Golden Valley Electric Association
PO Box 71249, Fairbanks, AK 99707-1249 • (907) 452-1151 • www.gvea.com
Your Touchstone Energy® Cooperative

June 9, 2020

Certified Mail
Return Receipt Requested
7019 0140 0001 0139 6884

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

Subject: **Zehnder Facility – Owner Requested Limit (ORL) under 18 AAC 50.508(5) for Permit Conditions Required by the Fairbanks $PM_{2.5}$ Serious State Implementation Plant (SIP).**

Dear Permit Intake Clerk,

Golden Valley Electric Association (GVEA) is submitting the enclosed application to request an owner requested limit (ORL) under 18 AAC 50.508(f) for the Zehnder Facility to Limit the SO_2 Potential to emit (PTE) to 64 tons per year from EU IDs 1, 2, 3, 4, 10, and 11. This limit and accompanying application is to establish permit conditions as required in the Fairbanks $PM_{2.5}$ Serious SIP, adopted November 19, 2019 by the Alaska Department of Environmental Conservation (ADEC).

Should you have any questions or require additional information, please contact me at 907-458-4557 or NMKnight@gvea.com

Sincerely,

Naomi Morton Knight, P.E.
Environmental Officer

Enclosure

cc: C. Kimball, SLR
dec.aq.airreports@alaska.gov

GVEA

Golden Valley Electric Association

Your Touchstone Energy® Cooperative

Title I Air Quality Permit Application

Zehnder Facility

Prepared for:

Golden Valley Electric Association

June 2020

SLR

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Title I Air Quality Permit Application

Prepared for:
Golden Valley Electric Association
P.O Box 71249
Fairbanks, Alaska 99707

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

June 2020

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Required Elements for Minor Permit Application

18 AAC 50.508(5)

The following table provides a summary of the required elements for a minor permit establishing an owner requested limit (ORL) under 18 AAC 50.508(5).

Minor Permit Application Elements

Regulatory Citation	Requirement	Location
18 AAC 50.540(b)	General Information	SSID Form
18 AAC 50.540(j)	Information and materials required under 18 AAC 50.225(b)(2) – (6) and (8)	Attachment A
18 AAC 50.225(b)(2)	List of all emission units at stationary source	Attachment B
18 AAC 50.225(b)(3)	Calculations of the stationary source actual emissions and potential to emit (PTE) air pollutants	Actual Emissions – Attachment C Potential Emissions – Attachment B
18 AAC 50.225(b)(4)	Description of each proposed limit, including calculations of the effect the limit will have on the stationary source PTE and allowable emissions	Attachment A and B
18 AAC 50.225(b)(5)	Description of verifiable method to attain and maintain each limit, including monitoring and record-keeping requirements	Attachment A
18 AAC 50.225(b)(6)	Citation to each requirement that is sought to avoid	Attachment A
18 AAC 50.225(b)(8)	Statement that owner/operator of the stationary source will be able to comply with each limit	Attachment A

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Alaska Department of Environmental Conservation
Air Quality Minor Permit Application

STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Name: Zehnder Facility			SIC: 4911
Project Name (if different): Serious $PM_{2.5}$ SIP	Contact: Naomi Morton Knight, P.E		
Physical Address: 758 Illinois St.	City: Fairbanks	State: AK	Zip :99707
	Telephone: (907) 458-4557		
	E-Mail Address: NMKnight@gvea.com		
UTM Coordinates (m) or Latitude/Longitude:	Northing:	Easting:	Zone:
	Latitude: 64° 51' 15'' N	Longitude: 147° 43' 30'' W	

Section 2 Legal Owner

Name: Golden Valley Electric Association		
Mailing Address: PO Box 71249		
City: Fairbanks	State: AK	Zip: 99707
Telephone #:		
E-Mail Address:		

Section 3 Operator *(if different from owner)*

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

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

Name: Frank E. Perkins		
Mailing Address: Fairbanks		
City: PO Box 71249	State: AK	Zip:99707
Telephone #:907-458-5780		
E-Mail Address: feperkins@gvea.com		

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

Name: Naomi Morton Knight, P.E		
Mailing Address: Fairbanks		
City: PO Box 71249	State: AK	Zip:99707
Telephone #:907- 458-4557		
E-Mail Address: NMKnight@gvea.com		

Section 6 Application Contact

Name: Courtney Kimball			
Mailing Address: 543 3rd Avenue, Suite 235	City: Fairbanks	State: AK	Zip:99701
	Telephone: 907-452-2280		
	E-Mail Address: ckimball@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)]

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

[18 AAC 50.502(b)]

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

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

[18 AAC 50.502(c)(1)]

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

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

[18 AAC 50.502(c)(2)]

Construction or relocation* of a:

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

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

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

[18 AAC 50.502(c)(3)]

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

[18 AAC 50.502(c)(4)]

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

Basis for calculating modification:

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

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

[18 AAC 50.508]

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

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

Section 11 Existing Permits and Limits

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

- ☒ Air quality permit Number(s)*: AQ109TVP03

- ☐ Owner Requested Limit(s) Permit Number(s):
- ☐ Pre-Approved Emission Limit (PAEL) Number(s)**:

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

Section 12 Project Description

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

Please use additional copies of this sheet if necessary.

Golden Valley Electric Association (GVEA) requests an owner requested limit (ORL) under 18 AAC 50.508(5) for the Zehnder Facility stationary source to limit the SO_2 potential to emit (PTE) to 64 tons per year (tpy) from EU IDs 1, 2, 3, 4, 10, and 11. The ORL is requested to avoid classification as a major source of SO_2 in a nonattainment area under 40 CFR 51.165 and 18 AAC 50.311 by limiting the SO_2 PTE at the facility to below the 70 tpy classification threshold. This ORL was proposed by GVEA during the Best Available Control Technology (BACT) determination analysis review for Fairbanks $PM_{2.5}$ Serious Implementation Plan (Serious SIP), adopted November 19, 2019, by the Alaska Department of Environmental Conservation.

Attachment A provides the required elements for an ORL application including the requested monitoring, recordkeeping, and reporting requirement for the proposed limits and permit conditions.

Attachment B provides the emission calculations to demonstrate the effect the ORL will have on the potential to emit for the facility. Actual emissions are provided as required in Attachment C.

Section 12 Project Description Continued

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

Not Applicable

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

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

Not Applicable

- The emission limitation representing that quantity of emission reduction.

Not Applicable

Section 12 Project Description Continued

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

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

Provided in Attachment A and Attachment B.

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

Provided in Attachment A

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)];

Provided in Attachment A

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)];

Provided in Attachment B

Section 12 Project Description Continued

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

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

Not Applicable

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

- Emissions;
  Not Applicable

- Other permit terms;
  Not Applicable

- The underlying ambient demonstration, if any;
  Not Applicable

- Compliance monitoring; and
  Not Applicable

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

Not Applicable

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 Zehnder Facility (Stationary Source Name) submitted to the Department on: June 9, 2020

Type of Application

☒ Initial Application

☐ Change to Initial Application

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

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

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

Signature: Frank E Perkins	Date: 6/9/2020
Printed Name: Frank E. Perkins	Title: Vice President of Power Supply

Section 15 Attachments

☒ Attachments Included. List attachments:

Attachment A: Owner Requested Limit
Attachment B: Emissions Unit Inventory and Emissions Calculations
Attachment C: FY2021 Assessable Emission Estimates

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

Request for an Owner Requested Limit Under 18 AAC 50.508(5)

Attachment A-1: Request for an Owner Requested Limit Under 18 AAC 50.508(5)

Attachment A-2: Proposed Permit Condition Language for ORL

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Attachment A-1
Request for an Owner Requested Limit under 18 AAC 50.508(5)

Under 18 Alaska Administrative Code (AAC) 50.540(j), an application for a minor air quality permit to establish an Owner Requested Limit (ORL) under 18 AAC 50.508(5) must include the information required under 18 AAC 50.225(b)(2) through (6) and (8). Each required element is addressed below or within this application.

GVEA requests an ORL to limit the sulfur dioxide (SO_2) potential to emit (PTE) for the Zehnder Facility for EU IDs 1, 2, 3, 4, 10, and 11 to 64 tons per year (tpy). This ORL will allow the Zehnder Facility to avoid being classified as a major stationary source of SO_2 in the Fairbanks $PM_{2.5}$ Serious nonattainment area per Title 40 Code of Federal Register (40 CFR) Part 51.165 and 18 AAC 50.311. The ORL will limit the SO_2 PTE of the stationary source to below the 70 tpy major stationary source classification threshold in 40 CFR 51.165(a)(1)(iv)(A)(1)(*viii*). As required by the Serious $PM_{2.5}$ nonattainment State Implementation Plan (SIP), the SO_2 ORL must be in effect no later than June 9, 2021. At that time, the Zehnder Facility will not be considered a major stationary source for SO_2 emissions and will not be subject to SO_2 Best Available Control Technology (BACT) limits described in the ADEC SIP. The Zehnder Facility will be subject to the Best Available Control Measures (BACM) limits. The BACM requirements state that after September 1, 2022, only fuel oil, containing no more than 1,000 parts per million (ppm) sulfur (i.e., 0.1 wt. pct. S), may be sold or purchased for use in fuel oil-fired equipment, including space heating devices.

GVEA proposes to comply with the requested ORL of 64 tpy of SO_2 for EU IDs 1, 2, 3, 4, 10, and 11 by calculating the total 12-month rolling SO_2 emissions on a monthly basis. The SO_2 emissions calculations will be based on daily fuel consumption for each of EU IDs 1, 2, 3, 4, 10, and 11. GVEA will either conduct monthly sulfur content samples of the onsite fuel oil storage tanks that supply fuel to EU IDs 1, 2, 3, 4, 10, and 11, or obtain fuel sulfur content analysis results from the fuel supplier to calculate the SO_2 12-month rolling emissions total. Sampling will not be necessary for any tanks storing only ultra-low sulfur diesel (ULSD).

18 AAC 50.225(b)(2)
Per 18 AAC 50.225(b)(2), a list of all emissions unit (EUs) at the stationary source is provided in Table B-2 of Attachment B of this application.

18 AAC 50.225(b)(3)
Per AAC 50.225(b)(3), a calculation of the stationary source's potential to emit (PTE) air pollutants is provided in Attachment B of this application. The emissions calculations in Attachment B-4 show the impact of the ORL after the emissions limit goes into effect no later than June 9, 2021. Attachment B-5 demonstrates the SO_2 PTE and change in allowed fuel use consumption when the BACM limits for fuel oil sold or purchased to have a sulfur content of less than 1,000 ppmw S

beginning September 1, 2022. Actual emissions from the stationary source are provided in Attachment C.

18 AAC 50.225(b)(4)

Per 18 AAC 50.225(b)(4), a description of each proposed limit is provided in Attachments A-2 a proposed permit condition. 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 are provided in Attachment B.

18 AAC 50.225(b)(5)

Per 18 AAC 50.225(b)(5), a description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements is provided in Attachments A-2 as a proposed permit condition.

18 AAC 50.225(b)(6)

Per 18 AAC 50.225(b)(6), a citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limits and how the limits allow the person to avoid the requirement is provided below.

Under 18 AAC 50.311 and 40 CFR 51.165, a stationary source with a PTE of 70 tons per year or more for any individual $PM_{2.5}$ precursor (e.g., SO_2) in any serious nonattainment area for $PM_{2.5}$ is classified as a nonattainment major stationary source. GVEA will avoid being classified as a major stationary source of SO_2 in the Fairbanks $PM_{2.5}$ Serious nonattainment area under 40 CFR 51.165(a)(1)(iv)(A)(1)(*viii*) (and for the purposes of 18 AAC 50.311) by requesting an ORL to limit the SO_2 emissions for EU IDs 1, 2, 3, 4, 10, and 11 to 64 tpy. This ORL will limit the Zehnder Facility SO_2 PTE to less than 70 tpy.

18 AAC 50.225(b)(8)

Per 18 AAC 50.225(b)(8), Golden Valley Electric Association will comply with the proposed limit.

Attachment A-2
Proposed Permit Condition Language for ORL

As indicated in Attachment A-1, a description of the proposed limit is provided below per 18 AAC 50.225(b)(4) as a permit condition. Per 18 AAC 50.225(b)(5), a description of a verifiable method to attain and maintain each limit including monitoring and recordkeeping requirements is provided below and is proposed as a new permit condition.

1. The Permittee shall not emit more than 64 tons of sulfur dioxide (SO_2) emissions per 12-month rolling period from EU IDs 1, 2, 3, 4, 10, and 11, combined. Compliance with this condition is ensured by calculating the total SO_2 emissions following the procedures in Condition 1.1 through 1.4.

    1.1 For EU IDs 1 and 2, monitor and record as follows:

    a. The Permittee shall determine the sulfur content of the fuel oil in onsite storage tank(s) that supply EU IDs 1 and 2 by one of the following methods:

    i. On a monthly basis, analyze a representative sample of the fuel oil from the storage tanks that supply fuel oil to EU IDs 1 and 2, following the procedures in the "Sulfur Compound Emissions Standards for fuel oil" condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50; or

    ii. Obtain fuel sulfur content analysis results from the supplier or refinery indicating the fuel sulfur content for each fuel type received. On a monthly basis, calculate the weighted average of the fuel oil sulfur content for the fuel in the onsite storage tanks that supply fuel to EU IDs 1 and 2.

    iii. If a fuel storage tank contains only ULSD, fuel sulfur content information from the supplier or the maximum ULSD sulfur content of 0.0015 percent by weight may be used instead of following the procedure in either Condition 1.1a.i or 1.1a.ii.

    b. On a daily basis, monitor and record the fuel consumption in gallons per day, for each of EU IDs 1 and 2, for each type of fuel.

    c. Determine or obtain test results indicating the specific gravity for each type of fuel in the onsite storage tanks which supply fuel to EU IDs 1 and 2.

    d. Calculate and record the 12-month rolling of SO_2 emissions for each month from EU IDs 1 and 2, using the data collected in Condition 1.1a through Condition 1.1c and following the procedures in Equation 1.

    1.2 For EU IDs 3 and 4, monitor and record as follows:

a. The Permittee shall determine the sulfur content of the fuel oil in onsite storage tank(s) that supply EU IDs 3 and 4 by one of the following methods:

i. On a monthly basis, analyze a representative sample of the fuel oil from the storage tanks that supply fuel oil to EU IDs 3 and 4, following the procedures in the "Sulfur Compound Emissions Standards for fuel oil" condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50; or

ii. Obtain fuel sulfur content analysis results from the supplier or refinery indicating the fuel sulfur content for each fuel type received. On a monthly basis, calculate the weighted average of the fuel oil sulfur content for the fuel in the onsite storage tanks that supply fuel to EU IDs 3 and 4.

iii. If a fuel storage tank contains only ULSD, fuel sulfur content information from the supplier or the maximum ULSD sulfur content of 0.0015 percent by weight may be used instead of following the procedure in either Condition 1.2a.i or 1.2a.ii.

b. On a daily basis, monitor and record the fuel consumption in gallons per day, for each of EU IDs 3 and 4, for each type of fuel.

c. Determine or obtain test results indicating the specific gravity for each type of fuel in the onsite storage tanks which supply fuel to EU IDs 3 and 4.

d. Calculate and record the 12-month rolling of SO_2 emissions for each month from EU IDs 3 and 4, using the data collected in Condition 1.2a through Condition 1.2c. and following the procedures in Equation 1.

1.3 For EU IDs 10 and 11, monitor and record as follows:

a. The Permittee shall determine the sulfur content of the fuel oil in onsite storage tank(s) that supply EU IDs 10 and 11 by one of the following methods:

i. On a monthly basis, analyze a representative sample of the fuel oil from the storage tanks that supply fuel oil to EU IDs 10 and 11, following the procedures in the "Sulfur Compound Emissions Standards for fuel oil" condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50; or

ii. Obtain fuel sulfur content analysis results from the supplier or refinery indicating the fuel sulfur content for each fuel type received. On a monthly basis, calculate the weighted average of the fuel oil sulfur content for the fuel in the onsite storage tanks that supply fuel to EU IDs 10 and 11.

iii. If a fuel storage tank contains only ULSD, fuel sulfur content information from the supplier or the maximum ULSD sulfur content of 0.0015 percent by weight may be used instead of following the procedure in either Condition 1.3a.i or 1.3a.ii.

b. On a daily basis, monitor and record the fuel consumption in gallons per day, for each of EU IDs 10 and 11, for each type of fuel.

c. Determine or obtain test results indicating the specific gravity for each type of fuel in the onsite storage tanks which supply fuel to EU IDs 10 and 11.

d. Calculate and record the 12-month rolling of SO_2 emissions for each month from EU IDs 10 and 11, using the data collected in Condition 1.3a through Condition 1.3c. and following the procedures in Equation 1.

1.4 Calculate the cumulative 12-month rolling SO_2 emission totals from EU IDs 1, 2, 3, 4, 10, and 11 using the data collected in Conditions 1.1, 1.2, and 1.3 using the procedures below:

$$Equation\ 1:\ Emissions = \sum Fuel\ Type\ \left(\frac{Wt.\ Pct.\ Sulfur}{100} * SG * F * \frac{2}{2000}\right)$$

Where:

Emissions	= SO_2 emissions (ton/12-month).
wt. pct. Sulfur	= Monthly sulfur content for each fuel type (wt. pct.).
F	= Diesel fuel consumption for facility (gal/12-month rolling).
SG	= Specific Gravity (i.e., density) for each fuel type (lb/gal).
100	= Conversion factor from percent to a fraction.
2	= Molecular weight ratio of SO_2 to Sulfur.
2,000	= Conversion factor from lbs to tons.

1.5 Keep records of the data collected in Conditions 1.1 through 1.4.

1.6 Report as described in the Operating Reports condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50, the12-month rolling SO_2 emissions for EU IDs 1, 2, 3, 4, 10, and 11, for each month of the reporting period.

1.7 Report as described in the Excess Emissions and Permit Deviation condition in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50 when the cumulative 12-month rolling total for SO_2 emissions for EU IDs 1, 2, 3, 4, 10, and 11 exceeds 64 tpy.

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Attachment B

Potential to Emit Calculations Tables

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Table B-1. Air Quality Minor Permit Emissions Summary
Golden Valley Electric Association - Zehnder Facility

Pollutant	Existing Potential to Emit (PTE) (tpy)[a]	PTE with ORL beginning June 9, 2021 (tpy)[b,c]	PTE with ORL beginning September 1, 2022 (tpy)[d,e]
Significant Emissions Units SO_2 PTE	580	64.0	64.0
Insignificant Emissions Units SO_2 PTE		5.2	3.4
Total Facility SO_2 PTE	**580**	**69**	**67**

Notes:

a. The detailed existing PTE calculations are provided in Table B-3.

b. The detailed PTE calculations beginning June 9, 2021 are provided in Table B-4.

c. The PTE effective June 9, 2021 reflects the ORL to limit the stationary source SO_2 emissions to less than 70 tpy.

d. The detailed PTE calculations beginning September 1, 2022 are provided in Table B-5.

e. The PTE beginning September 1, 2022 reflects the Best Available Control Measures (BACM) requirement to limit the fuel sulfur content of fuel oil sold or purchased to no more than 1,000 parts per million sulfur (i.e., 0.1 wt.pct. S).

f. The owner requested limit (ORL) in this minor permit application does not affect potential emissions of NO_x, CO, PM_{10}, $PM_{2.5}$, HAPs, and greenhouse gases. Tables B-6 through B-10 present the potential emissions calculations for NO_X, CO, PM_{10}, and $PM_{2.5}$. The potential emissions have been updated compared to the PTE shown in Table C of the Statement of Basis to Permit AQ0109TVP03 as described in Tables B-7 through B-10.

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Table B-2. Emissions Unit Inventory Parameters
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Fuel Consumption	Maximum Operation	Maximum Operation
ID	Description					
Significant Emissions Units						
1	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	1,956 gal/hr	8,760 hr/yr	17,136,350 gal/yr
2	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	1,956 gal/hr	8,760 hr/yr	17,136,350 gal/yr
3	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	204 gal/hr	500 hr/yr[c]	102,190 gal/yr
4	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	204 gal/hr	500 hr/yr[c]	102,190 gal/yr
10	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	11.8 gal/hr	8,760 hr/yr	108,701 gal/yr
11	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	11.8 gal/hr	8,760 hr/yr	108,701 gal/yr
Insignificant Emissions Units						
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	8,760 hr/yr	N/A
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	8,760 hr/yr	N/A
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	8,760 hr/yr	N/A
8	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	3.20 gal/hr	8,760 hr/yr	28,032 gal/yr
9	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	3.20 gal/hr	8,760 hr/yr	28,317 gal/yr
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 Mscf/hr	8,760 hr/yr	5 MMscf/yr
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 Mscf/hr	8,760 hr/yr	5 MMscf/yr
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil	0.28 MMBtu/hr	2.00 gal/hr	8,760 hr/yr	17,520 gal/yr
N/A	Energy Logic EL-340H Heater	Waste Oil	0.28 MMBtu/hr	2.25 gal/hr	8,760 hr/yr	19,710 gal/yr
N/A	Metzger Machine Corp. Boiler	Diesel	0.12 MMBtu/hr	1.00 gal/hr	8,760 hr/yr	8,760 gal/yr
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	1.40 gal/hr	8,760 hr/yr	12,264 gal/yr
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	1.40 gal/hr	8,760 hr/yr	12,264 gal/yr
N/A	Energy Logic EL-350H Heater	Waste Oil	0.35 MMBtu/hr	2.50 gal/hr	8,760 hr/yr	21,900 gal/yr
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	8,760 hr/yr	N/A
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	8,760 hr/yr	N/A
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	8,760 hr/yr	N/A
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	8,760 hr/yr	N/A
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	8,760 hr/yr	N/A
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	8,760 hr/yr	N/A
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	8,760 hr/yr	N/A
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	8,760 hr/yr	N/A
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	8,760 hr/yr	N/A

Notes:

[a] EU IDs 10 and 11 each have a fuel consumption rate of 11.8 gal/hr according to emissions units name plate.
[b] EU IDs 8 and 9 each have a fuel consumption rate of 3.2 gal/hr as estimated in the Title V application for Permit No. AQ0109TVP02.
[c] The Lean Burn Inc. Heater has a fuel consumption rate of 2.0 gal/hr according to the emissions unit nameplate.
[d] The Energy Logic EL-340H Heater has a fuel consumption rate of 2.25 gal/hr according to the emissions unit nameplate.
[e] The Metzger Boiler has a fuel consumption rate of 1.0 gal/hr according to the emissions unit nameplate.
[f] The Energy Logic EL-200H Heater has a fuel consumption rate of 1.4 gal/hr according to the emissions unit nameplate.
[g] The Energy Logic EL-350H Heater has a fuel consumption rate of 2.4 gal/hr according to the emissions unit nameplate.

Conversion factors:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c'*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*

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Table B-3. Existing Potential to Emit - Sulfur Dioxide (SO_2) Emissions
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Maximum Fuel Sulfur Content	SO_2 Emission Factor	Reference	Maximum Operation	Existing Potential SO_2 Emissions (tpy)
ID	Description							
Significant Emissions Units								
1	General Electric Frame 5 MS 5001-M	Diesel[a]	268 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
2	General Electric Frame 5 MS 5001-M	Diesel[a]	268 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
3	General Motors Electro-Motive Diesel 20-645E4	Diesel[a]	28 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	500 hr/yr[c]	
4	General Motors Electro-Motive Diesel 20-645E4	Diesel[a]	28 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	500 hr/yr[c]	
10	Weil McLain H-688 Boiler	Heating Oil/Diesel[a]	1.7 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
11	Weil McLain H-688 Boiler	Heating Oil/Diesel[a]	1.7 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
Insignificant Emissions Units								
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
8	Burnham Boiler	Heating Oil/Diesel[a]	0.44 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
9	Burnham Boiler	Heating Oil/Diesel[a]	0.44 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 lb/MMscf	0.6 lb/MMscf	AP-42 Table 1.4-2	8,760 hr/yr	
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 lb/MMscf	0.6 lb/MMscf	AP-42 Table 1.4-2	8,760 hr/yr	
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil[d]	0.28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	8,760 hr/yr	580 [b]
N/A	Energy Logic EL-340H Heater	Waste Oil[d]	0.28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	8,760 hr/yr	
N/A	Metzger Machine Corp. Boiler	Diesel[a]	0.12 MMBtu/hr	0.74 wt. pct. S	0.105 lb/gal	Mass Balance	8,760 hr/yr	
N/A	Energy Logic EL-200H Heater	Waste Oil[d]	0.20 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	8,760 hr/yr	
N/A	Energy Logic EL-200H Heater	Waste Oil[d]	0.20 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	8,760 hr/yr	
N/A	Energy Logic EL-350H Heater	Waste Oil[d]	0.35 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	8,760 hr/yr	
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	N/A	8,760 hr/yr	
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	N/A	8,760 hr/yr	
							Potential SO_2 Emissions:	**580**

Notes:

[a] The SO_2 EU IDs 1 through 4 are limited to a fuel sulfur content of 1 wt. pct. per Permit AQ0109TVP03 Condition 10. EU IDs 1 through 4 also have an estimated fuel sulfur limit of 0.74 wt. pct. S based on the 500 ppm SO_2 emissions limit per Permit AQ0109TVP03 Condition 8. The more conservative estimated fuel sulfur limit of 0.74 wt. pct. S is shown above.

[b] SO_2 emissions from the stationary source are limited to 580 tpy on a 12-month rolling basis per Permit AQ0109TVP03 Condition 9. The total SO_2 emissions reflect the ORL restrictions in Permit AQ0109TVP03 Condition 9.

[c] EU IDs 3 and 4 are classified as emergency engines. Based on the 1995 Seitz memo, EPA recommends calculating potential emissions for emergency engines based on 500 hours of annual operation.

[d] Assumes maximum sulfur content of waste oil used at the facility is 0.5 wt. pct.

Basis for Calculations

Molar mass ratio is 32 lb S/mol : 64 lb SO_2/mol

Stoichiometry: 1 mol S = 1 mol SO_2

SO_2 emissions, ton/yr =

(Mass Balance SO_2 EF, lb/gal) *(rating, MMBtu/hr) * (Maximum hours of operation per year, hr/yr) / (HHV of Diesel, Btu/gal) * (conversion, 1,000,000 / million) / (conversion, 2000 lb/ton)

Mass Balance SO_2 EF, lb/gal =

(Molar mass ratio, 2 lb SO2:1 lb S) * (wt. pct. S in fuel) x (density of fuel, lb/gal) / (100 pct.)

Conversion factors:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42, Table 3.1-1, Footnote 'c*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*
Density of Diesel	7.1 lb/gal	*From AP 42, Table 3.4-1, Footnote reference 'a'*

Table B-4. Potential to Emit Beginning June 9, 2021 - Sulfur Dioxide (SO_2) Emissions - with ORL
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Maximum Fuel Sulfur Content	SO_2 Emission Factor	Reference	Potential SO_2 Emissions
ID	Description						
Significant Emissions Units							
1	General Electric Frame 5 MS 5001-M	Diesel[c]	268 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	64 tpy[a,b]
2	General Electric Frame 5 MS 5001-M	Diesel[c]	268 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	
3	General Motors Electro-Motive Diesel 20-645E4	Diesel[c]	28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	
4	General Motors Electro-Motive Diesel 20-645E4	Diesel[c]	28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	
10	Weil McLain H-688 Boiler	Heating Oil/Diesel[c]	1.7 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	
11	Weil McLain H-688 Boiler	Heating Oil/Diesel[c]	1.7 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	
Significant Emissions Unit Subtotal:							**64 tpy[a]**
Insignificant Emissions Units							
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	N/A	0 tpy
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	N/A	0 tpy
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	N/A	0 tpy
8	Burnham Boiler	Heating Oil/Diesel[c]	0.44 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	1.0 tpy
9	Burnham Boiler	Heating Oil/Diesel[c]	0.44 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	1.0 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 lb/MMscf	0.6 lb/MMscf	AP-42 Table 1.4-2	0.002 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 lb/MMscf	0.6 lb/MMscf	AP-42 Table 1.4-2	0.002 tpy
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil[d]	0.28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.6 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil[d]	0.28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.6 tpy
N/A	Metzger Machine Corp. Boiler	Diesel[b]	0.12 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.3 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil[d]	0.20 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.5 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil[d]	0.20 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.5 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil[d]	0.35 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.8 tpy
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	N/A	0 tpy
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	N/A	0 tpy
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	N/A	0 tpy
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	N/A	0 tpy
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	N/A	0 tpy
Insignificant Emissions Units Subtotal:							**5.25 tpy**
Potential SO_2 Emissions:							**69.2 tpy**

Notes:

[a] The SIP BACT requirements for the significant emission units to combust only ULSD no longer apply when the facility wide ORL is established to limit the SO_2 emissions to less than 70 tpy. As a result, the facility will not be classified as a major source for SO_2 and the facility will be subject to the BACM requirements, when the permit is issued. The BACM requirement in 18 AAC 50.078(a) states that only fuel oil containing no more than 1,000 parts per million sulfur may be sold or purchased for use in fuel-oil fired equipment beginning September 1, 2022.

[b] The total SO_2 emissions for EU IDs 1, 2, 3, 4, 10 and 11 have been adjusted to reflect the requested ORL to not emit more than 64 tpy, combined.

[c] Conservatively assumes maximum sulfur content for diesel fuel received at the facility is 0.5 wt. pct.

[d] Assumes maximum sulfur content of waste oil used at the facility is 0.5 wt. pct.

Sample Calculations

Molar mass ratio is 32 lb S/mol : 64 lb SO_2/mol

Stoichiometry: 1 mol S = 1 mol SO_2

SO_2 emissions, ton/yr =

(Mass Balance SO_2 EF, lb/gal) *(rating, MMBtu/hr) * (Maximum hours of operation per year, hr/yr) / (HHV of Diesel, Btu/gal) * (conversion, 1,000,000 / million) / (conversion, 2000 lb/ton)

Mass Balance SO_2 EF, lb/gal =

(Molar mass ratio, 2 lb SO2:1 lb S) * (wt. pct. S in fuel) x (density of fuel, lb/gal) / (100 pct.)

Conversion factors:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c'*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*
Density of Diesel	7.1 lb/gal	*From AP 42, Table 3.4-1, Footnote reference 'a'*

Table B-5- Potential Fuel Sulfur Limits After September 1, 2022 - Sulfur Dioxide (SO_2) Emissions - with ORL
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Maximum Fuel Sulfur Content	SO_2 Emission Factor	Reference	Potential SO_2 Emissions
ID	Description						
Significant Emission Units							
1	General Electric Frame 5 MS 5001-M	Diesel[c]	268 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	64 tpy[a,b]
2	General Electric Frame 5 MS 5001-M	Diesel[c]	268 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	
3	General Motors Electro-Motive Diesel 20-645E4	Diesel[c]	28 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	
4	General Motors Electro-Motive Diesel 20-645E4	Diesel[c]	28 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	
10	Weil McLain H-688 Boiler	Heating Oil/Diesel[c]	1.7 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	
11	Weil McLain H-688 Boiler	Heating Oil/Diesel[c]	1.7 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	
Significant Emissions Units Subtotal:							**64 tpy**
Insignificant Emission Units							
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	N/A	0 tpy
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	N/A	0 tpy
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	N/A	0 tpy
8	Burnham Boiler	Heating Oil/Diesel[c]	0.44 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	0.2 tpy
9	Burnham Boiler	Heating Oil/Diesel[c]	0.44 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	0.2 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 lb/MMscf	0.6 lb/MMscf	AP-42 Table 1.4-2	0.002 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	0.6 lb/MMscf	0.6 lb/MMscf	AP-42 Table 1.4-2	0.002 tpy
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil[d]	0.28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.6 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil[d]	0.28 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.6 tpy
N/A	Metzger Machine Corp. Boiler	Diesel[b]	0.12 MMBtu/hr	0.1 wt. pct. S	0.014 lb/gal	Mass Balance	0.1 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil[d]	0.20 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.5 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil[d]	0.20 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.5 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil[d]	0.35 MMBtu/hr	0.5 wt. pct. S	0.071 lb/gal	Mass Balance	0.8 tpy
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	N/A	0 tpy
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	N/A	0 tpy
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	N/A	0 tpy
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	N/A	0 tpy
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	N/A	0 tpy
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	N/A	0 tpy
Insignificant Emissions Units Subtotal:							**3.42 tpy**
Potential SO_2 Emissions:							**67.4 tpy**

Notes:

[a] The SIP BACT requirements for the significant emission units to combust only ULSD no longer apply when the facility wide ORL is established to limit the SO_2 emissions to less than 70 tpy. As a result, the facility will not be classified as a major source for SO_2 and the facility will be subject to the BACM requirements, when the permit is issued. The BACM requirement in 18 AAC 50.078(a) states that only fuel oil containing no more than 1,000 parts per million sulfur may be sold or purchased for use in fuel-oil fired equipment beginning September 1, 2022.

[b] The total SO_2 emissions for EU IDs 1, 2, 3, 4, 10 and 11 reflect the requested ORL to not emit more than 64 tpy, combined.

[c] Diesel fuel with a sulfur content greater than 0.1 wt. pct. (i.e., 1,000 ppmw S) is not allowed to be sold or purchased after September 1, 2022. Emission estimates assumes sulfur content of fuel received at the facility will be less than 0.1 wt. pct. S.

[d] Assumes maximum sulfur content of waste oil used at the facility is 0.5 wt. pct. The waste oil is generated onsite and is not purchased, so is not subject to the BACM fuel sulfur content requirement.

Sample Calculations

Molar mass ratio is 32 lb S/mol : 64 lb SO_2/mol

Stoichiometry: 1 mol S = 1 mol SO_2

SO_2 emissions, ton/yr =

(Mass Balance SO_2 EF, lb/gal) *(rating, MMBtu/hr) * (Maximum hours of operation per year, hr/yr) / (HHV of Diesel, Btu/gal) * (conversion, 1,000,000 / million) / (conversion, 2000 lb/ton)

Mass Balance SO_2 EF, lb/gal =

(Molar mass ratio, 2 lb SO2:1 lb S) * (wt. pct. S in fuel) x (density of fuel, lb/gal) / (100 pct.)

Conversion factors:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c'*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*
Density of Diesel	7.1 lb/gal	*From AP 42, Table 3.4-1, Footnote reference 'a'*

Table B-6. Existing Potential Emissions Summary
Golden Valley Electric Association - Zehnder Facility

Potential To Emit	NO_X (tpy)	CO (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)
Significant Emissions Units	2,113	20.2	29.8	29.8	580
Insignificant Emissions Units	2	0.7	0.3	0.3	
Total Facility PTE:	**2,114**	**21**	**30**	**30**	**580**

Notes:

[a] The ORL in this minor permit application has no effect on the facility's potential to emit for NO_x, CO, PM_{10}, and $PM_{2.5}$. The potential emissions for NO_X, CO, and PM_{10} have been updated compared to the PTE shown in Table C of the Statement of Basis to Permit AQ0109TVP03 as described in Tables B-7 through B-10.

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Table B-7. Existing Potential To Emit - Oxides of Nitrogen (NO_X) Emissions
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Reference	NOx Emission Factor	Maximum Operation	Existing PTE NO_X Emissions [a]
ID	Description						
Significant Emission Units							
1	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-1	0.88 lb/MMBtu	8,760 hr/yr	1,033 tpy
2	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-1	0.88 lb/MMBtu	8,760 hr/yr	1,033 tpy
3	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	3.2 lb/MMBtu	500 hr/yr[b]	22 tpy[c]
4	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	3.2 lb/MMBtu	500 hr/yr[b]	22 tpy[c]
10	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Table 1.3-1	20 $lb/10^3gal$	8,760 hr/yr	1 tpy
11	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Table 1.3-1	20 $lb/10^3gal$	8,760 hr/yr	1 tpy
						Significant Emissions Units Subtotal:	**2,113 tpy**
Insignificant Emission Units							
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
8	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1	18 $lb/10^3gal$	8,760 hr/yr	0.3 tpy
9	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1	18 $lb/10^3gal$	8,760 hr/yr	0.3 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-1	100 $lb/10^6scf$	8,760 hr/yr	0.3 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-1	100 $lb/10^6scf$	8,760 hr/yr	0.3 tpy
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-2	11 $lb/10^3gal$	8,760 hr/yr	0.1 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-2	11 $lb/10^3gal$	8,760 hr/yr	0.1 tpy
N/A	Metzger Machine Corp. Boiler	Diesel	0.12 MMBtu/hr	AP-42 Table 1.3-1	18 $lb/10^3gal$	8,760 hr/yr	0.1 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-2	11 $lb/10^3gal$	8,760 hr/yr	0.1 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-2	11 $lb/10^3gal$	8,760 hr/yr	0.1 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil	0.35 MMBtu/hr	AP-42 Table 1.11-2	11 $lb/10^3gal$	8,760 hr/yr	0.1 tpy
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
						Insignificant Emissions Units Subtotal:	**1.6 tpy**
						Potential NO_X Emissions:	**2,114 tpy[c]**

Notes:

[a] The ORL submitted in this minor permit application has no effect on the facility's existing potential to emit for NO_x.

[b] Based on the 1995 Seitz memo, EPA recommends calculating potential emissions for emergency engines based on 500 hours of annual operation.

[c] The PTE for NO_x presented here differs from the PTE Summary presented in Table C of the Statement of Basis for Permit No. AQ0109TVP03 for the following reason:

1. Potential emissions for EU IDs 3 and 4 have been updated to use a basis of 500 operating hours per year in accordance with EPA guidance, as noted in footnote b.

[d] Basis of emissions calculations assume the following:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c'*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*

Table B-8. Existing Potential To Emit - Carbon Monoxide (CO) Emissions
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Reference	CO Emission Factor	Maximum Operation	Existing PTE CO Emissions [a]
ID	Description						
Significant Emission Units							
1	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-1	0.0033 lb/MMBtu	8,760 hr/yr	3.9 tpy
2	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-1	0.0033 lb/MMBtu	8,760 hr/yr	3.9 tpy
3	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	0.85 lb/MMBtu	500 hr/yr[b]	6.0 tpy[c]
4	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	0.85 lb/MMBtu	500 hr/yr[b]	6.0 tpy[c]
10	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Table 1.3-1	5 lb/10^3gal	8,760 hr/yr	0.3 tpy
11	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Table 1.3-1	5 lb/10^3gal	8,760 hr/yr	0.3 tpy
						Significant Emissions Units Subtotal:	**20.2 tpy**
Insignificant Emission Units							
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
8	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1	5 lb/10^3gal	8,760 hr/yr	7.01E-02 tpy
9	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1	5 lb/10^3gal	8,760 hr/yr	7.01E-02 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-1	84 lb/10^6scf	8,760 hr/yr	2.21E-01 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-1	84 lb/10^6scf	8,760 hr/yr	2.21E-01 tpy
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-2	1.7 lb/10^3gal	8,760 hr/yr	1.49E-02 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-2	1.7 lb/10^3gal	8,760 hr/yr	1.68E-02 tpy
N/A	Metzger Machine Corp. Boiler	Diesel	0.12 MMBtu/hr	AP-42 Table 1.3-1	5 lb/10^3gal	8,760 hr/yr	2.19E-02 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-2	1.7 lb/10^3gal	8,760 hr/yr	1.04E-02 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-2	1.7 lb/10^3gal	8,760 hr/yr	1.04E-02 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil	0.35 MMBtu/hr	AP-42 Table 1.11-2	1.7 lb/10^3gal	8,760 hr/yr	1.86E-02 tpy
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
						Insignificant Emissions Units Subtotal:	**0.7 tpy**
						Potential CO Emissions:	**20.8 tpy[c]**

Notes:

[a] The ORL submitted in this minor permit application has no effect on the facility's existing potential to emit for CO.

[b] Based on the 1995 Seitz memo, EPA recommends calculating potential emissions for emergency engines based on 500 hours of annual operation.

[c] The PTE for CO presented here differs from the PTE Summary presented in Table C of the Statement of Basis for Permit No. AQ0109TVP03 for the following reason:

1. Potential emissions for EU IDs 3 and 4 have been updated to use a basis of 500 operating hours per year in accordance with EPA guidance, as noted in footnote b.

[d] Basis of emissions calculations assume the following:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c'*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*

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Table B-9. Existing Potential To Emit - Particulate Matter (PM_{10}) Emissions
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Reference	PM_{10} Emission Factor	Maximum Operation	Existing PTE PM_{10} Emissions [a]
ID	Description						
Significant Emission Units							
1	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-2a	0.012 lb/MMBtu	8,760 hr/yr	14.1 tpy[c]
2	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-2a	0.012 lb/MMBtu	8,760 hr/yr	14.1 tpy[c]
3	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	0.1 lb/MMBtu	500 hr/yr[b]	0.7 tpy[c]
4	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	0.1 lb/MMBtu	500 hr/yr[b]	0.7 tpy[c]
10	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Tables 1.3-2 & 1.3-7	2.38 lb/10^3gal	8,760 hr/yr	0.1 tpy
11	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Tables 1.3-2 & 1.3-7	2.38 lb/10^3gal	8,760 hr/yr	0.1 tpy
						Significant Emissions Units Subtotal:	**29.8 tpy**
Insignificant Emission Units							
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
8	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1 & 1.3-2	1.7 lb/10^3gal	8,760 hr/yr	2.38E-02 tpy
9	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1 & 1.3-2	1.7 lb/10^3gal	8,760 hr/yr	2.38E-02 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-2	7.6 lb/10^6scf	8,760 hr/yr	2.00E-02 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-2	7.6 lb/10^6scf	8,760 hr/yr	2.00E-02 tpy
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-1	11.9 lb/10^3gal[d]	8,760 hr/yr	1.04E-01 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-1	11.9 lb/10^3gal[d]	8,760 hr/yr	1.17E-01 tpy
N/A	Metzger Machine Corp. Boiler	Diesel	0.12 MMBtu/hr	AP-42 Table 1.3-1 & 1.3-2	1.7 lb/10^3gal	8,760 hr/yr	7.45E-03 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-1	None Available	8,760 hr/yr	0 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-1	None Available	8,760 hr/yr	0 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil	0.35 MMBtu/hr	AP-42 Table 1.11-1	0.1 lb/10^3gal[e]	8,760 hr/yr	5.58E-04 tpy
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
						Insignificant Emissions Units Subtotal:	**0.3 tpy**
						Potential PM_{10} Emissions:	**30.1 tpy[c]**

Notes:

[a] The ORL submitted in this minor permit application has no effect on the facility's existing potential to emit for PM_0.

[b] Based on the 1995 Seitz memo, EPA recommends calculating potential emissions for emergency engines based on 500 hours of annual operation.

[c] The PTE for PM_{10} presented here differs from the PTE Summary presented in Table C of the Statement of Basis for Permit No. AQ0109TVP03 for the following reasons:

1. The PM_{10} emission factor for EU IDs 1 and 2 has been revised to use the established AP-42 emission factor for combustion turbines per the Voluntary $PM_{2.5}$ Serious Nonattainment Area BACT Analysis for the Zenhder Facility that GVEA submitted to ADEC in August 2017.
2. Potential emissions for EU IDs 3 and 4 have been updated to use a basis of 500 operating hours per year in accordance with EPA guidance, as noted in footnote b.

[e] Ash Content of 0.233 percent by weight was determined through testing conducted in December 2016.

[g] Ash Content of 0.001 percent by weight was determined through testing conducted in December 2016.

[f] Basis of emissions calculations assume the following:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*

Table B-10. Existing Potential To Emit - Particulate Matter ($PM_{2.5}$) Emissions
Golden Valley Electric Association - Zehnder Facility

Emissions Unit		Fuel Type	Emission Unit Rating/Capacity	Reference	$PM_{2.5}$ Emission Factor	Maximum Operation	Existing PTE $PM_{2.5}$ Emissions [a]
ID	Description						
Significant Emission Units							
1	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-2a	0.012 lb/MMBtu	8,760 hr/yr	14.09 tpy
2	General Electric Frame 5 MS 5001-M	Diesel	268 MMBtu/hr	AP-42 Table 3.1-2a	0.012 lb/MMBtu	8,760 hr/yr	14.09 tpy
3	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	0.1 lb/MMBtu	500 hr/yr[b]	0.70 tpy
4	General Motors Electro-Motive Diesel 20-645E4	Diesel	28 MMBtu/hr	AP-42 Table 3.4-1	0.1 lb/MMBtu	500 hr/yr[b]	0.70 tpy
10	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Tables 1.3-2 & 1.3-7	2.13 $lb/10^3gal$	8,760 hr/yr	0.11 tpy
11	Weil McLain H-688 Boiler	Heating Oil/Diesel	1.7 MMBtu/hr	AP-42 Tables 1.3-2 & 1.3-7	2.13 $lb/10^3gal$	8,760 hr/yr	0.11 tpy
						Significant Emissions Units Subtotal:	**29.8 tpy**
Insignificant Emission Units							
5	C-1 No. 1 Diesel Fuel Oil Storage Tank	Diesel	12,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
6	C-2 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
7	C-3 No. 2 Diesel Fuel Oil Storage Tank	Diesel	50,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
8	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1 & 1.3-2	1.7 $lb/10^3gal$	8,760 hr/yr	0.02 tpy
9	Burnham Boiler	Heating Oil/Diesel	0.44 MMBtu/hr	AP-42 Table 1.3-1 & 1.3-2	1.7 $lb/10^3gal$	8,760 hr/yr	0.02 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-2	7.6 $lb/10^6scf$	8,760 hr/yr	0.02 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.61 MMBtu/hr	AP-42 Table 1.4-2	7.6 $lb/10^6scf$	8,760 hr/yr	0.02 tpy
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-1	11.9 $lb/10^3gal$[c]	8,760 hr/yr	0.10 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil	0.28 MMBtu/hr	AP-42 Table 1.11-1	11.9 $lb/10^3gal$[c]	8,760 hr/yr	0.12 tpy
N/A	Metzger Machine Corp. Boiler	Diesel	0.12 MMBtu/hr	AP-42 Table 1.3-1 & 1.3-2	1.7 $lb/10^3gal$	8,760 hr/yr	0.01 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-1	None Available	8,760 hr/yr	0 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.20 MMBtu/hr	AP-42 Table 1.11-1	None Available	8,760 hr/yr	0 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil	0.35 MMBtu/hr	AP-42 Table 1.11-1	0.1 $lb/10^3gal$[d]	8,760 hr/yr	0.001 tpy
N/A	C-7 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-8 EMD Unit 5 Day Tank	Diesel	275 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-13 Fleet Fueling Diesel Tank	Diesel	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-14 Fleet Fueling Gasoline Tank	Gasoline	3,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-15 Vehicle Shop Addition Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-29 Nerland Building Heating Oil Tank	N/A	1,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-31 Vehicle Shop Addition Heating Oil Tank	N/A	8,000 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-32 Heating Oil Day Tank	N/A	150 gallons	N/A	N/A	8,760 hr/yr	0 tpy
N/A	C-33 Old Vehicle Shop Used Oil Tank	N/A	250 gallons	N/A	N/A	8,760 hr/yr	0 tpy
						Insignificant Emissions Units Subtotal:	**0.32 tpy**
						Potential $PM_{2.5}$ Emissions:	**30.1 tpy**

Notes:

[a] The ORL submitted in this minor permit application has no effect on the facility's existing potential to emit for PM_0.

[b] Based on the 1995 Seitz memo, EPA recommends calculating potential emissions for emergency engines based on 500 hours of annual operation.

[c] Ash Content of 0.233 percent by weight was determined through testing conducted in December 2016.

[d] Ash Content of 0.001 percent by weight was determined through testing conducted in December 2016.

[e] Basis of emissions calculations assume the following:

Natural Gas Heating Value	1,020 Btu/scf	*From AP 42,Table 3.1-1, Footnote 'c*
Diesel Heating Value	137,000 Btu/gal	*From AP 42, Appendix A, Page A-5*

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Attachment C
2019 Actual Emissions Estimates

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Table C-1 Actual Emissions Summary[1]
Golden Valley Electric Association - Zehnder Facility

EU ID	Emissions Unit Description	Fuel	Rating/Size	NOx	CO	PM_{10}	$PM_{2.5}$[2]	SO_2
Significant Emissions Units								
1	Simple Cycle Gas Turbine	Diesel	268 MMBtu/hr	3.8 tpy	1.45E-02 tpy	0.1 tpy	0.1 tpy	1.3 tpy
2	Simple Cycle Gas Turbine	Diesel	268 MMBtu/hr	69.9 tpy	2.72E-01 tpy	1.0 tpy	1.0 tpy	25.7 tpy
3	Diesel Generator Engine	Diesel	28 MMBtu/hr	6.62E-02 tpy	1.76E-02 tpy	1.18E-03 tpy	1.18E-03 tpy	3.18E-05 tpy
4	Diesel Generator Engine	Diesel	28 MMBtu/hr					
10	Boiler	Diesel	1.7 MMBtu/hr	6.89E-02 tpy	1.72E-02 tpy	8.20E-03 tpy	7.34E-03 tpy	9.79E-02 tpy
11	Boiler	Diesel	1.7 MMBtu/hr					
Insignificant Emissions Units								
6	Fuel Oil Storage Tank	Diesel	50,000 gallons	0 tpy	0 tpy	0 tpy	0 tpy	0.0 tpy
7	Fuel Oil Storage Tank	Diesel	50,000 gallons	0 tpy	0 tpy	0 tpy	0 tpy	0.0 tpy
N/A	Fuel Oil Storage Tank	Diesel	12,000 gallons	0 tpy	0 tpy	0 tpy	0 tpy	0.0 tpy
8	Burnham Boiler	Diesel	0.443 MMBtu/hr	1.18E-01 tpy	3.28E-02 tpy	1.11E-02 tpy	1.11E-02 tpy	0.2 tpy
9	Burnham Boiler	Diesel	0.443 MMBtu/hr					
N/A	Burnham Boiler - FE Building	Natural Gas	0.606 MMBtu/hr	5.87E-02 tpy	4.93E-02 tpy	3.23E-03 tpy	3.23E-03 tpy	0.0 tpy
N/A	Burnham Boiler - FE Building	Natural Gas	0.606 MMBtu/hr					
N/A	Lean Burn Inc. CB 2800 Overhead Shop Heater	Waste Oil	0.28 MMBtu/hr	0 tpy	0 tpy	0 tpy	0 tpy	0 tpy
N/A	Energy Logic EL-340H Heater	Waste Oil	0.275 MMBtu/hr	6.16E-03 tpy	1.62E-03 tpy	3.85E-03 tpy	3.85E-03 tpy	0.0 tpy
N/A	Metzger Machine Corp. Boiler	Diesel	0.12 MMBtu/hr	5.57E-02 tpy	1.55E-02 tpy	5.26E-03 tpy	5.26E-03 tpy	0.0 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.2 MMBtu/hr	1.29E-02 tpy	2.00E-03 tpy	0 tpy	0 tpy	0.0 tpy
N/A	Energy Logic EL-200H Heater	Waste Oil	0.2 MMBtu/hr	0 tpy	0 tpy	0 tpy	0 tpy	0 tpy
N/A	Energy Logic EL-350H Heater	Waste Oil	0.35 MMBtu/hr	4.85E-02 tpy	1.28E-02 tpy	1.30E-04 tpy	1.30E-04 tpy	4.38E-02 tpy
Total 2019 Actual Emissions				**74.1 tpy**	**0.43 tpy**	**1.1 tpy**	**1.1 tpy**	**27.4 tpy**

Notes: [1]Actual emission values are based on the Calendar Year 2019 actual emissions calculations provided to ADEC in the assessable emissions report dated March 27, 2020, except as otherwise note
Actual emissions are rounded to the nearest hundredth.

[2] Actual $PM_{2.5}$ emissions are consistent with PM_{10} emissions, except for EU IDs 10 and 11. Actual $PM_{2.5}$ emissions for EU IDs 10 and 11 were estimated using the calculated $PM_{2.5}$ emission factor of 2.13 pound per thousand gallons from AP-42 Tables 1.3-2 and 1.3-7.