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Title V Air Operating Permit

Renewal Application

Please provide the information requested in this application. Please submit to the Northwest Clean Air Agency three paper copies and one electronic copy of the completed application. The certification at the end of this document applies to the entire submittal. If additional room to reply is required, please attach pages to this request.

In some cases, a prior submittal to the NWCAA (e.g., the annual emissions inventory) may include information requested below. If you would like to refer the NWCAA to that information rather than provide the information here, please note this in your response. Any submittal to which the NWCAA is referred will become part of your renewal application. It is also acceptable to attach relevant portions of your current Air Operating Permit if the information therein provides an adequate response to a question below.

Part 1: General Information

1) Company name and address [or plant name and address if different from the company name]

Puget Sound Energy – Fredonia Generating Station
13085 Ball Road
Mount Vernon, WA 98273

2) Current Air Operating Permit number and expiration date

AOP Number 003R3M1 (Appendix A)
Expiration date of March 28, 2022

3) Owner's name and agent

Puget Sound Energy
PO Box 97034
Bellevue, WA 98009-9734

4) Responsible Official name and address

Ryan Blood
PSE M/S NOB
PO Box 91269
Bellevue, WA 98009-9269

5) Telephone number and name of plant site manager/contacts

Charlie Sziebert
Plant Manager
(509) 250-6041

Ray Rose
O&M Supervisor
(360) 855-5479

6) Were there any changes to the facility impacting air emissions since receiving the current Air Operating Permit? [if yes, please describe changes]

No

Part 2: Process and Emissions Information

7) Will there be any changes to the operating scenario(s) identified in the current AOP?

No changes to the operating scenarios identified in the current operation permit are requested.

8) Provide a description of process and products by Standard Industrial Classification (SIC) Code. Please list the applicable SIC Code. Please repeat the list of processes and products for each alternative operating scenario.

SIC Code 4911. This industry classification includes establishments engaged in the generation, transmission, and/or distribution of electric energy for sale.

9) Please list any and all pollutants that would cause the facility to be classified as a "major source" as defined in WAC 173-401.

Nitrogen Oxide (NOx)
Carbon Monoxide (CO)
Sulfur Dioxide (SO2)
Particulate Matter (PM10)

10) Please identify and describe all points of emissions at the facility except those that qualify as insignificant emission units or activities as defined in WAC 173-401-530. Are these emissions units correctly identified and defined in the current AOP? If not, please note the requested changes below.

Puget Sound Energy – Fredonia Generating Station is a fossil fuel-fired combustion turbine facility designed to generate electrical power from four different units. All four combustion turbine units are capable of firing on natural gas or distillate fuel. Units 1 and 2 at the facility are Westinghouse W501D simple cycle combustion turbines and Units 3 and 4 at the facility are Pratt and Whitney Model FT-8 Twin Pac simple cycle combustion turbines. Units 3 & 4 are each comprised of two turbines coupled to a single electrical generator and discharge exhaust gases through a single stack.

Onsite is a fixed-cone roof distillate fuel oil storage tank (Tank 1) with a capacity of 4,200,000 gallons.

All emission units are correctly identified in the current AOP.

11) Please list and quantify all emissions of regulated air pollutants from the emission points identified in item 10 above. Please include calculations. If the most recent annual emissions inventory accurately describes these emissions, it is not necessary to repeat the same information here. Please refer the NWAPA to the most recent annual emissions inventory.

Refer to the Annual Emission Inventory report for calendar year 2019 previously submitted to NWCAA (Appendix B).

12) List the fuels used and their respective usage rates at design capacity for the emission points identified in item 10 above.

Each turbine is permitted to burn natural gas and distillate fuel. The primary fuel for the units is natural gas supplied by Cascade Natural Gas/Northwest Pipeline Company. Distillate fuel oil is the backup fuel for all units.

While running on natural gas, Units 1 and 2 ISO usage ratings for gas fuel at baseload are 20,600 scfm. While running on distillate, ISO usage ratings for distillate fuel at baseload are 150 gpm.

While running on natural gas, Units 3 and 4 ISO usage ratings for gas fuel at baseload are 10,242 scfm. While running on distillate ISO usage ratings for distillate fuel at baseload are 70 gpm.

ISO Conditions are defined as 59°F, 60% relative humidity, 14.7 psia.

13) List the raw materials used and their respective usage rates at design capacity for the emission points identified in item 10 above.

Please refer to question #12 above for raw materials used and usage rates.

14) List the production rate at design capacity for the emission points identified in item 10 above.

At baseload ISO conditions, Units 1 and 2 have a production rate of 103.8 MW using gas. At peak conditions, Units 1 and 2 have a production rate of 112.8 MW using gas. While running on distillate, these units have a baseload ISO production rate of 104.1 MW using distillate. At peak conditions, Units 1 and 2 have a production rate of 113.2 MW using distillate.

At baseload ISO conditions, Units 3 and 4 have a production rate of 62 MW (at any temperature) and a heat input of approximately 9,465 BTU/kW-hr with gas and distillate.

ISO Conditions are defined as 59°F, 60% relative humidity, 14.7 psia. Also, as atmospheric conditions change, production rates of the units can vary.

15) Identify the facility operating schedule (anticipated operating hours per day, days per week, weeks per year)

The combustion turbines have no set operating schedule, but were designed and permitted to operate continuously on either natural gas or diesel fuel when the power situation warrants. The AOP still lists restrictions to the operation of Units 3 & 4 based on the calendar month and the sulfur content of the distillate fuel in the tank, as well as how much of the higher sulfur content diesel fuel (>0.01%) that has been combusted by all of the emission units at Fredonia. However, since June 30, 2010, the sulfur content of the distillate fuel in the tank has been less than 0.01 % sulfur by weight and so there are no run limitations based on the calendar month and the sulfur content of the diesel fuel for any of the emission units at Fredonia. Prior to June 30, 2010, a total of 2,519,504 gallons of diesel with a sulfur content greater than 0.01 % by weight was consumed by the four emission units at the Fredonia Generating Station. So while there is room in this limit to consume an additional 380,496 gallons of diesel fuel with a sulfur content greater than 0.01%, it would be unlikely to happen. The test results from samples taken

during the current AOP have typically been around 0.0022% (22 ppm) or less for sulfur. Given that the only diesel fuel available to purchase is ultra-low sulfur diesel at 0.0015% (15 ppm) or less sulfur, it would be extremely unlikely to have any more fuel onsite that would be above 0.01% (100 ppm) sulfur.

16) Please identify all air pollution control equipment at the facility. Is this air pollution control equipment correctly identified and defined in the current AOP? If not, please provide information necessary to correct.

As identified in the current AOP, demineralized water is injected into the turbine combustion chambers of Units 1 and 2 during operation to control NOx emissions by limiting combustion temperatures. Water injection rates are determined by compliance demonstration charts specific to these units. Water injection rates, fuel usage, MW output, date, time, and ambient temperatures are monitored and recorded by the control system.

Units 3 and 4 are equipped with a selective catalytic reduction (SCR) system to reduce NOx emissions from the turbines in conjunction with water injection. NOx reduction is achieved by injecting ammonia (NH3) at a controlled rate upstream of the SCR. The catalyst promotes the reaction between the NH3, NOx and oxygen to form nitrogen and water.

Units 3 and 4 are also equipped with an oxidation catalyst to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions.

Sulfur dioxide emissions are limited by use of natural gas and low sulfur diesel fuels.

All air pollution control equipment is correctly identified in the current AOP.

17) Please identify and describe all compliance monitoring devices or activities at the facility.

Units 1 and 2 inject water during operation to control NOx emissions by limiting combustion temperatures. Water injection rates are determined by compliance demonstration charts specific to these units. Water injection rates, fuel usage, MW output, date, time, and ambient temperatures are monitored and recorded by the control system. The system will automatically alarm if the data determines no water is being injected while the units are operating. In addition, in the event of a water injection system trip, the turbine control system will also automatically reduce the unit MW output to a lower set point below that in which water injection is required (based on the Compliance Curve).

Units 3 and 4 utilize a Continuous Emission Monitoring System (CEMS) installed on each unit's exhaust stack. The CEMS monitors CO and NOx (concentration and mass emissions), fuel usage, and oxygen per Acid Rain Program requirements (40 CFR Part 75) and NH3 consumption.

Visual monitoring is completed once per month for both fuels.

18) Identify any limitations on source operation that affect emissions of a regulated pollutant. Similarly, list any work practice standards that affect emissions of a regulated pollutant at this facility.

Facility operations are limited by the capacity of the equipment and the emission standards in effect. Please reference the information above and the attached AOP 003R3M1 for additional information.

Part 3: Applicable Requirements

19) Cite and describe all applicable requirements. An updated copy of the applicable requirements in the current AOP for the facility may be sufficient.

Please refer to AOP 003R3M1:
Section 2 – Standard Terms and Conditions
Section 3 – Standard Terms and Conditions for NSPS and NESHAP
Section 4 – Generally Applicable Requirements
Section 5 - Specifically Applicable Requirements
Section 6 – Units 3 and 4 Acid Rain Permit

20) Please list any applicable test method(s) for determining compliance with each applicable requirement listed in item 19 above. An updated copy of the current AOP for the facility may be sufficient.

Please refer to AOP 003R3M1:
Section 4 – Generally Applicable Requirements
Section 5 - Specifically Applicable Requirements
Section 6 – Units 3 and 4 Acid Rain Permit

21) Does the applicant propose any exemptions from an otherwise applicable requirement? If so, please explain.

No

22) Does the CAM rule (40 CFR part 64) apply to any of the emissions units?

Yes, for Units 1 and 2 the CAM rule applies for NOx since the facility has potential pre-control device emissions classifying the facility as a major source, is subject to an emission limitation and uses add-on control technology.

No, for Units 3 and 4. Since these units utilize continuous emission monitoring systems for NOx and CO, CAM should not apply to (40 CFR 64.(2)(b)(1)(vii) these units.

23) Does the accidental release prevention regulation (40 CFR part 68) apply to the facility?

No

24) Do the federal Acid Rain rules (40 CFR parts 72-78) apply to any of the emissions units?

Yes, the Acid Rain rules apply to Units 3 and 4 since they are affected units that produced electricity for sale and were constructed after 11/15/1990 (40 CFR 72.6).

25) Are there any requested changes to any condition in the current Air Operating Permit? [if yes, identify the condition, the requested change, and the reason]

Yes,

PSE would like to request the removal of AOP Terms 5.1.2, 5.1.3 and the underlying Regulatory Order 40. In reviewing the PTE calculations that we provided for the

prior permit renewal in 2016, there were no individual HAPS/TAPS that exceeded 10 TPY for either natural gas or distillate fuel. Additionally, the total of all HAPS/TAPS did not exceed 25 TPY for either natural gas or distillate fuel. The PTE calculations were based on the assumption that Unit 1 will run for the full 8760 hours in a calendar year just as the other three units. However, Unit 1 is limited to 688.3 TPY for NOx emissions and this is roughly 1/3 of the allowed NOx emissions from Unit 2, which are 2061 TPY. This limitation would have the same effect on all of the other emissions from Unit 1, which would further reduce the HAPS/TAPS emissions down by 2/3 of what was reported as PTE for Unit 1. Given that the HAPS/TAPS totals do not cross the 10 Ton limit for individual components or 25 Tons for combined even with the assumption of 8760 hours of run time for Unit 1 in a calendar year, the reality of the hard emission limit in NOx TPY for Unit 1 means that it isn't possible for the plant to exceed these limits. For these reasons, PSE is requesting removal of these terms and the required reporting.

Under a separate submittal to the Washington State Department of Ecology, PSE plans to request modifications to Fredonia's underlying PSD Permit No. 01-04. The modifications include:

1. **Requesting a ½ hr startup/shutdown exemption for NOx (similar to CO permit terms).**
2. **Requesting to replace the quarterly O&M Manual certification for Units 3 & 4 with an annual certification included in the Annual Compliance Certification submittal.**

26) If the applicant would like to request that the permit shield be extended to cover certain requirements that the applicant believes are inapplicable, please list those requirements, below. Please include a brief narrative description of each requirement and the basis for the belief that each is inapplicable.

PSE requests that the permit shield be extended to the requirements listed in section 6 of the AOP. Also, PSE would like to add to the list the requirements under WAC 173-400 regarding Washington State's greenhouse gas emissions performance standard as the Fredonia facility is not a baseload plant.

Part 4: Compliance Status and Certification

27) Describe the compliance status of the facility with regard to all applicable requirements. Compliance status for each applicable requirement shall be described as "continuous" or "intermittent". Please include the method used for determining compliance. If an annual compliance certification has been recently submitted to the NWAPA, the applicant may reference this report. However, if the applicable requirements or compliance status have changed since that submittal, an updated submittal is required.

Reference the 2020 Title-V Air Operating Permit Annual Compliance Certification (Appendix C).

28) Provide the following:

a) For applicable requirements with which the source is in compliance, provide a statement that the source will continue to comply with such requirements;

For applicable requirements with which Puget Sound Energy - Fredonia is in compliance, Puget Sound Energy - Fredonia will continue to comply with such requirements (see Appendix C).

b) For applicable requirements that become effective during the permit term, provide a statement that the source will meet such requirements on a timely basis;

For applicable requirements that will become effective during the permit term, Puget Sound Energy - Fredonia will meet such requirements on a timely basis.

c) For applicable requirements with which the source is not in compliance at the time of permit issuance, provide a narrative description and provide a schedule of compliance. Such a schedule shall include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with any applicable requirements for which the source will be in noncompliance at the time of permit issuance. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based;

Based on information and belief formed after reasonable inquiry the facility is in compliance with all applicable requirements.

d) For sources required to have a schedule of compliance to remedy a violation, provide a schedule for submission of certified progress reports every six months or at a more frequent period if specified in an applicable requirement; and

No schedule required.

Statement of Certification: *Based on information and belief formed after reasonable inquiry, the statements and information in this document and any attachments are true, accurate and complete.*

Ryan Blood	**Director, Generation North**
Name of designated responsible official	Title of responsible official
Ryan Blood	3/24/2021
Signature of responsible official	Date