

From: [Naomi M. Knight](#)
To: [Dec Air Comment](#)
Subject: Comments on the 2019 Draft Serious SIP for PM2.5 - Golden Valley Electric Association
Date: Friday, July 26, 2019 2:53:21 PM
Attachments: [190726 GVEA Comments Draft SIP.pdf](#)

Cindy,

Attached are comments submitted on behalf of GVEA.

Regards,
Naomi

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July 26, 2019

Electronic Submittal
dec.air.comment@alaska.gov

Cindy Heil
Division of Air Quality
ADEC
555 Cordova St.
Anchorage, AK 99501

RE: Comments on the 2019 Alaska Department of Environmental Conservation (ADEC) Proposed Regulations and State Implementation Plan (SIP) Amendments for the Fairbanks North Star Borough (FNSB) Fine Particulate Matter (PM_{2.5}) Nonattainment Area (NAA) - Golden Valley Electric Associations (GVEA's) North Pole Power Plant and Zehnder Facility.

Dear Ms. Heil,

Golden Valley Electric Association (GVEA) appreciates the opportunity to review and submit comments on the proposed regulation and State Implementation Plan (SIP) amendments as they relate to the Fairbanks North Star Borough (FNSB) Serious Nonattainment Area (NAA) for Fine Particulate Matter (PM_{2.5}). GVEA recognizes the difficulties the Alaska Department of Environmental Conservation (ADEC) faces in drafting an achievable attainment plan while not imposing undue economic or social burdens on the affected local communities. Likewise, GVEA appreciates the collaborative approach and sensitivity ADEC has shown in recognizing the uniqueness of this region and possible solutions.

Under cover dated November 28, 2018, GVEA submitted to ADEC alternative BACT proposals and updated cost information. ADEC included some of GVEA's proposals in the draft SIP, however it appears significant elements of the November 2018 information were not considered.¹

In the November 2018 submittal GVEA proposed that switching from current fuels to ultra-low sulfur diesel (ULSD) was not economically feasible for any of the primary electrical generating units at the North Pole Plant or Zehnder Facility. However, GVEA wishes to make a meaningful contribution to reducing SO₂ emissions without disproportionately burdening the cooperative's member owners or sacrificing electrical system reliability, and thus proposed several alternative BACT scenarios. In the proposed SIP, ADEC has included elements of GVEA's proposal; including to supply North Pole Emission Unit (EU) IDs 1 and 2 with No. 1 High Sulfur Diesel

¹ GVEA emailed Excel spreadsheets and data previously supplied by DVD with the November 28, 2018 submittal to Mr. Aaron Simpson on May 14, 2019

(HSD) during Air Quality Stage 1 and 2 curtailment days, and to limit the annual SO₂ emissions of the Zehnder Facility.

GVEA's comments presented below are focused primarily on proposed Best Available Control Technology (BACT) requirements for Sulfur Dioxide (SO₂) as they apply to the two generation facilities GVEA operates within the NAA.

1) Fuel Cost Assumptions, High Sulfur Diesel to Ultra Low Sulfur Diesel

In November 2018 GVEA supplied actual fuel costs incurred between January 2017 and October 2018 which showed a cost differential of \$0.424 per gallon between No. 2 HSD and ULSD. This was an increase from the differential cost of \$0.2668 per gallon incurred between August 2015 and April 2016 as presented in GVEA's 2017 proposed BACT. The updated differential fuel cost was not applied in the cost effectiveness calculations shown in the draft SIP. GVEA requests the use of the \$0.424 per gallon cost differential in cost effectiveness calculations for North Pole EU IDs 1 and 2, and for Zehnder EU IDs 1 and 2.

2) Fuel Cost Assumption, LSR Naphtha to Ultra Low Sulfur Diesel

On page III.D.7.7-65, in the review of GVEA's proposed cost effectiveness for converting from LSR Naphtha to ULSD for North Pole EU IDs 5 and 6 ADEC notes it "does not agree that the cost effectiveness should be based upon the annual cost of USLD, but on the difference in cost between the current fuel and ULSD."

In November 2018 GVEA submitted actual fuel cost data with the differential cost between LSR Naphtha and ULSD. That cost differential of \$1.117 per gallon was used in the cost effectiveness calculations GVEA submitted. GVEA requests the use of the \$1.117 per gallon cost differential in cost effectiveness calculations for North Pole EU IDs 5 and 6.

3) Cost Effectiveness

Using the updated fuel pricing increases the cost per ton of SO₂ removed for all primary North Pole and Zehnder generating units from that presented in the draft SIP. Table 1 shows the costs effectiveness presented in November of 2018 compared with the draft SIP cost effectiveness. Table 1 also shows GVEA's proposed cost effectiveness using ADEC's proposed interest rate of 5.5% and the differential fuel costs.

| Table 1. Cost Effectiveness \$/Ton of SO ₂ removal Conversion to ULSD | | | |
|--|---|---|---|
| | GVEA's 2018 Alternative BACT Cost Effectiveness (\$/Ton) | ADEC's 2019 Draft SIP Cost Effectiveness (\$/Ton) | GVEA's Draft SIP Comments Cost Effectiveness (\$/Ton) ¹ |
| North Pole | | | |
| EU ID 1 | \$13,942 | \$9,060 ² | \$14,225 |
| EU ID 2 | \$14,037 | \$9,147 ³ | \$14,347 |
| EU ID 5/6 | \$4,844,020 ⁴ | \$9,282,151 | \$4,844,020 |
| Zehnder | | | |
| EU ID 1/2 | \$14,250 | \$9,620 ⁵ | N/A ⁶ |

¹ Using an interest rate of 5.5% applied to the cost effectiveness calculations GVEA submitted in 2018, North Pole - Section 5 - SO₂_F_181121_ADEC_GVEA.xlsm. Note that the North Pole capital costs include all fuel storage capital costs under the assumption that a SO₂ emission limit on Zehnder is taken.

² ADEC references \$9,060 in the SIP text and \$9,138 in the file D7.07-appendix-chapter-707-northpole-so2-controls-economic-analysis-2019 (1).xlsx

³ ADEC references \$9,147 in the SIP text and \$9,233 in the file D7.07-appendix-chapter-707-northpole-so2-controls-economic-analysis-2019 (1).xlsx

⁴ GVEA's proposed cost effectiveness is lower based on a 50ppm sulfur limit for LSR Naphtha fuel as discussed in Comment 3

⁵ ADEC references \$9,060 in the SIP text and \$8,960 in the file D7.07-appendix-chapter-707-zehnder-so2-controls-economic-analysis-2019 (1).xlsx

⁶ GVEA's proposed BACT takes a SO₂ emission limit for Zehnder, removing it from consideration as a major source.

When applying the differential cost of \$0.424 per gallon, GVEA proposes that it is not economically feasible to switch to ULSD for any of the generating units listed in Table 1 in either the short or the long term.

4) North Pole Emission Units (EUs) ID 5 and 6 Fuel Sulfur Limit

As presented in the November 2018 submittal, GVEA currently receives all fuel from Petro Star Inc. (PSI) with the majority coming from the local North Pole Refinery adjacent to the North Pole Power Plant. In 2017 the combined cycle turbine at North Pole (EU ID 5) began receiving a Light Straight Run (LSR) Naphtha product directly from the Petro Star North Pole Refinery (PSI) via pipeline. The sulfur content of this fuel was specified to be below 30 ppm and extensive testing conducted in 2018 showed a maximum sulfur content of 27 ppm. Less than two percent of the fuel received is composed of other Naphtha fuels that have sulfur contents greater than 50 ppm. Assuming a maximum fuel sulfur content of 50 ppm would conservatively change the potential SO₂ emissions from EU ID 5 and proposed EU ID 6 from 6 to 10.1 tons per year (TPY). GVEA requests a maximum fuel sulfur content of 50 ppm for EU IDs 5 and 6, the draft SIP uses 30ppm.

5) North Pole Emission Units (EUs) ID 1 and 2 No. 1 HSD

ADEC has proposed SO₂ BACT for North Pole EU IDs 1 and 2 as the combustion of No. 1 HSD on Air Quality Stage 1 and Stage 2 curtailment days (page III.D.7.7-68). GVEA appreciates ADEC's consideration of GVEA's alternative BACT proposal and requests the BACT be worded to "take delivery of No. 1 HSD on Air Quality Stage 1 and 2 curtailment days." No. 2 and No. 1 HSD is delivered to North Pole EU IDs 1 and 2 by truck from PSI's North Pole refinery. The fuel is stored in an intermediate 50,000 gallon storage tank and it requires an estimated 5 to 10 hours of run time to fully transition between fuels. To meet the requirement of combusting only No. 1 HSD during Air Quality alerts, GVEA would have to construct additional fuel storage. Also, as discussed in the November 2018 submittal, the availability of No. 1 HSD is unknown with competing requirements. If PSI is unable to meet demand for home heating, military, and electrical generation use, the fuel will be trucked in at a cost differential similar to ULSD. For reliability purposes, GVEA wishes to maintain the ability to run these units in the event No. 1 HSD is not available.

The draft SIP proposes selective use of No. 1 HSD as short term BACT, and ULSD or Natural Gas as long term BACT. As discussed in comment 3 above, when using the differential costs submitted by GVEA in November 2018, GVEA proposes ULSD is not economically feasible as long term BACT. Likewise, natural gas is not yet available, and only EU IDs 5 or 6 would be configurable to combust natural gas.

6) Future Considerations

GVEA wishes to add clarification to items presented under the *Future Considerations* discussion in both sections 7.7.8.4.3 SO₂ Controls for Zehnder and 7.7.8.5.3 SO₂ Controls for North Pole.

- a) Switching to Natural Gas - GVEA is exploring options that may assist the Interior Gas Utility (IGU) in providing economical natural gas to the Fairbanks and North Pole areas. If economically feasible, GVEA would consider converting North Pole's EU ID 5, or constructing EU ID 6, to combust natural gas. This would replace an already low sulfur fuel (50 ppm) and would not provide much benefit in SO₂ reduction associated with electrical generation. It could however, benefit the community by stabilizing demand and providing an economy of scale that may make natural gas more attractive to the home heating sector. EU IDs 1 and 2 at both North Pole and Zehnder would not be converted to combust natural gas.
- b) Closing Operations - GVEA has not suggested "closing the operations at the North Pole and Zehnder Plants and operating at Healy Units 1 and 2". The availability of all generating plants is important to maintain GVEA's ability to reliably supply electrical power to the interior. The use of EU IDs 1 and 2 at North Pole and EU IDs 1 and 2 at Zehnder has dropped significantly since Healy Unit 2 came into commercial operation in September of 2018. The consumption of fuel in the NAA by these units will drop by 50% with the addition of Healy Unit 2 to the generation fleet.
- c) SCR on Healy Unit 2 - The SCR on Healy Unit 2 has been fully installed and commissioned so is no longer a consideration in future planning efforts.

7) Zehnder SO₂ BACT and SO₂ Requirements

The proposed SO₂ BACT for EUs 1, 2, 3, 4, 10, and 11 is a requirement to combust only ULSD fuel. The proposed SIP document then also includes a requirement for GVEA to submit a Title I permit application on or before October 31, 2019, to limit the potential emissions of SO₂ from Zehnder to less than 70 tons per year. The document does not clearly address the relationship

between the ULSD fuel requirement and the permit limit for facility SO₂ potential emissions. Based on Section 189(e) of the Clean Air Act, the intent appears to be that the ULSD requirement would only apply if GVEA does not submit a permit application to limit potential emissions of SO₂. GVEA proposes BACT is the Zehnder facility potential emissions of SO₂ without a restriction on fuel type or sulfur content.

8) Other Comments, North Pole Plant

a) North Pole, Emissions Units (EUs) 1 and 2 – Simple Cycle Gas Turbines

- i) The proposed NO_x BACT determination states that ADEC has revised the PTE for EU 2 based on the most recent source test data. The emission rate that ADEC is using for baseline PTE is 1.39 lb/MMBtu. Previously, PTE has been calculated using an emission factor of 0.88 lb/MMBtu from AP-42.
- ii) The proposed NO_x BACT determination uses a NO_x removal efficiency of 90 percent for selective catalytic reduction (SCR), but states that “removal efficiencies are generally 80 to 90 percent.” No engineering rationale is provided for use of the maximum removal efficiency.
- iii) Monitoring, recordkeeping, and reporting requirements are not specifically provided for EUs 1 and 2, other than conducting an initial source test to demonstrate compliance with the NO_x emission limit and that fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the fuel sulfur content limit.

b) North Pole, EUs 5 and 6 – Combined Cycle Gas Turbines

- i) The proposed NO_x BACT determination uses a NO_x removal efficiency of 90 percent for SCR, but states that “removal efficiencies are generally 80 to 90 percent.” No engineering rationale is provided for use of the maximum removal efficiency.
- ii) Monitoring, recordkeeping, and reporting requirements are not specifically provided for EUs 5 and 6, other than conducting an initial source test to demonstrate compliance with the NO_x emission limit and that fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the fuel sulfur content limit.

c) North Pole, EU 7 – Emergency Generator Engine

- i) Monitoring, recordkeeping, and reporting requirements are not specifically provided for EU 7, other than that fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the fuel sulfur content limit.

d) North Pole, EUs 11 and 12 - Boilers

- i) The requirement to install low NO_x burners assumes a control efficiency of 80 percent. No rationale is provided for this efficiency.
- ii) Fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the propane sulfur content limit. The sulfur content of the propane fuel may not be something typically provided by the vendor or otherwise readily available.

9) Other Comments, Zehnder Facility

a) Zehnder, Emissions Units (EUs) 1 and 2 – Combustion Turbines

- i) The proposed SIP documents do not include a source testing requirement for the engines to demonstrate compliance with the emissions limit for PM_{2.5}. The BACT documents do not state that source testing is required to demonstrate compliance

with the limit. The BACT documents do not appear to provide any specific compliance demonstration requirements.

- ii) Monitoring, recordkeeping, and reporting requirements are not specifically provided for EUs 1 and 2, other than conducting an initial source test to demonstrate compliance with the NO_x emission limit and that fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the fuel sulfur content limit.

b) Zehnder, EUs 3 and 4 – Large Diesel-Fired Engines

- i) Non-emergency operation is limited to no more than 100 hours per year for each engine. The documents are not clear whether non-emergency operation is restricted solely to maintenance checks and readiness testing, or if the 50 hours per year of non-emergency operation for other reasons as allowed in the federal rules is still available.
- ii) The proposed SIP documents do not include a source testing requirement for the engines to demonstrate compliance with the emissions limits for NO_x and PM_{2.5}. The BACT documents do not state that source testing is required to demonstrate compliance with the limits. The BACT documents do not appear to provide any specific compliance demonstration requirements.
- iii) Monitoring, recordkeeping, and reporting requirements are not specifically provided for EUs 3 and 4, other than that fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the fuel sulfur content limit.

c) Zehnder, EUs 10 and 11 - Boilers

- i) The proposed SIP documents do not include a source testing requirement for the boilers to demonstrate compliance with the emissions limits for NO_x and PM_{2.5}. The BACT documents do not state that source testing is required to demonstrate compliance with the limits. The BACT documents do not appear to provide any specific compliance demonstration requirements.
- ii) Monitoring, recordkeeping, and reporting requirements are not specifically provided for EUs 10 and 11, other than that fuel receipts or test results for sulfur content shall be used to demonstrate compliance with the fuel sulfur content limit.

Summary

GVEA appreciates ADEC's consideration of alternative BACT solutions and requests the following modifications to proposed SO₂ controls in the draft SIP based on information previously submitted by GVEA in November 2018.

The differential fuel cost of \$0.424 per gallon between HSD and ULSD and \$1.117 per gallon between LSR Naphtha and ULSD make the switch to ULSD economically infeasible as short term or long term BACT for all primary generating units at the North Pole Plant and Zehnder Facility.

For North Pole EU IDs 1 and 2, GVEA proposes to take delivery of No. 1 HSD and will transition to the combustion of No. 1 HSD during periods of Air Quality Stage 1 and Stage 2 curtailment periods, on the condition that No. 1 HSD is locally available.

For North Pole EU IDs 5 and 6, GVEA proposes to combust fuels with a sulfur content of 50 ppm or less.

For Zehnder EU IDs 1, 2, 3, 4, 10, and 11, GVEA proposes to submit a Title I permit application limiting the potential SO₂ emissions to less than 70 tons per year, except in emergency situations, without limiting the type of fuel or fuel sulfur content.

Sincerely,

A handwritten signature in blue ink, appearing to read "Naomi Morton Knight", with a long horizontal flourish extending to the right.

Naomi Morton Knight, P.E.
Environmental Officer