

April 22, 2021

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



KOTZEBUE
ELECTRIC ASSOCIATION

Post Office Box 44
Kotzebue, Alaska 99752

Tel. 907-442-3491
Fax. 907-442-2482

RE: Kotzebue Electric Association – Kotzebue Power Plant
Application for an Air Quality Minor Permit

Dear Permit Intake Client:

Kotzebue Electric Association (KEA) provides the attached Minor Air Permit Application for the Kotzebue Power Plant (KPP) stationary source. OSA is submitting the enclosed Title I application under 18 Alaska Administrative Code (AAC) 50.540(k) and includes the following required elements:

- Stationary Source Identification (SSID) Form
The form provides information pertaining to how the project is classified under 18 AAC 50.508(6) and provides references to sources of required information in the application to revise permit terms and conditions of minor air permit AQ0196MSS04.
- Attachment A – Project Description
This section includes a narrative of the scope of the specific project for the request made under this application.
- Attachment B – Required Elements for Minor Permit Application under 18 AAC 50.508(6)
This section includes details on the source of required information under 18 AAC 50.540 that can be found in various attachments to this application.
- Attachment C - Requested Revisions to Air Quality Control Minor Permit No. AQ0196MSS04
As required by 18 AAC 50.540(k)(2), this section includes a detailed description of the basis of the proposed changes to Conditions 12, 13.2, and 13.3 of minor air permit No. AQ0196MSS04.
- Attachment D – Permitting Analysis and Emission Calculations
This section includes a summary of permit applicability for the changes described under Attachment C. It provides an updated analysis of permit applicability under the Prevention of Significant Deterioration (PSD) permitting program for the installation of emission unit (EU) 16 with a new proposed emission limit to avoid triggering PSD permit applicability for the installation of this unit. No permit applicability under the minor permit program is provided because the changes under this application do not alter the total potential to emit for the stationary source.
- Attachment E – E – ADEC March 17, 2015 Letter



APR 22 REC'D

12:26 PM

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This section includes a letter from ADEC pertaining to a previously requested changes by KEA to revise the PSD avoidance limit for EU 16. This letter is provided as a reference to changes requested under Attachment C of this application.

- Attachment F – Copy of Minor Air Permit No. AQ0196MSS04
As required under 18 AAC 50.540(k)(1), this section provides a copy of the minor permit for which changes are requested under this application.

We look forward to working with you and staff in your office on this application. If you have any questions, please contact me at 907-442-3491 or Chris Lindsey with SLR International at (907) 264-6916.

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,



Martin Shroyer
General Manager

Attachments: Kotzebue Power Plant Minor Air Permit Application

APPLICATION TO REVISE AIR QUALITY CONTROL PERMIT NO. AQ0196MSS04

Kotzebue Power Plant

Prepared for:
Kotzebue Electric Association

April 2021

SLR[®] 

**APPLICATION TO REVISE AIR QUALITY CONTROL PERMIT NO.
AQ0196MSS04**

Prepared for:
Kotzebue Electric Association
P.O. Box 44
Kotzebue, AK 99752

prepared by

SLR INTERNATIONAL CORPORATION

2700 Gambell Street, Suite 200
Anchorage, Alaska 99503
(907) 222-1112

April 2021

**Alaska Department of Environmental Conservation
Air Quality Minor Permit Application**



STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Name: Kotzebue Power Plant		SIC: 4911	
Project Name (if different): Kotzebue Power Plant Minor Permit Revision		Contact: Martin Shroyer	
Physical Address: 4 th and Lagoon Streets, Building 245A Kotzebue, AK 99752		City: Kotzebue	State: AK Zip: 99752
		Telephone: 907-442-3491	
		E-Mail Address: m_shroyer@kea.coop	
UTM Coordinates (m) or Latitude/Longitude: Latitude/Longitude		Northing:	Easting: Zone:
		Latitude: 66° 53' 36.82" N	Longitude: 162° 35' 45.46" W

Section 2 Legal Owner

Name: Kotzebue Electric Association		
Mailing Address: PO Box 44		
City: Kotzebue	State: AK	Zip: 99752
Telephone #: 907-442-3491		
E-Mail Address: m_shroyer@kea.coop		

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: Martin Shroyer		
Mailing Address: PO Box 44		
City: Kotzebue	State: AK	Zip: 99752
Telephone #: 907-442-3491		
E-Mail Address: m_shroyer@kea.coop		

Section 5 Billing Contact Person (if different from owner)

Name: Catherine Greene		
Mailing Address: PO Box 44		
City: Kotzebue	State: AK	Zip: 99752
Telephone #: 907-442-3491		
E-Mail Address: s_moto@kea.coop		

Section 6 Application Contact

Name: Christopher Lindsey, SLR International Corporation		
Mailing Address: 2700 Gambell Street		
City: Anchorage	State: AK	Zip: 99503
Telephone: 907-222-1112		
E-Mail Address: clindsey@slrconsulting.com		

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)]

STATIONARY SOURCE IDENTIFICATION FORM

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.

See Attachment A.

STATIONARY SOURCE IDENTIFICATION FORM

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

STATIONARY SOURCE IDENTIFICATION FORM

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

STATIONARY SOURCE IDENTIFICATION FORM

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 Kotzebue Power Plant submitted to the Department on: 4/23/2021 (Stationary Source Name)

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: <i>Martin Shroyer</i>	Date: <i>4-22-2021</i>
Printed Name: Martin Shroyer	Title: General Manager

Section 15 Attachments

- Attachments Included. List attachments:
 - A – Project Description
 - B – Required Elements for Minor Permit Application under 18 AAC 50.508(6)
 - C – Requested Revisions to Air Quality Control Minor Permit AQ0196MSS04
 - D – Permitting Analysis and Emissions Calculations
 - E – ADEC March 17, 2015 Letter
 - F – Air Quality Minor Permit AQ0196MSS04

STATIONARY SOURCE IDENTIFICATION FORM

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
PROJECT DESCRIPTION**

Attachment A Project Description

Kotzebue Electric Association (KEA) is requesting a revision to the terms and conditions of Air Quality Control Minor Permit No. AQ0196MSS04 for the Kotzebue Power Plant and requests the changes be incorporated into the current Title V Permit. Specifically, this permit application is being submitted under 18 Alaska Administrative Code (AAC) 50.508(6) to revise Conditions 12, 13.2, and 13.3 in Air Quality Control Minor Permit No. AQ0196MSS04.

As currently written, Condition 12 limits the nitrogen oxide (NO_x) emissions from emission unit (EU) 16 to 45 tons per 12-month period based on a limit established by ADEC. This limit was originally established under Air Quality Control Minor Permit No. AQ0196MSS03. According to the Technical Analysis Report (TAR) for Permit No. AQ0196MSS03, the application for the permit "did not propose a limit for EU ID 16 to avoid PSD review." Therefore, after concurrence with KEA, the Alaska Department of Environmental Conservation (ADEC) imposed an annual limit of 45 tons per year of NO_x emissions for EU 16 based on a Prevention of Significant Deterioration (PSD) review analysis completed by ADEC.

Under the TAR for Permit No. AQ0196MSS03, ADEC evaluated the installation of EU 16 and removal of EUs 11 and 12 under the requirements of PSD. As stated under the TAR, the actual combined NO_x emissions for EUs 11 and 12 were estimated as 5.83 tons per year (tpy). It is unclear from the information presented in the TAR what annual average period was applied to estimate actual emissions of NO_x for EUs 11 and 12. The potential NO_x emissions increase for EU 16 was estimated as 96 tpy. Based on the analysis provided, ADEC imposed a 45 tpy NO_x limit on EU 16 to ensure the net emissions increase did not exceed 40 tpy.

KEA submitted a minor permit application on March 1, 2015, received by the Department on March 9, 2015, to revise the NO_x PSD review avoidance limit in Permit No. AQ0196MSS03 to correct for material errors in the PSD review analysis completed by ADEC. The Department responded to the application in a letter dated March 17, 2015 that stated the application was complete but requested additional updates to revise the PSD permit review analysis. ADEC's 2015 response is included in Attachment D of this application. It does not appear that a final action was taken by ADEC on the 2015 request from KEA and the original NO_x limit of 45 tpy is still effective.

KEA is now providing this application with an update to the PSD permit review analysis and is proposing that the NO_x limit for EU 16 in Condition 12 of Permit No. AQ0196MSS04 be revised to 79.3 tons per year. This revision highlights two significant changes from the analysis prepared by ADEC under Permit No. AQ0196MSS03.

- Actual NO_x emissions for EUs 11 and 12 are estimated to be 40.3 tpy based on March 2002 to February 2004 operational data and the use of an emission rate from 2003 performance test data.

- Potential to Emit emissions for EU 16 are estimated to be 135.7 tpy based on a Tier 2 emission factor and the application of a not-to-exceed (NTE) factor. The NTE factor does not appear to have been applied under the PSD analysis of Minor Air Permit No. AQ0196MSS03.

Please see Attachment E for supporting information to this request.

In addition to the request to revise the NO_x limit, KEA is requesting changes to certain monitoring and recordkeeping provisions to provide consistency in the permit. As currently written, Condition 13.3 in Permit No. AQ0196MSS04 requires NO_x emissions for EU IDs 7B, 10, and 14 through 17 to be calculated using hours of operation and respective NO_x emissions rates in units of pound per hour (lb/hr). However, Condition 12.2 requires NO_x emissions for EU ID 16 to be calculated using a different methodology of total electrical kilowatt hours per month and a NO_x emission rate in units of pound per electrical kilowatt hour (lb/ekW-hr).

Under this application, KEA requests revisions to Conditions 13.2 and 13.3 in Permit No. AQ0196MSS04 to allow the use of the same monitoring, recordkeeping, and calculation methodology similar to the requirements in Conditions 12.1 and 12.2. Conditions 13.2 and 13.3 are proposed to be changed to include the use of actual output (ekW-hrs) for EU IDs 7B, 10, 14, 15 and 17 to calculate NO_x emissions based on approved performance source test data. This alternative methodology results in more precise and representative NO_x emission estimates when calculating actual emissions to determine compliance with the NO_x PSD avoidance limit under Condition 13. KEA proposes to retain the existing methodology under Conditions 13.2 and 13.3 as a backup emissions estimation method in the event that ekW-hr data are unavailable to estimate emissions. Below is a summary of the proposed emission factors to be applied from ADEC-approved performance source test results completed May and August 2016 for EU IDs 7B, 10, 14, 15 and 17 according to the provisions of Condition 13.4 of Permit No. AQ0196MSS04.

**NO_x Emission Rates Proposed for Substitution under Condition 13.3
Approved 2016 Source Test Results**

EU ID	Test Date	Test Results	
7B	May 2016	35.74 lb/hr	0.031 lb/ekW-hr
10	August 2016	68.08 lb/hr	0.023 lb/ekW-hr
14	August 2016	70.99 lb/hr	0.025 lb/ekW-hr
15	May 2016	73.86 lb/hr	0.026 lb/ekW-hr
16	August 2016	24.64 lb/hr	0.018 lb/ekW-hr
17	May 2016	5.02 lb/hr	0.007 lb/ekW-hr

Note: Average emission rates using EPA Methods 1 through 4 at maximum load are applied.

ATTACHMENT B
REQUIRED ELEMENTS for MINOR PERMIT
APPLICATION UNDER 18 AAC 50.508(6)

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

The required elements of a minor application for revising or rescinding terms or conditions of a Title I permit are located in this application per the following table:

Title I Air Quality Permit Revision Application Elements

Regulatory Citation	Requirement	Location
18 AAC 50.540(b)	General Information	Stationary Source Identification (SSID) Form
18 AAC 50.540(k)(1)	Copy of applicable Title I permit	Attachment F
18 AAC 50.540(k)(2)	Explanation of proposed revisions/rescissions	Attachment C
18 AAC 50.540(k)(3)	Effects of revising the permit term or conditions on: - Emissions - Other permit terms - Underlying ambient demonstration - Compliance monitoring	Attachments C and D
18 AAC 50.540(k)(4)	Information on avoidance of permit classification	Not Applicable

ATTACHMENT C
REQUESTED REVISIONS to AIR QUALITY CONTROL
MINOR PERMIT No. AQ0196MSS04

ATTACHMENT C
REQUESTED REVISIONS TO AIR QUALITY CONTROL MINOR PERMIT NO. AQ0196MSS04

Suggested language to be removed is struck out and language to be added is underlined.

1. Condition 12. Please revise this condition as follows.

ORL to Avoid PSD Modification. Limit the NO_x emissions from EU ID 16 to less than or equal to ~~79.345~~ tons for any twelve consecutive month period.

- 12.1. Monitor and record the average electrical kilowatts (ekW) generated by EU ID 16 each minute of operation and sum the ekW-hrs for EU ID 16 for all periods of operation each month.
- 12.2. On or before the 15th of each month,
 - a. multiply the total ekW-hrs for the previous calendar month by 0.018 ~~0.01716~~ lb/ekW-hr to compute the monthly emissions of NO_x for EU ID 16. Record the monthly EU ID 16 NO_x emissions in tons, and
 - b. calculate and record the rolling 12-month EU ID 16 NO_x emissions, in tons.
- 12.3. Include copies of the records required under Condition 12.2 in the operating report required in Condition 21.
- 12.4. Report in accordance with Condition 20 any time the limit in Condition 12 is exceeded.

The permit condition was established under Air Quality Control Minor Permit AQ0196MSS04 (MSS04) which was finalized on March 1, 2016. Subsequent performance testing was conducted in August 2016 for EU 16. KEA proposes to update Condition 12.2.a with the most recent test results.

Condition 12 is an owner requested limit (ORL) to avoid prevention of significant deterioration (PSD) modification for emission unit (EU) 16 for nitrogen oxides (NO_x). EU 16 was added under Air Quality Control Minor Permit AQ0196MSS03 (MSS03), which has been rescinded by MSS04. As outlined in the Technical Analysis Report for MSS03, Kotzebue Electric Association (KEA) did not propose a limit in the application to avoid PSD review. The Alaska Department of Environmental Conservation (ADEC) proposed the annual NO_x limit of 45 tons for EU 16 after concurrence with KEA. KEA submitted a minor permit application in January 2015 to revise the ORL to avoid PSD modification in Condition 12. ADEC responded to the application in a letter dated March 17, 2015 (Attachment D) addressing errors in the calculations and/or assumptions. This application corrects those errors as explained below.

Item 1 from ADEC March 17, 2015 letter:

ADEC understands permit AQ0196MSS03 requires using the EU 16 rated capacity and monitored hours of operation to calculate emissions when determining compliance with the PSD avoidance limit and that EU 16 actually operates at variable loads during normal operation. This results in conservative values for NO_x emissions. KEA suggests the actual emissions calculation should be done on the basis of kW-hr. If KEA is requesting to revise monitoring requirements, KEA must provide proposed monitoring requirements and any

necessary supporting information on EU 16 operation, so ADEC can determine if the monitoring is sufficient to determine compliance with the PSD avoidance limit. KEA would also need to ensure load and hours of operation are monitored and recorded often enough to ensure emission calculations are accurate.

As stated below, the significant emissions increase threshold for step 1 of the PSD permit applicability analysis is 40 tons per year (tpy) for NO_x, and the significant net emissions increase threshold for step 2 of the PSD permit applicability analysis is also 40 tpy. However, these steps of the PSD applicability analysis are separate, and emissions are compared to each threshold separately. Therefore, any PSD avoidance limit for NO_x must limit the increase to less than 40 tpy using the step 1 calculations or limit the increase to less than 40 tpy using the step 2 calculations, as applicable.

The first paragraph of ADEC's letter referenced above regarding the emission calculations for EU 16 was addressed in MSS04. The calculation methodology for EU 16 was revised to allow use of total electrical kilowatt hours (ekW-hr) multiplied by a NO_x emission factor (lb/ekW-hr) to calculate monthly emissions. KEA proposes to revise Condition 13 as indicated below to allow the use of NO_x emission factors in units of pounds per hour (lb/hr) or lb/ekW-hr for EUs 7B, 10, and 14 through 17.

The second paragraph of ADEC's letter referenced above regarding the PSD analysis is addressed in the responses below.

Item 2 from ADEC March 17, 2015 letter:

40 CFR 51.165 requirements adopted by ADEC under 18 AAC 50.040(i) contain text setting out provisions that a state implementation plan shall or may contain. 40 CFR 52.21(a)(2), adopted by ADEC under 18 AAC 50.040(h)(3), contains the PSD permit applicability procedures.

The PSD avoidance limit in Condition 10 of AQ0196MSS03 is 45 tpy for NO_x. Since the limit is greater than 40 tpy, the limit was set using calculations from step 2 of the PSD permit applicability analysis under 40 CFR 52.21(b)(3), which allows for contemporaneous emission reductions. Step 1 of the analysis only considers emission increases (project netting is not allowed).

Under 40 CFR 52.21(b)(3)(i)(b), baseline actual emissions for calculating emissions increases and decreases are calculated in accordance with 40 CFR 52.21(b)(48). Under 40 CFR 52.21(b)(48)(ii), the consecutive 24-month period for calculating baseline actual emissions must be in a 10-year period "immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier". ADEC's records show the application for AQ0196MSS03 was complete on December 29, 2011. Therefore, the allowed 10-year period is November 2001 to November 2011. The two-year periods referenced by KEA above are not valid. If KEA decides to further pursue a revision to the PSD avoidance limit based on

contemporaneous emission reductions from EUs 11 and 12, different two-year periods for baseline actual emissions need to be defined and baseline actual emissions for EUs 11 and 12 must be recalculated.

Also, the NO_x emission calculations provided for EUs 11 and 12 are inconsistent. Emissions for years 2010 and 2011 use an emission factor of 36 lb/hr as specified for emission calculations in AQ0196TVP02 for the 314 tpy owner requested limit (ORL), while emissions for years 2006 through 2009 use specific lb/kW-hr emission factors. If KEA decides to further pursue a revision to the PSD avoidance limit based on contemporaneous emission reductions from EUs 11 and 12, the source of the 2006 through 2009 emission factors must be provided.

The PSD analysis is included below in Table B-1 and in Attachment C of this application. The 10-year period from November 2001 through October 2011 was used to determine the two-year period for the baseline actual emissions for EUs 11 and 12. Monthly hours of operation and electrical kilowatt hours (ekW-hrs) available for the period of November 2001 to October 2011 for EUs 11 and 12 are included in Table 10 in Attachment C of this application. The two-year period selected to represent the baseline actual emissions is March 2002 through February 2004. Table 4 in Attachment C includes emission calculations for the period of March 2002 through February 2004. Emissions were calculated using the pounds per kilowatt-hr emissions factor from the 2003 source test results. Based on these calculations, the updated ORL to avoid PSD modification for NO_x is 79.3 tons per year.

Item 3 from ADEC March 17, 2015 letter:

Under 40 CFR 52.21 (a)(2)(iv)(a), "a project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases—a significant emissions increase (as defined in paragraph (b)(40) of this section), and a significant net emissions increase (as defined in paragraphs (b)(3) and (b)(23) of this section). The project is not a major modification if it does not cause a significant emissions increase. If the project causes a significant emissions increase, then the project is a major modification only if it also results in a significant net emissions increase." Emission increases determined in the step 1 calculations for PSD permit applicability are compared to the significant emission increase thresholds (40 tpy for NO_x). If the emission increases are less than the significant emission increase thresholds, PSD permit requirements are not applicable. If step 1 of the analysis shows an emission increase equal to or greater than a significant emission increase threshold, step 2 of the analysis is triggered. In step 2, the emission increase from step 1 is added to all contemporaneous emission increases and decreases. If this change in emissions is greater than the significant net emission increase threshold (40 tpy for NO_x) PSD permit requirements are applicable. Otherwise, PSD permit requirements do not apply.

The significant emission increase threshold and significant net emission increase threshold are not additive. Each threshold is used separately in different steps of the PSD permit applicability analysis. Therefore KEA's request for a revised limit of 75 tons per year cannot be granted.

PSD Analysis Step 1 – EU 16 has potential NO_x emissions greater than 40 tons per year. EU 16 potential emissions of carbon monoxide (CO), particulate matter less than 10 microns in diameter

(PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), volatile organic compounds (VOC), and sulfur dioxide (SO₂) are below the PSD significant emission thresholds.

PSD Analysis Step 2 – The removal of EUs 11 and 12 results in decreases of NO_x emissions as specified in the following table. KEA proposes to revise the NO_x ORL for EU 16 to avoid PSD modification. The source-wide potential emissions of NO_x did not increase with the addition of EU 16 because EU 16 was incorporated into the source-wide annual 314 tons NO_x limit that originated in a previous permit action. KEA does not propose to change the source-wide NO_x limit. Note that EU 16 potential emissions presented in the Technical Analysis Report of MSS04 are updated in the following table.

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

Parameter	NO _x	CO	SO ₂	VOC	PM _{2.5}	PM ₁₀
Step 1						
EU 16 Potential Emissions	135.7	87.0	0.1	5.4	4.7	4.7
PSD Modification Threshold	40	100	40	40	10	15
Proceed to Step Two?	Yes	No	No	No	No	No
Step 2						
EU 16 Limited Emissions	79.3	NA	NA	NA	NA	NA
EUs 11 and 12 Actual Emissions	40.3	NA	NA	NA	NA	NA
Change in Actual Emissions	39.0	NA	NA	NA	NA	NA
PSD Modification Threshold	40	NA	NA	NA	NA	NA
PSD Modification Applicable?	No	NA	NA	NA	NA	NA

Note: PM_{2.5} applicability is also triggered for indirect emissions of 40 tpy of SO₂ or 40 tpy of NO_x. Ozone applicability is triggered for 40 tpy of NO_x or VOC.

Item 4 from ADEC March 17, 2015 letter:

ADEC understands that annual NO_x emissions decrease if EU 16 is operated instead of EU 10. However, step 1 of the PSD permit applicability analysis is project specific and only emission increases are considered. In step 2, PSD permit applicability is based on the PTE of EU 16 and changes in actual emissions for existing emission units. As specified in 40 CFR 52.21(b)(3)(vi)(b), a reduction in actual emissions is creditable only to the extent that:

- *the old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions;*
- *it is enforceable as a practical matter at and after the time that actual construction on the particular change begins.*

Other than the removal of EUs 11 and 12, no other creditable emission decreases have been provided to ADEC. If other creditable emissions decreases are applicable please provide this information.

Only the removal of EUs 11 and 12 are included in the enclosed analysis as creditable emissions decreases.

2. Condition 13.2. Please revise the condition as follows to allow monitoring of electric kilowatt-hours (ekW-hr) in addition to hours to estimate oxides of nitrogen (NO_x) emissions. Under this application, ekW-hrs are proposed as an alternative method to be used to estimate emissions in lieu of hours. This methodology is consistent with the methodology provided under Condition 12 of MSS04.

13.2 Monitor and record the average ekW generated by EU IDs 7B, 10, and 14 through 17 each minute of operation and sum the ekW-hrs for each unit for all periods of operation each month. Alternatively, Mmonitor and record the hours of operation for each of EU IDs 7B, 10, and 14 through 17 on a daily basis.

3. Condition 13.3. Please revise the condition as follows to allow calculation of total NO_x emissions using electric kilowatt-hours (ekW-hr) emission factors. Under this application, ekW-hrs are proposed as an alternative method to be used to estimate emissions. The proposed emissions factors listed are from May 2016 and August 2016 performance tests using the results from EPA Methods 1 through 4, which are more accurate than those calculated using EPA Method 19.

13.3 On or before the 15th of each month, cCalculate and record the total NO_x emissions for each calendar month for EU IDs 7B, 10, and 14 through 17 based on ekW-hrs or hours of operation for the previous month recorded in Condition 13.2 and NO_x emission rates as follows:

- a. EU ID 7B: ~~45~~ 35.74 lb/hr or 0.031 lb/ekW-hr;
- b. EU IDs 10, 14 and 15: ~~75~~ 68.08 lb/hr or 0.023 lb/ekW-hr;
- c. EU ID 14: 70.99 lb/hr or 0.025 lb/ekW-hr;
- d. EU ID 15: 73.86 lb/hr or 0.026 lb/ekW-hr;
- ee. EU ID 16: ~~25~~ 24.64 lb/hr or 0.018 ekW-hr;
- ef. EU ID 17: ~~5~~ 5.02 lb/hr or 0.007 ekW-hr.

The requested revisions have the following effects.

Emissions – The changes described under this application will result in no increase in source-wide potential to emit emissions because the underlying NO_x emission limit of 314 tpy for the source under Condition 13 is not proposed to be changed. Additionally, the proposed changes do not result in a modification to any existing emission units because there is no physical change or change in the method of operation that results in an increase in emissions.

Other Permit Terms – The effect of the revisions on each affected permit term is provided above.

Underlying Ambient Demonstration – The underlying ambient demonstration at this stationary source is not affected by the changes listed above because EU 16 was not included in any prior ambient demonstrations nor required to be included in a previous ambient demonstration because EU ID 16 was permitted under 18 AAC 50.508(6), not 18 AAC 50.502(c)(3).

Compliance Monitoring – Revised monitoring requirements are needed to track the monthly ekW-hr for EU IDs 7B, 10, and 14 through 17 to more precisely estimate actual emissions from these emissions units.

Avoidance of Classification – No effect. The existing and proposed revised ORLs in Condition 12 each are intended to avoid a PSD permit classification under 18 AAC 50.306.

ATTACHMENT D
PERMITTING ANALYSIS AND EMISSIONS
CALCULATIONS

**Table D-1a. Kotzebue Electric Association - Kotzebue Power Plant
New Emissions Unit Inventory**

EU ID	EU Name	EU Description	Rating/Size	Installation or Construction Date
New Unit Installed Under Air Quality Control Minor Permit No. AQ0196MSS03				
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	2013

**Table D-1b. Kotzebue Electric Association - Kotzebue Power Plant
Existing Emissions Unit Inventory ¹**

EU ID	EU Name	EU Description	Rating/Size	Installation or Construction Date
Existing Units Removed from Service				
11	Caterpillar 3512	Diesel Electric Generator	1,020 kW	1992
12	Caterpillar 3512	Diesel Electric Generator	1,020 kW	1992

Notes:

¹ EU IDs 11 and 12 were permanently removed from service in 2012.

**Table D-2. Kotzebue Electric Association - Kotzebue Power Plant
Step 1 PSD Air Quality Permit Applicability - New EU 16 Project ¹**

Air Pollutant	Baseline Actual Emissions ² (EU 16)	Potential to Emit Emissions ³ (EU 16)	Step 1 - Total Change in Emissions ⁴	PSD Permit Applicability Threshold ⁵	Permit Required
NO _x	0 tpy	79.3 tpy	79.3 tpy	40 tpy	Yes
CO	0 tpy	87.0 tpy	87.0 tpy	100 tpy	No
PM	0 tpy	4.7 tpy	4.7 tpy	25 tpy	No
PM ₁₀ ⁶	0 tpy	4.7 tpy	4.7 tpy	15 tpy	No
PM _{2.5} ⁶	0 tpy	4.7 tpy	4.7 tpy	10 tpy	No
NO _x as a precursor to PM _{2.5}	0 tpy	79.3 tpy	79.3 tpy	40 tpy ⁷	Yes
SO ₂ as a precursor to PM _{2.5}	0 tpy	0.09 tpy	0.09 tpy	40 tpy ⁷	No
NO _x as a precursor to O ₃	0 tpy	79.3 tpy	79.3 tpy	40 tpy ⁸	Yes
VOC as a precursor to O ₃	0 tpy	5.4 tpy	5.4 tpy	40 tpy ⁸	No
SO ₂	0 tpy	0.09 tpy	0.09 tpy	40 tpy	No
Lead ⁹	0 tpy	0 tpy	0 tpy	0.6 tpy	No
CO _{2e}	0 tpy	9,694 tpy	9,694 tpy	75,000 tpy	No

Notes:

- ¹ A Step 1 PSD permitting applicability test is required to be conducted in accordance with 40 CFR 52.21(a)(2)(iv)(c) through (f), as applicable upon submittal of the original application for Air Quality Control Minor Permit No. AQ0169MSS03 in December 2011.
- ² Per 40 CFR 52.21(b)(48)(iii), for a new emissions unit, the *baseline actual emissions* for purposes of determining the emissions increase that will result from the initial construction and operation of such unit shall equal zero.
- ³ Per 40 CFR 52.21(b)(4), *potential to emit* meant the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including restrictions on hours of operation, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.
- ⁴ An *actual-to-potential test for projects that only involve construction of a new emissions unit(s)* for PSD permit applicability was used for this analysis in accordance with 40 CFR 52.21(a)(2)(iv)(d).
- ⁵ The PSD applicability thresholds are provided in 40 CFR 52.21(23)(i), per 18 AAC 50.306.
- ⁶ PM_{2.5} and PM₁₀ emissions are conservatively estimated to equal PM emissions.
- ⁷ Per 40 CFR 52.21(23)(i), the PSD significant emission increase threshold for PM_{2.5} is 10 tpy of direct PM_{2.5} emissions, 40 tpy of SO₂ emissions, or 40 tpy of NO_x emissions unless demonstrated not to be a PM_{2.5} precursor under 40 CFR 52.21(b)(50).
- ⁸ Per 40 CFR 52.21(23)(i), the PSD significant emission increase threshold for ozone is 40 tpy of VOC or NO_x.
- ⁹ Lead emissions are considered negligible.

**Table D-3. Kotzebue Electric Association - Kotzebue Power Plant
Step 2 PSD Air Quality Permit Applicability - New EU 16 Project ¹**

Air Pollutant	Step 1 - Total Change in Emissions	Baseline Actual Emissions ² (EU IDs 11 & 12)	Projected Actual Emissions ^{3,4} (EU IDs 11 & 12)	Creditable Increases or Decreases in Actual Emissions ^{5,6}	Step 2 - Total Change in Emissions	PSD Permit Applicability Threshold ⁷	Permit Required
NO _x	79.3 tpy	40.3 tpy	0 tpy	-40.3 tpy	39.0 tpy	40 tpy	No
NO _x as a precursor to PM _{2.5}	79.3 tpy	40.3 tpy	0 tpy	-40.3 tpy	39.0 tpy	40 tpy	No
NO _x as a precursor to O ₃	79.3 tpy	40.3 tpy	0 tpy	-40.3 tpy	39.0 tpy	40 tpy	No

Notes:

¹ A Step 2 PSD permitting applicability is conducted in accordance with 40 CFR 52.21(a)(2)(iv)(b).

A Step 2 PSD permitting applicability was required to be conducted in accordance with 40 CFR 52.21(a)(2)(iv)(c) through (f), as applicable upon submittal of the original application for Air Quality Control Minor Permit No. AQ0169MSS03 in December 2011.

² *Baseline actual emissions* means the rate of emissions, in tons per year, of a regulated NSR pollutant, as determined in accordance with paragraphs (b)(48)(i) through (iv) of this section.

Per 40 CFR 52.21(b)(48)(i), *baseline actual emissions* means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator.

³ *Projected actual emissions* means the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, per 40 CFR 52.21(b)(41).

⁴ EU IDs 11 and 12 were permanently removed from service in 2012.

⁵ An increase or decrease in actual emissions is creditable only if the Administrator or other reviewing authority has not relied on it in issuing a permit for the source, per 40 CFR 52.21(b)(3)(iii).

⁶ An *actual-to-projected-actual applicability test for projects that only involve existing emissions units* for PSD permit applicability is used for this analysis in accordance with 40 CFR 52.21(a)(2)(iv)(c).

⁷ The PSD applicability thresholds are provided in 40 CFR 52.21(23)(i), per 18 AAC 50.306.

**Table D-4a. Kotzebue Electric Association - Kotzebue Power Plant
Criteria Pollutant Potential to Emit Emissions for New Units: Oxides of Nitrogen (NO_x)**

Emissions Unit					Potential Operation	Emission Factor		Potential Annual NO _x Emissions
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	9.8 g/kW-hr	40 CFR 60.4201(d), Tier 2	135.7 tpy
Total Potential to Emit NO_x Emissions - Unlimited								135.7 tpy
Total Potential to Emit NO_x Emissions - w/Proposed Limit								79.3 tpy

**Table D-4b. Kotzebue Electric Association - Kotzebue Power Plant
Criteria Pollutant Baseline Actual Emissions for Existing Units: Oxides of Nitrogen (NO_x)**

Emissions Unit					Operating Rate ²	Emission Factor		Baseline Actual NO _x Emissions
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
11	Caterpillar 3512	Diesel Electric Generator	1,020 kW	Diesel	2,573,167 kW-hr	0.0369 lb/kW-hr	2003 Source Test Results	23.7 tpy
12	Caterpillar 3512	Diesel Electric Generator	1,020 kW	Diesel	1,502,855 kW-hr	0.0441 lb/kW-hr	2003 Source Test Results	16.6 tpy
Total Baseline Actual NO_x Emissions								40.3 tpy

Notes:

¹ Not-to-exceed multiplier of 1.25 applied to emission rates, per Eq. 1 of 40 CFR 60.4212(c).

² *Baseline actual emissions* are based on the average annual operating rate during the 24 consecutive month period from March 2002 to February 2004. See Table D-10.

**Table D-5. Kotzebue Electric Association - Kotzebue Power Plant
Criteria Pollutant Potential to Emit Emissions for New Units: Carbon Monoxide (CO)**

Emissions Unit					Potential Operation	Emission Factor		Potential Annual CO Emissions
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	6.25 g/kW-hr ¹	40 CFR 60.4201(d), Tier 2	87.0 tpy
Total Potential to Emit CO Emissions - Unlimited								87.0 tpy

Notes:

¹ Not-to-exceed multiplier of 1.25 applied to emission rates, per Eq. 1 of 40 CFR 60.4212(c).

**Table D-6. Kotzebue Electric Association - Kotzebue Power Plant
Criteria Pollutant Potential to Emit Emissions for New Units: Particulate Matter (PM)**

Emissions Unit					Potential Operation	Emission Factor		Potential Annual PM Emissions
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	0.338 g/kW-hr ¹	40 CFR 60.4201(d), Tier 2	4.7 tpy
Total Potential to Emit PM Emissions - Unlimited								4.7 tpy

Notes:

¹ Not-to-exceed multiplier of 1.25 applied to emission rates, per Eq. 1 of 40 CFR 60.4212(c).

**Table D-7. Kotzebue Electric Association - Kotzebue Power Plant
Criteria Pollutant Potential to Emit Emissions for New Units: Volatile Organic Compounds (VOC)**

Emissions Unit					Potential Operation	Emission Factor		Potential Annual VOC Emissions
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	6.42E-04 lb/hp-hr	AP-42 Table 3.4-1	5.4 tpy
Total Potential to Emit VOC Emissions - Unlimited								5.4 tpy

**Table D-8. Kotzebue Electric Association - Kotzebue Power Plant
Criteria Pollutant Potential to Emit Emissions for New Units: Sulfur Dioxide (SO₂)**

EU ID	EU Name	Emissions Unit			Potential Operation	Emission Factor ¹		Potential Annual SO ₂ Emissions ¹
		EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	0.0002 lb/gal	Mass Balance	0.09 tpy
Total Potential to Emit SO₂ Emissions - Unlimited								0.09 tpy

Notes:

¹ Parameters and conversions:

Ultra-low sulfur diesel (ULSD) sulfur content:	15 ppmw	
#1 ULSD, Arctic Diesel, BTU Gross	133,500 Btu/gal	
#1 ULSD arctic density:	7.10 lb/gal	(source: amref.com)
Engine heat rate, AP-42	7,000 Btu/hp-hr	

**Table D-9. Kotzebue Electric Association - Kotzebue Power Plant
Greenhouse Gas (GHG) Potential to Emit Emissions for New Units: Carbon Dioxide Equivalent (CC₂e)**

Emissions Unit					Potential Operation	CO ₂ Emission Factor		Potential Annual CO ₂ Emissions ¹
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	73.96 kg/MMBtu	Table C-1, 40 CFR 98	9,660.4 tpy
Total Potential to Emit GHG Emissions - Unlimited								9,660.4 tpy

Notes:

¹ Parameters and conversions:

#1 ULSD, Arctic Diesel, BTU Gross

133,500 Btu/gal

Engine heat rate, AP-42

7,000 Btu/hp-hr

² CO₂e applies the global warming potential for CO₂ (1), CH₄ (25), and N₂O (298), per 40 CFR 98, Table A-1.

**Table D-9. Kotzebue Electric Association - Kotzebue Power Plant
Greenhouse Gas (GHG) Potential to Emit Emissions for New Units: Carbon Dioxide Equivalent (CC₂e)**

Emissions Unit					Potential Operation	CH ₄ Emission Factor		Potential Annual CH ₄ Emissions ¹
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference	
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	3.00E-03 kg/MMBtu	Table C-2, 40 CFR 98	0.4 tpy
Total Potential to Emit GHG Emissions - Unlimited								0.4 tpy

Notes:

¹ Parameters and conversions:

#1 ULSD, Arctic Diesel, BTU Gross	133,500 Btu/gal
Engine heat rate, AP-42	7,000 Btu/hp-hr

² CO₂e applies the global warming potential for CO₂ (1), CH₄ (25), and N₂O (298), per 40 CFR 98, Table A-1.

**Table D-9. Kotzebue Electric Association - Kotzebue Power Plant
Greenhouse Gas (GHG) Potential to Emit Emissions for New Units: Carbon Dioxide Equivalent (CC₂e)**

Emissions Unit					Potential Operation	N ₂ O Emission Factor		Potential Annual N ₂ O Emissions ¹	Potential Annual CO ₂ e Emissions ²
EU ID	EU Name	EU Description	Rating/Size	Fuel		Units	Reference		
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	Diesel	8,760 hrs/yr	6.00E-04 kg/MMBtu	Table C-2, 40 CFR 98	0.08 tpy	9,693.6 tpy
Total Potential to Emit GHG Emissions - Unlimited								0.08 tpy	9,693.6 tpy

Notes:

¹ Parameters and conversions:

#1 ULSD, Arctic Diesel, BTU Gross	133,500 Btu/gal
Engine heat rate, AP-42	7,000 Btu/hp-hr

² CO₂e applies the global warming potential for CO₂ (1), CH₄ (25), and N₂O (298), per 40 CFR 98, Table A-1.

**Table D-10. Kotzebue Electric Association - Kotzebue Power Plant
EU IDs 11 and 12 Baseline Actual Nitrogen Oxide (NO_x) Emissions**

DATE	EU 11 Hours Reading	EU 12 Hours Reading	EU 11 kWh Reading	EU 12 kWh Reading	EU 11 Hours	EU 12 Hours	EU 11 kW-hrs	EU 12 kW-hrs	EU 11 24-Month Hours	EU 12 24-Month Hours	EU 11 24-Month kW-hrs	EU 12 24-Month kW-hrs	EU 11 12-Month Average NO _x Emissions (tons)	EU 12 12-Month Average NO _x Emissions (tons)	EUs 11 and 12 12-Month Average NO _x Emissions (tons)
OCT 2001	16,476	15,901	1,553,702	1,815,586											
NOV 2001	16,494	15,916	1,558,892	1,821,459	17	15	5,190	5,873							
DEC 2001	16,494	16,234	1,558,892	1,966,464	0	318	0	145,005							
JAN 2002	16,638	16,641	1,602,005	2,135,367	144	407	43,113	168,903							
FEB 2002	16,818	16,662	1,673,233	2,144,140	180	21	71,228	8,773							
MAR 2002	16,872	16,836	1,694,061	2,208,367	54	174	20,828	64,227							
APR 2002	17,193	17,213	1,823,994	2,406,760	321	377	129,933	198,393							
MAY 2002	17,522	17,547	1,945,922	2,495,423	329	334	121,928	88,663							
JUN 2002	17,934	17,547	2,187,339	2,671,134	412	0	241,417	175,711							
JUL 2002	18,505	18,253	2,536,956	2,889,886	571	706	349,617	218,752							
AUG 2002	18,844	18,532	2,754,612	3,029,872	339	279	217,656	139,986							
SEP 2002	19,140	18,642	2,913,604	3,087,746	295	110	158,992	57,874							
OCT 2002	19,170	18,821	2,915,912	3,132,928	31	179	2,308	45,182							
NOV 2002	19,562	18,908	3,062,236	3,173,439	392	87	146,324	40,511							
DEC 2002	19,758	18,990	3,125,675	3,198,048	197	82	63,439	24,609							
JAN 2003	19,969	19,011	3,184,310	3,203,895	211	22	58,635	5,847							
FEB 2003	20,162	19,181	3,257,711	3,263,875	193	170	73,401	59,980							
MAR 2003	20,349	19,302	3,315,950	3,304,144	187	121	58,239	40,269							
APR 2003	20,349	19,468	3,315,950	3,366,862	0	167	0	62,718							
MAY 2003	20,359	19,534	3,318,202	3,381,504	10	66	2,252	14,642							
JUN 2003	20,554	19,567	3,363,451	3,390,039	195	33	45,249	8,535							
JUL 2003	20,836	19,707	3,495,715	3,468,380	282	140	132,264	78,341							
AUG 2003	21,106	19,713	3,576,972	3,471,370	270	6	81,257	2,990							
SEP 2003	21,338	19,744	3,679,828	3,482,865	232	31	102,856	11,495							
OCT 2003	21,469	19,795	3,730,174	3,499,419	131	51	50,346	16,554	4,993	3,894	2,176,472	1,683,833	20.08	18.56	38.64
NOV 2003	21,679	20,016	3,825,382	3,576,727	210	221	95,208	77,308	5,185	4,100	2,266,490	1,755,268	20.91	19.35	40.26
DEC 2003	21,860	20,107	3,917,079	3,609,973	181	91	91,697	33,246	5,366	3,873	2,358,187	1,643,509	21.75	18.12	39.87
JAN 2004	22,188	20,183	4,051,035	3,637,182	328	76	133,956	27,209	5,550	3,542	2,449,030	1,501,815	22.59	16.56	39.15
FEB 2004	22,634	20,218	4,246,400	3,646,995	446	35	195,365	9,813	5,816	3,556	2,573,167	1,502,855	23.74	16.57	40.31
MAR 2004	22,923	20,220	4,333,480	3,647,283	289	2	87,080	288	6,051	3,384	2,639,419	1,438,916	24.35	15.86	40.21
APR 2004	23,199	20,255	4,421,699	3,653,434	276	35	88,219	6,151	6,006	3,042	2,597,705	1,246,674	23.96	13.74	37.71
MAY 2004	23,229	20,255	4,427,661	3,655,443	30	0	5,962	2,009	5,707	2,708	2,481,739	1,160,020	22.89	12.79	35.68
JUN 2004	23,246	20,267	4,431,279	3,655,443	17	12	3,618	0	5,312	2,720	2,243,940	984,309	20.70	10.85	31.55
JUL 2004	23,255	20,267	4,433,238	3,655,443	9	0	1,959	0	4,750	2,014	1,896,282	765,557	17.49	8.44	25.93
AUG 2004	23,280	20,413	4,444,248	3,700,741	25	146	11,010	45,298	4,436	1,881	1,689,636	670,869	15.59	7.40	22.98
SEP 2004	23,284	20,476	4,444,892	3,712,021	4	63	644	11,280	4,145	1,834	1,531,288	624,275	14.13	6.88	21.01
OCT 2004	23,406	20,579	4,477,150	3,740,807	122	103	32,258	28,786	4,236	1,758	1,561,238	607,879	14.40	6.70	21.10
NOV 2004	23,713	20,629	4,598,275	3,751,914	307	50	121,125	11,107	4,151	1,721	1,536,039	578,475	14.17	6.38	20.55
DEC 2004	23,884	20,653	4,663,344	3,765,062	171	24	65,069	13,148	4,126	1,663	1,537,669	567,014	14.18	6.25	20.44
JAN 2005	23,915	20,753	4,672,680	3,796,531	31	100	9,336	31,469	3,946	1,742	1,488,370	592,636	13.73	6.53	20.26
FEB 2005	23,942	20,765	4,684,072	3,800,367	27	12	11,392	3,836	3,780	1,584	1,426,361	536,492	13.16	5.91	19.07
MAR 2005	24,033	21,108	4,714,726	3,913,469	91	343	30,654	113,102	3,684	1,807	1,398,776	609,325	12.90	6.72	19.62
APR 2005	24,154	21,399	4,754,079	3,995,500	121	291	39,353	82,031	3,805	1,931	1,438,129	628,638	13.27	6.93	20.20
MAY 2005	24,350	21,524	4,806,401	4,018,068	196	125	52,322	22,568	3,991	1,990	1,488,199	636,564	13.73	7.02	20.75
JUN 2005	24,375	21,536	4,812,768	4,020,085	25	12	6,367	2,017	3,821	1,969	1,449,317	630,046	13.37	6.95	20.32
JUL 2005	24,375	21,536	4,812,768	4,020,085	0	0	0	0	3,539	1,829	1,317,053	551,705	12.15	6.08	18.23
AUG 2005	24,377	21,537	4,813,016	4,020,089	2	1	248	4	3,271	1,824	1,236,044	548,719	11.40	6.05	17.45
SEP 2005	24,443	21,612	4,829,752	4,036,050	66	75	16,736	15,961	3,105	1,868	1,149,924	553,185	10.61	6.10	16.71
OCT 2005	24,596	21,691	4,874,032	4,057,406	153	79	44,280	21,356	3,127	1,896	1,143,858	557,987	10.55	6.15	16.70
NOV 2005	24,976	21,765	5,022,097	4,074,672	380	74	148,065	17,266	3,297	1,749	1,196,715	497,945	11.04	5.49	16.53
DEC 2005	25,064	21,765	5,062,051	4,074,672	88	0	39,954	0	3,204	1,658	1,144,972	464,699	10.56	5.12	15.69

**Table D-10. Kotzebue Electric Association - Kotzebue Power Plant
EU IDs 11 and 12 Baseline Actual Nitrogen Oxide (NO_x) Emissions**

DATE	EU 11 Hours Reading	EU 12 Hours Reading	EU 11 kWh Reading	EU 12 kWh Reading	EU 11 Hours	EU 12 Hours	EU 11 kW-hrs	EU 12 kW-hrs	EU 11 24-Month Hours	EU 12 24-Month Hours	EU 11 24-Month kW-hrs	EU 12 24-Month kW-hrs	EU 11 12-Month Average NO _x Emissions (tons)	EU 12 12-Month Average NO _x Emissions (tons)	EUs 11 and 12 12-Month Average NO _x Emissions (tons)
JAN 2006	25,341	21,765	5,184,964	4,074,672	277	0	122,913	0	3,153	1,582	1,133,929	437,490	10.46	4.82	15.28
FEB 2006	25,420	21,903	5,212,871	4,110,591	79	138	27,907	35,919	2,786	1,685	966,471	463,596	8.92	5.11	14.03
MAR 2006	25,456	22,055	5,223,191	4,151,258	36	152	10,320	40,667	2,533	1,835	889,711	503,975	8.21	5.56	13.76
APR 2006	25,501	22,317	5,238,195	4,227,270	45	262	15,004	76,012	2,302	2,062	816,496	573,836	7.53	6.33	13.86
MAY 2006	25,514	22,405	5,240,859	4,266,087	13	88	2,664	38,817	2,285	2,150	813,198	610,644	7.50	6.73	14.23
JUN 2006	25,527	22,490	5,243,374	4,266,968	13	85	2,515	881	2,281	2,223	812,095	611,525	7.49	6.74	14.23
JUL 2006	25,527	22,510	5,243,374	4,266,968	0	20	0	0	2,272	2,243	810,136	611,525	7.47	6.74	14.22
AUG 2006	25,527	22,510	5,243,374	4,266,968	0	0	0	0	2,247	2,097	799,126	566,227	7.37	6.24	13.61
Maximum Annual NO_x Emissions														40.31	

Source Test Results

EU ID 11	February 2003	0.0369 lb/kWhr	Methods 1 thru 4
	March 2009	0.0532 lb/kWhr	Methods 1 thru 4
EU ID 12	February 2003	0.0441 lb/kWhr	Methods 1 thru 4
	March 2009	0.0568 lb/kWhr	Methods 1 thru 4

ATTACHMENT E
ADEC MARCH 17, 2015 LETTER

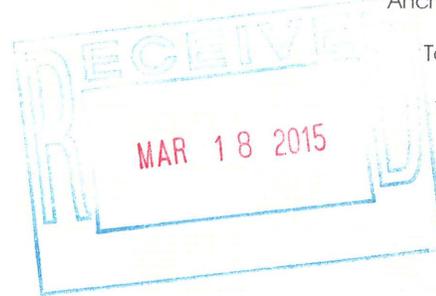


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March 17, 2015

Brad Reeve
Kotzebue Electric Association
P.O. Box 44
Kotzebue, AK 99752

Subject: Minor Permit Application Complete/Incomplete Determination,
Kotzebue Electric Association, Kotzebue Power Plant file No. 410.16.001.

Dear Mr. Reeve:

On January 14, 2015 John Kuterbach received a request for an amendment to an AQ0196MSS03 permit condition for prevention of significant deterioration (PSD) permit avoidance. Patrick Dunn emailed a reply on February 19, 2015 stating the Alaska Department of Environmental Conservation (ADEC) considered the email request and attachments as an application for a minor permit under 18 AAC 50.508(6) for revising terms and conditions of a Title I permit. The email also stated Kotzebue Electric Association (KEA) needed to provide additional information as required under 18 AAC 50.540(a), (b) and (k) for the minor permit application to be considered complete. ADEC received the requested minor permit application information on March 9, 2015, and ADEC has determined that the minor permit application is complete. However, due to errors in assumptions made or calculations submitted, ADEC does not currently plan to continue processing the permit application unless KEA resubmits and/or provides additional information.

KEA submitted the information below in Section 8 of the Stationary Source Identification Form. ADEC addresses some of the assumptions made, provides clarification, and requests information in the bullets following the paragraphs.

From KEA: Because of the success of the wind farm conversion at KEA Unit #16 is being used more consistently than was originally expected. But because it is operated as a "load following" unit in order to more closely compensate for variations in wind conditions it is frequently operating at less than 100% of full load. As can be seen from the footnote on Condition 11.4c the permit assumes operation at 100% of load for all operating hours. This results in a substantial and significant error in the calculation of emissions. This electronically-regulated engine has approximately level fuel consumption and NO_x emissions down to low load conditions. To accurately reflect actual emissions, the calculation should be done on the basis of kW-hr rather than hours at an imagined full load. Alternatively, if internal ADEC

guidelines require a calculation assuming full load for each hour of operation, the total limit for the year can be increased without triggering a PSD review.

If it is elected to revise the calculation method, the more useful value would be 17.2 lb/MWhr. If it is elected to revise the ORL to the maximum allowed by PSD rules (40 CFR 51.165 and 166) the correct value would be 75 tons/running 12 months.

- ADEC understands permit AQ0196MSS03 requires using the EU 16 rated capacity and monitored hours of operation to calculate emissions when determining compliance with the PSD avoidance limit and that EU 16 actually operates at variable loads during normal operation. This results in conservative values for NO_x emissions. KEA suggests the actual emissions calculation should be done on the basis of kW-hr. If KEA is requesting to revise monitoring requirements, KEA must provide proposed monitoring requirements and any necessary supporting information on EU 16 operation, so ADEC can determine if the monitoring is sufficient to determine compliance with the PSD avoidance limit. KEA would also need to ensure load and hours of operation are monitored and recorded often enough to ensure emission calculations are accurate.

As stated below, the significant emissions increase threshold for step 1 of the PSD permit applicability analysis is 40 tons per year (tpy) for NO_x, and the significant net emissions increase threshold for step 2 of the PSD permit applicability analysis is also 40 tpy. However, these steps of the PSD applicability analysis are separate, and emissions are compared to each threshold separately. Therefore, any PSD avoidance limit for NO_x must limit the increase to less than 40 tpy using the step 1 calculations or limit the increase to less than 40 tpy using the step 2 calculations, as applicable.

From KEA: Subsections (a)(l)(xxviii) and (xxxv) of 40 CFR 51.165 appear to be the appropriate guidance for calculating what would be a significant increase when old units are removed (Units #11 and #12, removed as described in Condition 9 of the same permit) and a new unit is installed. The attached spreadsheet provides calculations of the highest separate two year periods for each (according to the provision of (xxxv)(B)(4) excluded as provided in (vi)(A)(l)) removed unit. That was a yearly average over the two year period of July 2011 through June 2013 for Unit #11 of 28.7 tons and a yearly average over the two year period of July 2010 through June 2012 for Unit # 12 of 11.3 tons, for a total of removed emissions of 40 tons per year.

- 40 CFR 51.165 requirements adopted by ADEC under 18 AAC 50.040(i) contain text setting out provisions that a state implementation plan shall or may contain. 40 CFR 52.21(a)(2), adopted by ADEC under 18 AAC 50.040(h)(3), contains the PSD permit applicability procedures.

The PSD avoidance limit in Condition 10 of AQ0196MSS03 is 45 tpy for NO_x. Since the limit is greater than 40 tpy, the limit was set using calculations from step 2 of the PSD permit applicability analysis under 40 CFR 52.21(b)(3), which allows for contemporaneous emission reductions. Step 1 of the analysis only considers emission increases (project netting is not allowed).

Under 40 CFR 52.21(b)(3)(i)(b), baseline actual emissions for calculating emissions increases and decreases are calculated in accordance with 40 CFR 52.21(b)(48). Under 40 CFR 52.21(b)(48)(ii), the consecutive 24-month period for calculating baseline actual emissions must be in a 10-year period “immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or

by the reviewing authority for a permit required by a plan, whichever is earlier". ADEC's records show the application for AQ0196MSS03 was complete on December 29, 2011. Therefore, the allowed 10-year period is November 2001 to November 2011. The two-year periods referenced by KEA above are not valid. If KEA decides to further pursue a revision to the PSD avoidance limit based on contemporaneous emission reductions from EUs 11 and 12, different two-year periods for baseline actual emissions need to be defined and baseline actual emissions for EUs 11 and 12 must be recalculated.

Also, the NO_x emission calculations provided for EUs 11 and 12 are inconsistent. Emissions for years 2010 and 2011 use an emission factor of 36 lb/hr as specified for emission calculations in AQ0196TVP02 for the 314 tpy owner requested limit (ORL), while emissions for years 2006 through 2009 use specific lb/kW-hr emission factors. If KEA decides to further pursue a revision to the PSD avoidance limit based on contemporaneous emission reductions from EUs 11 and 12, the source of the 2006 through 2009 emission factors must be provided.

From KEA: 40 CFR 51.165(a)(x)(A) and 40CFR51.166 (a)(23)(i) both describe as significant a "net emissions increase" of NO_x of 40 tons per year. We interpret this as meaning that the new Unit # 16 should not exceed a total of 80 tons per year emissions if it is not to trigger PSD review. With some margin for comfort we believe a reasonable replacement for Condition 10, given the calculations in the spreadsheet, would be 75 tons per year.

- Under 40 CFR 52.21(a)(2)(iv)(a), "a project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases—a significant emissions increase (as defined in paragraph (b)(40) of this section), and a significant net emissions increase (as defined in paragraphs (b)(3) and (b)(23) of this section). The project is not a major modification if it does not cause a significant emissions increase. If the project causes a significant emissions increase, then the project is a major modification only if it also results in a significant net emissions increase." Emission increases determined in the step 1 calculations for PSD permit applicability are compared to the significant emission increase thresholds (40 tpy for NO_x). If the emission increases are less than the significant emission increase thresholds, PSD permit requirements are not applicable. If step 1 of the analysis shows an emission increase equal to or greater than a significant emission increase threshold, step 2 of the analysis is triggered. In step 2, the emission increase from step 1 is added to all contemporaneous emission increases and decreases. If this change in emissions is greater than the significant net emission increase threshold (40 tpy for NO_x) PSD permit requirements are applicable. Otherwise, PSD permit requirements do not apply.

The significant emission increase threshold and significant net emission increase threshold are not additive. Each threshold is used separately in different steps of the PSD permit applicability analysis. Therefore KEA's request for a revised limit of 75 tons per year cannot be granted.

From KEA: Making this change in the permit will not increase annual emissions but will decrease emissions. This will allow us to use Unit #16 instead of Unit #10. As noted, the NO_x emissions from #16 are 17.2 lb/MW-hr. The NO_x emissions from # 10 are 24.35 lb/MW-hr. Using #16 allows us to reduce NO_x, PM and CO₂ emissions. This revision has no effect on other permit conditions.

- ADEC understands that annual NO_x emissions decrease if EU 16 is operated instead of EU 10. However, step 1 of the PSD permit applicability analysis is project specific and only emission increases are considered. In step 2, PSD permit applicability is based on the PTE of EU 16 and changes in actual emissions for existing emission units. As specified in 40 CFR 52.21(b)(3)(vi)(b), a reduction in actual emissions is creditable only to the extent that:
 - the old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions;
 - it is enforceable as a practical matter at and after the time that actual construction on the particular change begins.

Other than the removal of EUs 11 and 12, no other creditable emission decreases have been provided to ADEC. If other creditable emissions decreases are applicable please provide this information.

Where to Find Statutes, Regulations, and Application Forms:

The Alaska Air Quality Control statutes and regulations can be found at the following website:
<http://dec.alaska.gov/air/ap/regulati.htm>

Permit application forms can be obtained from the following website:
<http://dec.alaska.gov/air/ap/constructionperapp.html>

How ADEC Will Maintain Fee Accounts For This Project:

ADEC will keep the billing account open until May 1, 2015 and will resume processing the application if KEA provides additional information by that date. If KEA does not submit any additional information by May 1, 2015, or requests an extension of the deadline, ADEC will consider the application withdrawn. If KEA decides to pursue the permit after May 1, 2015, KEA must re-submit the application with all applicable fees.

Please contact me at (907) 269-6883 or scott.faber@alaska.gov with any questions.

Sincerely,



Scott Faber
Engineering Associate I, DEC

cc: Zeena Siddeek, ADEC/APP/Juneau
Patrick Dunn, ADEC/APP/Anchorage
Scott Faber, ADEC/APP, Anchorage
Jim Baumgartner, ADEC/APP, Juneau
P. Moses Coss, ADEC/APP, Fairbanks
Jeremy Ptak, ADEC/APP, Anchorage
Jim Plosay, ADEC/APP, Juneau
Mike Ruby (mruby@envirometrics.com)

ATTACHMENT F
AIR QUALITY CONTROL MINOR PERMIT
No. AQ0196MSS04

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONTROL MINOR PERMIT

Permit No. AQ0196MSS04
Rescinds Permit No. AQ0196MSS03

Final – March 1, 2016

The Alaska Department of Environmental Conservation, under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit No. AQ0196MSS04 to the Permittee listed below.

Owner and Operator: Kotzebue Electric Association
P.O. Box 44
Kotzebue, AK 99752

Permittee: Same as Owner and Operator

Stationary Source: Kotzebue Power Plant

Location: Latitude: 66° 53' 38.08" N
Longitude: 162° 35' 45.54" W

Physical Address: Fourth and Lagoon Streets
Kotzebue, AK 99752

Project: Addition of Emission Unit 17

Permit Contact: Brad Reeve, (907) 442-3491, kea_gm@otz.net

This project is classified under 18 AAC 50.508(6) for revising or rescinding the terms and conditions of a Title I permit. This permit satisfies the obligation of the Permittee to obtain a minor permit under 18 AAC 50. As required by AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this permit.

The Permittee may operate under the terms and conditions of this permit upon issuance.


for John F. Kuterbach, Manager
Air Permits Program

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Abbreviations and Acronyms

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AS	Alaska Statutes
ASTM	American Society of Testing and Materials
C.F.R.	Code of Federal Regulations
EU	emission unit
EPA	Environmental Protection Agency
HHV	higher heating value
ID	source identification number
ISO	International Standards Organization
LHV	lower heating value
MR&R	monitoring, recordkeeping, and reporting
NA	not applicable
NAICS	North American Industry Classification System
PSD	Prevention of Significant Deterioration
SIC	Standard Industrial Classification
TAR	technical analysis report

Units and Measures

gr./dscf	grains per dry standard cubic feet (1 pound = 7,000 grains)
dscf	dry standard cubic foot
gph	gallons per hour
Hp	horsepower
kW, kW-e	kilowatts, kilowatts electric
lb/hr	pounds per hour
MMBtu/hr	million British thermal units per hour
ppm	parts per million
ppmv	parts per million by volume
tph	tons per hour
tpy	tons per year
wt%	weight percent

Pollutants

CO	carbon monoxide
HAPs	hazardous air pollutants
H ₂ S	hydrogen sulfide
NO _x	oxides of nitrogen
NO ₂	nitrogen dioxide
PM-10	particulate matter with an aerodynamic diameter less than 10 microns
SO ₂	sulfur dioxide
VOC	volatile organic compound

Section 1. Emission Unit Inventory

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

Table 1 – Emission Unit Inventory ¹

EU ID	EU Name	EU Description	Rating	Installation Date
7B	Caterpillar 3516	Diesel Electric Generator	1,135 kW	1987
10	GM EMD 20-710-G4	Diesel Electric Generator	3,080 kW	1992
14	GM EMD 16-710-G4	Diesel Electric Generator	2,865 kW	1994
15	GM EMD 16-710-G4	Diesel Electric Generator	2,865 kW	2005
16	GM EMD 8-710-GC	Diesel Electric Generator	1,441 kW	2013
17	Caterpillar C27	Diesel Electric Generator	725 kW	2015
T2	Fuel Storage Tank	Fuel Tank	10 ⁶ gallons	1978
T3	Fuel Storage Tank	Fuel Tank	10 ⁶ gallons	1984

Notes:

¹ All emission units other than EU ID 17 were authorized under previous Title I permits.

Section 2. Emission and Compliance Fees

2. **Assessable Emissions.** The Permittee shall pay to the Department an annual emission fee based on the stationary source's assessable emissions as determined by the Department under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410. The Department will assess fees per ton of each air pollutant that the stationary source emits or has the potential to emit in quantities greater than 10 tons per year. The quantity for which fees will be assessed is the lesser of:
 - 2.1. The stationary source's assessable potential to emit of 557 tpy; or
 - 2.2. The stationary source's projected annual rate of emissions that will occur from July 1 to the following June 30, based upon actual annual emissions emitted during the most recent calendar year or another 12 month period approved in writing by the Department, when demonstrated by:
 - a. An enforceable test method described in 18 AAC 50.220;
 - b. Material balance calculations;
 - c. Emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or
 - d. Other methods and calculations approved by the Department.
3. **Assessable Emission Estimates.** Emission fees will be assessed as follows:
 - 3.1. No later than March 31 of each year, the Permittee may submit an estimate of the stationary source's assessable emissions to ADEC, Air Permits Program, ATTN: Assessable Emissions Estimate, 410 Willoughby Ave., PO Box 111800, Juneau, AK 99811-1800; the submittal must include all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the Department can verify the estimates; or
 - 3.2. If no estimate is received 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 2.1.
4. **Administration Fees.** The Permittee shall pay to the Department all assessed permit administration fees. Administration fee rates are set out in 18 AAC 50.400 through 405.

Section 3. State Emission Standards

5. Industrial Process and Fuel-Burning Equipment Visible Emissions. The Permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from any of EU IDs 7B, 10, and 14 through 17 listed in Table 1 to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.

5.1. The Permittee shall observe the exhaust of EU ID 17 using 40 C.F.R. 60, Appendix A-4, Method 9 within 60 calendar days of the emission unit becoming fully operational¹. The exhaust shall be observed for 18 minutes to obtain 72 consecutive 15-second opacity observations.

5.2. For the Method 9 observations under Condition 5.1:

a. The observer shall record:

- (i) The name of the stationary source, emission unit and location, emission unit type, observer's name and affiliation, and the date on the Visible Emission Observation Form in Section 11.
- (ii) The time, estimated distance to the emissions location, sun location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), plume background, and operating mode (load or fuel consumption rate or best estimate if unknown) on the sheet at the time opacity observations are initiated and completed;
- (iii) The presence or absence of an attached or detached plume and the approximate distance from the emissions outlet to the point in the plume at which the observations are made;
- (iv) Opacity observations to the nearest five percent at 15-second intervals on the Visible Emission Observation Form in Section 11, and
- (v) The minimum number of observations required by the permit; each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period.

b. To determine the six-minute average opacity, divide the observations recorded on the record sheet into sets of 24 consecutive observations; sets need not be consecutive in time and in no case shall two sets overlap; for each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24; record the average opacity on the sheet.

¹ Fully operational is defined as completing all testing and commissioning requirements after unit installation. Installation is defined as the point when unit is ready for testing. Testing and commissioning requirements shall not exceed 60 days after unit installation. The Permittee may request an extension in writing from the Department to this 60 day requirement in circumstances beyond the Permittee's reasonable control.

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- c. Calculate and record the highest 6-consecutive-minute and 18-consecutive-minute averages observed.
 - 5.3. For the observations required under Condition 5.1, include in the operating report under Condition 21:
 - a. Copies of the observation results (i.e. opacity observations); and
 - b. A summary to include:
 - (i) The highest six-minute average observed; and
 - (ii) Dates when one or more observed six-minute averages were greater than 20 percent;
 - 5.4. Report the results of Method 9 observations that exceed an average of 20 percent opacity for any six-minute period in accordance with Condition 20.
 - 6. **Industrial Process and Fuel-Burning Equipment Particulate Matter.** The Permittee shall not cause or allow particulate matter emitted from any of EU IDs 7B, 10, and 14 through 17 listed in Table 1 to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.
 - 6.1. For EU ID 17, the Permittee shall demonstrate initial compliance with Condition 6 by conducting source tests on EU ID 17 to determine the concentration of particulate matter (PM) in the exhaust of the emission units as follows:
 - a. Within six months of exceeding the criteria of Condition 6.1.b(i) or 6.1.b(ii), either:
 - (i) Conduct a PM source test according to requirements set out in Section 9; or
 - (ii) Make repairs so that emissions no longer exceed the criteria of Condition 6.1.b; to show that emissions are below those criteria, observe emissions as described in Condition 5.1 under load conditions comparable to those when the criteria were exceeded.
 - b. Conduct the test according to Condition 6.1.a if:
 - (i) 18 consecutive minutes of Method 9 observations conducted in accordance with Condition 5.1 result in an 18-minute average opacity greater than 20 percent; or
 - (ii) For an emission unit with an exhaust stack diameter that is less than 18 inches, 18 consecutive minutes of Method 9 observations conducted in accordance with Condition 5.1 result in an 18-minute average opacity that is greater than 15 percent and not more than 20 percent, unless the Department has waived this requirement in writing.

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- c. During each one-hour PM source test run, observe the exhaust for 60 minutes in accordance with Method 9 and calculate the average opacity measured during each one-hour test run. Submit a copy of these observations with the source test report.
 - 6.2. Within 60 calendar days of starting up EU ID 17, the Permittee shall record the exhaust stack diameter of EU ID 17. Report the stack diameter in the next operating report under Condition 21.
 - 6.3. The Permittee shall report as follows:
 - a. report under Condition 20:
 - (i) the results of any PM source test that exceeds the PM emissions limit; or
 - (ii) if one of the criteria of Condition 6.1.b was exceeded and the Permittee did not comply with either Condition 6.1.a(i) or 6.1.a(ii), this must be reported by the day following the day compliance with Condition 6.1.a was required;
 - b. report observations in excess of the threshold of Condition 6.1.b(ii) within 30 days of the end of the month in which the observations occur;
 - c. in each operating report under Condition 21, include
 - (i) the dates, EU ID(s), and results when an observed 18-minute average was greater than an applicable threshold in Condition 6.1.b;
 - (ii) a summary of the results of any PM testing under Condition 6; and
 - (iii) copies of any visible emissions observation results (opacity observations) greater than the thresholds of Condition 6.1.b, if they were not already submitted.
 7. **Sulfur Compound Emissions.** The Permittee shall not cause or allow sulfur compound emissions, expressed as SO₂, from any of EU IDs 7B, 10, and 14 through 17 listed in Table 1 to exceed 500 ppm averaged over three hours.

Section 4. Best Available Control Technology (BACT) Requirements

NO_x BACT

8. For EU ID 7B, the operating load shall not exceed 999 kW.
 - 8.1. Monitor and record the date, time, and daily maximum measured power output for EU ID 7B for each day that the unit operates to determine compliance with Condition 8. To the extent possible, make the readings at a consistent time. If the unit is not operating at that time, but does operate on that day, make one reading during its period of operation.
 - 8.2. Monitor and record the maximum power output recorded each month and keep a list of the days and the power output for which the recorded power output exceeded the limit in Condition 8.
 - 8.3. Report the maximum power output recorded for each month in the operating report required in Condition 21.
9. For EU IDs 10 and 14, limit the NO_x emissions expressed as NO₂, averaged over the duration of an emission performance test or any three consecutive hours to 75 lb/hr each.
 - 9.1. Operate EU ID 10 and 14 with optimal fuel injection timing retard, with an improved injector design, and with a four pass aftercooler with separate cooling water supply. Optimal fuel injection timing retard balances low NO_x emissions with engine performance (i.e. fuel consumption and visible emissions).
 - 9.2. No less than once per calendar year, verify that the engine setting used in the source test is being maintained. Submit documents or maintenance logs in the operating report required in Condition 21.

SO₂ BACT

10. For EU IDs 10 and 14:
 - 10.1. The sulfur content of the oil burned shall not exceed 0.49 percent by weight at any time.
 - 10.2. Keep all fuel receipts indicating the fuel grade and the amount of fuel delivered to the stationary source. Provided copies of the fuel receipts in the operating report required in Condition 21.

CO BACT

11. Limit the CO emission rate of EU ID 10 to 16 lb/hr, averaged over the duration of an emission performance test or any three consecutive hours.
 - 11.1. Operate with good combustion practices.

- 11.2. No later than every five years after the first source test of EU ID 10, conduct a source test for CO, in accordance with Section 9, at the maximum and minimum load within the normal operating range to ascertain compliance with the emission limit in Condition 11.

Section 5. Owner Requested Limits (ORLs)

12. ORL to Avoid PSD Modification. Limit the NO_x emissions from EU ID 16 to less than or equal to 45 tons for any twelve consecutive month period.

- 12.1. Monitor and record the average electrical kilowatts (ekW) generated by EU ID 16 each minute of operation and sum the ekW-hrs for EU ID 16 for all periods of operation each month.
- 12.2. On or before the 15th of each month,
 - a. multiply the total ekW-hrs for the previous calendar month by 0.01716 lb/ekW-hr to compute the monthly emissions of NO_x for EU ID 16. Record the monthly EU ID 16 NO_x emissions in tons, and
 - b. calculate and record the rolling 12-month EU ID 16 NO_x emissions, in tons.
- 12.3. Include copies of the records required under Condition 12.2 in the operating report required in Condition 21.
- 12.4. Report in accordance with Condition 20 any time the limit in Condition 12 is exceeded.

13. ORL to Avoid PSD Modification and Minor Permit Requirements. Limit the combined NO_x emissions from EU IDs 7B, 10, and 14 through 17 to less than 314 tons for any twelve consecutive calendar months expressed as NO₂.

- 13.1. Operate EU ID 15 with optimal fuel injection timing retard, with an improved injector design, and with a four pass aftercooler with separate cooling water supply. Optimal fuel injection timing retard balances low NO_x emissions with engine performance (i.e. fuel consumption and visible emissions).
 - a. No less than once per calendar year, verify that the engine setting used in the source test is being maintained. Submit documents or maintenance logs in the operating report required in Condition 21.
- 13.2. Monitor and record the hours of operation for each of EU IDs 7B, 10, and 14 through 17 on a daily basis.
- 13.3. Calculate and record the total NO_x emissions for each calendar month for EU IDs 7B, 10, and 14 through 17 based on hours of operation recorded in Condition 13.2 and NO_x emission rates as follows:
 - a. EU ID 7B: 45 lb/hr;
 - b. EU IDs 10, 14 and 15: 75 lb/hr;
 - c. EU ID 16: 25 lb/hr
 - d. EU ID 17: 5 lb/hr

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- e. If an updated emission factor from a Department approved NO_x source test is available and testing was conducted at 95% or greater of allowable or maximum load, the Permittee shall use the emission rate measured for each of EU IDs 7B, 10, and 14 through 17 by the most recent source tests conducted. The Permittee shall begin using the emission factor at the first day of the month in which the source test results were approved by the Department. For each of EU IDs 7B, 10, 14 and 15, tests shall be conducted in accordance with Condition 13.4.
- 13.4. Conduct a source test for NO_x for each of EU IDs 7B, 10, 14 and 15 within five years of the most recent source test and at least once every 5 years thereafter.
- a. Tests shall be conducted:
- (i) at three loads in the normal operating range of the emission units and at:
- (A) 95% or greater of maximum rated load or maximum achievable load for EU IDs 10, 14, and 15.
- (B) 95 to 100% of allowable load or maximum achievable load for EU ID 7B.
- (ii) in accordance with source testing requirements in Section 9.
- b. Monitor and record the fuel consumption rate and electrical power generating rate during each test run and provide in the source test report. In addition, document the fuel injection timing setting and provide in the source test report.
- c. Three 1-hour test runs shall be conducted at each load. For each test run, determine a NO_x emission rate for each load expressed as NO₂, using exhaust properties determined by both Method 19 and exhaust gas measurements as set out in Section 9.
- 13.5. Attach to the periodic operating report required in Condition 21, the cumulative twelve-month NO_x emissions, expressed as NO₂, from EU IDs 7B, 10, and 14 through 17.
- 13.6. If the combined NO_x emissions for EU IDs 7B, 10, and 14 through 17 exceed 310 tons for any twelve consecutive month period, then install and certify a Continuous Emission Monitoring System (CEMS) with data acquisition for each of EU IDs 7B, 10, and 14 through 17 within 180 days.
- a. Monitor compliance with the emission limit listed in Condition 13 with CEMS.
- b. During operations of each of EU IDs 7B, 10, and 14 through 17:
- (i) Measure and record the one-hour average NO_x emission concentration.

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- (ii) Calculate and record the one-hour average NO_x emission concentration, corrected to 15% O₂.
 - (iii) Calculate and record the three-consecutive-hour average NO_x emission concentration, corrected to 15% O₂, no less than once each hour. Calculate and record the three-consecutive-hour average NO_x emission rates expressed as NO₂, based on the methodology set out in 40 C.F.R. 60, Appendix A, Method 19.
 - (iv) Calculate and record the total NO_x emissions, expressed as NO₂, for each 24-hour and monthly period.
 - (v) Calculate and record the twelve-consecutive-month averages of NO_x emissions expressed as NO₂.
 - (vi) Record the CEMS daily calibration check. Maintain a log to document date, time, duration, and reason for any period during which the CEMS is out-of-bounds with CEMS performance parameters.
 - (vii) Conduct cylinder gas audits and relative accuracy audits in accordance with 40 C.F.R. 60, Appendix F.
 - (viii) Report the cumulative twelve-month total NO_x emissions, expressed as NO₂, from EU IDs 7B, 10, and 14 through 17 in the periodic operating report required in Condition 21.
- 14. ORL to Avoid PSD Modification.** Limit the combined SO₂ emissions from EU IDs 7B, 10, 14, and 15 to no greater than 68 tons in any twelve consecutive month period.
- 14.1. Burn only Ultra Low Sulfur Diesel (ULSD) fuel at the source.
- a. Keep the receipts of each fuel shipment indicating the sulfur content of all the fuel delivered at the stationary source and provide copies of the fuel receipts in the operating report required in Condition 21; and
 - b. If any fuel used is not ultra-low sulfur diesel, report in accordance with Condition 20.

Section 6. Ambient Air Quality Protection Requirements

15. Exhaust Stack Height Requirements. The Permittee shall operate EU IDs 7B, 10, 14, and 15 with the following parameters:

- 15.1. Engine exhaust no less than 16.5 meters above ground level;
- 15.2. Provide stacks with:
 - a. Sampling ports that comport with 40 C.F.R. 60, Appendix A, Method 1, Section 2.1, and a stack or duct free of cyclonic flow at the port location during applicable test methods and procedures;
 - b. Safe sampling platforms;
 - c. Safe access to sampling platforms; and
 - d. Utilities for emission sampling at testing equipment.

Section 7. General Recordkeeping, Reporting, and Certification Requirements

- 16. Recordkeeping Requirements.** The Permittee shall keep all records required by this permit for at least five years after the date of collection, including:
- 16.1. Copies of all reports and certifications submitted pursuant to this section of the permit; and
 - 16.2. Records of all monitoring required by this permit, and information about the monitoring including:
 - a. the date, place, and time of sampling or measurements;
 - b. the date(s) analyses were performed;
 - c. the company or entity that performed the sampling and analyses;
 - d. the analytical techniques or methods used;
 - e. the results of such analyses; and,
 - f. the operating conditions as existing at the time of sampling or measurement.
- 17. Certification.** The Permittee shall certify all reports, compliance certifications, or other documents submitted to the Department and required under the permit by including the signature of a responsible official for the permitted stationary source following the statement: *“Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.”* Excess emission reports must be certified either upon submittal or with an operating report required for the same reporting period. All other reports and other documents must be certified upon submittal.
- 17.1. The Department may accept an electronic signature on an electronic application or other electronic record required by the Department if:
 - a. A certifying authority registered under AS 09.25.510 verifies that the electronic signature is authentic; and
 - b. The person providing the electronic signature has made an agreement with the certifying authority described in Condition 17.1.a, that the person accepts or agrees to be bound by an electronic record executed or adopted with that signature.
- 18. Submittals.** Unless otherwise directed by the Department or this permit, the Permittee shall send an original and one copy of reports, compliance certifications, and other submittals required by this permit to **ADEC, Air Permits Program, 610 University Ave., Fairbanks, AK 99709-3643, ATTN: Compliance Technician**. The Permittee may, upon consultation with the Compliance Technician regarding software compatibility, provide electronic copies of data reports, emission source test reports, or other records under a cover letter certified in accordance with Condition 17.

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

20. Excess Emissions and Permit Deviation Reports.

20.1. Except as provided in Condition 28, the Permittee shall report all emissions or operations that exceed or deviate from the requirements of this permit as follows:

- a. In accordance with 18 AAC 50.240(c), as soon as possible after the event commenced or is discovered, report
 - (i) emissions that present a potential threat to human health or safety; and
 - (ii) excess emissions that the Permittee believes to be unavoidable;
- b. In accordance with 18 AAC 50.235(a), within two working days after the event commenced or was discovered, report an unavoidable emergency, malfunction, or nonroutine repair that causes emissions in excess of a technology based emission standard;
- c. Report all other excess emissions and permit deviations:
 - (i) within 30 days of the end of the month in which the excess emissions or deviation occurred, except as provided in Conditions 20.1.c(ii) and 20.1.c(iii);
 - (ii) if a continuous or recurring excess emissions is not corrected within 48 hours of discovery, within 72 hours of discovery unless the Department provides written permission to report under Condition 20.1.c(i); and
 - (iii) for failure to monitor, as required in other applicable conditions of this permit.

20.2. When reporting excess emissions or permit deviations, the Permittee shall report using either the Department's on-line form, which can be found at <http://www.dec.state.ak.us/air/ap/site.htm>, or if the Permittee prefers, the form contained in Section 12 of this permit. The Permittee must provide all information called for by the form that is used.

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

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

- 21.1. The operating report must include all information required to be in operating reports by other conditions of this permit.
- 21.2. If excess emissions or permit deviations that occurred during the reporting period are not reported under Condition 21.1, either
 - a. The Permittee shall identify
 - (i) the date of the deviation;
 - (ii) the equipment involved;
 - (iii) the permit condition affected;
 - (iv) a description of the excess emissions or permit deviation; and
 - (v) any corrective action or preventive measures taken and the date of such actions; or
 - b. When excess emissions or permit deviations have already been reported under Condition 20 the Permittee shall cite the date or dates of those reports.

Section 8. Standard Terms and Conditions

22. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 46.14, 18 AAC 50, and, except for those terms or conditions designated in the permit as not federally enforceable, the Clean Air Act, and is grounds for:
- 22.1. An enforcement action; or
 - 22.2. Permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280.
23. 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.
24. The Permittee shall allow the Department or an inspector authorized by the Department upon presentation of credentials and at reasonable times with the consent of the owner or operator to:
- 24.1. Enter upon the premises where an emissions unit subject to this permit is located or where records required by the permit are kept;
 - 24.2. Have access to and copy any records required by this permit;
 - 24.3. Inspect any stationary source, equipment, practices, or operations regulated by or referenced in the permit; and
 - 24.4. Sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.
25. 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.
26. The permit may be modified, reopened, revoked and reissued, or terminated for cause. A request by the Permittee for modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
27. The permit does not convey any property rights of any sort, nor any exclusive privilege.
28. **Air Pollution Prohibited.** No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.
- 28.1. Monitoring, Recordkeeping, and Reporting for Air Pollution Prohibited
 - a. If emissions present a potential threat to human health or safety, the Permittee shall report any such emissions according to Condition 20.

- b. As soon as practicable after becoming aware of a complaint that is attributable to emissions from the stationary source, the Permittee shall investigate the complaint to identify emissions that the Permittee believes have caused or are causing a violation of Condition 28.
- 28.2. The Permittee shall initiate and complete corrective action necessary to eliminate any violation identified by a complaint or investigation as soon as practicable if
 - a. after an investigation because of a complaint or other reason, the Permittee believes that emissions from the stationary source have caused or are causing a violation of Condition 28; or
 - b. the Department notifies the Permittee that it has found a violation of Condition 28.
- 28.3. The Permittee shall keep records of
 - a. the date, time, and nature of all emissions complaints received;
 - b. the name of the person or persons that complained, if known;
 - c. a summary of any investigation, including reasons the Permittee does or does not believe the emissions have caused a violation of Condition 28; and
 - d. any corrective actions taken or planned for complaints attributable to emissions from the stationary source.
- 28.4. With each stationary source operating report under Condition 21 the Permittee shall include a brief summary report which must include
 - a. the number of complaints received;
 - b. the number of times the Permittee or the Department found corrective action necessary;
 - c. the number of times action was taken on a complaint within 24 hours; and
 - d. the status of corrective actions the Permittee or Department found necessary that were not taken within 24 hours.
- 28.5. The Permittee shall notify the Department of a complaint that is attributable to emissions from the stationary source within 24 hours after receiving the complaint, unless the Permittee has initiated corrective action within 24 hours of receiving the complaint.

Section 9. General Source Test and Monitoring Requirements

- 29. Requested Source Tests.** In addition to any source testing explicitly required by this permit, the Permittee shall conduct source testing as requested by the Department to determine compliance with applicable permit requirements.
- 30. Operating Conditions.** Unless otherwise specified by an applicable requirement or test method, the Permittee shall conduct source testing
- 30.1. at a point or points that characterize the actual discharge into the ambient air; and
 - 30.2. at the maximum rated burning or operating capacity of the emission unit or another rate determined by the Department to characterize the actual discharge into the ambient air.
- 31. Reference Test Methods.** The Permittee shall use the following as reference test methods when conducting source testing for compliance with this permit:
- 31.1. Source testing for the reduction in visibility through the exhaust effluent must be conducted in accordance with the procedures set out in Reference Method 9.
 - 31.2. Source testing for emissions of total particulate matter, sulfur compounds, nitrogen compounds, carbon monoxide, lead, volatile organic compounds, fluorides, sulfuric acid mist, municipal waste combustor organics, metals, and acid gases must be conducted in accordance with the methods and procedures specified in 40 C.F.R. 60, Appendix A.
 - 31.3. Source testing for emissions of PM-10 must be conducted in accordance with the procedures specified in 40 C.F.R. 51, Appendix M, Methods 201 or 201A and 202.
 - 31.4. Source testing for emissions of any pollutant may be determined using an alternative method approved by the Department in accordance with 40 C.F.R. 63 Appendix A, Method 301.
- 32. Excess Air Requirements.** To determine compliance with this permit, standard exhaust gas volumes must include only the volume of gases formed from the theoretical combustion of the fuel, plus the excess air volume normal for the specific emission unit type, corrected to standard conditions (dry gas at 68° F and an absolute pressure of 760 millimeters of mercury).
- 33. Test Deadline Extension.** The Permittee may request an extension to a source test deadline established by the Department. The Permittee may delay a source test beyond the original deadline only if the extension is approved in writing by the Department's appropriate division director or designee.

- 34. Test Plans.** Except as provided in Condition 37, before conducting any source tests, the Permittee shall submit a plan to the Department. The plan must include the methods and procedures to be used for sampling, testing, and quality assurance, and must specify how the emission unit will operate during the test and how the Permittee will document that operation. The Permittee shall submit a complete plan within 60 days after receiving a request under Condition 29 and at least 30 days before the scheduled date of any test unless the Department agrees in writing to some other time period. Retesting may be done without resubmitting the plan.
- 35. Test Notification.** Except as provided in Condition 37, at least 10 days before conducting a source test, the Permittee shall give the Department written notice of the date and the time the source test will begin.
- 36. Test Reports.** Except as provided in Condition 37, within 60 days after completing a source test, the Permittee shall submit two copies of the results in the format set out in the *Source Test Report Outline*, adopted by reference in 18 AAC 50.030. The Permittee shall certify the results in the manner set out in Condition 17. If requested in writing by the Department, the Permittee must provide preliminary results in a shorter period of time specified by the Department.
- 37. Test Exemption.** The Permittee is not required to comply with Conditions 34, 35, and 36 (Test Plans, Test Notification and Test Reports) for visible emissions observations using Method 9.

Section 10. Permit Documentation

<i>Date</i>	<i>Document Details</i>
August 17, 2015	Department received an addendum to the minor permit application.
March 31, 2015	Department received an addendum to the minor permit application.
March 3, 2015	Department received a complete minor permit application.
December 19, 2014	Department received a complete minor permit application.
October 3, 2014	Department received an incomplete minor permit application.

Section 11. Visible Emissions Forms

VISIBLE EMISSION OBSERVATION FORM

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

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

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION AIR PERMITS PROGRAM - VISIBLE EMISSIONS OBSERVATION FORM							Page No.						
Stationary Source Name		Type of Emission Unit		Observation Date		Start Time	End Time						
Emission Unit Location				Sec	0	15	30	45	Comments				
City				Min									
State		Zip		1									
Phone # (Key Contact)		Stationary Source ID Number		2									
Process Equipment		Operating Mode		3									
Control Equipment		Operating Mode		4									
Describe Emission Point/Location				5									
Height above ground level		Height relative to observer		Clinometer Reading		6							
Distance From Observer		Direction From Observer		7									
Start		End		Start		End		8					
Describe Emissions & Color				9									
Start		End		10									
Visible Water Vapor Present? If yes, determine approximate distance from the stack exit to where the plume was read				11									
No	Yes			12									
Point in Plume at Which Opacity Was Determined				13									
Describe Plume Background		Background Color		14									
Start		Start		15									
End		End		16									
Sky Conditions:				17									
Start		End		18									
Wind Speed		Wind Direction From		19									
Start		End		Start		End		20					
Ambient Temperature		Wet Bulb Temp		RH percent		21							
SOURCE LAYOUT SKETCH: 1 Stack or Point Being Read 2 Wind Direction From 3 Observer Location 4 Sun Location 5 North Arrow 6 Other Stacks				22									
				23									
				24									
				25									
				26									
				27									
				28									
				29									
				30									
				Range of Opacity				31					
				Minimum				Maximum					
I have received a copy of these opacity observations				Print Observer's Name									
Print Name:				Observer's Signature		Date							
Signature:				Observer's Affiliation:									
Title		Date		Certifying Organization		Date							
Certified By:													
Data Reduction:													
Duration of Observation Period (minutes):				Duration Required by Permit (minutes):									
Number of Observations:				Highest Six-Minute Average Opacity (%):									
Number of Observations exceeding 20%:				Highest 18-Consecutive-Minute Average Opacity (%)(engines and turbines only)									
In compliance with six-minute opacity limit? (Yes or No)													
Average Opacity Summary:													
Set Number	Time		Opacity		Comments								
	Start	End	Sum	Average									

Section 12. ADEC Notification Form²

Kotzebue Power Plant

AQ0196MSS04

Stationary Source Name

Air Quality Permit No.

Kotzebue Electric Association

Company Name

Date

When did you discover the Excess Emissions/Permit Deviation?

Date: _____ / _____ / _____

Time: _____ : / _____

When did the event/deviation occur?

Begin Date: _____ / _____ / _____

Time: _____ : _____ (Use 24-hr clock.)

End Date _____ / _____ / _____

Time: _____ : _____ (Use 24-hr clock.)

What was the duration of the event/deviation?

_____ : _____ (hrs:min) or _____ days

(total # of hrs, min, or days, if intermittent then include only the duration of the actual emissions/deviation)

Reason for Notification: (please check only 1 box and go to the corresponding section)

- Excess Emissions – Complete Section 1 and Certify
- Deviation from Permit Condition – Complete Section 2 and Certify
- Deviations from COBC, CO, or Settlement Agreement – Complete Section 2 and Certify

Section 1. Excess Emissions

(a) Was the exceedance: Intermittent or Continuous

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

- Start Up/Shut Down Natural Cause (weather/earthquake/flood)
- Control Equipment Failure Schedule Maintenance/Equipment Adjustment
- Bad Fuel/Coal/Gas Upset Condition Other _____

(c) Description

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

(d) Emissions Units Involved:

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

EU ID	EU Name	Permit Condition Exceeded/Limit/Potential Exceedance

² Revised as of August 20, 2008.

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

- Opacity _____ %
 Venting _____ gas/scf
 Control Equipment Down
 Fugitive Emissions
 Emission Limit Exceeded
 Other _____
 Marine Vessel Opacity
 Flaring _____

(f) Unavoidable Emissions:

Do you intend to assert that these excess emissions were unavoidable? Yes No

Do you intend to assert the affirmative defense of 18 AAC 50.235? Yes No

Certify Report (Go to end of form.)

Section 2. Permit Deviations

(a) Permit Deviation Type (check only one box, corresponding with the section in the permit):

- Emission Unit-Specific Generally Applicable Requirements
 Failure to Monitor/Report Reporting/Monitoring for Diesel Engines
 General Source Test/Monitoring Requirements Recordkeeping Failure
 Recording/Reporting/Compliance Certification Insignificant Emission Unit
 Standard Conditions Not Included in the Permit Stationary Source Wide

Other Section: _____ (Title of section and section number of your permit).

(b) Emission Unit Involved:

Identify the emission unit involved in the event, using the same identification number and name as in the permit. List the corresponding permit conditions and the deviation.

EU ID	EU Name	Permit Condition/ Potential Deviation

(c) Description of Potential Deviation:

Describe briefly what happened and the cause. Include the parameters/operating conditions and the potential deviation.

(d) Corrective Actions:

Describe actions taken to correct the deviation or potential deviation and to prevent future recurrence.

Certification:

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

Printed Name: _____ Title: _____ Date: _____
Signature: _____ Phone Number: _____

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

To Submit this Report:

Fax to: 907-451-2187

Or

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

If faxed or emailed, the report must be certified within the operating report required for the same reporting period per Condition 21.

Or

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

Or

Phone Notification: 907-451-5173

Phone notifications require a written follow-up report.

Or

Submission of information contained in this report can be made electronically at the following website:

<https://myalaska.state.ak.us/dec/air/airtoolsweb/>

If submitted online, report must be submitted by an authorized E-Signer for the stationary source.

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR PERMITS PROGRAM**

TECHNICAL ANALYSIS REPORT
for
Air Quality Control Minor Permit No. AQ0196MSS04

Kotzebue Electric Association, Inc.
Kotzebue Power Plant

Addition of Emission Unit 17

Preparer: Scott Faber
Supervisor: Patrick Dunn
Final: March 1, 2016

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Abbreviations and Acronyms

AAAQS	Alaska Ambient Air Quality Standard
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AS	Alaska Statutes
C.F.R.	Code of Federal Regulations
EF	emission factor
EU	emission unit
EPA	Environmental Protection Agency
KEA	Kotzebue Electric Association, Inc.
MR&R	monitoring, recordkeeping, and reporting
NA	not applicable
PSD	Prevention of Significant Deterioration
PTE	potential to emit
TAR	technical analysis report
ULSD	ultra-low sulfur diesel

Units and Measures

dscf	dry standard cubic foot
gph	gallons per hour
gr/dscf	grains per dry standard cubic feet (1 pound = 7,000 grains)
hp	horsepower
kW, ekW	kilowatts, kilowatts electric
MMBtu	million British thermal units
ppm	parts per million
ppmv	parts per million by volume
tph	tons per hour
tpy	tons per year
wt%	weight percent

Pollutants

CO	carbon monoxide
CO ₂ e	carbon dioxide equivalent
GHG	greenhouse gas
HAPs	hazardous air pollutants
NO _x	oxides of nitrogen
NO ₂	nitrogen dioxide
PM-2.5	particulate matter with an aerodynamic diameter less than 2.5 microns
PM-10	particulate matter with an aerodynamic diameter less than 10 microns
SO ₂	sulfur dioxide
VOC	volatile organic compound

1. Introduction

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Air Quality Control Minor Permit AQ196MSS04 to Kotzebue Electric Association, Inc. (KEA) for the Kotzebue Power Plant. The Department is issuing Minor Permit AQ0196MSS04 under 18 AAC 50.508(6) for revising or rescinding the terms and conditions of a Title I permit. This TAR only includes the basis for the changes to Minor Permit AQ0196MSS03 as permitted in Minor Permit AQ0196MSS04. The TAR for Minor Permit AQ0196MSS03 contains the basis for that permit.

1.1 Stationary Source Description

Kotzebue Power Plant is a diesel electric generating power plant that provides electric power to the city of Kotzebue, Alaska. The current emission unit inventory consists of six diesel-fired reciprocating engines and two diesel fuel storage tanks.

1.2 Application Description

The Department received KEA's application for Minor Permit AQ0196MSS04 on October 3, 2014. The application is for the addition of a diesel-fired reciprocating engine (EU 17). KEA requests that the Department add EU 17 to the current NO_x owner requested limit (ORL) for EUs 7B, 10, and 14 through 16.

The Department determined the initial application to be incomplete, and KEA submitted a complete application on December 19, 2014. KEA requested the minor permit be issued using the fast track permit procedures under 18 AAC 50.542(b). However, fast track permit issuance is for permits classified under 18 AAC 50.502, and the requested minor permit is to be issued under 18 AAC 50.508. Therefore, the fast track permit procedures are not allowed for this minor permit.

The Department received an additional minor permit application on March 3, 2015 and addendums to the application on March 31, 2015 and August 17, 2015. The Department initially processed the application under Minor Permit No. AQ0196MSS05. However, the Department is addressing the requested permit revisions in Minor Permit AQ0196MSS04.

KEA requests revisions to the monitoring requirements for the NO_x PSD avoidance limit for EU ID 16 under 18 AAC 50.508(6). The Department initially established the monitoring requirements under Condition 10 of Minor Permit AQ0196MSS03. Minor Permit AQ0196MSS03 required use of maximum rated EU 16 output for all periods of operation to calculate actual emissions. To prevent over calculating emissions, KEA wishes to monitor and record actual EU 16 output and use monthly-recorded kW-hrs to calculate actual NO_x emissions for EU 16.

2. Emissions Summary

Kotzebue Electric Association provided emission calculations for the project in the application for Minor Permit AQ0196MSS04. Table 1 provides a summary of potential to emit (PTE), step one of the PSD permit applicability analysis, and the minor permit applicability analysis. Detailed project PTE calculations are in Appendix A to this TAR.

Table 1 – Emission Summary and Permit Applicability

Type of PTE	Emissions (tpy)					
	NO _x	CO	SO ₂	PM-10/ PM-2.5	VOC	CO _{2e}
Existing PTE	314	122.1	0.8	42	38.7	NA
Change in Stationary Source PTE	0	34.4	0.05	1.0	3.9	NA
Minor Permit Threshold	10	NA ¹	10	10	NA ²	NA ²
Minor Permit Required?	No	No	No	No	No	No
Project PTE	34.4	34.4	0.05	1.0	3.9	NA ³
PSD Threshold	40	100	40	15/10	40	Any Increase
PSD Permit Required?	No	No	No	No	No	No
Assessable Emissions ⁴	314	157	0	43	43	0

Table Notes:

- ¹ The stationary source is not within 10 kilometers of a carbon monoxide nonattainment area, therefore the emission thresholds under 18 AAC 50.502(c)(1) and (3) are not applicable.
- ² No minor permit requirements under 18 AAC 50, Article 5.
- ³ In accordance with the Supreme Court decision, greenhouse gas (GHG) emissions cannot be the sole reason for requiring a PSD permit.
- ⁴ Assessable emissions are the sum of the emissions of each individual regulated air pollutant, other than GHGs, for which the stationary source has the potential to emit quantities greater than 10 TPY.

3. Department Findings

Based on the review of the application for Minor Permit AQ0196MSS04, the Department made the following findings:

- The Kotzebue Power Plant requires a minor permit under 18 AAC 50.508(6) for revising or rescinding the terms and conditions of a Title I permit.
- The Department added EU ID 17 to the existing 314 tpy ORL for NO_x, which ensures minor permit requirements under 18 AAC 50.502(c)(3) are not applicable due to NO_x PTE.
- The existing requirement for stationary source-wide use of ultra-low sulfur diesel (ULSD) ensures minor permit requirements under 18 AAC 50.502(c)(3) are not applicable due to EU ID 17 SO₂ PTE.

- A minor permit under 18 AAC 50.502(c)(3) is not required due to PTE of any pollutant other than NO_x or SO₂ because none of the emission thresholds under 18 AAC 50.502(c)(3) are exceeded.
- A PSD permit under 18 AAC 50.306 is not required for the project because the increase in PTE of any pollutant is below the significant emission rates at Step 1 of the two-step PSD permit applicability process.
- Using actual EU 16 output (ekW-hrs) to calculate NO_x emissions results in more precise NO_x emission totals when calculating actual emissions to determine compliance with the NO_x PSD avoidance limit for EU 16.
- Condition 10 of Minor Permit AQ0196MSS03 required use of 25 lb/hr (the emission factor for Tier 2 certificate of 7.8 g/kW-hr converted to lb/hr for the 1440 kW engine) as the NO_x emission factor to calculate EU 16 emissions. Vendor test data for EU 16 shows a NO_x emission factor of 6.9 g/kW-hr and a value of 7.1 g/kW-hr for NO_x + HC. The vendor data also shows the NO_x + HC certification level of 7.2 g/kW-hr and the EPA standard of 7.8 g/kW-hr. KEA proposes use of 7.8 g/ekW-hr for the NO_x emission factor. With an engine kW/generator ekW ratio of 1.035, the emission factor is 7.54 g/kW-hr for the engine. Therefore, there is a safety factor of 1.09 when comparing the proposed 7.8 g/ekW-hr emission factor to the 6.9 g/kW-hr vendor value. The Department accepts the use of 7.8 g/ekW-hr as the NO_x emission factor for EU 16.
- For the 314-tpy NO_x PSD modification avoidance limit, source testing is not required for EU IDs 16 and 17 because these engines are subject to the requirements of 40 C.F.R. 60 Subpart IIII. These requirements include NO_x emission limits and installation, configuration, operation, and maintenance of the engines in accordance with manufacturer's instruction. Source testing is also required if the owner or operator does not adhere to the manufacturer's instruction.

4. Permit Requirements

State regulations in 18 AAC 50.544 describe the elements the Department must include in minor permits. This section of the TAR provides the technical and regulatory basis for the permit requirements in Minor Permit AQ0196MSS04.

4.1 General Requirements for all Minor Permits

As required by 18 AAC 50.544(a), Minor Permit AQ0196MSS04 includes:

- Identification of the stationary source, the project, the Permittee, and contact information;
- Requirements to pay fees in accordance with 18 AAC 50.400 through 50.499;
- Standard permit conditions from 18 AAC 50.345; and
- Conditions to protect ambient air quality.

4.2 Requirements for Each Minor Permit Under 18 AAC 50.508(6)

As required under 18 AAC 50.544(i), Minor Permit AQ0196MSS04 includes terms and conditions as necessary to ensure that the Permittee will construct and operate the proposed stationary source or modification in accordance with 18 AAC 50.

4.3 Revisions to Minor Permit AQ0196MSS03 Requirements

The Department is rescinding Minor Permit AQ0196MSS03 and issuing a new minor permit (AQ0196MSS04) with permit conditions revised as noted in Table 2.

Table 2 – Revisions to Minor Permit AQ0196MSS03 Conditions

AQ0196MSS03 Condition Number	AQ0196MSS04 Condition Number	Revision
Table 1	Table 1	Added EU ID 17.
2 through 4: State Emission Standards	5 through 7	Added EU ID 17 and visible emission and particulate matter initial compliance requirements.
5.3: NO _x BACT Reporting Requirement	8.3	Eliminated the reference to the operating permit.
6.2: NO _x BACT Reporting Requirement	9.2	Eliminated the reference to the operating permit.
7.2: SO ₂ BACT Reporting Requirement	10.2	Revised for clarity.
8.2: CO BACT Source Test Requirement	11.2	Eliminated the reference to the operating permit.
9: Startup and Decommission Requirements	NA	One-time requirement that has been complied with.
10.1: ORL Monitoring Requirements	12.1 and 12.2	Required monitoring and recording actual EU 16 output (ekW-hrs) and calculating and recording monthly and rolling 12-month EU 16 NO _x emissions.
10.2 and 10.3: ORL Reporting Requirements	12.3 and 12.4	Eliminated the reference to the operating permit.
11: NO _x ORL	13	Added EU ID 17.
11.2: ORL Reporting Requirements	13.1.a	Eliminated the reference to the operating permit.
11.3: NO _x ORL Monitoring	13.2	Added EU ID 17.
11.4: NO _x ORL Monitoring and Recordkeeping	13.3	Added EU ID 17. Require use of emission factors from the most recent source tests if testing is conducted at 95% or greater of maximum allowable or rated load.

AQ0196MSS03 Condition Number	AQ0196MSS04 Condition Number	Revision
12: NO _x Source Tests	13.4	Revised requirements to require testing at three normal operating loads and at 95% or greater of maximum or allowable load or at maximum achievable load.
13: NO _x Emissions Reporting	13.5	Added EU ID 17. Eliminated the reference to the operating permit.
14: NO _x CEMS	13.6	Added EU IDs 16 and 17. Changed “Method 9” to “Method 19”.
15.1a and b: SO ₂ ORL Reporting	14.1a and b	Revised for clarity.
17 through 28: NSPS Requirements	NA	NSPS requirements are not included due to integrated review with AQ0196TVP03.
NA	Section 7: General Recordkeeping, Reporting, and Certification Requirements	Added to the permit rather than using references to the Title V permit.
NA	Section 9: General Source Test and Monitoring Requirements	Added to the permit rather than using references to the Title V permit.

5. Permit Administration

The Department intends to incorporate the requirements of Minor Permit AQ0196MSS04 into the operating permit renewal (AQ0196TVP03) by conducting an integrated review of the permits. The Permittee may operate under Minor Permit AQ0196MSS04 upon permit issuance.

Appendix A: Emission Calculations

Table 3 – Project Emission Factors ¹

EU ID	Description	NO _x	CO	SO ₂ ²	PM-10	VOC	CO _{2e}
17	Diesel-fired engine	4.375 g/kW-hr	4.375 g/kW-hr	0.0015 wt% S	0.125 g/kW-hr	0.5 g/kW-hr	NA ³

Notes:

- ¹ NO_x, CO, PM-10, and VOC emission factors are from 40 C.F.R. 1039.102, Table 7. The Department multiplied the emission factors from 40 C.F.R. 1039.102 by 1.25 to obtain not-to-exceed (NTE) values consistent with NSPS Subpart IIII compliance requirements. Engine horsepower (1,093 hp) converted to kW for calculations.
- ² Stationary source-wide ULSD requirement.
- ³ In accordance with the recent Supreme Court decision, greenhouse gas (GHG) emissions cannot be the sole reason for requiring a PSD permit. Additionally, there are no GHG emission thresholds for minor permitting under 18 AAC 50.502.

Table 4 – Project PTE (tpy)

EU ID	Description	NO _x	CO	SO ₂	PM-10	VOC	CO _{2e}
17	Diesel-fired engine	34.4	34.4	0.05	1.0	3.9	NA

Table 5 – Stationary Source Emission Factors and PTE

EU ID	Description	NO _x		CO		SO ₂		PM-10		VOC		CO _{2e} ¹	
		EF	PTE	EF	PTE	EF ²	PTE	EF ³	PTE	EF ³	PTE	EF	PTE
7B	Diesel-fired engine	Combined Emission Limit	314	1.2 lb/hr (source test)	5.3	0.0015 wt% S	0.1	0.0007 lb/hp-hr	4.1	0.00064 lb/hp-hr	3.8	NA	NA
10	Diesel-fired engine			16 lb/hr (BACT)	70.1	0.0015 wt% S	0.2	0.0007 lb/hp-hr	12.7	0.00064 lb/hp-hr	11.6		
14	Diesel-fired engine			1.8 lb/hr (source test)	7.9	0.0015 wt% S	0.2	0.0007 lb/hp-hr	11.8	0.00064 lb/hp-hr	10.8		
15	Diesel-fired engine			2.3 lb/hr (source test)	10.1	0.0015 wt% S	0.2	0.0007 lb/hp-hr	11.8	0.00064 lb/hp-hr	10.8		
16	Diesel-fired engine			6.25 g/kW-hr (NSPS Subpart III)	28.9	0.0015 wt% S	0.1	0.338 g/kW-hr (NSPS Subpart III)	1.6	0.00064 lb/hp-hr	1.7		
17	Diesel-fired engine			4.375 g/kW-hr (NSPS Subpart III)	34.4	0.0015 wt% S	0.1	0.125 g/kW-hr (NSPS Subpart III)	1.0	0.5 g/kW-hr (NSPS Subpart III)	3.9		

Notes:

- ¹ GHG emissions are not assessable.
- ² Stationary source-wide ULSD requirement.
- ³ Emission factors are from EPA, AP 42 unless noted otherwise. Emission factors from NSPS Subpart III are NTE values (standard × 1.25).

