Northwest Pipeline, LLC
8907 NE 219th Street
Battle Ground, WA 98604

July 19, 2023

Jason Bouwman
Northwest Clean Air Agency
1600 South Second Street
Mount Vernon, WA 98273-5202

Subject: **Title V Operating Permit Renewal Application**
Air Operating Permit 002R3, Expires August 16, 2024
Northwest Pipeline, LLC – Mount Vernon Compressor Station
NWCAA ID: 1440
Skagit County, Washington

Dear Mr. Bouwman:

Northwest Pipeline, LLC (Northwest) hereby submits the attached Title V Operating Permit Renewal Application for the Mount Vernon Compressor Station, located at 15498 Lange Road in Mount Vernon, Skagit County, Washington.

No changes have been made and no new equipment has been installed at the facility since the current Title V Operating Permit was issued on August 16, 2019 other than those described below.

The current Title V Operating Permit expires August 16, 2024, and the renewal application is due no later than twelve (12) months prior to permit expiration.

The only changes being requested to the Operating Permit are identified below.

- Please update the Responsible Official from Glen Jasek to Camilo Amezquita.
- Please update the Title V permit language to align the existing OAC's terms and conditions with those in the PSD amendment update (PSD 01-09, Amendment 7) issued January 24, 2020.

A Site-Wide Potential to Emit Summary is provided below:

Northwest Pipeline LLC
Mount Vernon Compressor Station
Application to Renew Title V Operating Permit

Site-Wide Potential-to-Emit (PTE) Summary

Status	Source ID	Description	NOx tpy	CO tpy	VOC tpy	HCHO tpy	MeOH tpy	Tot HAP tpy	CO2e tpy
Existing	Unit 1	Compressor Engine 01 - Dresser-Rand Clark TCV-12	191.05	368.18	15.86	7.30	0.33	10.51	15,479
Existing	Unit 2	Compressor Engine 02 - Dresser-Rand Clark TCV-12	158.73	86.11	15.86	7.30	0.33	10.51	15,479
Existing	Unit 3	Compressor Turbine 01 - Solar Centaur 50-6100S	11.04	0.22	0.00	0.16	---	0.24	25,035
Existing	Unit 4	Compressor Turbine 02 - Solar Mars 90-12000S	24.66	2.28	0.09	0.31	---	0.47	49,045
Existing	Unit 5	Compressor Turbine 03 - Solar Centaur 40-4700S	Mobile Turbine Operates on As-Needed Basis When Clark Engine is Unavailable						
Existing	Unit 6	B Plant - Sellers C-125-W Boiler	2.25	1.89	0.12	2E-03	---	0.05	2,721
Existing	Unit 7	C Plant - Sellers C-80-W Boiler	1.44	1.21	0.08	1E-03	---	0.03	1,736
Existing	Unit 8	Backup Generator - Caterpillar G3412	0.04	0.04	0.04	0.03	4E-03	0.04	147
		Total PTE:	**389.22**	**459.93**	**32.06**	**15.10**	**0.66**	**21.85**	**109,643**

In addition to this paper copy with the Responsible Official's signature, an e-mail copy has also been provided to the Northwest Clean Air Agency.

If you have any questions concerning this Title V Operating Permit Renewal Application, please contact Monica Mogg at (360) 600-1907 or Monica.Mogg@Williams.com.

Sincerely,

DocuSigned by:
Camilo Amezquita
DABE55A3AC5F45D...

Camilo Amezquita
VP / GM - Northwest Pipeline

Attachments:

Title V Operating Permit Application Form
Compliance Monitoring Devices and Activities
Applicable Requirements (Sections 4 and 5 of Operating Permit 002R3)
Emission Calculations

Title V Operating Permit Renewal Application
Permit No. 002R3, Expires August 16, 2024

For the:

Northwest Pipeline, LLC

Mount Vernon Compressor Station

NWCAA ID: 1440

Skagit County, Washington

Submitted to:

Northwest Clean Air Agency
1600 South Second Street
Mount Vernon, WA 98273-5202

Submitted by:

Northwest Pipeline, LLC
8907 NE 219th Street
Battle Ground, WA 98604

Prepared by:

EcoLogic Environmental Consultants, LLC
864 Windsor Court
Santa Barbara, CA 93111

July 2023

Title V Operating Permit Renewal Application
Permit No. 002R3, Expires August 16, 2024

Northwest Pipeline, LLC
Mount Vernon Compressor Station (NWCAA ID: 1440)
Skagit County, WA

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Mount Vernon Compressor Station (NWCAA ID: 1440)
Skagit County, WA

Attachment 1
Title V Operating Permit Application Form

northwest Clean Air agency

1600 South Second Street
Mount Vernon, WA 98273-5202
ph 360.428.1617
fax 360.428.1620
www.nwcleanair.org

Title V Air Operating Permit

Renewal Application

The information requested in this document must be provided for a complete application. Please submit to the Northwest Clean Air Agency (NWCAA) one paper copy 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]

Northwest Pipeline, LLC
295 Chipeta Way
Salt Lake City, UT 84108

2) Current Air Operating Permit number and expiration date

002R3 Expires August 16, 2024

3) Owner's name and agent

Northwest Pipeline, LLC
Monica Mogg

4) Responsible Official name and address

Camilo Amezquita
VP/GM - Northwest Pipeline
2800 Post Oak Blvd, Houston, TX 77056-6147

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

Sam Chesnut - Operations Supervisor, Seattle Area
(360) 201-8923

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

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 4922 – Natural Gas Transmission

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.

NOx, CO and formaldehyde

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.

Unit #1 Clark TCV-12
Unit #2 Clark TCV-12
Unit #3 Solar Centaur 50
Unit #4 Solar Mars 90
Unit #6 Sellers C-125-W Boiler
Solar Centaur 40 Turbine (Please Note: This unit is portable and operated only during periods when Clark engine is not operable

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.

See Attachment 4 - Emission Calculation Spreadsheet

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

Natural gas is the sole fuel source for listed equipment at the Mount Vernon Compressor Station. See Attachment 4 - Emission Calculation Spreadsheet for design capacities.

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

See Attachment 4 - Emission Calculation Spreadsheet for design capacities.

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

See Attachment 4 - Emission Calculation Spreadsheet

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

24 hours per day
7 days per week
52 weeks per year

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.

The 545 bhp emergency generator engine is equipped with a three-way catalyst (NSCR).

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

See Attachment 2 - Compliance monitoring devices/activities

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.

The standby generator engine will operate no more than 500 hours per year, except during emergencies.

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.

See Attachment 3 - Applicable Requirements from current AOP

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.

40 CFR 60 Appendix A Method's 7A-7E, 9, 10, 20
EPA Conditional Test Method 034

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?

No

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?

No

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. The AOP should be updated to align the existing OAC's terms and conditions with those in the PSD amendment update (PSD 01-09, Amendment 7) issued January 24, 2020.

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.

Applicant does not request permit shield to be extended.

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 NWCAA, the applicant may reference this report. However, if the applicable requirements or compliance status have changed since that submittal, an updated submittal is required.

Please see Compliance Report Submitted on January 19, 2023

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;

Northwest Pipeline LLC is currently in compliance and will continue to comply with all terms and conditions of Title V Operating Permit 002R3

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;

Northwest Pipeline LLC will comply on a timely basis with any applicable requirement that becomes effective during the permit term.

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;

Not Applicable

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; an

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.

Camilo Amezquita	VP/GM - Northwest Pipeline
Name of designated responsible official	Title of responsible official
DocuSigned by: Camilo Amezquita DABE55A3AC5F45D...	7/19/2023
Signature of responsible official	Date

Title V Operating Permit Renewal Application
Permit No. 002R3, Expires August 16, 2024

Northwest Pipeline, LLC
Mount Vernon Compressor Station (NWCAA ID: 1440)
Skagit County, WA

Attachment 2
Compliance Monitoring Devices and Activities

Attachment 2
Northwest Pipeline LLC - Mount Vernon Compressor Station
Compliance Monitoring Devices and Activities

Emission Unit	Compliance Monitoring Device/Activity	Method for determining compliance
All	Monthly and twelve month rolling total NOx emission calculations for each significant emission unit	Recordkeeping
1,2	One of the two Clark engines shall be tested for NOx once every five years.	Method 7A-7E
All	Sulfur monitoring to assure that only natural gas from the pipeline is used as fuel.	Sulfur Chromatograph
3,4	Annual boroscope analysis	Recordkeeping
3,4	Semiannual inspection of fuel injectors	Recordkeeping
3,4	Conduct NOx and CO emissions test using a portable emissions analyzer not less than 336 hours or 672 hours upon demonstrating compliance for 6 months.	Modified CTM-034
3,4	Accuracy of portable emissions analyzers shall be verified annually	Modified CTM-034
3,4	Total sulfur in the fuel is monitored with a sulfur chromatograph located at the Sumas Compressor Station.	Sulfur Chromatograph
3,4	Records of the number of startups and shutdowns are maintained.	Recordkeeping
3,4	Conduct annual opacity measurements	Method 9
3,4	Conduct annual NOx and CO Source tests	Method 10 and 20
3,4	Monthly NOx and CO emission calculations to demonstrate compliance with annual emission limit	Recordkeeping
3,4	Each startup and shutdown of units will be recorded.	Recordkeeping
Centaur 40	Conduct NOx and CO stack test following 5000 hours of operation	Method 10 and 20
Centaur 40	Fuel use summary when in operation	Recordkeeping
All	Maintain log of all nuisance complaints received	Recordkeeping
Generator	The hours the standby generator operates are monitored with an hour meter to assure it operates less than 500 hours in any consecutive 12 month period.	Recordkeeping
Generator	The standby generator will be tested for NOx with a portable analyzer at least once every 500 hours of operation.	Modified CTM-034
Boiler	The boiler will be emissions tested for compliance with NOx limits not less frequently than once every 5 years of operation	Modified CTM-034
Boiler	A log of boiler operating hours will be maintained.	Recordkeeping

Title V Operating Permit Renewal Application
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Northwest Pipeline, LLC
Mount Vernon Compressor Station (NWCAA ID: 1440)
Skagit County, WA

Attachment 3
Applicable Requirements
Sections 4 and 5 of Operating Permit 002R3

SECTION 4 GENERALLY APPLICABLE REQUIREMENTS

The cited requirements in the "Citation" column and incorporated herein by reference are applicable plant-wide at the source, including insignificant emission units. These requirements are federally enforceable unless identified as "State Only". A requirement designated "State Only" is enforceable only by the state or the NWCAA, and not by the EPA or through citizen suits. The "Description" column is a brief description of the applicable requirements for informational purposes only and is not enforceable. Periodic or continuous monitoring requirements (including testing) are specified in the "Monitoring, Recordkeeping & Reporting" column, which identifies monitoring, recordkeeping and reporting (MR&R) obligations the source must perform as required by WAC 173-401-605(1) and 615(1) and (2) or the underlying requirement. MR&R obligations do not apply to insignificant emission units.

The requirements in the MR&R column listed below the *"Directly Enforceable"* label are legally enforceable requirements added under the NWCAA's "gap-filling" authority (WAC 173-401-615(1)(b) & (c), (10/17/02)). Other requirements not labeled *"Directly Enforceable"* or above the *"Directly Enforceable"* label are brief descriptions of the regulatory requirements for information purposes, and are not enforceable. Unless the text of the MR&R column is specifically identified to be directly enforceable, the language of the cited regulation takes precedence over a paraphrased requirement.

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.1 General	WAC 173-401-615(3) (10/17/02) 40 CFR 60 Subpart A 60.19(c) (2/12/98) 40 CFR 63 Subpart A 63.10(a)(5) (4/20/06)	Required Monitoring Reports Submit reports of any required monitoring to the NWCAA at least once every six months. All instances of deviations from permit requirements must be clearly identified in such reports.	*Directly Enforceable:* Monthly reports shall cover a calendar month, quarterly reports shall cover a calendar quarter, six-month reports shall cover January through June and July through December, and annual reports shall cover a calendar year. The reports shall be submitted within 30 days after the close of the period that the reports cover, except when the reporting deadline is specified in a permit term including, but not limited to: AOP Term 2.1.8 – Source Testing AOP Term 2.4.1 – Annual AOP Certification AOP Term 2.4.4 – Annual emissions inventory AOP Term 2.4.5 – Annual GHG emissions AOP Term 2.9.1 - GHG Clean Air Rule
4.2 General	NWCAA 342 (9/8/93) NWCAA 342 (7/14/05 State Only)	Operation and Maintenance Sources are required to keep any process and/or air pollution control equipment in good operating condition and repair.	Operating instructions and maintenance schedules for process and/or control equipment must be available on site.

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.3 Nuisance	NWCAA 530 (3/09/00 State Only)	General Nuisance No person shall discharge from any source quantities of air contaminants, with the exception of odors, in sufficient amounts and of such characteristics and duration as is likely to be injurious or cause damage to human health, plant or animal life, or property; or which unreasonably interferes with enjoyment of life and property. An air contaminant is defined as "dust, fumes, mist, smoke, other particulate matter, vapor gas, odorous substance, or any combination thereof.	*Directly Enforceable:* A written air contaminant complaint response plan will be maintained at the facility. Upon receiving an air contaminant complaint from the NWCAA or the public, all possible sources of the nuisance emissions at the facility shall be checked for proper operation. Problems identified shall be repaired or corrected as soon as practicable. If the problems identified cannot be repaired or corrected within four hours, action shall be taken to minimize emissions until repairs can be made and the NWCAA shall be notified within 12 hours with a description of the complaint and action being taken to resolve the problem. The results of the investigation, identification of any malfunctioning equipment or aberrant operation, and the date and time of repair or mitigation shall be recorded. A log of these records shall be maintained for inspection. Receipt of a nuisance complaint in itself shall not necessarily be a violation.
4.4 Nuisance	WAC 173-400-040(5) (9/20/93) WAC 173-400-040(6) (9/16/18 State Only)	Emission Detrimental to Persons or Property No person shall cause or allow the emission of any air contaminant from any source if it is detrimental to the health, safety, or welfare of any person, or causes damage to property or business.	
4.5 Odor	NWCAA 535 (3/09/00 State Only)	Odor Control Measures Appropriate practices and control equipment shall be installed and operated to reduce odor-bearing gases emitted into the atmosphere to a reasonable minimum. Any person who shall cause the generation of any odor from any source which may reasonably interfere with any other property owner's use and enjoyment of their property must use recognized best practices and control equipment to reduce these odors to a reasonable minimum. No person shall cause or permit the emission of any odorous air contaminant from any source if it is detrimental to the health, safety, or welfare of any person, or causes damage to property or business.	
4.6 Odor	WAC 173-400-040(5) (9/16/18 State Only)	Odors Source may not generate odors which may unreasonably interfere with property use and must use recognized good practice and procedures to reduce odors to reasonable minimum.	

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.7 Odor	OAC 794e, Condition 14, (3/26/12)	Odors from the facility shall not result in a nuisance at or beyond the property boundary as determined by NWCAA staff.	
4.8 PM	NWCAA 550 (4/14/93)	Preventing Particulate Matter from Becoming Airborne Best Available Control Technology (BACT) required to prevent the release of fugitive matter to the ambient air. Nuisance particulate fallout is prohibited.	*Directly Enforceable:* Follow MR&R under AOP Term 4.5.
4.9 PM	NWCAA 550 (9/11/14 State Only)	Preventing Particulate Matter from Becoming Airborne The owner or operator of a source or activity that generates fugitive dust, including, but not limited to, material handling, building construction or demolition, abrasive blasting, roadways and lots, shall employ reasonable precautions to prevent fugitive dust from becoming airborne and must maintain and operate the source or activity to minimize emissions. It shall be unlawful for any person to cause or allow the emission of particulate matter which becomes deposited upon the property of others in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.	
4.10 PM	WAC 173-400-040(3) (9/16/18 State Only)	Fallout Source may not generate the emission of particulate matter to be deposited beyond the property line in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.	
4.11 PM	WAC 173-400-040(3)(a) (9/20/93) WAC 173-400-040(4)(a) (9/16/18 State Only)	Fugitive Emissions From an emissions unit engaging in materials handling, construction, demolition, or other operation which is a source of fugitive emissions, take reasonable precautions to prevent the release of air contaminants from the operation.	

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.12 PM	WAC 173-400-040(8)(a) (9/20/93) WAC 173-400-040(9)(a) (9/16/18 State Only)	Fugitive Dust Reasonable precautions to prevent release of fugitive dust required. Maintain and operate source to minimize emissions.	
4.13 VE	NWCAA 451.1 (10/13/94)	Emission of Air Contaminant - Visual Standard No person shall cause or permit the emission, for any period aggregating more than 3 minutes in any 1 hour, of an air contaminant from any source which, at the point at emission, or within a reasonable distance of the point of emission, exceeds 20% opacity (Ecology Method 9A) except: When there is valid data to show that the opacity is in excess of 20% as a result of the presence of condensed water droplets, and that the concentration of the particulate matter, as shown by a source test approved by the Control Officer, is less than 0.10 (0.23 g/m^3) grain/dscf.	*Directly Enforceable:* At least once during each calendar quarter that an emission unit operates, conduct qualitative or quantitative (as described in (iii) below) visual observations on each stack while operating to determine whether there are visible emissions (VE). If, at any time, visible emissions are observed, take one or more the following actions within 24 hours or it will be considered prima facie evidence that all applicable opacity limits have been exceeded. (i) Complete action that returns visible emissions to a non-visible level. (ii) Shutdown the unit until appropriate corrective action can be taken.
4.14 VE	NWCAA 451.1 (11/8/07 State Only)	Emission of Air Contaminant - Visual Standard No person shall cause or permit the emission, for any period aggregating more than 3 minutes in any 1 hour, of an air contaminant from any source which, at the point at emission, or within a reasonable distance of the point of emission, exceeds 20% opacity except: When there is valid data to show that the opacity is in excess of 20% as a result of the presence of condensed water droplets, and that the concentration of the particulate matter, as shown by a source test approved by the Control Officer, is less than 0.10 (0.23 g/m^3) grain/dscf.	

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.15 VE	WAC 173-400-040(1) (9/20/93) WAC 173-400-040(2) (9/16/18 State Only)	Visible Emissions No person shall cause or allow the emission for more than three minutes, in any one hour, of an air contaminant from any emissions unit which at the emission point, or within a reasonable distance of the emission point, exceeds twenty percent opacity except: When the owner or operator of a source supplies valid data to show that the presence of uncombined water is the only reason for the opacity to exceed 20%.	(iii) Observe and record VE using a certified observer in accordance with EPA Method 9 (six consecutive minutes). If any single reading is greater than an applicable numerical opacity limit, the certified observer shall determine opacity in accordance with the appropriate method for each opacity limit applicable to that emission unit. A certified observer shall determine opacity on a daily basis according to each applicable opacity limit until visible emissions are determined to be in compliance with each opacity limit. For each qualitative or quantitative VE observation, record the date and time of the observation, emission unit(s) observed, and name of observer. For stacks with visible emissions, record any related equipment or operational failure, failure dates and times, duration of visible emissions, and corrective actions taken. If visible emissions are observed, a follow-up qualitative or quantitative observation shall be made within a month. If no visible emissions are observed, return to the quarterly observation frequency. Compliance with this MR&R does not excuse an exceedance of the underlying opacity standard.
4.16 PM	NWCAA 455.1 and 455.11 (9/8/93) NWCAA 455.1 and 455.11 (5/11/95 State Only)	Emission of Particulate Matter No person shall cause or permit emission of particulate matter in excess of 0.10 grain/dry standard cubic foot (dscf) (0.23 g/m3) (combustion emissions shall be corrected to 7% O2) except: 455.11 From all gaseous and distillate fuel burning equipment, emissions shall not exceed 0.05 grain/dscf (0.11 g/m3) at 7% O_2.	*Directly Enforceable:* Follow MR&R under AOP Term 4.15.
4.17 PM	WAC 173-400-060 (3/22/91) WAC 173-400-060 (7/1/16 State Only)	Emission Standards for General Process Units Particulate emissions greater than 0.1 grain/dscf prohibited.	

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.18 PM	WAC 173-400-050(1) and (3) (3/22/91) WAC 173-400-050(1) and (3) (7/1/16 State Only)	Emission Standards for Combustion and Incineration Units Particulate emissions from combustion units greater than 0.1 grains/dscf at 7% O_2 prohibited.	
4.19 SO_2	NWCAA 462 (10/14/87)	Emission of Sulfur Compounds Sulfur compound emissions, calculated as SO_2, shall not exceed 1,000 ppmvd at 7% O_2. This requirement is not violated if reasonable evidence is presented that concentrations will not exceed ambient standards and the permittee demonstrates that no practical method of reducing the concentration exists.	*Directly Enforceable:* Maintain records of type, quantity, and sulfur content of all fuel combusted in accordance with AOP term 5.4. Records shall be made available for inspection upon request.
4.20 SO_2	NWCAA 462 (3/13/97 State Only) WAC 173-400-040(7) (9/16/18 State Only)	Emission of Sulfur Compounds Sulfur compounds emissions, calculated as SO_2, shall not exceed 1,000 ppmvd at 7% O_2 averaged for a 60 consecutive minute period. This requirement is not violated if reasonable evidence is presented that concentrations will not exceed ambient standards and the permittee demonstrates that no practical method of reducing the concentration exists.	
4.21 SO_2	WAC 173-400-040(6) first paragraph only (9/20/93)	Sulfur Dioxide Sulfur dioxide emissions shall not exceed 1,000 ppmvd at 7% O_2 for combustion sources, based on the average of any 60 consecutive minute period.	
4.22 SO_2	NWCAA 520.14 (4/14/93)	Sulfur Compounds in Fuel Prohibited to burn, sell, or make available for sale for burning in fuel burning equipment within the jurisdiction of the NWCAA, fuel containing sulfur in excess of the following for a time period not to exceed 30 days in a 12-month period: • gaseous fuels – 50 grains/100 scf	

Term	Citation	Description	Monitoring, Recordkeeping, & Reporting
4.23 SO_2	NWCAA 520.14 (5/9/96 state only)	Sulfur Compounds in Fuel Prohibited to burn, sell, or make available for sale for burning in fuel burning equipment within the jurisdiction of the NWCAA, fuel containing sulfur in excess of the following for a time period not to exceed 30 days in a 12-month period: • gaseous fuels – 50 grains/100 scf Ocean-going vessels are exempt.	

SECTION 5 SPECIFICALLY APPLICABLE REQUIREMENTS FOR EMISSION UNITS

The cited requirements in the "Citation" column and incorporated herein by reference are applicable to emission units specified in the header of the table. These requirements are federally enforceable unless identified as "State Only". A requirement designated "State Only" is enforceable only by the state or the NWCAA, and not by the EPA or through citizen suits. The "Description" column is a brief description of the applicable requirements for informational purposes only and is not enforceable. Periodic or continuous monitoring requirements, including testing, are specified in the "Monitoring, Recordkeeping and Reporting" (MR&R) column, which identifies MR&R obligations the source must perform as required by WAC 173-401-605(1) and 615(1) and (2) or the underlying requirement. MR&R obligations do not apply to insignificant emission units. The test method cited or any credible evidence may be used to determine compliance.

The requirements in the MR&R column labeled "Directly Enforceable" are legally enforceable requirements added under the NWCAA's "gap-filling" authority (WAC 173-401-615(1)(b) & (c), (10/17/02)). Other requirements not labeled "Directly Enforceable" are brief descriptions of the regulatory requirements for information purposes, and are not enforceable. Unless the text of the MR&R column is specifically identified to be directly enforceable, the language of the cited regulation takes precedence over a paraphrased requirement.

All of the federal regulations listed in Section 5 have been adopted by reference in Section 104.2 of the NWCAA Regulation. NWCAA 104.2 was last amended by the agency on September 13, 2018.

Table 5-1 Specifically Applicable Requirements

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
Entire Facility			
5.1 NO_X	OAC 794e Conditions 12 and 13(c) (3/26/12)	Plantwide NO_X Emissions - NO_X emissions from the facility's significant emission units shall not exceed 753.2 tons for any twelve consecutive months.	Submit report within 45 days following each quarter summarizing the number of pounds of NO_X emitted from each significant emission unit, both existing and new equipment, per month in the quarter and as a twelve consecutive month rolling sum.
5.2 NO_X	PSD 93-01 Amendment 1 Condition 3 (5/11/98)	Plantwide NO_X Emissions - NO_X emissions from the facility shall not exceed 716.7 tons for any twelve consecutive months.	
Clark TCV-12 Reciprocating Engines (Units 1-2; A-Plant)			
5.3 NO_X	PSD 93-01 Amendment 1 Conditions 3 and 6 (5/11/98)	NO_X emissions from one of the two identical Clark TCV-12 reciprocating engines shall be tested (EPA Method 7-7E) once every five years, with the first test performed in 1997.	Comply with source testing requirements in Term 2.1.8.3.

This section needs to be updated to align the existing OAC's terms and conditions with those in the PSD amendment update (PSD 01-09, Amendment 7) issued January 24, 2020

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
	OAC 794e Condition 11 (3/26/12)		
5.4	PSD 93-01 Amendment 1 Condition 9 (5/11/98)	Operation and Maintenance Manuals for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Emissions that result from a failure to follow the requirements of the manuals may be considered proof that the equipment was not properly operated and maintained.	*Directly Enforceable:* Monitor, keep records and report in accordance with the terms of this permit.
Centaur 50S Turbine (Unit 3), Caterpillar 450 kW Emergency Generator (Unit 8) (B-Plant); and Mars 90S Turbine (Unit 4), Sellers C-80-W Heater/Boiler (Unit 7) (C-Plant)			
5.5 SO_2	PSD-01-09 Amendment 6 Conditions 1, 8.2, 8.3.1 and 8.3.2 (2/22/12)	NWP-MVCS may only burn natural gas from the pipeline.	Submit quarterly reports certifying that only natural gas from the pipeline was used. Monitor and report the analytical data from the NWP-Sumas Compressor Station monitor location regarding the chemical composition of the fuel. *Directly enforceable* Submit quarterly reports no later than 45 days after the end of each calendar quarter.
5.6 General	PSD-01-09 Amendment 6 Conditions 8.3.3 and 9 (2/22/12)	Operation and Equipment (O&M) Manual for the facility. Within 90 days of startup NWP-MVCS shall identify operational procedures for the 450 kW standby generator, Sellers C-80 heater/ boiler, the Solar Centaur 50S combustion turbine and the Solar Mars 90S combustion turbine that constitute proper operation relative to compliance with emission limitations.	Keep O&M manuals up-to-date and readily available at the facility. Manuals shall include: • Manufacturers' operating instructions and design specifications. • Normal operating parameters and design specifications. • Updates to reflect any modifications made to equipment or operating procedure. Submit quarterly reports certifying that relevant equipment was operated and maintained in accordance with operational parameters and practices incorporated in the O&M Manual. *Directly Enforceable* Submit quarterly reports no later than 45 days after the end of each calendar quarter.

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
Centaur 50S Turbines (Unit 3; B-Plant) and Mars 90S (Unit 4; C-Plant)			
5.7 General	PSD-01-09 Amendment 6 Condition 4 (2/22/12) OAC 794e Condition 1 (3/26/12)	(a) Startup is defined as any operating period that is ramping up from less than 90% of full load, and less than 15 minutes has elapsed since fuel was introduced to the turbine after the immediately preceding shutdown. (b) Shutdown is defined as any operating period below 90% of full load, and fuel feed has continued for not more than 15 minutes after going below 90% of full load operation.	NWP-MVCS shall keep a log of each startup and shutdown event.
5.8 CO	OAC 794e Conditions 2, 8, and 13(a) (3/26/12)	Annual CO emissions from the two turbines, including emissions during startup and shutdown, shall not exceed the limits below. The emissions shall be calculated, and compliance status shall be determined, each month for the previous 12-month rolling period. (a) Mars 90S: 46.4 ton/year (b) Centaur 50S: 27.5 ton/year	Within twenty days of the end of each month, NWP-MVCSNWP-MVCS shall determine the tons of CO emissions from each of the turbines for the most recent consecutive 12 months. For this calculation, NWP-MVCS shall utilize a time-weighted average of the relevant stack test results wherein the results of each source test shall be the presumed emission rate until the next source test. Submit report within 45 days following each quarter with all calculations of CO emitted (tpy) from each turbine.
5.9 CO	OAC 794e Conditions 1 and 3 (3/26/12)	When determining compliance status with Term 5.7, NWP-MVCS shall count CO emissions during startup and shutdown at the rates specified below: (a) Mars 90S: 11 lb CO per startup. (b) Mars 90S: 4 lb CO per shutdown. (c) Centaur 50S: 4 lb CO per startup. (d) Centaur 50S: 0.7 lb CO per shutdown.	NWP-MVCS shall keep a log of each startup and shutdown event.
5.10 CO, VE	OAC 794e Conditions 4, 5, and 7 (3/26/12)	Except during periods of startup or shutdown, neither of the turbines shall exceed the following short-term emission rates: (a) CO: 50 ppmvd at 15% O_2 (1-hour average) (b) VE: 5% opacity as measured by 40 CFR 60 Appendix A Method 9	NWP-MVCS shall monitor compliance with the CO limit in this Term by measuring the CO concentration of each turbine exhaust stack no less frequently than once every 336 hours of turbine operation, except as provided in paragraph (d). (a) NWP-MVCS shall conduct these measurements by use of a portable emissions analyzer capable of adjustment to the 15% O_2 concentration basis, and verified as accurate in accordance with the process described in Term 5.11.

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
			(b) Testing shall be in accordance with USEPA Designated Conditional Test Method 34 (CTM-034). An alternate test method may be used if approved in writing by NWCAA prior to the test. (c) NWP-MVCS shall perform 3 consecutive tests using the portable analyzer. Should the average of the 3 results indicate potential noncompliance with the CO limit in this Term, NWP-MVCS shall shut down the unit as soon as is practical and contact the NWCAA as promptly as possible and in no event more than 12 hours later. Exceedance of the CO limit in this Term as indicated by the average of the three tests shall be prima facie evidence of a violation of the CO limit in this Term. (d) After 6 consecutive months during which every test using the portable emissions analyzer indicates compliance with the CO limit in this Term for a given turbine, NWP-MVCS may submit a request that the testing frequency for that turbine be reduced to no less frequently than once every 672 hours of operation. The request must include an analysis of the accuracy of the portable emissions analyzer using recent accuracy verification data and an analysis of the portable emissions data collected during the 6 months and an explanation as to why these data support the request. Upon NWCAA approval of the request, NWP-MVCS may test at the reduced frequency until such time as the results indicate potential noncompliance with the CO limit in this Term. If this occurs, NWP-MVCS must revert to the 336-hour testing frequency for at least 6 consecutive months at which time NWP-MVCS may again request the reduced testing frequency using the same process as above. NWP-MVCS shall demonstrate compliance with the CO and VE limits in this Term by source testing on an annual basis. Annual source tests shall occur no later than 13 months after the previous tests. Testing for CO shall be conducted at four points in the normal operating range of the turbines, including the minimum point in the normal operating range and peak

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
			load. Testing for VE shall be at peak load. All source testing shall be conducted in accordance with NWCAA Appendix A. EPA Reference Method 10 shall be used for CO and EPA reference Method 9 shall be used for VE.
5.11 NOx	PSD-01-09 Amendment 6 Conditions 5.1.1, 5.1.2, 5.1.5, 5.1.6, 5.2.1, 5.2.2, 5.2.5, 5.2.6 and 8.3.6.1 (2/22/12)	Except during periods of startup or shutdown, neither of the turbines shall exceed the following short-term emission rate: NO_X: 25 ppmvd at 15% O_2, ISO (1-hour average)	NWP-MVCS shall monitor compliance by measuring the NOx concentration of each turbine exhaust stack no less frequently than once every 336 hours of turbine operation. (a) NWP-MVCS may conduct these measurements by use of a portable emissions analyzer capable of adjustment to the 15% O_2 concentration basis, and verify as accurate in accordance with the process described in Term 5.11. (b) Portable emissions analyzer testing shall be in accordance with USEPA Designated Conditional Test Method 34 (CTM-034). An alternate test method may be used if approved in writing by Ecology prior to the test. (c) NWP-MVCS shall perform 3 consecutive tests using the portable analyzer. Should the average of the 3 results indicate potential noncompliance, NWP-MVCS shall shut down the unit as soon as is practical and contact the NWCAA as promptly as possible and in no event more than 12 hours later. Exceedance of the limit as indicated by the average of the three tests shall be prima facie evidence of a violation of the NOx limit. (d) Upon submission of 6 consecutive months monitoring results during which every test using the portable emissions analyzer indicates compliance with the NOx limit for a given turbine, NWP-MVCS may submit a request that the testing frequency for that turbine be reduced to no less frequently than once every 672 hours of operation. The request must include an analysis of the accuracy of the portable emissions analyzer using recent accuracy verification data and an analysis of the portable emissions data collected during the 6 months and an explanation as to why these data support the request. Upon NWCAA approval of the request, NWP-MVCS may test at the reduced frequency until such time as the results indicate potential

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
			noncompliance with the NOx limit. If this occurs, NWP-MVCS must revert to the 336-hour testing frequency for at least 6 consecutive months at which time NWP-MVCS may again request the reduced testing frequency using the same process as above. Demonstrate compliance with an annual source test performed no later than 13 months after the previous test. Compliance shall be demonstrated in accordance with 40 CFR 60 Subpart GG and 40 CFR 60 Appendix A, Method 20 except that the instrument span shall be reduced as appropriate. NWP-MVCS shall submit a test plan to NWCAA for approval at least 30 days prior to testing. NWP-MVCS shall submit a complete test report to the NWCAA no later than 60 days after completion of the tests. Submit report within 45 days following each quarter including all exhaust NOx concentrations since the last report.
5.12 General	OAC 794e Condition 6 (3/26/12)	NWP-MVCS shall verify the accuracy of any portable emissions analyzers used to satisfy the monitoring requirements of OAC 794e no less than once every calendar year in conjunction with the CO test required by Term 5.9.	NWP-MVCS shall submit a protocol to NWCAA for approval for verifying the accuracy of any portable emissions analyzer prior to the analyzer's use to satisfy the monitoring requirements of this Order. After receiving approval for the protocol, NWP-MVCS shall comply with the requirements of the protocol.
5.13 General	PSD-01-09 Amendment 6 Condition 6 (2/22/12)	NWP-MVCS shall verify the accuracy of any portable emissions analyzer used to satisfy the monitoring requirements of this permit.	NWP-MVCS shall verify the accuracy of any portable analyzers not less than once every calendar year in conjunction with annual turbine stack tests and keep records of the emissions analyzer accuracy verifications for not less than five years for Ecology and NWCAA review.
5.14 General	PSD-01-09 Amendment 6 Condition 5.2.5.3 (2/22/12)	Test plan and report timing	Comply with Section 2.1.8.3.
5.15 General	OAC 794e Conditions 9, 10, and 13(b) (3/26/12)	NWP-MVCS shall perform boroscope analysis and visual inspection of fuel injectors on each turbine according to the manufacturer's specified schedule.	Submit report within 45 days following the end of each calendar quarter including the results of the fuel injector inspection and/or boroscope analysis if performed during the quarter. Inspections records and the results of any testing shall be maintained on site for review.

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
5.16 SO_2	40 CFR §60.333(b) (7/8/04) §60.334(h)(3)(i) (2/24/06) NWCAA 104.2 (9/13/18)	NSPS Subpart GG – Fuel Bound Sulfur Sulfur content of fuels limited to 0.8 %, by weight. Any daily period during which the sulfur content of the fuel being combusted in the gas turbine exceeds 0.8%, by weight, shall be deemed a period of excess emissions and reported.	NWP-MVCS has elected not to monitor the total sulfur content of the gaseous fuel as allowed by §60.334(h)(3)(i) and formalized in a letter to NWCAA dated 01/23/04.
Solar Centaur 50S Turbine (Unit 3; B-Plant)			
5.17 NO_X	PSD-01-09 Amendment 6 Condition 5.2.3.1 and 5.2.5 (2/22/12)	NO_X emissions from the Centaur 50S turbine, including emissions during startup and shutdown, shall not exceed 106 lb/calendar day.	Demonstrate compliance with an annual source test performed no later than 13 months after the previous test. Compliance shall be demonstrated in accordance with 40 CFR 60 Subpart GG and 40 CFR 60 Appendix A, Method 20 except that the instrument span shall be reduced as appropriate. NWP-MVCS shall submit a test plan to NWCAA for approval at least 30 days prior to testing. NWP-MVCS shall submit a complete test report to the NWCAA no later than 60 days after completion of the tests.
5.18 NOx	PSD-01-09 Amendment 6 Condition 5.2.3.2, 5.2.6.2 and 8.3.6.2 (2/22/12)	NO_X emissions from the Centaur 50S turbine, including emissions during startup and shutdown, shall not exceed 18.5 tons for any consecutive 12-month period.	Within 20 days of the end of each month, NWP-MVCS shall determine the tons of NOx emissions from the turbine for the most recent consecutive 12 months. For this calculation, NWP-MVCS shall utilize a time-weighted average of the relevant stack test results wherein the results of each source test shall be the presumed emission rate until the next source test. Report the total NOx mass emissions for the 12 immediately preceding months ending with each month included in the report. *Directly Enforceable:* Report shall be submitted quarterly no later than 45 days after the end of each calendar quarter. Report shall include results of all calculations necessary to show compliance status for the reporting period.
5.19 NO_X	PSD-01-09 Amendment 6 Condition 5.2.4 (2/22/12)	When determining compliance status with Term 5.17, NWP-MVCS shall count NO_X emissions at a rate of 2 lb per startup or shutdown.	Record startups and shutdowns.

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
5.20 NO_X	40 CFR §60.332(a)(2) and (d) (6/30/16) §60.334(c) (2/24/06) NWCAA 104.2 (9/13/18)	Subpart GG NO_X Standard The turbine shall not discharge into the atmosphere any gases that contain nitrogen oxides in excess of 178 ppmvd at 15% O_2.	If the owner or operator has previously submitted and received EPA or local authority approval of a petition for an alternative procedure for continuously monitoring compliance with an applicable NO_X emissions limit that procedure may continue to be used. Monitor NO_X emissions in accordance with alternate monitoring program described in Term 5.10.
Solar Mars 90S Turbine (Unit 4; C-Plant)			
5.21 NO_X	PSD-01-09 Amendment 6 Conditions 5.1.3.1 and 5.1.5 (2/22/12)	NO_X emissions from the Mars 90S turbine, including emissions during startup and shutdown, shall not exceed 258 lb/calendar day.	Demonstrate compliance with an annual source test performed no later than 13 months after the previous test. Compliance shall be demonstrated in accordance with 40 CFR 60 Subpart GG and 40 CFR 60 Appendix A, Method 20 except that the instrument span shall be reduced as appropriate. NWP-MVCS shall submit a test plan to NWCAA for approval at least 30 days prior to testing. NWP-MVCS shall submit a complete test report to the NWCAA no later than 60 days after completion of the tests.
5.22 NO_X	PSD-01-09 Amendment 6 Conditions 5.1.3.2, 5.1.6.2 and 8.3.6.2	NO_X emissions from the Mars 90S turbine, including emissions during startup and shutdown, shall not exceed 43.6 tons for any consecutive 12-month period.	Within 20 days of the end of each month, NWP-MVCS shall determine the tons of NO_X emitted from the turbine during the most recent consecutive 12-month period. For this calculation, NWP-MVCS shall utilize a time-weighted average of the relevant reference method stack test results wherein the results of each source test shall be the presumed emission rate until the next source test. Report the total NOx mass emissions for the 12 immediately preceding months ending with each month included in the report. *Directly Enforceable:* Report shall be submitted quarterly no later than 45 days after the end of each calendar quarter. Report shall include results of all calculations necessary to show compliance status for the reporting period.
5.23 NO_X	PSD-01-09 Amendment 6 Condition 5.1.4 (2/22/12)	When determining compliance status with Term 5.21, NWP-MVCS shall count NO_X emissions at a rate of 4 lb per startup or shutdown.	Record startups and shutdowns.

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
5.24 NO_X	40 CFR §60.332(a)(2) and (d) (6/30/16) §60.334(c) (2/24/06) NWCAA 104.2 (9/13/18)	Subpart GG NO_X Standard The turbine shall not discharge into the atmosphere any gases that contain nitrogen oxides in excess of 196 ppmvd at 15% O_2.	If the owner or operator has previously submitted and received EPA or local authority approval of a petition for an alternative procedure for continuously monitoring compliance with an applicable NO_X emissions limit that procedure may continue to be used. Monitor NO_X emissions in accordance with alternate monitoring program described in AOP Condition 5.10.
Solar Centaur 40 Turbine (Unit 5; Mobile)			
5.25 SO_2	40 CFR §60.333(b) (7/8/04) §60.334(h)(3)(i) (2/24/06) OAC 657 Condition 1 (5/12/98) NWCAA 104.2 (9/13/18)	NSPS Subpart GG – Fuel-Bound Sulfur Sulfur content of fuels limited to 0.8 %, by weight. Any daily period during which the sulfur content of the fuel being combusted in the gas turbine exceeds 0.8%, by weight, shall be deemed a period of excess emissions and reported.	NWP-MVCS has elected not to monitor the total sulfur content of the gaseous fuel as allowed by 60.334(h)(3)(i) and formalized in a letter to NWCAA dated 01/23/04.
5.26 CO	OAC 657 Conditions 2b, 4b, 7, 9, 10 and 11 (5/12/98)	CO emissions shall not exceed: • 50 ppmvd at 15% O_2, one hour average • 5.50 lb/hr • 24.1 ton/yr	Conduct a NO_X (EPA Method 20) and CO (EPA Method 10) stack test following each accumulation of 5,000 hours of operation at the NWP-MVCS. Tests on the turbine performed at other compressor stations may be sufficient to fulfill this condition, if submitted to and approved by the NWCAA. Record the number of hours of operation of the turbine at the NWP-MVCS. Maintain test records on site for a minimum of two years and make them available to the NWCAA for inspection. NWP-MVCS shall provide safe access and sampling ports. A test plan shall be submitted to the NWCAA at least 30 days prior to testing. Submit stack test results within 45 days after the end of the quarter with a stack test. Within 45 days following each quarter with turbine operation, a report shall be submitted to the NWCAA summarizing the number of hours of operation during the quarter and the pounds of NO_X and CO emitted from the turbine, per month in the quarter and as a twelve consecutive month rolling sum.
5.27 NO_X	OAC 657 Conditions 2a, 4a, 7, 9, 10 and 11 (5/12/98)	NO_X emissions shall not exceed: • 42 ppmvd at 15% O_2 ISO, one hour average, except during idling • 7.59 lb/hr • 33.2 ton/yr	
5.28 NO_X	40 CFR §60.332(a)(2) and (d) (6/30/16)	Subpart GG NO_X Standard The turbines shall not discharge into the atmosphere any gases, which contain nitrogen oxides in excess of 160 ppmvd at 15% O_2.	

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
	§60.334(c) (2/24/06) OAC 657 Condition 1 (5/12/98) NWCAA 104.2 (11/17/11)		
5.29 General	OAC 657 Condition 3 (5/12/98)	Turbine idling time shall not exceed 30 hours per month.	*Directly enforceable* Record the idling time hours and present records when requested by the NWCAA.
5.30 VE	OAC 657 Condition 5 (5/12/98)	Opacity from the turbine stack shall not exceed 5% as measured by EPA Method 9.	*Directly enforceable* A written air contaminant complaint response plan will be maintained at the facility. Upon receiving a nuisance complaint from the NWCAA or the public, all possible sources of nuisance emissions at the facility shall be checked for proper operation as soon as possible and problems identified shall be repaired within three working days. Investigation results, the identification of any malfunctioning equipment or aberrant operation, and the date and time of repair or mitigation shall be recorded. Receipt of a nuisance complaint in itself shall not necessarily be a violation.
5.31 Odor	OAC 657 Condition 13 (5/12/98)	Odors from this source shall not be detected off-site that may result in a nuisance as determined by NWCAA personnel.	
5.32 General	OAC 657 Condition 6 (5/12/98)	Operate the turbine only when one or more Clark TCV-12 reciprocating engine is offline.	Keep records verifying the operational status of the offline Clark engine during turbine operation.
5.33 General	OAC 657 Condition 8 (5/12/98)	The turbine shall burn only natural gas from the pipeline.	*Directly enforceable* Within 45 days following each quarter with turbine operation, a report shall be submitted to the NWCAA summarizing the fuel used by the turbine during the quarter.
5.34 General	OAC 657 Condition 12 (5/12/98)	Maintain an O&M manual identifying acceptable operation and maintenance procedures. Failure to follow the procedures may be considered proof that the equipment was not properly maintained.	Comply with Term 4.2.

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
Caterpillar 450 kW Emergency Generator (Unit 8; B-Plant)			
5.35 General	PSD-01-09 Amendment 6 Conditions 2.1, 2.2, 8.2 and 8.3.4.1 (2/22/12)	The standby generator shall be operated no more than 500 hours in any consecutive 12-month period.	Within 45 days following each quarter, a report shall be submitted to the NWCAA summarizing total hours of operation for the twelve immediately preceding months. An hour meter shall be provided to monitor operation of the generator. Permittee may not reset the hour without authorization of Ecology or NWCAA.
5.36 NO_X	PSD-01-09 Amendment 6 Conditions 2.3, 2.5, 6, 7, 8.2 and 8.3.4. (2/22/12)	NO_X emissions from the generator are limited to not greater than 82 grams per hour.	NO_X emission performance testing shall be conducted not less frequently than once every 500 hours of operation. The tests may be conducted by use of a portable emissions analyzer and EPA Conditional Test Method 34. NWP-MVCS shall determine the emissions rate in units of grams per hour by using the source test results in applicable engineering calculations. NWP-MVCS shall verify the accuracy of any portable analyzers not less than once every calendar year in conjunction with annual turbine stack tests and keep records of accuracy verification on site for not less than five years. Submit reports not less than once per calendar quarter or on another approved schedule that includes the total hours of operation for the 12 immediately preceding months, the total NOx mass emissions for the twelve immediately preceding months, and the results of any compliance tests since the last report. NWP-MVCS shall provide safe access and sampling ports for source testing consisting of not less than a man-lift or situation-specific scaffolding.
Sellers C-80-W Heater/Boiler (Unit 7; C-Plant)			
5.37 NO_X	PSD-01-09 Amendment 6 Conditions 3.1, 3.3, 6, 7, 8.2 and 8.3.5.2 (2/22/12)	NO_X emissions from the boiler stack are limited to not greater than 34 ppmvd over a 24-hour average when corrected to 3% O_2.	NO_X emission performance testing shall be conducted not less frequently than once every 5 years of operation. The tests may be conducted by use of a portable emissions analyzer capable of adjustment to the 3% O_2 concentration basis and EPA Conditional Test Method 34. NWP-MVCS shall verify the accuracy of any portable analyzers not less than once every calendar year in conjunction with annual turbine stack tests and keep records of the emissions

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
			analyzer accuracy verifications for not less than five years for Ecology and NWCAA review. Submit report not less than once per calendar quarter or on another approved schedule that includes the results of any compliance tests performed since the last report. NWP-MVCS shall provide safe access and sampling ports for source testing consisting of not less than a man-lift or situation-specific scaffolding.
5.38 NO_X	PSD-01-09 Amendment 6 Conditions 3.4, 3.5, 8.2 and 8.3.5.1 (2/22/12)	Mass emissions of NO_X shall not exceed 4 lb per calendar day and 0.66 tons in any consecutive 12-month period.	NWP-MVCS shall keep a log of operating hours, assume a maximum achievable fuel consumption rate and use the most recent performance test results and appropriate F-factor to determine mass NO_X emissions. Submit report not less than once per calendar quarter or on another approved schedule that includes total NO_X mass emissions for the twelve immediately preceding months.
5.39 Boiler MACT	40 CFR §63.7500(a) & (e) (11/20/15) §63.7505(a) (11/20/15) §63.7515(d) (11/20/15) §63.7540(a)(10) & (a)(12) (11/20/15) §63.7550(a), (b), (c)(1), (c)(5), (h)(3) and Table 9 (11/20/15) §63.7555(a) (11/20/15) NWCAA 104.2 (9/13/18)	<u>Boiler MACT Tune-ups</u> Conduct a tune-up on the boilers no less than once every 61 months. The periodic tune-up shall include the following; inspect the burner, clean and replace burner components as necessary, inspect the burner flame pattern and adjust as necessary, inspect and maintain the air-to-fuel ratio system to ensure it is calibrated and functioning properly by measuring CO concentrations in the exhaust with a portable analyzer before and after adjustments are made.	At least once every five calendar years, submit electronically to EPA's Central Data Exchange (www.cdx.epa.gov) a report demonstrating that a periodic tune-up was completed. The report shall include the tune-up and burner inspection dates, a statement regarding deviations during the reporting period, and a certification by the Responsible Official. Maintain a copy of each compliance report submitted. Maintain a record describing each tune-up including CO concentrations before and after the tune-up and any corrective actions taken as a part of the tune-up

Permit Term	Citation	Description	Monitoring, Recordkeeping & Reporting
Sellers C-125-W Heater/Boiler (Unit 6; B-Plant)			
5.40 General	OAC 311a Conditions 2 and 3 (5/12/98)	The unit shall only burn natural gas.	Fuel consumption data shall be made available to the NWCAA upon request.
5.41 Boiler MACT	40 CFR §63.7500(a) & (e) (11/20/15) §63.7505(a) (11/20/15) §63.7515(d) (11/20/15) §63.7540(a)(10) & (a)(12) (11/20/15) §63.7550(a), (b), (c)(1), (c)(5), (h)(3) and Table 9 (11/20/15) §63.7555(a) (11/20/15) NWCAA 104.2 (9/13/18)	Boiler MACT Tune-ups Conduct a tune-up on the boilers no less than once every 61 months. The periodic tune-up shall include the following; inspect the burner, clean and replace burner components as necessary, inspect the burner flame pattern and adjust as necessary, inspect and maintain the air-to-fuel ratio system to ensure it is calibrated and functioning properly by measuring CO concentrations in the exhaust with a portable analyzer before and after adjustments are made.	At least once every five calendar years, submit electronically to EPA's Central Data Exchange (www.cdx.epa.gov) a report demonstrating that a periodic tune-up was completed. The report shall include the tune-up and burner inspection dates, a statement regarding deviations during the reporting period, and a certification by the Responsible Official. Maintain a copy of each compliance report submitted. Maintain a record describing each tune-up including CO concentrations before and after the tune-up and any corrective actions taken as a part of the tune-up

Title V Operating Permit Renewal Application
Permit No. 002R3, Expires August 16, 2024

Northwest Pipeline, LLC
Mount Vernon Compressor Station (NWCAA ID: 1440)
Skagit County, WA

Attachment 4
Emissions Calculations

Criteria Pollutant Summary
Hazardous Air Pollutants Summary
Greenhouse Gas Pollutant Summary

Unit 1	Dresser-Rand Clark TCV-12 Compressor Engine
Unit 2	Dresser-Rand Clark TCV-12 Compressor Engine
Unit 3	Solar Centaur 50-6100S Compressor Turbine
Unit 4	Solar Mars 90-13000S Compressor Turbine
Unit 6	Sellers C-125-W Boiler (B Plant)
Unit 7	Sellers C-80-W Boiler (C Plant)
Unit 8	Caterpillar G3412 Backup Generator

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Criteria Pollutants

Status	Source ID	APCE	Description	Site Rating	hr/yr	NOx		CO		VOC (w/HCHO)		SO2		PM10/2.5	
						lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy	lb/hr*	tpy
Mount Vernon Compressor Station - Point Sources															
Existing	Unit 1	na	Compressor Engine 01 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	43.62	191.05	84.06	368.18	3.62	15.86	0.02	0.08	1.16	5.08
Existing	Unit 2	na	Compressor Engine 02 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	36.24	158.73	19.66	86.11	3.62	15.86	0.02	0.08	1.16	5.08
Existing	Unit 3	na	Compressor Turbine 01 - Solar Centaur 50-6100S	4,162 bhp	8,760	2.52	11.04	0.05	0.22	0.00	0.00	0.08	0.35	0.16	0.70
Existing	Unit 4	na	Compressor Turbine 02 - Solar Mars 90-12000S	14,908 bhp	8,760	5.63	24.66	0.52	2.28	0.02	0.09	0.13	0.55	0.22	0.96
Existing	Unit 5	na	Compressor Turbine 03 - Solar Centaur 40-4700S	4,700 bhp	---	Mobile Turbine Operates on As-Needed Basis When Clark Engine is Unavailable									
Existing	Unit 6	na	B Plant - Sellers C-125-W Boiler	5.25 MMBtu/hr	8,760	0.51	2.25	0.43	1.89	0.03	0.12	3E-03	0.01	0.04	0.17
Existing	Unit 7	na	C Plant - Sellers C-80-W Boiler	3.35 MMBtu/hr	8,760	0.33	1.44	0.28	1.21	0.02	0.08	2E-03	0.01	0.02	0.11
Existing	Unit 8	NSCR	Backup Generator - Caterpillar G3412	545 bhp	500	0.17	0.04	0.14	0.04	0.16	0.04	3E-03	7E-04	0.10	0.02
				Point Sources:		**89.02**	**389.22**	**105.14**	**459.93**	**7.47**	**32.06**	**0.25**	**1.08**	**2.86**	**12.12**

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Hazardous Air Pollutants (HAP)

Status	Source ID	APCE	Description	Site Rating	hr/yr[a]	Acetaldehyde		Acrolein		Benzene		Butadiene		Ethylbenzene		HCHO		n-Hexane	
						lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy
Mount Vernon Compressor Station - Point Sources																			
Existing	Unit 1	na	Compressor Engine 01 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	0.23	1.03	0.23	1.03	0.06	0.26	0.02	0.11	3E-03	0.01	1.67	7.30	0.01	0.06
Existing	Unit 2	na	Compressor Engine 02 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	0.23	1.03	0.23	1.03	0.06	0.26	0.02	0.11	3E-03	0.01	1.67	7.30	0.01	0.06
Existing	Unit 3	na	Compressor Turbine 01 - Solar Centaur 50-6100S	4,162 bhp	8,760	2E-03	0.01	3E-04	1E-03	6E-04	0.00	2E-05	1E-04	2E-03	0.01	0.04	0.16	---	---
Existing	Unit 4	na	Compressor Turbine 02 - Solar Mars 90-12000S	14,908 bhp	8,760	4E-03	0.02	6E-04	3E-03	1E-03	0.01	4E-05	2E-04	3E-03	0.01	0.07	0.31	---	---
Existing	Unit 5	na	Compressor Turbine 03 - Solar Centaur 40-4700S	4,700 bhp	---	Mobile Turbine Operates on As-Needed Basis When Clark Engine is Unavailable													
Existing	Unit 6	na	B Plant - Sellers C-125-W Boiler	5.25 MMBtu/hr	8,760	---	---	---	---	1E-05	5E-05	---	---	---	---	4E-04	2E-03	9E-03	0.04
Existing	Unit 7	na	C Plant - Sellers C-80-W Boiler	3.35 MMBtu/hr	8,760	---	---	---	---	7E-06	3E-05	---	---	---	---	2E-04	1E-03	0.01	0.03
Existing	Unit 8	NSCR	Backup Generator - Caterpillar G3412	545 bhp	500	0.01	3E-03	0.01	3E-03	0.01	2E-03	3E-03	8E-04	1E-04	3E-05	0.10	0.03	---	---
				Point Sources:		**0.49**	**2.08**	**0.48**	**2.06**	**0.13**	**0.52**	**0.05**	**0.22**	**0.01**	**0.05**	**3.54**	**15.10**	**0.04**	**0.18**

Status	Source ID	APCE	Description	Site Rating	hr/yr[a]	Methanol		POM/PAH		Toluene		2,2,4-TMP		Xylenes		Trace/Other		Total HAP	
						lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy	lb/hr[a]	tpy
Mount Vernon Compressor Station - Point Sources																			
Existing	Unit 1	na	Compressor Engine 01 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	0.07	0.33	0.01	0.04	0.03	0.13	0.03	0.11	0.01	0.04	0.02	0.09	2.40	10.51
Existing	Unit 2	na	Compressor Engine 02 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	0.07	0.33	0.01	0.04	0.03	0.13	0.03	0.11	0.01	0.04	0.02	0.09	2.40	10.51
Existing	Unit 3	na	Compressor Turbine 01 - Solar Centaur 50-6100S	4,162 bhp	8,760	---	---	2E-03	0.01	0.01	0.03	2E-05	1E-04	0.00	0.01	1E-03	0.01	0.05	0.24
Existing	Unit 4	na	Compressor Turbine 02 - Solar Mars 90-12000S	14,908 bhp	8,760	---	---	3E-03	0.02	0.01	0.06	4E-05	2E-04	0.01	0.03	3E-03	0.01	0.11	0.47
Existing	Unit 5	na	Compressor Turbine 03 - Solar Centaur 40-4700S	4,700 bhp	---	Mobile Turbine Operates on As-Needed Basis When Clark Engine is Unavailable													
Existing	Unit 6	na	B Plant - Sellers C-125-W Boiler	5.25 MMBtu/hr	8,760	---	---	9E-04	4E-03	2E-05	8E-05	---	---	---	---	6E-06	3E-05	0.01	0.05
Existing	Unit 7	na	C Plant - Sellers C-80-W Boiler	3.35 MMBtu/hr	8,760	---	---	6E-04	2E-03	1E-05	5E-05	---	---	---	---	4E-06	2E-05	0.01	0.03
Existing	Unit 8	NSCR	Backup Generator - Caterpillar G3412	545 bhp	500	0.02	4E-03	1E-03	3E-04	3E-03	7E-04	---	---	1E-03	2E-04	9E-04	2E-04	0.16	0.04
				Point Sources:		**0.17**	**0.66**	**0.02**	**0.10**	**0.08**	**0.34**	**0.05**	**0.22**	**0.03**	**0.11**	**0.04**	**0.19**	**5.14**	**21.85**

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Greenhouse Gas (GHG) Pollutants

Status	Source ID	APCE	Description	Site Rating	hr/yr	Heat Input (HHV)	CO2 GWP: 1	CO2e	CH4 GWP: 25	CO2e	N2O GWP: 298	CO2e	TOTAL CO2e	
						MMBtu/hr	tpy	tpy	tpy	tpy	tpy	tpy	lb/hr*	tpy
Mount Vernon Compressor Station - Point Sources														
Existing	Unit 1	na	Compressor Engine 01 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	30.18	15,463	15,463	0.29	7.29	0.03	8.68	**3,534**	**15,479**
Existing	Unit 2	na	Compressor Engine 02 - Dresser-Rand Clark TCV-12	4,000 bhp	8,760	30.18	15,463	15,463	0.29	7.29	0.03	8.68	**3,534**	**15,479**
Existing	Unit 3	na	Compressor Turbine 01 - Solar Centaur 50-6100S	4,162 bhp	8,760	51.44	24,785	24,785	1.95	48.67	0.68	201.43	**5,716**	**25,035**
Existing	Unit 4	na	Compressor Turbine 02 - Solar Mars 90-12000S	14,908 bhp	8,760	100.78	48,555	48,555	3.81	95.34	1.32	394.62	**11,197**	**49,045**
Existing	Unit 5	na	Compressor Turbine 03 - Solar Centaur 40-4700S	4,700 bhp	8,760	39.78	Mobile Turbine Operates on As-Needed Basis When Clark Engine is Unavailable							
Existing	Unit 6	na	B Plant - Sellers C-125-W Boiler	5.25 MMBtu/hr	8,760	5.25	2,705	2,705	0.05	1.30	0.05	14.78	**621**	**2,721**
Existing	Unit 7	na	C Plant - Sellers C-80-W Boiler	3.35 MMBtu/hr	8,760	3.35	1,726	1,726	0.03	0.83	0.03	9.43	**396**	**1,736**
Existing	Unit 8	NSCR	Backup Generator - Caterpillar G3412	545 bhp	500	5.01	146.63	146.63	3E-03	0.07	3E-04	0.08	**587.13**	**146.78**
					Point Sources:	**265.97**	**108,844**	**108,844**	**6.43**	**160.78**	**2.14**	**637.72**	**25,586**	**109,643**

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Compressor Engine (Unit 1) Emissions

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
Unit 1	**Compressor Engine 01** **Dresser-Rand Clark TCV-12 (2SLB)** **4,000 bhp** **8,760 hr/yr** Manufactured 1966 NESHAP ZZZZ Affected 7,545 Btu/bhp-hr (HHV) 30.18 MMBtu/hr (HHV) 29,588 scf/hr 259.19 MMscf/yr 1,020 Btu/scf (HHV)	Stack Test	NOx	4.95	1.45	43.62	191.05	---	**4.95**	**43.62**	**191.05**
		Stack Test	CO	9.53	2.79	84.06	368.18	---	**9.53**	**84.06**	**368.18**
		AP-42 Table 3.2-1	VOC	0.41	0.12	3.62	15.86	---	**0.41**	**3.62**	**15.86**
		AP-42 Table 3.2-1	SO2	2.01E-03	5.88E-04	0.02	0.08	---	**2E-03**	**0.02**	**0.08**
		Stack Test	PM10/2.5	0.13	0.04	1.16	5.08	---	**0.13**	**1.16**	**5.08**
		AP-42 Table 3.2-1	Acetaldehyde	2.66E-02	7.76E-03	0.23	1.03	---	**0.03**	**0.23**	**1.03**
		AP-42 Table 3.2-1	Acrolein	2.66E-02	7.78E-03	0.23	1.03	---	**0.03**	**0.23**	**1.03**
		AP-42 Table 3.2-1	Benzene	6.64E-03	1.94E-03	0.06	0.26	---	**0.01**	**0.06**	**0.26**
		AP-42 Table 3.2-1	Butadiene, 1,3-	2.81E-03	8.20E-04	0.02	0.11	---	**3E-03**	**0.02**	**0.11**
		AP-42 Table 3.2-1	Ethylbenzene	3.70E-04	1.08E-04	0.00	0.01	---	**4E-04**	**0.00**	**0.01**
		AP-42 Table 3.2-1	Formaldehyde	1.89E-01	5.52E-02	1.67	7.30	---	**0.19**	**1.67**	**7.30**
		AP-42 Table 3.2-1	n-Hexane	1.52E-03	4.45E-04	0.01	0.06	---	**0.00**	**0.01**	**0.06**
		AP-42 Table 3.2-1	Methanol	8.49E-03	2.48E-03	0.07	0.33	---	**0.01**	**0.07**	**0.33**
		AP-42 Table 3.2-1	POM/PAH	9.18E-04	2.68E-04	0.01	0.04	---	**9E-04**	**0.01**	**0.04**
		AP-42 Table 3.2-1	Toluene	3.30E-03	9.63E-04	0.03	0.13	---	**0.00**	**0.03**	**0.13**
		AP-42 Table 3.2-1	TMP, 2,2,4-	2.90E-03	8.46E-04	0.03	0.11	---	**3E-03**	**0.03**	**0.11**
		AP-42 Table 3.2-1	Xylenes	9.17E-04	2.68E-04	0.01	0.04	---	**9E-04**	**0.01**	**0.04**
		AP-42 Table 3.2-1	Other/Trace HAP	2.25E-03	6.57E-04	0.02	0.09	---	**2E-03**	**0.02**	**0.09**
		Sum	Total HAP	0.27	0.08	2.40	10.51	---	**0.27**	**2.40**	**10.51**
		40CFR98 - Table C1	CO2 (GWP=1)	400.34	116.98	3,530	15,463	---	**400.34**	**3,530**	**15,463**
		40CFR98 - Table C2	CH4 (GWP=25)	0.01	2.20E-03	0.07	0.29	---	**0.01**	**0.07**	**0.29**
		40CFR98 - Table C2	N2O (GWP=298)	7.55E-04	2.20E-04	0.01	0.03	---	**8E-04**	**0.01**	**0.03**
		Weighted Sum	CO2e	400.75	117.10	3,534	15,479	---	**400.75**	**3,534**	**15,479**

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.

2 - For worst-case emissions estimates, all particulate matter is assumed to be less than 2.5 microns in diameter, thus PM10 emissions equal PM2.5 emissions.

3 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

4 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Compressor Engine (Unit 2) Emissions

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
Unit 2	**Compressor Engine 02**	Stack Test	NOx	4.11	1.20	36.24	158.73	---	**4.11**	**36.24**	**158.73**
		Stack Test	CO	2.23	0.65	19.66	86.11	---	**2.23**	**19.66**	**86.11**
	Dresser-Rand Clark TCV-12 (2SLB)	AP-42 Table 3.2-1	VOC	0.41	0.12	3.62	15.86	---	**0.41**	**3.62**	**15.86**
		AP-42 Table 3.2-1	SO2	2.01E-03	5.88E-04	0.02	0.08	---	**2E-03**	**0.02**	**0.08**
		Stack Test	PM10/2.5	0.13	0.04	1.16	5.08	---	**0.13**	**1.16**	**5.08**
	4,000 bhp	AP-42 Table 3.2-1	Acetaldehyde	2.66E-02	7.76E-03	0.23	1.03	---	**0.03**	**0.23**	**1.03**
	8,760 hr/yr	AP-42 Table 3.2-1	Acrolein	2.66E-02	7.78E-03	0.23	1.03	---	**0.03**	**0.23**	**1.03**
		AP-42 Table 3.2-1	Benzene	6.64E-03	1.94E-03	0.06	0.26	---	**0.01**	**0.06**	**0.26**
		AP-42 Table 3.2-1	Butadiene, 1,3-	2.81E-03	8.20E-04	0.02	0.11	---	**3E-03**	**0.02**	**0.11**
		AP-42 Table 3.2-1	Ethylbenzene	3.70E-04	1.08E-04	0.00	0.01	---	**4E-04**	**0.00**	**0.01**
		AP-42 Table 3.2-1	Formaldehyde	1.89E-01	5.52E-02	1.67	7.30	---	**0.19**	**1.67**	**7.30**
		AP-42 Table 3.2-1	n-Hexane	1.52E-03	4.45E-04	0.01	0.06	---	**0.00**	**0.01**	**0.06**
		AP-42 Table 3.2-1	Methanol	8.49E-03	2.48E-03	0.07	0.33	---	**0.01**	**0.07**	**0.33**
		AP-42 Table 3.2-1	POM/PAH	9.18E-04	2.68E-04	0.01	0.04	---	**9E-04**	**0.01**	**0.04**
	Manufactured 1966	AP-42 Table 3.2-1	Toluene	3.30E-03	9.63E-04	0.03	0.13	---	**0.00**	**0.03**	**0.13**
	NESHAP ZZZZ Affected	AP-42 Table 3.2-1	TMP, 2,2,4-	2.90E-03	8.46E-04	0.03	0.11	---	**3E-03**	**0.03**	**0.11**
		AP-42 Table 3.2-1	Xylenes	9.17E-04	2.68E-04	0.01	0.04	---	**9E-04**	**0.01**	**0.04**
	7,545 Btu/bhp-hr (HHV)	AP-42 Table 3.2-1	Other/Trace HAP	2.25E-03	6.57E-04	0.02	0.09	---	**2E-03**	**0.02**	**0.09**
	30.18 MMBtu/hr (HHV)	Sum	Total HAP	0.27	0.08	2.40	10.51	---	**0.27**	**2.40**	**10.51**
	29,588 scf/hr	40CFR98 - Table C1	CO2 (GWP=1)	400.34	116.98	3,530	15,463	---	**400.34**	**3,530**	**15,463**
	259.19 MMscf/yr	40CFR98 - Table C2	CH4 (GWP=25)	0.01	2.20E-03	0.07	0.29	---	**0.01**	**0.07**	**0.29**
	1,020 Btu/scf (HHV)	40CFR98 - Table C2	N2O (GWP=298)	7.55E-04	2.20E-04	0.01	0.03	---	**8E-04**	**0.01**	**0.03**
		Weighted Sum	CO2e	400.75	117.10	3,534	15,479	---	**400.75**	**3,534**	**15,479**

Notes:

1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.

2 - For worst-case emissions estimates, all particulate matter is assumed to be less than 2.5 microns in diameter, thus PM10 emissions equal PM2.5 emissions.

3 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

4 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

Compressor Turbine (Unit 3) Emissions

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
Unit 3	**Compressor Turbine 01**	Stack Test	NOX	---	---	2.52	11.04	---	---	2.52	11.04
		Stack Test	CO	---	---	0.05	0.22	---	---	0.05	0.22
		Stack Test	VOC	---	---	0.00	0.00	---	---	0.00	0.00
	Solar Centaur 50-6100S	Stack Test	SO2	---	---	0.08	0.35	---	---	0.08	0.35
		Stack Test	PM10/2.5	---	---	0.16	0.70	---	---	0.16	0.70
		AP-42 Table 3.1-3	*Acetaldehyde	2.24E-04	4.00E-05	2E-03	0.01	---	2E-04	2E-03	0.01
	4,162 bhp (site-rating)	AP-42 Table 3.1-3	*Acrolein	3.59E-05	6.40E-06	3E-04	1E-03	---	4E-05	3E-04	1E-03
	8,760 hr/yr	AP-42 Table 3.1-3	Benzene	6.73E-05	1.20E-05	6E-04	3E-03	---	7E-05	6E-04	3E-03
		AP-42 Table 3.1-3	Butadiene, 1,3-	2.41E-06	4.30E-07	2E-05	1E-04	---	2E-06	2E-05	1E-04
		AP-42 Table 3.1-3	Ethylbenzene	1.79E-04	3.20E-05	2E-03	0.01	---	2E-04	2E-03	7E-03
		AP-42 Table 3.1-3	*Formaldehyde	3.98E-03	7.10E-04	0.04	0.16	---	4E-03	0.04	0.16
		AP-42 Table 3.1-3	n-Hexane	---	---	---	---	---	---	---	---
		AP-42 Table 3.1-3	Methanol	---	---	---	---	---	---	---	---
	Constructed: 2003	AP-42 Table 3.1-3	POM/PAH	1.95E-04	3.47E-05	2E-03	0.01	---	2E-04	2E-03	0.01
	NSPS GG: Affected	AP-42 Table 3.1-3	Toluene	7.29E-04	1.30E-04	7E-03	0.03	---	7E-04	7E-03	0.03
		AP-42 Table 3.1-3	TMP, 2,2,4-	2.41E-06	4.30E-07	2E-05	1E-04	---	2E-06	2E-05	1E-04
		AP-42 Table 3.1-3	Xylenes	3.59E-04	6.40E-05	3E-03	0.01	---	4E-04	3E-03	0.01
	12,360 Btu/bhp-hr (HHV)	AP-42 Table 3.1-3	Other/Trace HAP	1.63E-04	2.90E-05	1E-03	7E-03	---	2E-04	1E-03	7E-03
	51.44 MMBtu/hr (HHV)	Sum	Total HAP	5.94E-03	1.06E-03	0.05	0.24	---	6E-03	0.05	0.24
	50,434 scf/hr	AP-42 Table 3.1-3	CO2 (GWP=1)	616.70	110.00	5,659	24,785	---	616.70	5,659	24,785
	441.80 MMscf/yr	AP-42 Table 3.1-3	CH4 (GWP=25)	4.84E-02	8.64E-03	0.44	1.95	---	0.05	0.44	1.95
	1,020 Btu/scf (HHV)	AP-42 Table 3.1-3	N2O (GWP=298)	1.68E-02	3.00E-03	0.15	0.68	---	0.02	0.15	0.68
		Weighted Sum	CO2e	622.93	111.11	5,716	25,035	---	622.93	5,716	25,035

* = Aldehyde

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.

2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde.

3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5

4 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Compressor Turbine (Unit 4) Emissions

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
Unit 4	Compressor Turbine 02	Stack Test	NOX	---	---	5.63	24.66	---	---	5.63	24.66
		Stack Test	CO	---	---	0.52	2.28	---	---	0.52	2.28
		Stack Test	VOC	---	---	0.02	0.09	---	---	0.02	0.09
	Solar Mars 90-13000S	Stack Test	SO2	---	---	0.13	0.55	---	---	0.13	0.55
		Stack Test	PM10/2.5	---	---	0.22	0.96	---	---	0.22	0.96
		AP-42 Table 3.1-3	*Acetaldehyde	1.23E-04	4.00E-05	4E-03	0.02	---	1E-04	4E-03	0.02
	14,908 bhp (site-rating)	AP-42 Table 3.1-3	*Acrolein	1.96E-05	6.40E-06	6E-04	3E-03	---	2E-05	6E-04	3E-03
	8,760 hr/yr	AP-42 Table 3.1-3	Benzene	3.68E-05	1.20E-05	1E-03	5E-03	---	4E-05	1E-03	5E-03
		AP-42 Table 3.1-3	Butadiene, 1,3-	1.32E-06	4.30E-07	4E-05	2E-04	---	1E-06	4E-05	2E-04
		AP-42 Table 3.1-3	Ethylbenzene	9.81E-05	3.20E-05	3E-03	0.01	---	1E-04	3E-03	1E-02
		AP-42 Table 3.1-3	*Formaldehyde	2.18E-03	7.10E-04	0.07	0.31	---	2E-03	0.07	0.31
		AP-42 Table 3.1-3	n-Hexane	---	---	---	---	---	---	---	---
		AP-42 Table 3.1-3	Methanol	---	---	---	---	---	---	---	---
	Constructed: 2003	AP-42 Table 3.1-3	POM/PAH	1.06E-04	3.47E-05	3E-03	0.02	---	1E-04	3E-03	0.02
	NSPS GG: Affected	AP-42 Table 3.1-3	Toluene	3.99E-04	1.30E-04	1E-02	0.06	---	4E-04	1E-02	0.06
		AP-42 Table 3.1-3	TMP, 2,2,4-	1.32E-06	4.30E-07	4E-05	2E-04	---	1E-06	4E-05	2E-04
		AP-42 Table 3.1-3	Xylenes	1.96E-04	6.40E-05	6E-03	0.03	---	2E-04	6E-03	0.03
	6,760 Btu/bhp-hr (HHV)	AP-42 Table 3.1-3	Other/Trace HAP	8.89E-05	2.90E-05	3E-03	1E-02	---	9E-05	3E-03	1E-02
	100.78 MMBtu/hr (HHV)	Sum	Total HAP	3.25E-03	1.06E-03	0.11	0.47	---	3E-03	0.11	0.47
	98,802 scf/hr	AP-42 Table 3.1-3	CO2 (GWP=1)	337.29	110.00	11,086	48,555	---	337.29	11,086	48,555
	865.51 MMscf/yr	AP-42 Table 3.1-3	CH4 (GWP=25)	2.65E-02	8.64E-03	0.87	3.81	---	0.03	0.87	3.81
	1,020 Btu/scf (HHV)	AP-42 Table 3.1-3	N2O (GWP=298)	9.20E-03	3.00E-03	0.30	1.32	---	0.01	0.30	1.32
		Weighted Sum	CO2e	340.69	111.11	11,197	49,045	---	340.69	11,197	49,045

* = Aldehyde

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.

2 - As per vendor specifications, NMNEHC (non-methane/non-ethane hydrocarbons) do NOT include aldehydes. VOC is the sum of NMNEHC, Acetaldehyde, Acrolein, and Formaldehyde.

3 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5

4 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

B-Plant Boiler (Unit 6) Emissions

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
Unit 6	Boiler 01 B Plant - Sellers C-125-W Capacity: 5.25 MMBtu/hr (HHV) 1,020 Btu/scf (HHV) 8,760 hr/yr 5,147 scf/hr 45.09 MMscf/yr	EPA AP-42 Table 1.4-1	NOx	100.00	9.80E-02	0.51	2.25
		EPA AP-42 Table 1.4-1	CO	84.00	8.24E-02	0.43	1.89
		EPA AP-42 Table 1.4-2	NMNEHC	5.50	5.39E-03	0.03	0.12
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	0.03	0.12
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	3E-03	0.01
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	0.04	0.17
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	---	---
		EPA AP-42 Table 1.4-3	Acrolein	---	---	---	---
		EPA AP-42 Table 1.4-3	Benzene	2.10E-03	2.06E-06	1E-05	5E-05
		EPA AP-42 Table 1.4-3	Butadiene, 1,3-	---	---	---	---
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	---	---
		EPA AP-42 Table 1.4-3	Formaldehyde	7.50E-02	7.35E-05	4E-04	2E-03
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	0.01	0.04
		EPA AP-42 Table 1.4-3	Methanol	---	---	---	---
		EPA AP-42 Table 1.4-3	POM/PAH	1.72E-01	1.69E-04	9E-04	4E-03
		EPA AP-42 Table 1.4-3	Toluene	3.40E-03	3.33E-06	2E-05	8E-05
		EPA AP-42 Table 1.4-3	TMP, 2,2,4-	---	---	---	---
		EPA AP-42 Table 1.4-3	Xylenes	---	---	---	---
		EPA AP-42 Table 1.4-3	Other/Trace HAP	1.20E-03	1.18E-06	6E-06	3E-05
		Sum	Total HAP	2.05	2.01E-03	0.01	0.05
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	120,000	117.65	617.65	2,705
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	2.30	2.25E-03	0.01	0.05
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	2.20	2.16E-03	0.01	0.05
		Weighted Sum	CO2e	120,713	118.35	621.32	2,721

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.
2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
3 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

C-Plant Boiler (Unit 7) Emissions

Source ID	Description	Reference	Pollutant	Emission Factor		Emissions	
				lb/MMscf	lb/MMBtu	lb/hr	tpy
Unit 7	**Boiler 02** **C Plant - Sellers C-80-W** Capacity: **3.35 MMBtu/hr (HHV)** 1,020 Btu/scf (HHV) 8,760 hr/yr 3,284 scf/hr 28.77 MMscf/yr	EPA AP-42 Table 1.4-1	NOx	100.00	9.80E-02	**0.33**	**1.44**
		EPA AP-42 Table 1.4-1	CO	84.00	8.24E-02	**0.28**	**1.21**
		EPA AP-42 Table 1.4-2	NMNEHC	5.50	5.39E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	VOC	5.50	5.39E-03	**0.02**	**0.08**
		EPA AP-42 Table 1.4-2	SO2	0.60	5.88E-04	**2E-03**	**0.01**
		EPA AP-42 Table 1.4-2	PM10/2.5	7.60	7.45E-03	**0.02**	**0.11**
		EPA AP-42 Table 1.4-3	Acetaldehyde	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Acrolein	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Benzene	2.10E-03	2.06E-06	**7E-06**	**3E-05**
		EPA AP-42 Table 1.4-3	Butadiene, 1,3-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Ethylbenzene	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Formaldehyde	7.50E-02	7.35E-05	**2E-04**	**1E-03**
		EPA AP-42 Table 1.4-3	n-Hexane	1.80	1.76E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-3	Methanol	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	POM/PAH	1.72E-01	1.69E-04	**6E-04**	**2E-03**
		EPA AP-42 Table 1.4-3	Toluene	3.40E-03	3.33E-06	**1E-05**	**5E-05**
		EPA AP-42 Table 1.4-3	TMP, 2,2,4-	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Xylenes	---	---	**---**	**---**
		EPA AP-42 Table 1.4-3	Other/Trace HAP	1.20E-03	1.18E-06	**4E-06**	**2E-05**
		Sum	Total HAP	2.05	2.01E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	CO2 (GWP=1)	120,000	117.65	**394.12**	**1,726**
		EPA AP-42 Table 1.4-2	CH4 (GWP=25)	2.30	2.25E-03	**0.01**	**0.03**
		EPA AP-42 Table 1.4-2	N2O (GWP=298)	2.20	2.16E-03	**0.01**	**0.03**
		Weighted Sum	CO2e	120,713	118.35	**396.46**	**1,736**

Notes:
1 - The emissions shown are based on operation at 100% of rated load for 8,760 hr/yr.
2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5
3 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Northwest Pipeline LLC

Mount Vernon Compressor Station

Application to Renew Title V Operating Permit

Caterpillar Back-up Generator (Unit 8) Engine Emissions

Source ID	Description	Reference	Pollutant	Pre-Controlled Emissions				Control Efficiency	Controlled Emissions		
				g/bhp-hr	lb/MMBtu	lb/hr	tpy		g/bhp-hr	lb/hr	tpy
Unit 8	**Backup Generator Engine**	Vendor Data	NOx	---	---	0.17	0.74	---	---	**0.17**	**0.04**
		Vendor Data	CO	---	---	0.14	0.61	---	---	**0.14**	**0.04**
	Caterpillar G3412 (4SRB)	AP-42 Table 3.2-3	VOC (w/Aldehydes)	0.14	0.03	0.16	0.71	---	**0.14**	**0.16**	**0.04**
		AP-42 Table 3.2-3	SO2	2.45E-03	5.88E-04	3E-03	0.01	---	**2E-03**	**3E-03**	**7E-04**
		AP-42 Table 3.2-3	PM10/2.5	8.10E-02	1.94E-02	0.10	0.43	---	**0.08**	**0.10**	**0.02**
	545 bhp	AP-42 Table 3.2-3	Acetaldehyde*	1.16E-02	2.79E-03	0.01	0.06	---	**0.01**	**0.01**	**3E-03**
	500 hr/yr	AP-42 Table 3.2-3	Acrolein*	1.10E-02	2.63E-03	0.01	0.06	---	**0.01**	**0.01**	**3E-03**
		AP-42 Table 3.2-3	Benzene	6.59E-03	1.58E-03	8E-03	0.03	---	**0.01**	**8E-03**	**2E-03**
		AP-42 Table 3.2-3	Butadiene, 1,3-	2.77E-03	6.63E-04	3E-03	0.01	---	**3E-03**	**3E-03**	**8E-04**
		AP-42 Table 3.2-3	Ethylbenzene	1.03E-04	2.48E-05	1E-04	5E-04	---	**1E-04**	**1E-04**	**3E-05**
		AP-42 Table 3.2-3	Formaldehyde*	8.55E-02	2.05E-02	0.10	0.45	---	**0.09**	**0.10**	**0.03**
		AP-42 Table 3.2-3	n-Hexane	---	---	---	---	---	---	---	---
		AP-42 Table 3.2-3	Methanol	1.28E-02	3.06E-03	0.02	0.07	---	**0.01**	**0.02**	**4E-03**
		AP-42 Table 3.2-3	POM/PAH	9.94E-04	2.38E-04	1E-03	5E-03	---	**1E-03**	**1E-03**	**3E-04**
	Manufactured 1993	AP-42 Table 3.2-3	Toluene	2.33E-03	5.58E-04	3E-03	0.01	---	**0.00**	**3E-03**	**7E-04**
	NESHAP ZZZZ Affected	AP-42 Table 3.2-3	TMP, 2,2,4-	---	---	---	---	---	---	---	---
		AP-42 Table 3.2-3	Xylenes	8.14E-04	1.95E-04	1E-03	4E-03	---	**8E-04**	**1E-03**	**2E-04**
	9,200 Btu/bhp-hr (HHV)	AP-42 Table 3.2-3	Other/Trace HAP	7.48E-04	1.79E-04	9E-04	4E-03	---	**7E-04**	**9E-04**	**2E-04**
	5.01 MMBtu/hr (HHV)	Sum	Total HAP	0.14	0.03	0.16	0.71	---	**0.14**	**0.16**	**0.04**
	4,916 scf/hr	40CFR98 - Table C1	CO2 (GWP=1)	488.15	116.98	587	2,569	---	**488.15**	**587**	**147**
	2.46 MMscf/yr	40CFR98 - Table C2	CH4 (GWP=25)	0.01	2.20E-03	0.01	0.05	---	**0.01**	**0.01**	**3E-03**
	1,020 Btu/scf (HHV)	40CFR98 - Table C2	N2O (GWP=298)	9.20E-04	2.20E-04	1E-03	5E-03	---	**9E-04**	**1E-03**	**3E-04**
		Weighted Sum	CO2e	488.66	117.10	587	2,572	---	**488.66**	**587**	**147**

* = Aldehyde

Notes:

1 - The Pre-controlled emissions shown are based on operation at 100% of rated load for 8,760 hr/yr. Controlled emissions are based on operation at 100% load for 400 hr/yr.

2 - PM10/2.5 is filterable and condensable particulate matter; including PM10 and PM2.5

3 - "Other/Trace HAPs" includes: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, 1,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Phenol, Propylene Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

4 - The fuel heating value will vary, 1,020 Btu/scf (HHV) is at the low end of the range and results in a high (conservative) fuel consumption estimate. (It does NOT impact the emission estimates.)

Potentially Applicable

AP-42 and GHG EMISSION FACTORS

(Preferentially use test data or vendor data where available)

	Pollutant	Natural Gas-Fired Reciprocating Engines			Stationary Gas-Fired Turbines	
		AP-42 Table 3.2-1; 3.2-2; 3.2-3 07/00			AP-42 Table 3.1-1; 3.1-2a; 3.1-3 04/00	
		2SLB lb/MMBtu	4SLB lb/MMBtu	4SRB lb/MMBtu	Uncontrolled lb/MMBtu	Lean Pre-Mix# lb/MMBtu
CRITERIA	NOx (<90% Load)	3.17E+00	4.08E+00	2.27E+00	3.23E-01	9.91E-02
	CO (≥ 90% Load)	3.86E-01	3.17E-01	3.72E+00	8.23E-02	1.51E-02
	VOC (NMNEHC w/o Aldehydes*)	4.93E-02	5.17E-02	6.50E-03	2.06E-03	2.06E-03
	VOC (NMNEHC w/ Aldehydes*)	1.20E-01	1.18E-01	3.24E-02*	2.82E-03	2.13E-03
	SO2 (2,000 gr-S/MMscf ≈ 0.0007 W%)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04
	PM10/2.5 (Condensible and Filterable)	4.83E-02	9.99E-03	1.94E-02	6.63E-03	6.63E-03
HAPs	Acetaldehyde*	7.76E-03	8.36E-03	2.79E-03	4.00E-05	4.00E-05
	Acrolein*	7.78E-03	5.14E-03	2.63E-03	6.40E-06	6.40E-06
	Benzene	1.94E-03	4.40E-04	1.58E-03	1.20E-05	9.10E-07
	Butadiene, 1,3-	8.20E-04	2.67E-04	6.63E-04	4.30E-07	4.30E-07
	Ethylbenzene	1.08E-04	3.97E-05	2.48E-05	3.20E-05	3.20E-05
	Formaldehyde (HCHO)*	5.52E-02	5.28E-02	2.05E-02	7.10E-04	2.00E-05
	n-Hexane	4.45E-04	1.11E-03	---	---	---
	Methanol (MeOH)	2.48E-03	2.50E-03	3.06E-03	---	---
	Polycyclic Organic Matter (POM/PAH)	2.68E-04	3.74E-04	2.38E-04	3.47E-05	3.47E-05
	Toluene	9.63E-04	4.08E-04	5.58E-04	1.30E-04	1.30E-04
	Trimethylpentane, 2,2,4- (i-Octane)	8.46E-04	2.50E-04	---	---	---
	Xylenes	2.68E-04	1.84E-04	1.95E-04	6.40E-05	6.40E-05
	Other/Trace HAP**	6.57E-04	3.21E-04	1.79E-04	2.90E-05	2.90E-05
	TOTAL HAP	7.95E-02	7.22E-02	3.24E-02*	1.06E-03	3.57E-04
GHG	CO2 (GWP=1)	1.10E+02	1.10E+02	1.10E+02	1.10E+02	1.10E+02
	CH4 (GWP=25)	1.45E+00	1.25E+00	2.30E-01	8.64E-03	8.64E-03
	N2O (GWP=298)	Use 40CFR98	Use 40CFR98	Use 40CFR98	3.00E-03	3.00E-03
	CO2e	Use 40CFR98	Use 40CFR98	Use 40CFR98	Use 40CFR98	Use 40CFR98

(*AP-42 shows V-HAP>VOC?) (#Lean Pre-Mix - aka: Dry Low Emissions (DLE or DLN) or SoLoNOx)

	Pollutant	Natural Gas (External) Combustion			Industrial Flares	Diesel Engines
		AP-42 Table 1.4-1; 1.4-2; 1.4-3 (<100 MMBtu/hr) 07/98			13.5-1 06/17	3.3-1; 3.3-2 10/96
		Uncontrolled lb/MMBtu	LoNOx Burners lb/MMBtu	Flue Gas Recirc lb/MMBtu	Combustion lb/MMBtu	Uncontrolled lb/MMBtu
CRITERIA	NOx (≥ 90% Load)	9.80E-02	4.90E-02	3.14E-02	Use Ext. Comb.	4.41E+00
	CO (≥ 90% Load)	8.24E-02	8.24E-02	8.24E-02	3.10E-01	9.50E-01
	VOC (NMNEHC w/o Aldehydes*)	5.32E-03	5.32E-03	5.32E-03		3.60E-01
	VOC (NMNEHC w/ Aldehydes*)	5.39E-03	5.39E-03	5.39E-03	Use Ext. Comb.	3.62E-01
	SO2 (2,000 gr-S/MMscf ≈ 0.0007 W%)	5.88E-04	5.88E-04	5.88E-04		2.90E-01
	PM10/2.5 (Condensible and Filterable)	7.45E-03	7.45E-03	7.45E-03		3.10E-01
HAPs	Acetaldehyde*	---	---	---		7.67E-04
	Acrolein*	---	---	---		9.25E-05
	Benzene	2.06E-06	2.06E-06	2.06E-06		9.33E-04
	Butadiene, 1,3-	---	---	---		3.91E-05
	Ethylbenzene	---	---	---		---
	Formaldehyde (HCHO)*	7.35E-05	7.35E-05	7.35E-05		1.18E-03
	n-Hexane	1.76E-03	1.76E-03	1.76E-03	Use Ext. Comb.	---
	Methanol (MeOH)	---	---	---		---
	Polycyclic Organic Matter (POM/PAH)	1.69E-04	1.69E-04	1.69E-04		1.68E-04
	Toluene	3.33E-06	3.33E-06	3.33E-06		4.09E-04
	Trimethylpentane, 2,2,4- (i-Octane)	---	---	---		---
	Xylenes	---	---	---		2.85E-04
	Other/Trace HAP**	1.18E-06	1.18E-06	1.18E-06		---
	TOTAL HAP	2.01E-03	2.01E-03	2.01E-03		3.87E-03
GHG	CO2 (GWP=1)	1.18E+02	1.18E+02	1.18E+02		1.64E+02
	CH4 (GWP=25)	2.25E-03	2.25E-03	2.25E-03	Use Ext. Comb.	
	N2O (GWP=298)	2.16E-03	6.27E-04	6.27E-04		Use 40CFR98
	CO2e	Use 40CFR98	Use 40CFR98	Use 40CFR98		

40CFR98 - Default Greenhouse Gas (GHG) Emission Factors					
		Table C-1 to Subpart C of Part 98	Table C-2 to Subpart C of Part 98		Weighted Sum
Fuel Type	Default HHV	Carbon Dioxide lb CO2/MMBtu	Methane lb CH4/MMBtu	Nitrous Oxide lb N2O/MMBtu	CO2e lb CO2e/MMBtu
Fuel Oil No. 2 (Diesel)	138,000 Btu/gal	1.63E+02	6.61E-03	1.32E-03	1.64E+02
Propane	91,000 Btu/gal	1.39E+02	6.61E-03	1.32E-03	1.39E+02
Natural Gas	1,026 Btu/scf	1.17E+02	2.20E-03	2.20E-04	1.17E+02

* Aldehyde (not measured in EPA Test Method 25)

** Other/Trace HAPs include: Carbon Tetrachloride, Chlorobenzene, Chloroform, Dichloropropene, ,3-Dichloropropene, Ethylene Dibromide, Methylene Chloride, Naphthalene, Phenol, Propylene, Oxide, Styrene, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Vinyl Chloride (as per AP-42).

Global Warming Potential (100 Yr) (GWP) Table A-1 to Subpart A of Part 98		
CO2	CH4	N2O
1	25	298

Revised: 05/22/19

Title V Operating Permit Renewal Application
Permit No. 002R3, Expires August 16, 2024

Northwest Pipeline, LLC
Mount Vernon Compressor Station (NWCAA ID: 1440)
Skagit County, WA

End of Title V Operating Permit Renewal Application