisfy additional SIP inclusion conditions recommended by EPA Region 10 in a letter dated August 23, 2024.

Appendix A. Emissions Calculations

Table A-1 presents details of the potential to emit (PTE) for $PM_{2.5}$ and SO_2 for the affected emissions units (see Table 1) at University of Alaska Fairbanks Campus, that are subject to the FNSB $PM_{2.5}$ SIP requirements, at respective dates of effectivity. Note that the first set of columns includes $PM_{2.5}$ and SO_2 emissions prior to October 1, 2020, for both sets of pollutants, and after Minor Permit AQ0MSS08 Rev. 1 becomes effective for SO_2 emissions, because the previous SO_2 restrictions from AQ0316MSS08 have been rescinded by this permit revision. Meanwhile, the last set of columns includes both set of pollutants after October 1, 2023, until AQ0316MSS08 Rev. 1 becomes effective, at which point the existing SO_2 limits are rescinded and only the $PM_{2.5}$ emissions remain valid.

Table A-1 – Potential-to-Emit (PTE) Details, $PM_{2.5}$ and SO_2

EU ID	EU Description/ Fuel Type	Maximum Rating Capacity	Annual Operating Hour/ Limits	EF References / Notes	Pre-October 1, 2020 & Upon AQ0316MSS08 Rev. 1 becoming effective for SO_2 Emissions				October 1, 2020				June 9, 2021				October 1, 2023 & Upon AQ0316MSS08 Rev. 1 becoming effective for $PM_{2.5}$ Emissions			
					$PM_{2.5}$		SO_2[12]		$PM_{2.5}$		SO_2[12]		$PM_{2.5}$		SO_2[12]		$PM_{2.5}$		SO_2[12]	
					EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY
Boilers / Diesel Engine		**MMBtu/hr**		**See Notes**																
3	Zurn Boiler/ dual-fuel, Gas/Diesel	180.9	8,760 hrs	1, 16	0.016 lb/ MMBtu	12.3	0.07 lb/gal 0.5 wt%S	404.8	0.016 lb/ MMBtu	12.3	1.40E-02 lb/gal 0.1 wt%S	244.2	0.012 lb/ MMBtu	9.51	1.40E-02 lb/gal 0.1 wt%	244.2	0.012 lb/ MMBtu	9.51	2.10 E-04 lb/gal ULSD	204.9
4	Zurn Boiler/ dual-fuel, Gas/Diesel	180.9	8,760 hrs	1, 2																
8	Morse Colt-Pielstick/ Diesel	13,266	1,403,509 gal/yr	2, 5	0.056 lb/ MMBtu	5.35	See Note 13	40.0	0.056 lb/ MMBtu	5.35	See Note 13	40.0	0.056 lb/ MMBtu	5.35	See Note 13	40.0	0.056 lb/ MMBtu	5.35	See Note 13	40.0
113	CFB Boiler/ dual-fuel, Coal/Woody Biomass	295.6	8,760 hrs	3	0.012 lb/ MMBtu	15.5	See Note 14	258.9	0.012 lb/ MMBtu	15.5	See Note 14	258.9	0.012 lb/ MMBtu	15.5	See Note 14	258.9	0.012 lb/ MMBtu	15.5	See Note 14	258.9
19	BiRD Boiler #1/ Diesel	6.13	19,650 hrs	1, 4	0.016 lb/ MMBtu	0.936	2.10 E-04 lb/gal ULSD	0.0923	0.016 lb/ MMBtu	0.936	2.10 E-04 lb/gal ULSD	0.0923	0.012 lb/ MMBtu	0.723	2.10 E-04 lb/gal ULSD	0.0923	0.012 lb/ MMBtu	0.723	2.10 E-04 lb/gal ULSD	0.0923
20	BiRD Boiler #2/ Diesel	6.13																		
21	BiRD Boiler #3/ Diesel	6.13																		
Diesel-Fired Engines		**Hp**		**See Notes**																
24	Emergency Cummins 4B3.9-G2/ Diesel	72	500 hrs	6, 16	0.0022 lb/Hp-hr	0.040	0.07 lb/gal 0.5 wt%S	0.0644	0.0022 lb/Hp-hr	0.040	0.07 lb/gal 0.5 wt%S	0.0644	0.0022 lb/Hp-hr	0.040	2.10 E-04 lb/gal ULSD	0.0002	0.0022 lb/Hp-hr	0.040	2.10 E-04 lb/gal ULSD	0.0002
26	Mitsubishi-Bosh/ Diesel	64	8,760 hrs	6, 16		0.612	0.07 lb/gal 0.5 wt%S	0.9951		0.612	0.07 lb/gal 0.5 wt%S	0.9951		0.612		0.0030		0.612		0.0030
27	Caterpillar C-15/ Diesel	500	4380 hrs	7, 15	4.14E-04 lb/Hp-hr	0.453	2.10 E-04 lb/gal ULSD	0.0117	4.14E-04 lb/Hp-hr	0.453	2.10 E-04 lb/gal ULSD	0.0117	4.14E-04 lb/Hp-hr	0.453		0.0117	4.14E-04 lb/Hp-hr	0.453		0.0117
28	Emergency Detroit/ Diesel	120	500 hrs	6, 16	0.0022 lb/Hp-hr	0.066	0.07 lb/gal 0.5 wt%S	0.1073	0.0022 lb/Hp-hr	0.066	0.07 lb/gal 0.5 wt%S	0.1073	0.0022 lb/Hp-hr	0.066		0.0003	0.0022 lb/Hp-hr	0.066		0.0003

EU ID	EU Description/ Fuel Type	Maximum Rating Capacity	Annual Operating Hour/ Limits	EF References / Notes	Pre-October 1, 2020 & Upon AQ0316MSS08 Rev. 1 becoming effective for SO_2 Emissions				October 1, 2020				June 9, 2021				October 1, 2023 & Upon AQ0316MSS08 Rev. 1 becoming effective for $PM_{2.5}$ Emissions			
					$PM_{2.5}$		SO_2[12]		$PM_{2.5}$		SO_2[12]		$PM_{2.5}$		SO_2[12]		$PM_{2.5}$		SO_2[12]	
					EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY	EF	TPY
29	Emergency Cummins QSB7-G6/ Diesel	314	500 hrs	8, 15	0.023 lb/Hp-hr	0.004	2.10 E-04 lb/gal ULSD	0.0008	0.023 lb/Hp-hr	0.004	2.10 E-04 lb/gal ULSD	0.0008	0.023 lb/Hp-hr	0.004		0.0008	0.023 lb/Hp-hr	0.004		0.0008
Incinerator				**See Notes**																
9A	Therm-Tec/G-30P-1H (burning waste)	83 lb/hr	109 tons	9	4.67 lb/ton	0.255	2.17 lb/ton	0.1183	4.67 lb/ton	0.255	2.17 lb/ton	0.1183	4.67 lb/ton	0.255	2.17 lb/ton	0.1183	4.67 lb/ton	0.255	2.17 lb/ton	0.1183
Material Handling Sources		**acfm**																		
105	Limestone Handling System for Boiler No. 1	1,200	8,760 hrs	10, 17	0.003 gr/dscf	0.135	NA	0.0	0.003 gr/dscf	0.135	NA	0.0	0.003 gr/dscf	0.135	NA	0.0	0.003 gr/dscf	0.135	NA	0.0
107	Sand Handling System	1,600	8,760 hrs			0.180				0.180				0.180				0.180		
109	Ash Handling System	1,000	8,760 hrs			0.113				0.113				0.113				0.113		
110	Ash Handling System Vacuum	2,000	8,760 hrs			0.225				0.225				0.225				0.225		
128	Coal Silo No. 1 with Bin Vent	1,650	8,760 hrs			0.186				0.186				0.186				0.186		
129	Coal Silo No. 2 with Bin Vent	1,650	8,760 hrs			0.186				0.186				0.186				0.186		
130	Coal Silo No. 3 with Bin Vent	1,650	8,760 hrs			0.186				0.186				0.186				0.186		
111	Ash Loadout to Truck	NA	8,760 hrs	11, 17	5.50E-05 lb/ton	0.001			5.50E-05 lb/ton	0.001			5.50E-05 lb/ton	0.001			5.50E-05 lb/ton	0.001		
114	Dry Sorbent Handling Vent Filter Exhaust	5	8,760 hrs	10, 17	0.050 gr/dscf	0.009			0.050 gr/dscf	0.009			0.050 gr/dscf	0.009			0.050 gr/dscf	0.009		
Total Emissions						**36.8**		**705.1**		**36.8**		**544.5**		**33.8**		**543.4**		**33.8**		**503.8**
Emissions Reduction						**NA**		**NA**		**0.0**		**(160.6)**		**(3.0)**		**(1.1)**		**0.0**		**(39.6)**

Notes:

Conversion Factors:

Diesel Heating Value:	0.137 MMBtu/gal
Coal Heating Value:	15.3 MMBtu/ton
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 (Hp):	1.341 kW
One pound (lb):	7,000 grains (gr)

1 The existing $PM_{2.5}$ Emission Factors (EFs) for the boilers, EU IDs 3, 4, and 19 – 21 and EU ID 9A (burning diesel) are from AP-42 Tables 1.3-2 (condensable, in lb/kgal) and 1.3-7 ($PM_{2.5}$ for commercial boilers, in lb/kgal) for EUs burning distillate oil. To convert EFs to lb/MMBtu: (1.3 + 0.83) lb/1,000 gal/ 0.137 MMBtu/gal = 0.016 lb/MMBtu. Beginning June 9, 2021, EU IDs 3, 4, and 19 – 21, the $PM_{2.5}$ EFs for EU IDs 3, 4, and 19 – 21 will be based on the SIP BACT limit of 0.012 lb/MMBtu.

2 EU IDs 4 and 8 are subject to an existing capped ORL of 40 TPY each for NO_x and SO_2 PSD review avoidance under Minor Permit AQ0316MSS05. To assume worst-case, the potential $PM_{2.5}$ emissions for EU IDs 4 and 8 are calculated using the maximum fuel use by EU ID 8 (1,403,509 gal/yr) that would allow the unit to meet the NO_x emission ORL.

3 The $PM_{2.5}$ EF for the dual fuel-fired CFB Boiler, EU IDs 113, is based on vendor data.

4 EU IDs 19-21 are subject to operational limit of 19,650 hours combined per rolling 12-month period and ultra-low sulfur diesel (ULSD) fuel requirements to avoid minor permitting under 18 AAC 50.502(c)(3) for NO_x and SO_2. $PM_{2.5}$ and SO_2 PTEs for these EUs are based on these operational limits and appropriate EFs.

5 The $PM_{2.5}$ Emission Factor (EF) for the diesel-fired engine, EU ID 8 is from AP-42 Table 3.4-2.

6 The $PM_{2.5}$ EFs for EU IDs 24, 26, and 28 are from AP-42 Table 3.3-1, using corresponding annual operational hours. Used full annual operational hours for EU ID 26; used the default 500-hr/yr for emergency diesel engines for EU IDs 24 and 28.

7 EU ID 27 is subject to NSPS Subpart IIII. Used the applicable Tier 3 weighted-cycle emission rate for $PM_{2.5}$ multiplied by 1.25 to determine the Not-to-Exceed emission factor per 40 C.F.R. 1039.101(e) as EF. EU ID 27 is also subject to operational limit of 4,380 hours per rolling 12-month period; used this operational hour limit to calculate $PM_{2.5}$ and SO_2 PTEs in TPY.

8 EU ID 29 is subject to NSPS Subpart IIII. Used the applicable Tier 4i weighted-cycle emission rate for PM multiplied by 1.5 to determine the Not-to-Exceed emission factor per 40 C.F.R. 1039.101(e) as EF.

9 The Therm Tec incinerator, EU ID 9A, is subject to an ORL of 109 tons of waste combusted per rolling 12-month period to avoid being classified as major for HAPs. EFs are based on AP 42 Table 2.3-1 (for SO_2) and Table 2.3-2 (for $PM_{2.5}$; assumed $PM_{2.5}$ is equal to Total PM) and using the ORL as annual waste combusted. The same EF of 4.67 lb/ton for $PM_{2.5}$ is used as SIP BACT limit effective June 9, 2021.

10 EFs of 0.003 gr/dscf for EU IDs 105, 107, 109, and 110 and 0.05 gr/dscf for EU IDs 114 are based on the equipment's design specifications. The same values are used as SIP BACT limits for the EUs, effective June 9, 2021.

11 For EU ID 111, EF for $PM_{2.5}$ is from AP-42, Section 13.2.4 empirical equation:

$$E = k \times 0.0032 \times (U/5)^{1.3}/(M/2)^{1.4} \text{ lb/ton}$$

Where:

E = emission factor
k = particle size multiplier (dimensionless); 0.053 for aerodynamic particle size < 2.5 μm
U = mean wind speed, miles per hour [mph]; 5.4 mph in Fairbanks, per National Climactic Data Center (Value used in 2015 preliminary BACT PTE calculations)
M = material moisture content percent (%); 4.8% (from AP-42, page 13.2.4-4)

12 EFs shown for SO_2 for all diesel fuel-fired emissions units are from mass balance calculations using the corresponding fuel sulfur percent content limit by weight ($wt\%S_{fuel}$), using the following conversion factors:

a. Molar (mol) mass ratio is 32 lb S/mol: 64 lb SO_2/mol; Stoichiometry: 1 mol S = 2 mol SO_2
b. Diesel: Density = 7.0 lb/gal; High heat value (HHV) = 137,000 Btu/gal [AP-42, Appendix A]

SO_2 Emission Factor, lb/gal = (Molar mass ratio, 2 lb SO_2:1 lb S) x (weight % S in fuel) x (density of fuel, lb/gal) / 100%
= 2 lb SO_2/lb S x ($wt\%S_{fuel}$/100) S x 7.0 lb/gal = 0.140($wt\%S_{fuel}$)S lb SO_2/gal

13 Combined SO_2 PTE for EU IDs 4 and 8 is based on the EUs' existing capped ORL of 40 TPY for SO_2 PSD review avoidance under Minor Permit AQ0316MSS05.

14 SO_2 PTE for EU ID 113 is based on the EU's existing capped ORL of 258.9 TPY for SO_2 PSD review and $PM_{2.5}$ Nonattainment New Source Review avoidance

under Minor Permit AQ0316MSS06 Revision 2.

15 EU IDs 27 and 29 are subject to ULSD grade (0.0015 wt%S_{fuel}) fuel requirement under NSPS Subpart IIII. Used 0.0015 wt%S_{fuel} to calculate SO_2 PTEs for these EUs on all phases.

16 Used the default 0.50 wt%S_{fuel} to calculate SO_2 PTEs for all diesel fuel-burning EUs without fuel restrictions before periods when more stringent fuel sulfur contents are required, i.e., EU ID 3 before-October 1, 2020 and during the period April 1 through September 30 after October 1, 2020, and EU IDs 24, 26, and 28 before-June 9, 2021.

17 EU IDs 105, 107, 109, 110, 111, and 114 do not have SO_2 emissions; these EUs do not burn fuel or waste materials.