

Statement of Basis for the Air Operating Permit - Final

Puget Sound Energy Whitehorn Generating Station

Blaine, Washington

February 5, 2013



Serving Island, Skagit & Whatcom Counties

PERMIT INFORMATION
PUGET SOUND ENERGY, WHITEHORN GENERATING STATION
4930 Brown Road, Blaine, Washington 98230

SIC: 4911

NAICS: 221112

NWCAA ID: 1310-V-W

EPA AFS: 53-073-60028

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Supersedes Permit Number:	Expiration Date:
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APPENDIX B: CAM Plan for NO_x for Units 2 and 3

1 INTRODUCTION

Puget Sound Energy (PSE) Whitehorn Generating Station (PSE Whitehorn, permittee, or the facility) is required to obtain an air operating permit (AOP or permit) pursuant to Title V of the 1990 Federal Clean Air Act (FCAA) and chapter 173-401 of the Washington Administrative Code (WAC). The permit is required because PSE Whitehorn has the potential-to-emit more than 100 tons per year of three regulated criteria air pollutants: sulfur dioxide (SO₂), oxides of nitrogen (NO_x), and carbon monoxide (CO). These air pollutants are emitted as products of combustion during turbine operation.

The purpose of this Statement of Basis (SOB) is to set forth the legal and factual evidence for the conditions in PSE Whitehorn's AOP and to provide background information for permit review by interested parties. This Statement of Basis is not a legally enforceable document in accordance with WAC 173-401-700(8).

The Northwest Clean Air Agency (NWCAA or Agency) issued the original AOP for PSE Whitehorn on May 1, 1998 and it expired on May 1, 2003. The first renewal was issued on February 3, 2005, and expired on February 3, 2010. See SOB Appendix A for the changes made to the AOP during the first renewal.

1.1 Changes Made During the Second Renewal

The NWCAA received the application for the second renewal of the PSE Whitehorn Generating Station on July 31, 2009. The following changes have been made to the AOP during the second renewal:

- The Statement of Basis content and layout were revised to standardize the documents issued for the Puget Sound Energy facilities within NWCAA jurisdiction. Factual information was revised to correct for current operation and some text has been rephrased to add clarification.
- Regulatory citations in the permit were revised to reflect new or modified regulations and updated revision/promulgation dates.
- Formatting throughout the entire document has been updated to current NWCAA standards.
- Contact names and information for PSE and the NWCAA were updated as appropriate. In addition, the Permit Information page reflects the updated permit number and dates for the permit renewal. Note that the renewal application is due a year in advance of the permit expiration date.
- AOP Section 1 (Emission Unit Identification) has been reformatted for clarification and updated to properly reflect facility equipment. A diesel fired emergency generator was added as an Emission Unit.
- AOP Section 2 (Standard Terms and Conditions) has been replaced with the latest NWCAA standard version, containing any new or modified regulations and updated reference dates. The applicable requirement pertaining to the regulation of greenhouse gas (GHG) emissions is included as AOP Terms 2.4.5 and 2.9.

- AOP Section 3 (Standard Terms and Conditions for NSPS and NESHAP) has been replaced with the latest NWCAA standard version of applicable requirements, containing any new or modified regulations and updated reference dates. The NESHAP Standard Terms and Conditions have been added as a result of the applicability of 40 CFR 63 Subpart ZZZZ to the emergency generator.
- For clarity and simplicity and pursuant to PSE request, the opacity monitoring, recordkeeping, and reporting (MR&R) requirements in AOP Sections 4 and 5 have been consolidated into a single procedure to demonstrate compliance with the multiple standards.
- The distillate purchase volume was clarified to reflect the 3,000,000 gallon value listed in the Administrative Order on Consent.
- The NWCAA had excused PSE from the requirement to report full-speed no-load (FSNL) operation in advance under AOP Term 2.4.9. Because FSNL operation is not a function of startup or shutdown, it is not subject to AOP Term 2.4.9 and therefore does not require exemption from the advance reporting requirements.
- Pursuant to PSE request and for simplicity, the turbine NO_x limit from NSPS Subpart GG listed in the AOP was changed from the equation in the rule to the calculated concentration limit. The assumptions used in the equation are discussed in SOB Section 5.6.
- 40 CFR 63 Subpart ZZZZ (referred to as the Reciprocating Internal Combustion Engine [RICE] Maximum Achievable Control Technology [MACT]) requirements applicable to the diesel-fired emergency generator are now included in AOP Table 5.
- As part of the renewal, PSE provided a revised CAM Plan for NO_x for Units 2 and 3 updated to make reporting timeframes and data averaging periods consistent with other mandated requirements and to reflect current operation. The updated CAM Plan for Units 2 and 3 are included in SOB Appendix B and the related requirements are included in the AOP.
- The list of Inapplicable Requirements (AOP Section 6) has been reviewed and updated to reflect current regulations and applicability.
- As part of this AOP renewal, PSE provided new water-to-fuel operating charts for Units 2 and 3 to clarify that these curves are for turbine operation at an ambient temperature of 59°F. The units on the charts were changed as well to better match the signals for the raw data on the flowmeters. Please note that the new plots, after unit conversion and ISO condition conversion, are identical to the previous plots for the actual turbine operating range and are still based on the initial testing.
- To avoid confusion, the water-to-fuel operating charts are included in the AOP Appendix only and are deleted from the SOB Appendix.

1.2 Changes made during Modification 1 (Administrative Amendment)

A typographical error was found on Air Operating Permit 012R2. The header, starting from page 5, read "PROPOSED – December 19, 2011," rather than the correct value "FINAL – January 1, 2012." The header for both the AOP and SOB were changed to read, "FINAL – October 23, 2012. Permit information on page 2 of the AOP and SOB were changed to reflect issuance of this modification.

These changes were performed in accordance with WAC 173-401-720.

1.3 Changes made during Modification 2 (Administrative Amendment)

The responsible official was changed from Wayne Gould to Ed Odom. Permit information on page 2 of the AOP and SOB were changed to reflect issuance of this modification.

These changes were performed in accordance with WAC 173-401-720.

2 FACILITY DESCRIPTION

2.1 General Facility Description

PSE Whitehorn is a fossil fuel-fired, combustion turbine facility designed to generate electrical power for PSE customers. The facility can run on a continuous basis; however, due to economic and system conditions, the facility only runs intermittently as a peaking plant. The Whitehorn Generating Station is located west of the BP Cherry Point refinery in Whatcom County (see Figure 1).

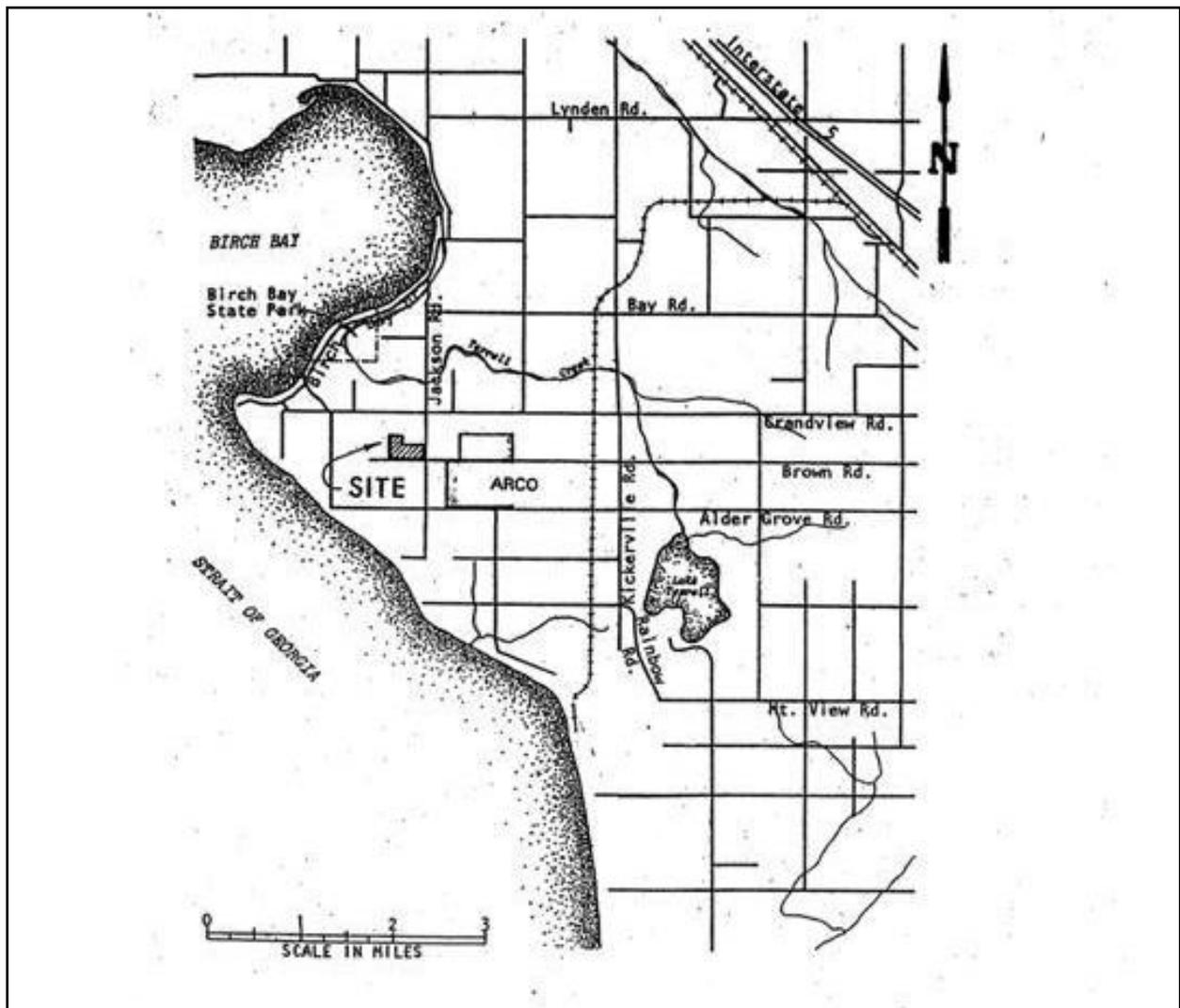


Figure 1 PSE Whitehorn Location Map

The facility consists of two combustion turbine generators, lubricating oil ventilation systems, three distillate fuel storage tanks, a water treatment system, an emergency generator, and an electric substation. Figure 2 is the facility plot plan.

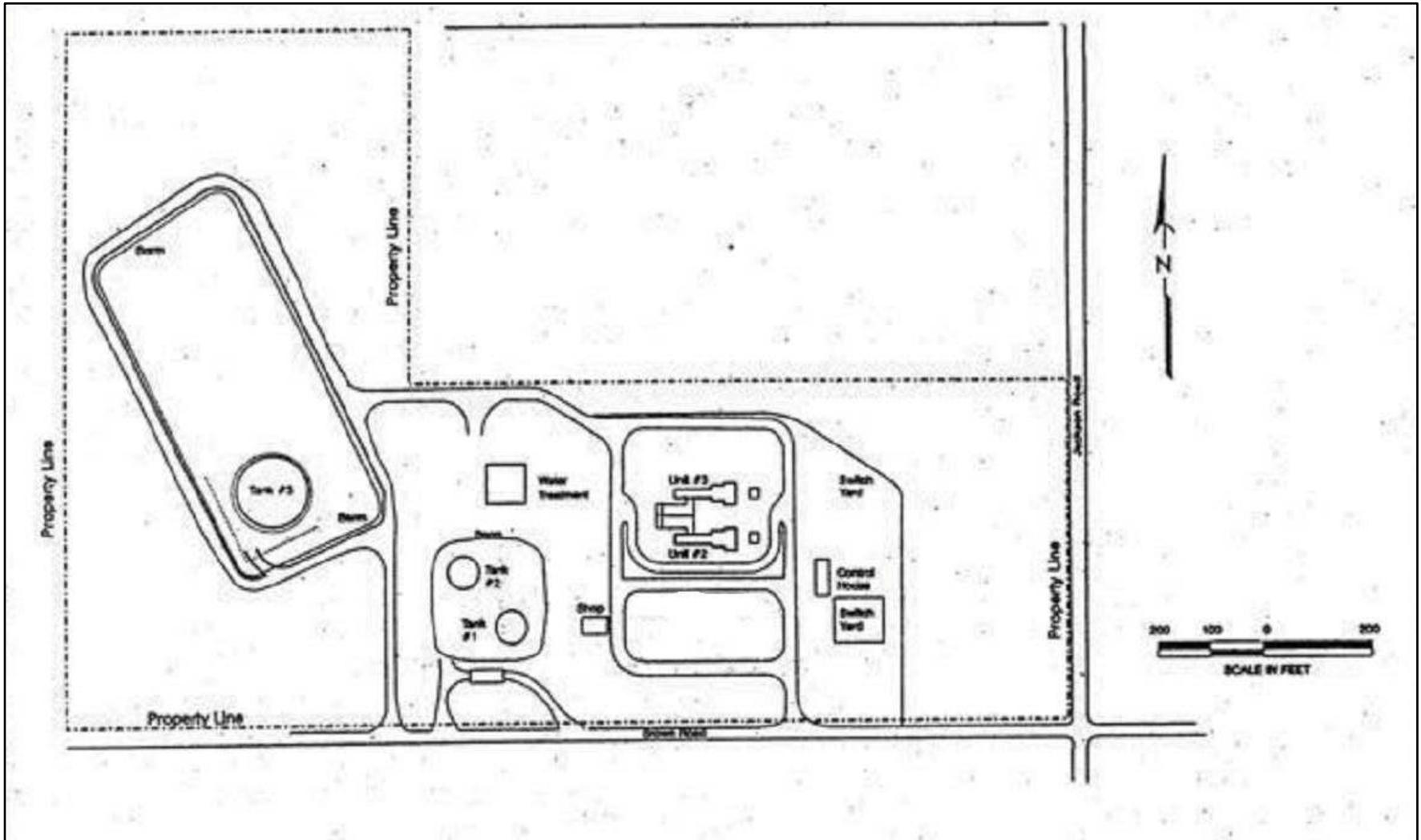


Figure 2 PSE Whitehorn Site Plan

2.2 Emission Unit Description

2.2.1 Turbine Units

The facility, originally permitted by the NWCAA in 1973, became operational in January 1975. The 1975 operation consisted of one distillate-fired Turbo Power Marine (TPM) Twin Pak simple cycle combustion turbine generator designated as Unit 1. It had a base-load rating of 55.9 megawatts (MW). Unit 1 combustion turbine was decommissioned and removed from the facility in 2000.

PSE Whitehorn was expanded in 1979 with the addition of two General Electric (GE) Frame 7, type 7101E simple cycle combustion turbine generators (Units 2 and 3) with individual stacks, along with a water treatment system. These units have a base-load rating of 74.4 MW each and a peak cold weather rating of 80.5 MW each when burning natural gas. The primary fuel for the combustion turbine generators is natural gas supplied via underground pipeline by Cascade Gas/Northwest Pipeline Company. Distillate fuel oil is the alternate fuel for Units 2 and 3.

To control emissions and meet best available control technology (BACT) standards, Units 2 and 3 have been equipped with water injection to reduce NO_x emissions. NO_x emissions are controlled by injecting purified water into the turbine combustion chambers. The added water reduces formation of NO_x by limiting combustion temperatures to approximately 1,900°F. Figure 3 shows a combustion turbine flow diagram for the turbines at PSE Whitehorn.

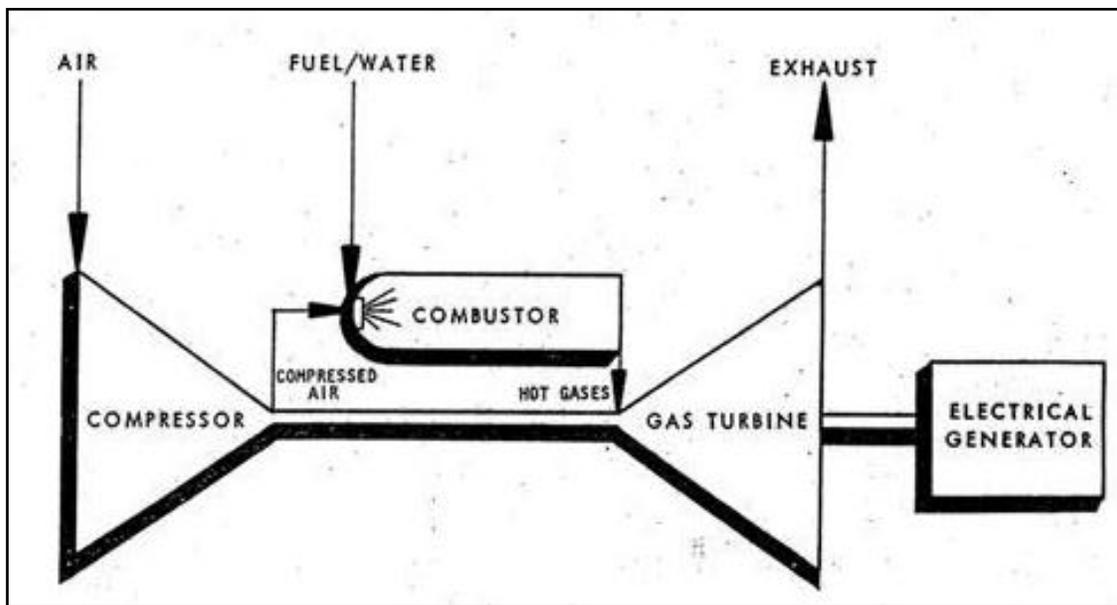


Figure 3 Combustion Turbine Flow Diagram

The combustion turbine generators typically can be started, operated, and be shut down remotely from PSE's Redmond dispatch center or locally by operators onsite.

2.2.2 Oil Mist Collection Systems

Units 2 and 3 are equipped with oil mist collection systems (also referred to as lubricating oil system ventilation or lube oil mist eliminator systems). These systems collect the oil mist generated from the lubricating oil (for the engines) and seal oil (for the bearings) circulating systems. The oil reservoirs are equipped with electric heaters to manage oil viscosity during cold weather. For proper equipment operation, these systems must be operated under negative pressure, which requires them to vent to the atmosphere. Each collection system is equipped with one vent stack for each unit.

The primary emissions from these systems are particulate matter (PM). For Units 2 and 3, emissions are minimized by utilizing a mist eliminator filter. Emissions from the oil mist collection systems are also minimized by using good operation and maintenance practices.

An electrostatic precipitator was originally installed with the turbines as the oil mist collection system. The electrostatic precipitator was very messy, difficult to maintain, and not very effective. When GE phased out the electrostatic precipitator, PSE replaced the electrostatic precipitator with a mist eliminator in 1993.

These sources are not considered Insignificant Emission Units under WAC 173-401-532(4) because these reservoirs are process equipment that are heated as necessary and require more than "lids or covers" to prevent "airborne particulate matter". Additionally, if the control equipment fails, these sources have the potential for opacity emissions, which is contrary to the concept of an insignificant emission unit.

2.2.3 Distillate Oil Storage Tanks

Fuel oil for the facility is stored in two 1,050,000-gallon internal floating roof storage tanks (Tanks 1 and 2) and one 4,200,000-gallon fixed roof tank (Tank 3). Distillate fuel oil is purchased periodically in batch quantities and stored in the facility storage tanks. Distillate fuels are analyzed for sulfur content whenever new fuel is received at the facility in accordance with 40 CFR 60 Subpart GG and 40 CFR 75.

Tanks 1 and 2 were included in the original facility permitting in 1973 and were operational January 1975. These two internal floating roof tanks originally held JP4 as the lightest fuel but are currently used for distillate fuel oil (No. 2).

Tank 3 was constructed in 1979. This distillate tank is an above-ground tank equipped with a fixed cone roof. The tank is only used to store material with a low vapor pressure (i.e., less than 3.5 kPa maximum true vapor pressure).

2.2.4 Emergency Generator

PSE Whitehorn operates a 50 kW diesel-fired compression-ignition emergency generator (Onan 50DGCA serial number B920449397). The emergency generator supplies back-up power for some communication and substation equipment, as well as some office equipment, during a power outage. The emergency generator was installed in October 1992.

2.3 Emission Inventory

Tables 1 and 2 show the annual emissions inventory for PSE Whitehorn as submitted to the NWCAA. The turbines are typically used to provide electrical capacity during peak use periods or during periods when power supply economics dictate their use. These units may go months or years without any significant operation except for testing but may operate continuously for weeks when the power situation warrants. The facility permit does not contain limitations on hours of operation.

Table 1 Criteria Pollutant Emissions Inventory, ton per year

	2004	2005	2006	2007	2008	2009	2010
PM	0	0	0	0	0	0	0
PM ₁₀	0	0	0	0	0	0	0
PM _{2.5}	0	0	0	0	0	0	0
SO ₂	8	0	0	0	0	0	0
NO _x	14	2	33	28	9	35	21
VOC	0	0	0	0	0	0	0
CO	0	0	3	1	0	3	2
Ammonia	0	0	0	0	0	0	0
GHG (CO ₂ e)	*	*	10,969	9,479	3,428	13,280	7,140

* Not reported

Table 2 Toxic Pollutant Emissions Inventory, pound per year

	2004	2005	2006	2007	2008	2009	2010
1,3-Butadiene	1	0	0	0	0	0	0
Acetaldehyde	2	1	6	6	2	7	5
Acrolein	0	0	1	1	0	1	0
Arsenic	1	0	0	0	0	0	0
Benzene	3	0	3	2	1	4	2
Cadmium	1	0	0	0	0	0	0
Chromium	2	0	0	0	0	0	0
Ethyl benzene	2	0	5	5	1	6	4
Formaldehyde	47	9	122	114	32	140	88
Lead compounds	1	0	0	0	0	0	0
Manganese compounds	35	1	19	8	12	34	5
Mercury	0	0	0	0	0	0	0

	2004	2005	2006	2007	2008	2009	2010
Naphthalene	2	0	1	0	0	2	0
Nickel	0	0	0	0	0	0	0
PAHs	*	*	1	0	0	2	0
Propylene oxide	2	0	5	4	1	5	4
Selenium	1	0	1	0	0	1	0
Toluene	6	2	21	21	5	23	16
Xylene	3	0	10	10	3	12	7

* Not reported

2.4 Permitting History

Order of Approval to Construct (OAC) issued November 14, 1973: The NWCAA initially permitted a 60 MW Twin Pac combustion turbine (Unit 1), one 24,000 barrel internal floating roof tank onsite, and one 150,000 barrel internal floating roof tank at the ARCO (now BP) refinery. PSE modified the OAC to relocate the site to the west side of the ARCO (now BP) refinery and to build a second 24,000 barrel internal floating roof storage tank onsite. The file does not include any comments on this revision; as such, NWCAA approval for this modification became effective on March 27, 1974. Unit 1 combustion turbine was decommissioned and removed from the facility in 2000. This permit contains no ongoing requirements and, therefore, is not included in the AOP.

PSD X-80-02 issued December 19, 1979 & OAC issued November 21, 1979: PSE submitted a Notice of Construction (NOC) application June 29, 1979 and simultaneous application for a PSD permit submitted June 11, 1979 to U.S. EPA Region 10 to construct two GE Frame 7 simple-cycle combustion turbines (Units 2 and 3) and three 100,000 barrel tanks. Only one of the three 100,000 barrel tanks was constructed. The OAC contains no ongoing requirements and, therefore, is not included in the AOP.

An initial performance test for NO_x was conducted during November 5 through 12, 1981 while burning natural gas and distillate fuel oil. At that time, PSE demonstrated that Units 2 and 3 were operating within the emission limits established in the applicable approvals and regulations. The performance test data was used by General Electric to generate NSPS compliance charts included in the AOP Appendix. These charts are used to maintain water injection rates adequate to meet NO_x emission limitations in accordance with 40 CFR 60 Subpart GG.

EPA Administrative Order on Consent CAA-10-2001-0107, Conditions 9a and 9b, issued April 6, 2001: On May 4, 2001, PSE submitted an NOC to construct and operate two Pratt and Whitney Model FT-8 Twin Pac simple-cycle units at another PSE generating station (Units 3 and 4 at the PSE Fredonia Generating Station) for power production during peak use periods. PSE was allowed to begin construction on the new units on an accelerated schedule (without a PSD permit) as a result of an Administrative Order (CAA-10-2001-0107 dated

April 6, 2001 – PSE Order) issued by EPA Region 10 at the request of the Governor of Washington, Gary Locke. The accelerated schedule was allowed in order to provide additional electrical generation capacity in the face of severe expected energy shortfalls during latter part of 2001.

This PSE Order required that PSE offset new emissions by taking specified actions. One of those actions (Condition 9b) was for PSE to purchase 3,000,000 gallons of low sulfur diesel instead of high sulfur diesel for use at PSE Whitehorn. This fuel substitution was to yield sufficient secondary PM₁₀ emissions reductions to offset some of the pre-permit PM₁₀ emissions increases from the new turbines at PSE Fredonia.

In addition, Administrative Order on Consent CAA-10-2001-0096 (BP Order) allowed the BP (then ARCO) Cherry Point refinery to construct 14 natural gas turbines to replace 26 non-road diesel engines without first obtaining a PSD permit. This BP Order required that BP offset PM₁₀ emissions by, among other things, replacing orders of high sulfur diesel totaling 50,000 gallons with low sulfur diesel and absorbing the cost differential. According to the PSE Order Condition 9b, the fuel in this BP offset is to be separate from the PSE Fredonia swap and cannot be included in the PSE 3,000,000 gallon totals. According to BP (Liz Daly, 12/20/10 email), the BP fuel swap was completed on September 25, 2001 and PSE Whitehorn was not a recipient of the low sulfur diesel. BP shipped the distillate involved in this swap via the Olympic Pipeline to the Tesoro Terminal in Vancouver for use by Burlington Northern Santa Fe Railway. As such, all the qualifying distillate consumed at PSE Whitehorn can be counted toward the 3,000,000 gallon requirement.

Another action that was mandated by the PSE Order (Condition 9a) was that the water injection for one of the turbines at PSE Whitehorn be increased such that the NO_x emissions be reduced to below 50 ppm_{dv} at 15% oxygen for a period specified in the PSE Order to offset NO_x emissions from the turbines at PSE Fredonia. Testing was required to demonstrate compliance with the limit. See SOB Section 4.2 for a discussion of the test results.

Air Operating Permit 012: PSE submitted the facility AOP application on June 7, 1995. The original AOP for PSE Whitehorn was issued by the NWCAA on May 1, 1998.

The first AOP renewal application for PSE Whitehorn was submitted on October 16, 2002. The first AOP renewal (012R1) was issued by the NWCAA on February 3, 2005.

AOP 012R1 was issued with a typo in the date the renewal was due. The renewal application was submitted in a timely fashion on July 31, 2009 prior to the August 3, 2009 due date.

2.5 Compliance History

2.5.1 Notices of Violation

Table 3 presents a listing of Notices of Violation (NOV) issued to PSE Whitehorn by the NWCAA since January 1, 1998. Violations are resolved through a combination

of penalty assessments and corrective actions taken by the source. In most cases a summary of corrective action taken by the source is submitted to the NWCAA as a written response to the violation. Additional information about each violation can be obtained upon request to the NWCAA.

Table 3 PSE Whitehorn Notices of Violation

NOV	Date Issued	Description
NOV #2878	09/1/98	Failure to meet NO _x limit due to failure of water injection system
NOV #2899	10/29/98	Failure to meet NO _x limit due to shutdown of water injection system
NOV #3200	10/15/01	Failure to perform monthly visual monitoring as required by the air operating permit
NOV #3239	05/14/02	Failure to submit continuous monitoring system report as required by the NWCAA

2.5.2 Compliance Reports

The PSE Whitehorn AOP requires periodic, semiannual, and annual reports to be submitted to the NWCAA as part of the facility’s ongoing compliance demonstration. When a permit deviation occurs, the facility is required to submit a periodic report within 30 days after the end of the month during which the deviation occurred identifying any excess emissions and provide a discussion as to the cause and what was done to correct the problem. The facility submits a semiannual summary report of emissions, process information, and continuous monitoring system performance. In addition, semiannual reports are submitted providing for the certification by the responsible corporate official of the truth, accuracy, and completeness of reports submitted during the previous six-month period. Annually, the responsible corporate official also certifies compliance with all applicable requirements in the AOP term by term and whether the facility was fully or intermittently in compliance with each term.

3 BASIS OF REGULATION APPLICABILITY

3.1 New Source Performance Standards (NSPS)

40 CFR 60 Subpart K - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978: Tanks 1 and 2 (1,050,000-gallon each of which began operation in 1975) are potentially subject to NSPS Subpart K based on size and construction date. However, these tanks currently store No. 2 distillate fuel which does not qualify as “petroleum liquids” as defined in 40 CFR 60.111(b); as such, NSPS Subpart K does not apply.

40 CFR 60 Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984: Tank 3 (4,200,000-gallon which was constructed in 1979) is potentially subject to NSPS Subpart Ka based on size and construction date. However, this tank currently stores No. 2 distillate fuel which does not qualify as “petroleum liquids” as defined in 40 CFR 60.111a(b); as such, NSPS Subpart Ka does not apply.

40 CFR 60 Subpart GG – Standards of Performance for Stationary Gas Turbines: The provisions of NSPS Subpart GG are applicable to stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 million Btu) per hour, based on the lower heating value of the fuel fired, for which construction, modification, or reconstruction is commenced after October 3, 1977. Units 2 and 3 were built after the adoption of NSPS Subpart GG for turbine generators. Therefore, NSPS Subpart GG, along with NSPS Subpart A (General Provisions), apply to both turbines.

3.2 National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61 and 63)

40 CFR 63 Subpart YYYY—National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines: 40 CFR 63 Subpart YYYY establishes national emission and operating limitations for hazardous air pollutant (HAP) emissions from stationary combustion turbines located at major sources of HAP emissions, and requirements to demonstrate initial and continuous compliance with the emission and operating limitations. A major source is one that has the potential to emit 10 tons or more per year of any single HAP or 25 tons per year or more of any combination of HAPs. 40 CFR 63 Subpart YYYY does not apply to PSE Whitehorn because the facility is not a major source; it does not have a potential-to-emit of 10 tons or more of a single HAP or 25 tons or more of a combination of HAPs.

A NESHAP standard that applies to stationary combustion turbines at area sources of HAPs has not been promulgated.

40 CFR 63 Subpart ZZZZ— National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines: 40 CFR 63 Subpart ZZZZ establishes national emission and operating limitations for HAP emissions from stationary reciprocating internal combustion engines (RICE)

located at major and area sources of HAP emissions. PSE Whitehorn is an area source of HAP emissions and, as such, is potentially subject to 40 CFR 63 Subpart ZZZZ. As a RICE that was constructed prior to June 12, 2006 and is used exclusively for emergency situations, the PSE Whitehorn generator is considered an existing emergency stationary RICE located at an area source of HAP emissions under 40 CFR 63 Subpart ZZZZ. The facility must be in compliance with these generator requirements on May 3, 2013.

3.3 Acid Rain

40 CFR Parts 72, 73, 74, 75, 77, and 78 – The Acid Rain Program: Permits, Allowance System, Sulfur Dioxide Opt-Ins, Continuous Emission

Monitoring, Excess Emissions, and Appeal Procedures: Title IV of the Clean Air Act authorizes the EPA to establish the Acid Rain Program. The purpose of the Acid Rain Program is to significantly reduce emissions of sulfur dioxide and nitrogen oxides from utility electric generating plants in order to reduce the resultant adverse health and ecological impacts of acidic deposition (or acid rain). The EPA promulgated these rules on January 11 and March 23, 1993. PSE Whitehorn Units 2 and 3 are not subject to the Acid Rain Program because, as simple cycle turbines that were installed before November 15, 1990, they are not “affected units” (40 CFR 72.6(b)(1)).

3.4 Compliance Assurance Monitoring (CAM)

40 CFR 64 – Compliance Assurance Monitoring: The CAM rule under 40 CFR Part 64 requires owners or operators of subject sources to conduct monitoring that satisfies specific criteria established in the rule to provide a reasonable assurance of compliance with applicable requirements. Monitoring focuses on emissions units that rely on pollution control equipment to achieve compliance. The CAM rule coordinates existing monitoring requirements with additional monitoring if current requirements fail to specify adequate detail. CAM applies to units that (1) are subject to an emission limit, (2) use an add-on control device to meet the emission limit, and (3) have potential pre-control device emissions classifying it as a major source (also referred to as an “uncontrolled major source”).

A control device is defined under CAM as “equipment, other than inherent process equipment, that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere” (40 CFR 64.1). Both turbines utilize water injection to reduce NO_x emissions. Water injection is not considered inherent process equipment because the turbines can operate with water injection offline; as such, water injection is deemed to be a control device under CAM.

As such, both turbines at PSE Whitehorn are potentially subject to CAM: Units 2 and 3 are each subject to NO_x limitations, each use add-on control technology (i.e., water injection), and each are uncontrolled major sources.

Sources subject to CAM must submit CAM Plans, the requirements of which are to be included in the AOP. CAM Plans provide information on the monitoring requirements, appropriateness of the control approach, details of the quality assurance/quality control measures, and rationale for selection of indicator range.

The combined CAM Plan for Units 2 and 3 for NO_x are included in its entirety in SOB Appendix B; the CAM Plan requirements are incorporated in AOP Section 5.

3.5 Risk Management Plan (RMP)

40 CFR 68 – Chemical Accident Prevention Provisions: The goal of 40 CFR Part 68 and the risk management program is to prevent accidental releases of substances that can cause serious harm to the public and the environment from short-term exposures and to mitigate the severity of releases that do occur. If a facility contains the hazardous or flammable substances listed in 40 CFR 68.130 in an amount above the “threshold quantity” specified for that substance, the facility operator is required to develop and implement a risk management program.

PSE Whitehorn is exempt from this regulation because the facility does not have any of the listed substances in quantities above the threshold values.

3.6 New Source Review (NSR)

3.6.1 Prevention of Significant Deterioration (PSD)

Before a major source can be constructed or modified in an area that meets all the ambient air requirements, the owner or operator must demonstrate that the project will not cause or contribute to violations of any ambient air quality standard or air quality increment pursuant to the PSD program under 40 CFR 52.21. Also, the owner or operator must demonstrate that the project will not cause significant deterioration in nearby Class I Areas (parks and wilderness areas).

PSE Whitehorn qualifies as a major source, and is therefore potentially a subject source under the PSD program. Prevention of Significant Deterioration permit PSD-X80-02 was issued on December 19, 1979 by EPA Region 10 prior to commencement of construction of Units 2 and 3 at the facility.

3.6.2 Minor NSR

New or modified sources of air pollution are required to obtain a permit from the NWCAA before beginning construction. Permits are referred to as OACs and contain a wide range of local, state, and federal requirements to minimize air pollution impacts on the environment. The type of activity, the size of the operation, and the kinds of pollutants emitted determine permit conditions. Two minor NSR permits have been issued by the NWCAA to PSE Whitehorn, as described in SOB Section 2.4.

3.7 Greenhouse Gas (GHG) Regulation

Greenhouse gases are chemicals that contribute to climate change by trapping heat in the atmosphere. The greenhouse gases recognized by EPA and Ecology are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF₆). "Hydrofluorocarbons" or "HFCs" means a class of greenhouse gases primarily used as refrigerants, consisting of hydrogen, fluorine, and carbon.

PSE Whitehorn is required to meet the following federal and state greenhouse gas emission requirements, as applicable.

3.7.1 40 CFR 98 – Federal Mandatory Greenhouse Gas Emission Inventory Regulation

This regulation applies to PSE Whitehorn due to its GHG emission levels and type of facility. The rule requires annual GHG inventories and reporting beginning in calendar year 2010, with reports due to EPA by no later than March 31 of the following year.¹ This regulation is implemented in its entirety by the EPA. This regulation is excluded from appearing in a Title V air operating permit because it does not contain applicable requirements under the Title V program (WAC 173-401-200(4)).

3.7.2 Chapter 173-407 WAC – Carbon Dioxide Mitigation Program, Greenhouse Gases Emissions Performance Standard and Sequestration Plans and Programs for Thermal Electric Generating Facilities (Part I WAC 173-407-010 through -070, and Part II WAC 173-407-100 through -320)

Chapter 173-407 WAC, “Carbon Dioxide Mitigation Program, Greenhouse Gases Emissions Performance Standard And Sequestration Plans And Programs For Thermal Electric Generating Facilities”, consists of two parts: Part I, WAC 173-407-010 through -070, and Part II, WAC 173-407-100 through -320. According to WAC 173-407-005, Part II, “Greenhouse Gases Emissions Performance Standard And Sequestration Plans And Programs For Baseload Electric Generation Facilities Implementing Chapter 80.80 RCW” is the emissions performance standard that must be met first. Then the requirements of Part I, “Carbon Dioxide Mitigation For Fossil-Fueled Thermal Electric Generating Facilities, Implementing Chapter 80.80 RCW”, are applied.

The Part II greenhouse gas emissions performance standard is applicable to all existing baseload electric generation facilities and units when a new baseload electric generating facility or unit at the existing facility is issued construction approval or site certification agreement (WAC 173-407-120(3)(a)), the existing facility or a unit is upgraded (WAC 173-407-120(3)(b)), or the existing facility or unit is subject to a new long-term financial commitment (WAC 173-407-120(3)(c)).

At this time, Part II performance standards do not apply to PSE Whitehorn. Should PSE Whitehorn become subject, these requirements do meet the definition of Title V “applicable requirements” and therefore will be incorporated into the AOP.

3.7.3 Chapter 173-441 WAC – Reporting of Emissions of Greenhouse Gases

Chapter 173-441 WAC, “Reporting of Emissions of Greenhouse Gases”, adopts a mandatory greenhouse gas reporting rule for:

- Suppliers that supply applicable fuels sold in Washington state of which the complete combustion or oxidation would result in at least 10,000 metric tons of carbon dioxide annually; or

¹ The deadline for reporting for emission year 2010 has been postponed to September 30, 2011.

- Any listed facility that emits at least 10,000 metric tons of carbon dioxide equivalents (CO₂e) of greenhouse gases annually in the state.

Chapter 173-441 WAC was adopted by Ecology on December 1, 2010 and was effective on January 1, 2011. This regulation applies to PSE Whitehorn due to the fact that it emits at least 10,000 metric tons of CO₂e of greenhouse gases per year (see SOB Table 1). Similar to the federal reporting rule under 40 CFR 98, the rule requires annual GHG inventories due to Ecology by no later than March 31 of the following year beginning for calendar year 2012. This regulation is implemented in its entirety by Ecology. This regulation is considered an applicable requirement under the Title V program; as such, it is included in the AOP.

4 GENERAL ASSUMPTIONS OF THE PERMIT

4.1 Permit Content

The permit contains (1) standard terms; (2) generally applicable conditions for the type of facility permitted; and (3) specifically applicable conditions originating from PSD permits, approvals to construct and any orders referencing the facility.

Applicable requirements that were satisfied by a single past action on the part of the source are not included in the AOP but are discussed in the SOB. In addition, as discussed below, conditions that do not contain substantive requirements and have no ongoing compliance demonstrations are excluded from the AOP.

Regulations that require action by a regulatory agency, but not of the regulated source, are not included as applicable permit conditions.

4.2 Excluded Requirements

The following requirements are excluded from the AOP:

- The NWCAA OAC issued November 14, 1973 for Unit 1 has no ongoing requirements and is not included in the AOP.
- The NWCAA issued an OAC on November 21, 1979, for Units 2 and 3 and for three 100,000 barrel fuel tanks. This OAC has no ongoing requirements and are not included in the AOP.
- PSD-X80-02 Condition 2: Upon construction and permitting in PSD-X80-02, the increases in potential emissions of any regulated pollutant, excluding NO_x, SO₂, and particulate matter, resulting from this modification were required to be and are assumed to be less than 250 tons per year. As such, PSD-X80-02 Condition 2 has been completed and is not included in the AOP.
- PSD-X80-02 Condition 4 states that the PSD approval “shall become void if on-site construction is not commenced within eighteen (18) months after receipt of the approval or if on-site construction once initially commenced is discontinued for a period of eighteen (18) months.” The PSD-X80-02 approval was issued on December 19, 1979. Construction was commenced and Units 2 and 3 began operation during April 1981, within 18 month of approval. This requirement has been completed and is not included in the AOP.
- PSD-X80-02 Condition 5 states that the construction, modification or operation of the proposed facility shall be in accordance with the permit application. This condition does not impose any new requirements that are not already in the generally applicable regulations. As such, it is not listed in the AOP.
- 40 CFR 60 Subpart GG and PSD X-80-02 Condition 6a require initial compliance demonstrations be completed for NO_x in accordance with 40 CFR 60.335. The NO_x tests were performed on November 5 through 12, 1981, while burning oil and natural gas. The results showed that Units 2 and 3 were operating within the emission limits established in 40 Part 60 Subpart

GG and PSD-X80-02. These requirements have been completed and are not included in the AOP.

In addition to NO_x, the PSD permit mentions initial source testing for SO₂ “as required under Federal New Source Performance Standards (NSPS) (40 CFR 60.335)”. 40 CFR 60.335 does not require testing for SO₂. As such, this requirement is excluded from the AOP.

- PSD X-80-02 Condition 7 states that the EPA and Ecology shall be notified in writing of the commencement of construction date and the startup date within 30 days of their occurrence. PSE Whitehorn notified EPA and the NWCAA that the facility started up in April 1981 (letter received April 10, 1981). This requirement has been completed and is not included in the AOP.
- Pursuant to the PSE Order (CAA-10-2001-0107) Condition 9a, PSE was required to provide NO_x offsets for the operation of PSE Fredonia Units 3 and 4 by increasing the water injection for one of the turbines at PSE Whitehorn for a specific period of time. PSE turned up the water injection on Unit 2 at PSE Whitehorn from approximately 15 gpm to 55 gpm on June 18, 2001. Testing on July 26, 2001 confirmed compliance (i.e., 36.7 ppmdv at 15% oxygen) with the interim 50 ppmdv limit. The required period of reduced emissions ended with the issuance of the PSD permit (July 29, 2003). This requirement has been completed and is not included in the AOP.

4.3 Federal Enforceability

Federally enforceable requirements are terms and conditions required under the Federal Clean Air Act or under any of its applicable requirements. Local and state regulations may become federally enforceable by formal approval and incorporation into the State Implementation Plan (SIP) or through other delegation mechanisms. Federally enforceable requirements are enforceable by the EPA and citizens. All applicable requirements in the permit including standard terms and conditions, generally applicable requirements, and specifically applicable requirements are federally enforceable unless identified in the permit as enforceable only by the state (i.e., labeled as “State Only”).

Most rules and requirements are followed by a date in parentheses. Two different versions (identified by the date) of the same regulatory citation may apply to the source if federal approval/delegation lags behind changes made to the WAC or the NWCAA Regulation. For WAC regulations, the date listed in parenthesis in the AOP represents the State Effective date. For the NWCAA regulations, the date represents the most recent Board of Directors adoption date, which is identified as the “Passed” or “Amended” date in the NWCAA Regulation. The date associated with an OAC or PSD permit represents the latest revision date of that order. For a federal rule, the date is the rule’s most recent promulgation date.

Chapter 173-401 WAC is not federally enforceable although the requirements of this regulation are based on federal requirements for the air operating permit program. Upon issuance of the permit, the terms based on Chapter 173-401 WAC will become federally enforceable for the source.

4.4 Gap-Filling

Certain air pollution regulations and permit conditions do not specifically call out sufficient MR&R methods(s) to adequately demonstrate compliance with the applicable requirement. In these cases, the permitting agency may develop site-specific MR&R requirements that the source must follow pursuant to WAC 173-401-615(1)(b) & (c) (10/17/02). The inclusion of the customized MR&R requirements is called "gap-filling". For instance, nuisance rules and opacity requirements have site-specific gap-filled obligations for the source. If gap-filling has been incorporated for a requirement of the AOP, the MR&R for that term will state "Directly Enforceable" above the gap-filled text.

On August 19, 2008, the U.S. Court of Appeals vacated EPA's 2006 interpretive rule that prohibited states from enhancing monitoring in Title V permits. As a result, permitting authorities again must ensure that monitoring in each permit is sufficient to assure compliance with the terms and conditions of the permit.

4.5 Future Requirements

Applicable requirements promulgated with future effective compliance dates may be included as applicable requirements in the permit. The emergency generator is subject to 40 CFR 63 Subpart ZZZZ and the applicable requirements are included in AOP Table 5; however, pursuant to 40 CFR 63.6595(a), PSE Whitehorn does not have to comply with these requirements until May 3, 2013.

Some requirements that are not applicable until triggered by an action, such as the requirement to file an application prior to constructing a new source, are addressed within the standard terms and conditions section of the permit. PSE certified in the permit application that the facility will meet any future applicable requirements on a timely basis.

4.6 Compliance Options

PSE did not request emissions trading provisions or specify more than one operating scenario in the air operating permit application; therefore, the permit does not address these options as allowed under WAC 173-401-650. This permit does not condense overlapping applicable requirements (i.e., streamlining) nor does it provide any alternative emission limitations.

5 PERMIT ELEMENTS, BASIS FOR TERMS AND CONDITIONS, AND CHANGES MADE DURING SECOND RENEWAL

5.1 Permit Organization

The PSE Whitehorn air operating permit is divided into the following sections:

- Permit Information
- Attest
- Table of Contents
- Emission Unit Identification
- Standard Terms and Conditions
- Standard Terms and Conditions for NSPS and NESHAP
- Generally Applicable Requirements
- Specifically Applicable Requirements
- Inapplicable Requirements
- Appendix – General Electric Water Injection Curves for NO_x Control

5.2 Permit Information and Attest

5.2.1 Permit Information

The Permit Information page of the permit identifies the source and provides general information about the permit, the responsible official, and the agency personnel responsible for permit preparation, review, and issuance.

5.2.2 Attest

The Attest page provides authorization for the source to operate under the terms and conditions contained in the permit.

5.3 AOP Section 1 Emission Unit Identification

The Emission Unit Identification section lists emission units, equipment ratings, and control devices present at PSE Whitehorn. Additional information about the facility may be found in the operating permit application and in associated files.

5.4 AOP Section 2 Standard Terms and Conditions

The Standard Terms and Conditions section contains administrative requirements and prohibitions; most of which do not have ongoing compliance monitoring requirements. The citations giving legal authority to the Standard Terms and Conditions are provided in the section. At times, requirements are paraphrased. In this case the language of the cited regulation takes precedence over the paraphrased summary. For clarity and readability, the terms and conditions have been grouped by function. Similar requirements from the State and the NWCAA regulations are grouped together where possible. There are several requirements

included that are not applicable until triggered. An example of this would be the requirement to file an NOC application.

5.5 AOP Section 3 Standard Terms and Conditions for NSPS and NESHAP

The Standard Terms and Conditions for NSPS and NESHAP section contains applicable requirements from Subpart A of 40 CFR 60 and Subpart A of 40 CFR 63.

5.6 AOP Sections 4 and 5 Generally and Specifically Applicable Requirements

Requirements that limit emissions and broadly apply to all sources within the jurisdiction of the NWCAA are identified in AOP Section 4 - Generally Applicable Requirements. Requirements that limit emissions and apply specifically to emission units at PSE Whitehorn are identified in AOP Section 5 - Specifically Applicable Requirements.

The first column lists the condition number and identifies the pollutant. The second column identifies the regulatory citation. The third column provides a brief description of the applicable requirements for informational purposes and is not enforceable. The fourth column identifies the periodic or continuous MR&R obligations the source must perform as required by WAC 173-401-605(1), -615(1) & (2), or the underlying requirement. MR&R obligations do not apply to insignificant emission units pursuant to WAC 173-401-530(2)(c).

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)). MR&R requirements noted as "CAM Plan" are part of the Compliance Assurance Monitoring Plan for the specified unit(s) as required by 40 CFR 64.6(c) (10/22/97). The CAM plans submitted by the facility per 40 CFR 64.4 are included in SOB Appendix B. Other MR&R requirements not labeled "Directly Enforceable" or "CAM Plan" are brief descriptions of the regulatory requirements for informational purposes, and are not enforceable, unless they are identical to the cited requirement. Unless the text of the MR&R column is specifically identified to be directly enforceable or pursuant to CAM, the language of the cited regulation takes precedence over a paraphrased requirement.

The following paragraphs provide additional information describing the basis and provide clarifications for those MR&R requirements that do not stem directly from other regulations (i.e., those requirements that are directly enforceable or come from the CAM Plan).

Opacity Requirements: The Generally and Specifically Applicable Requirements sections of the permit list opacity limits stemming from NWCAA, State, and Federal rules. PSE Whitehorn is subject to two opacity limitations with two demonstration methods: shall not exceed 20% for any period aggregating more than three minutes in any one hour (demonstrated using Ecology Source Test Method 9A - Visual Determination of Opacity for a Three Minute Standard (7/12/90)) and shall not exceed 10% pursuant to PSD-X80-02 issued December 19, 1979. Because this PSD permit was issued by EPA using federally enforceable rules, the 10% opacity requirements is determined to be on a six-minute average basis demonstrated

using 40 CFR 60 Appendix A Method 9 – Visual determination of the opacity of emissions from stationary sources. Both methods call for opacity readings to be taken at 15-second intervals.

For clarity and simplicity, the MR&R requirements for these two requirements have been consolidated and gap-filled as directly enforceable. Demonstration of compliance with the permit visible emission limits for the turbines and any other oil burning combustion unit (i.e., emergency generator) will be based on monthly qualitative visual opacity observations. Any observed visible emissions at any time will require either corrective action or an EPA Method 9 test. If EPA Method 9 shows an exceedance of the applicable six-minute standard(s), an Ecology Method 9A test shall be conducted to demonstrate compliance with applicable three-minute standards. With the lower opacity threshold, the EPA Method 9 reading is more conservative, but, if EPA Method 9 shows an exceedance, compliance will be determined using both methodologies.

All EPA Method 9 or Ecology Method 9A opacity readings must be taken by an individual holding a valid Certification of Completion for Plume Evaluation Training from the Washington State Department of Ecology or other authorized training facility.

Particulate Matter Requirements: The gas turbine exhaust stacks and the oil mist collection system stacks are the only process stacks and likely sources of particulate emissions at PSE Whitehorn. Modern gas turbines, when fueled by natural gas or low-sulfur oil, are extremely unlikely to exceed particulate matter emission standards if the units are properly operated and maintained. Therefore, Opacity is being used as a surrogate for particulate matter.

The opacity MR&R has been gap-filled to demonstrate compliance with the particulate matter limits, both facility-wide in the Generally Applicable Requirements (AOP Section 4) and for Units 2 and 3 in the Specifically Applicable Requirements (AOP Section 5).

Pursuant to Administrative Order CAA-10-2001-0107 Condition 9b for PSE Fredonia (see SOB Section 2.4 for further discussion), to offset secondary particulate emissions (potentially consisting of sulfuric acid), PSE Whitehorn must use 3,000,000 gallons of low sulfur distillate (less than 0.05 wt% sulfur) in place of high sulfur distillate (sulfur content between 0.05 wt% and 0.5 wt%). To track the progress of this requirement and because there were no MR&R requirements in the Administrative Order, requirements were gap-filled to monitor the sulfur content of the distillate along with the volume of low sulfur distillate fuel purchased for PSE Whitehorn.

Nitrogen Oxides Requirements – Emission Limit: The turbines are subject to NSPS Subpart GG. NSPS Subpart GG contains a NO_x limit for subject turbines based on the following equation (40 CFR 60.332(a)(1)):

$$STD = 0.0075 \times \frac{14.4}{Y} + F$$

where:

STD = allowable ISO corrected (if required under 60.335(b)(1)) NO_x emission in percent by volume dry at 15% oxygen

Y = manufacturer's rated heat rate at manufacturer's rated load in kJ/W-hr

= Units 2 and 3 firing gas: 11.1 kJ/W-hr (10,551 Btu/kW-hr LHV)

= Units 2 and 3 firing oil: 11.2 kJ/W-hr (10,661 Btu/kW-hr LHV)

F = NO_x emission allowance for fuel-bound nitrogen (referred to as an F-factor)

ISO conversion under 60.335(b)(1) is optional because both units are equipped with add-on control technology (i.e., water injection). PSE generally chooses not to correct for ISO standard conditions to determine compliance with the NO_x limit.

According to 40 CFR 60.332(a)(3), sources may accept an F-factor of zero or may determine an appropriate F-factor through fuel sampling or manufacturer's analysis. PSE has chosen to accept an F-value of zero. EPA developed a National Policy, dated August 14, 1987 that waives the nitrogen monitoring requirement for natural gas because there is no fuel-bound nitrogen and the free nitrogen does not contribute appreciably to NO_x emissions. If PSE chose to utilize an F-factor that was greater than zero, sampling would be required in accordance with 40 CFR 60 Subpart GG.

Assuming an F-factor of 0, the allowable NO_x concentration for Units 2 and 3 are 97.0 ppm_{dv} for gas and 96.0 ppm_{dv} for oil. According to 40 CFR 60.334(j)(1)(i)(A), for units that monitor water to fuel ratio only (such as Units 2 and 3), excess emission events, and hence the emission limits, are based on one-hour averages.

Nitrogen Oxides Requirements – Turbine Operation: Injecting water into the turbine combustion chambers in Units 2 and 3 during operation reduces nitrogen oxide emissions. Water injection rates are determined by compliance demonstration charts specific to GE Frame 7 units (AOP Appendix). These charts were generated utilizing the 1981 performance test data.

Automated alarm systems are configured to activate when the water injection rate falls a specified amount from the compliance demonstration level. If water injection rates fall below the compliance demonstration level, PSE is required to take immediate corrective action and notify the NWCAA of an upset condition as soon as possible, but no later than 12 hours after the incident occurs (pursuant to AOP Term 2.4.8).

Pursuant to 40 CFR 334(g), PSE Whitehorn is required to develop a parameter monitoring plan that describes the proper operation of the NO_x emission controls. The NWCAA has determined that operation according to the curves developed from the initial testing along with monitoring and reporting as required in the AOP satisfies the requirement to develop a parameter monitoring plan under 40 CFR 60.334(g).

Nitrogen Oxides Requirements – Excess Emissions Reporting: As designed by the turbine manufacturer, during startup of Units 2 and 3, water injection is withheld until the turbines reach a specified fuel input, which correlates to a power output of approximately 42 MW while burning gaseous fuel and 20 MW while

burning fuel oil. If water is injected prior to reaching these thresholds, the water will quench the flame. PSE refers to operating at below these thresholds as “operating below the point of water injection.” During certain market and power conditions, PSE operates the turbines below the point of water injection at what they call “full speed no load” (FSNL) or “full speed low load” (also called “spinning reserve”).

FSNL is when the engine is running at full and is turning the generator but is not generating power (i.e., the breaker is not shut). Spinning reserve is when the engine is running at full, the generator is turning and is energized and synchronized to the grid (i.e., the breaker is shut) but is generating a minimal amount of power. Because both of these situations have a power output of less than the minimum water injection thresholds, water is not being injected into the turbine. The turbines can operate at either of these thresholds for extended periods of time, not necessarily as part of startup.

Pursuant to 40 CFR 60.334(j)(1)(i)(A), as operating hours without water injection, these periods of FSNL and spinning reserve shall be included as excess emissions in the reporting in accordance with 40 CFR 60.7(c).

Nitrogen Oxides Requirements – CAM Plan: The combined CAM Plan for Units 2 and 3 for NO_x are included in SOB Appendix B. Those requirements stemming from the CAM Plan that are unique to the CAM Plan (i.e., not repeated elsewhere) are included in the MR&R column under “CAM Plan.”

The information in the CAM Plan was incorporated into the permit terms in the MR&R column including descriptions of “excursion” and “exceedance” events, as appropriate. An excursion is a departure from an indicator range established for monitoring consistent with the averaging period specified for the monitoring. An excursion does not necessarily indicate that a permit limit has been exceeded and includes periods when significant periods of data collection are missed. An exceedance is an incident when emissions limits have been surpassed. In the case of the nature of the monitoring and averaging periods at PSE Whitehorn, excursions are defined as the same as exceedances and the permit terms are written as such.

As units with potential post-control major source emissions, CAM mandates that the required monitoring collect at least four data points each hour (one in each 15-minute quadrant). Based on site-specific considerations, this monitoring frequency can be reduced to no less than once per 24-hour period. PSE is proposing that the water-to-fuel ratio be monitored continuously (i.e., at least one reading in each 15-minute quadrant) in accordance with NSPS Subpart GG, which meets the monitoring frequency requirement in CAM for the short-term concentration limit (i.e., ppm_{dv} on a 1-hour average). The continuously-monitored water-to-fuel ratio data can be converted via a stack test to a mass emission rate on a short-term (i.e., lb/hr) basis.

In addition to the continuous water-to-fuel ratio monitoring, PSE also proposes to stack test each turbine once every 10,000 operating hours or once every five calendar years, whichever occurs sooner, for demonstrating compliance with the concentration limit and the pound per hour limit. The testing will provide additional data to “spot-check” compliance and correlate actual emissions against the water-

to-fuel operation curve. This monitoring scheme is determined to be adequate to satisfy the CAM requirements.

One case where requirements unique to the CAM Plan were not included in the AOP was the requirement to monitor and record megawatt output on 15-minute intervals. Because the water injection rate is based on fuel flow, as can be seen in the compliance chart, there is no need for the power output to be monitored and recorded to demonstrate compliance with the NO_x requirements.

Also, in the CAM Plan, PSE proposes to report semiannually the recorded monthly hours of operation on natural gas and distillate oil and calculated rolling 12-month NO_x emissions totals. Because PSE Whitehorn Units 2 and 3 do not have an annual NO_x emission limit, reporting the monthly hours of operation on natural gas and distillate oil and the calculated 12-month NO_x emission totals is unnecessary. As such, any reference to demonstrating compliance with an annual NO_x limit in the CAM Plan is excluded from the AOP.

Sulfur Dioxide Requirements: Sulfur dioxide emissions are controlled by limiting the sulfur content of the fuel burned in the turbines. Fuel sulfur testing is required under 40 CFR 60.334(h)(1). However, if the gaseous fuel burned meets the definition of natural gas (i.e., with a sulfur content of 20.0 grains or less of total sulfur per 100 scf [680 ppmw, 0.068 wt%, 338 ppmv total sulfur at 20° C]), a current, valid purchase contract, tariff sheet or transportation contract that specifies that the maximum total sulfur content of the fuel is 20.0 grains/100 scf or less is adequate to meet the fuel sulfur monitoring requirement.

For distillate fuel, fuel sampling and sulfur testing must be performed in accordance with the Acid Rain provisions in 40 CFR 75 Appendix D. 40 CFR 75 Appendix D Section 2.2.1 lists four ways the sampling can take place: sample from the storage tank for the unit after each addition of oil to the storage tank; sample from the fuel lot in the shipment tank or container upon receipt of each oil delivery or from the fuel lot in the oil supplier's storage container; use the flow proportional sampling methodology; or use the daily manual sampling methodology. The sulfur analysis must be performed using the methods listed in 40 CFR 60.335(b)(10).

Because PSE Whitehorn has an aggregate heat input capacity greater than 500 MMBtu/hr, the facility is subject to NWCAA 460. As such, PSE Whitehorn is not subject to the 412 ppm at standard conditions sulfur limit under to NWCAA 520.14. Additionally, NWCAA Regulation Section 460.2 requires a sulfur dioxide ambient monitoring plan. The NWCAA has determined that the fact that PSE Whitehorn burns for practical purposes only natural gas or ultra-low sulfur diesel satisfies this requirement.

Emergency Generator Requirements: The generator is subject to the requirements in 40 CFR 63 Subpart ZZZZ for emergency compression-ignition RICE at area sources. According to 40 63.6640(f), emergency generator operation is limited to 100 hours per year for maintenance checks and readiness testing. The 100 hours per year of operation may include up to 50 hours per year operation in non-emergency situations (which may include up to 15 hours per year as part of a demand response program). There is no time limit on the use of emergency stationary RICE in emergency situations.

Please note that NWCAA 300.4 i) exempts emergency generators that operate less than 500 hours per year for maintenance, testing, or emergency situations from the requirement to obtain a new source review (NSR) permit. Should it become necessary to operate the generator for more than 500 hours per year, an NSR permit may be required.

5.7 AOP Section 6 Inapplicable Requirements

WAC 173-401-640 allows a determination regarding inapplicable requirements. AOP Section 6 contains a list of inapplicable requirements and the causal basis.

6 INSIGNIFICANT EMISSIONS UNITS

Table 4 below lists emission units present at PSE Whitehorn that are insignificant based their size or production rates in accordance with WAC 173-401-533. Column three of the table provides a justification for the exemption based on operational characteristics for each unit.

Some categorically exempt insignificant emission units as defined in WAC 173-401-532 are present at PSE Whitehorn but are not required to be listed herein.

Table 4 Insignificant Emission Units

EMISSION UNIT	DESCRIPTION	LIMIT	CITATION
Facility operation and maintenance	Normal operation and maintenance, exclusive of fuel, associated with the operation of a combustion turbine	Less than threshold quantities	WAC 173-401-530
Natural gas piping	Fuel supply line	Less than threshold quantities	WAC 173-401-530
General welding	Welding for general maintenance and construction	Less than one ton of welding rod/day	WAC 173-401-533 (2)(i)
Space and hot water heaters	Natural gas or propane fired space heaters	Less than 5 MMBtu/hour heat input	WAC 173-401-533 (2)(r)
Storage, loading and unloading of distillate fuels	Distillate fuels have very low vapor pressures.	Vapor pressure less than 5 mm Hg @ 21°C (0.1 psia)	WAC 173-401-533 (2)(t)
Site drainage retention pond	Storm water and oily water collection system	NPDES permitted, used for removing suspended solids and oil.	WAC 173-401-533 (3)(d)

7 PUBLIC DOCKET

Copies of PSE Whitehorn's air operating permit, permit application, and any technical support documents are available at the following locations:

Online:

www.nwcleanair.org

Office:

Northwest Clean Air Agency
1600 South Second Street
Mount Vernon, WA 98273-5202
(360) 428-1617 (call for an appointment to review)

8 DEFINITIONS AND ACRONYMS

Definitions are assumed to be those found in the underlying regulation. A short list of definitions has been included to cover those not previously defined.

An "applicable requirement" is a provision, standard, or requirement in any of the listed regulations or statutes as it applies to an emission unit at a stationary source.

An "emission unit" is any part or activity of a stationary source that emits or has the potential to emit air pollutants.

"Permit" means for the purposes of the air operating permit program an air operating permit issued pursuant to Title V of the 1990 Federal Clean Air Act.

"Technology-Based Emission Standard" means a standard, the stringency of which is based on determinations of what is technologically feasible considering relevant factors.

"State" means for the purposes of the air operating permit program the NWCAA or the Washington State Department of Ecology.

The following is a list of Acronyms and definitions used in the Air Operating Permit and/or Statement of Basis:

AOP	Air Operating Permit
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
Btu	British thermal units
CFR	Code of Federal Regulations
CO	carbon monoxide
dscf	standard cubic feet (dry basis)
EPA	Environmental Protection Agency
FCAA	Federal Clean Air Act
GHG	Greenhouse Gas
ISO	International Organization for Standardization
kW	kilowatt
MMBtu	Million British thermal units
MR&R	monitoring, recordkeeping and reporting requirements
MW	Megawatt
NH ₃	Ammonia
NO _x	nitrogen oxides
NOC	Notice of Construction
NSPS	New Source Performance Standard

NSR	New Source Review
NWCAA	Northwest Clean Air Agency
OAC	Order of Approval to Construct
PS	Performance Specification
PSE	Puget Sound Energy
ppmdv	parts per million by volume (dry basis)
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter of less than 10 microns
PM _{2.5}	particulate matter with an aerodynamic diameter of less than 2.5 microns
RCW	Revised Code of Washington
scf	standard cubic foot
SIP	State Implementation Plan
STP	standard pressure and temperature (14.7 psia and 60°F)
SO ₂	sulfur dioxide
VOC	volatile organic compounds
WAC	Washington Administration Code

Appendix A

AOP Changes in Previous Revisions

Changes made during the first renewal issued February 3, 2005

The Northwest Clean Air Agency (NWCAA) issued the original AOP for the PSE Whitehorn facility on May 1, 1998 and it expired on May 1, 2003. The first renewal was issued on February 3, 2005, and it expired on February 3, 2010.

- Regulatory citations in the permit were updated to reflect revision/promulgation dates.
- General provisions from Subpart A of Title 40 Code of Federal Regulations Part 60 were added.
- References to Turbine Unit 1 were removed from the permit to reflect removal of this combustion turbine generator from the facility.
- Terms were added to reflect applicability of the federal "Compliance Assurance Monitoring (CAM) Rule" (40 CFR Part 64) and requirements stemming from regulatory orders issued to PSE. The CAM Plan was incorporated into this document to illustrate how the CAM provisions influence the monitoring requirements for NO_x emissions.
- Factual information was revised to correct for current operation and some text has been rephrased to add clarification.
- Section 2 - Standard Terms and Conditions were substantially revised to include recent regulatory changes and to allow standardization of permits issued by the Northwest Clean Air Agency.
- Terms have been revised and added to reflect the July 8, 2004 revisions to 40 CFR Part 60 Subpart GG.
- Agency name was changed from Northwest Air Pollution Agency (NWAPA) to Northwest Clean Air Agency (NWCAA).
- Content was reorganized as necessary to meet standard NWCAA layout updates

Appendix B

CAM Plan for NO_x for Units 2 and 3

**Compliance Assurance Monitoring
Water Injection for Nitrogen Oxides (NO_x) Control
Whitehorn Generating Facility**

BACKGROUND

I. EMISSIONS UNIT

Description: General Electric (GE) Frame 7, Type 7101E Simple Cycle Combustion Turbine
Identification: Units 2 & 3
Facility: Puget Sound Energy – Whitehorn Generating Station, Blaine, WA

II. APPLICABLE REGULATIONS, EMISSION LIMIT, AND MONITORING REQUIREMENTS

Requirement: PSD-X80-02

Emission Limit: NO_x emissions from Units 2 & 3 shall not exceed 500 lb/hr per unit.

Requirement: NSPS Subpart GG

Emission Limit: NO_x emissions limited to:

- Firing natural gas: 97.0 ppm_{dv} @ 15% oxygen, 1-hour average.
- Firing fuel oil: 96.0 ppm_{dv} @ 15% oxygen, 1-hour average.

Monitoring Requirements: NO_x emissions from Unit 2 & 3 shall be measured every 10,000 hours of Unit 2 & 3's operation or once every five years, whichever occurs sooner. Emission testing shall be done at the most frequent load level and shall follow Title 40 Code of federal Regulations (CFR) Part 60 Subpart A, Appendix A method 20 or 7E, and the relevant parts of 40 CFR 60.335.

Monitoring Requirements: Puget Sound Energy (PSE) shall record water injection, fuel use, and MW output in 15-minute intervals and determine and record one-hour average water-to-fuel ratios. PSE shall report semiannually to NWCAA (within 30 days after the end of each six-month period): recorded monthly hours of operation on natural gas and distillate oil and calculated rolling 12-month NO_x emissions totals. Emission calculations shall be based on fuel consumption, and water injection/turbine load relationships.

III. Control Technology

Water injection shall be used to control NO_x from Units 2 & 3 during fuel combustion. The key elements of the monitoring approach are presented in Table 1.

TABLE 1. UNITS 2&3 MONITORING APPROACH AT PUGET SOUND ENERGY - WHITEHORN

REQUIREMENT	PARAMETER
I Indicator:	
A. Measurement Approach	Emissions Stack Testing NO _x emissions from Unit 2 & 3 shall be measured every 10,000 hours of Unit’s operation or once every five years, whichever occurs sooner. Emission testing shall be done at the most frequent load level and shall follow 40 CFR Part 60 Subpart A, Appendix A Method 20 or 7E, and the relevant parts of 40 CFR 60.335.
B. Measurement Approach	Water-to-fuel Ratio Monitoring Hourly water-to-fuel ratios shall be monitored to determine compliance with 40 CFR 60.332(a).
II. Indicator Range:	
A. Indicator Range Emissions Stack Testing	An acceptable range of NO _x emissions includes a total concentration of no more than 97.0 ppm _{dv} @ 15% O ₂ while combusting natural gas and 96.0 ppm _{dv} @ 15% O ₂ while combusting distillate, in any one hour period and no more than 500 lb per unit in any one-hour period. Any one hour period during which NO _x emissions exceed 97.0 ppm _{dv} @ 15% O ₂ while combusting natural gas, 96.0 ppm _{dv} @ 15% O ₂ while combusting distillate, or 500 lb/hr per unit shall be reported to NWCAA within 30 days following months end of the exceedance. If necessary, corrective actions shall be taken immediately.
B. Indicator Range Water-To-Fuel Ratio Monitoring	An acceptable water-to-fuel ratio shall be in compliance with 40 CFR 60.322(a). For any one hour period during which the average water-to-fuel ratio falls below the NO _x compliance limit as calculated in 40 CFR 60.332(a) and determined by the GE compliance chart, activate alarm and notify NWCAA within 12 hours. For any one-hour period the average water-to-fuel ratio falls below the minimums established in the GE compliance chart shall be reported to NWCAA within 30 days following months end after the event. If necessary, corrective actions shall be taken immediately.

TABLE 1 CONTINUED. UNITS 2&3 MONITORING APPROACH AT PUGET SOUND ENERGY - WHITEHORN

III. Performance Criteria:	
A. Data Representativeness	<p>NO_x emissions testing shall be measured from the Unit’s exhaust stack by source testing. Emission test results shall meet the data quality requirements of the test methodology.</p> <p>The water flow and fuel flow measuring devices shall be calibrated, maintained, and operated in accordance with manufacturer’s specifications.</p>
B. Verification of Operational Status	<p>Emissions tests shall be performed as specified.</p> <p>The monitoring system shall be operated according to manufacturer specifications.</p>
C. QA/QC Practices and Criteria	<p>Emissions testing shall be done at the most frequent load level and shall follow 40 CFR Part 60 Subpart A, Appendix A Method 20 or 7E, and the relevant parts of 40 CFR 60.335. Emission test results shall meet the data quality requirements of the test methodology.</p>
III. Performance Criteria:	
D. Monitoring Frequency and Data Collection Procedures	<p>Puget Sound Energy (PSE) shall record water injection, fuel use, and MW output in 15-minute intervals and determine and record one-hour average water-to-fuel ratios. PSE shall report semiannually to NWCAA (within 30 days after the end of each six-month period): recorded monthly hours of operation on natural gas and distillate oil and calculated rolling 12-month NO_x emissions totals. Emission calculations shall be based on fuel consumption, and water injection/turbine load relationships.</p> <p>In the case of an exceedance, the report shall document the month of the exceedance occurred, the duration and magnitude of the exceedance, the probable cause of the occurrence, corrective actions taken or planned, and the name of any other agency contacted. This report shall be submitted to NWCAA within 30-days following month’s end of the exceedance.</p> <p>NWCAA shall be notified as soon as possible and in no case later than twelve hours after a breakdown, upset, startup or shutdown conditions occurs which results in or may have resulted in: a) exceedance of an emission or ambient standard; b) a potential threat to human health or safety.</p>

JUSTIFICATION

I. BACKGROUND

The General Electric (GE) Frame 7, Type 7101E simple cycle dual-fueled combustion turbine (Unit 2 & 3) are located at the Whitehorn Generating Station. Each turbine has the capability to supply a gross power output of approximately 75 MW. NO_x emissions from Units 2 & 3 are controlled using water injection.

II. RATIONALE FOR SELECTION OF PERFORMANCE INDICATORS

The NO_x performance indicators were selected based on the approval conditions outlined in the PSD permit PSD-X80-02 and NSPS Subpart GG and the Whitehorn Generating Station's Air Operation Permit No. 012R1.

Stack testing every 10,000 hours of Unit's operation or once every five calendar years, whichever occurs sooner, and fuel monitoring shall be considered satisfactory to determine performance regarding NO_x emissions on a concentration or mass basis.

The water-to-fuel ratio system indicates compliance with requirements to maintain NO_x emissions at or below 97.0 ppmdv @ 15% O₂ while combusting natural gas, 96.0 ppmdv @ 15% O₂ while combusting distillate and less than 500 lb/hr, by comparing the recorded water-to fuel ratios against the GE compliance chart. Compliance with this condition is further confirmed with the periodic stack testing.

The annual emissions shall be calculated by using emission factors determined through stack testing and fuel use records.

These indicators are justified by 40 CFR 64.4, which states, "If an owner or operator relies on presumptively acceptable monitoring, no further justification for the appropriateness of that monitoring should be necessary other than an explanation of the applicability of such monitoring to the unit in question." Units 2 & 3 are already performing these monitoring methods required by the New Source Performance Standards (NSPS) subpart GG and therefore may use them to satisfy the monitoring requirements of this CAM plan.

III. RATIONALE FOR SELECTION OF INDICATOR RANGES

The indicator range is selected to show compliance with the conditions of the PSD permit PSD-X80-02, NSPS Subpart GG, and Whitehorn Generating Station's Air Operating Permit No 004. Stack testing and fuel monitoring shall provide data to calculate NO_x emissions on an hourly basis and provide an accurate estimate of emission concentration within the exhaust stack of Units 2 & 3. Water-to-fuel monitoring shall provide information to determine compliance with 40 CFR 60.335.

TEST AND IMPLEMENTATION PLAN

I. TEST PLAN

NO_x emissions from Units 2 & 3 shall be measured every 10,000 hours of Units 2 & 3 operation or once every five calendar years, whichever occurs sooner. Emission testing shall be done at the most frequent load level and shall follow 40 CFR Part 60 Subpart A Appendix A method 20 or 7E and the relevant parts of 40 CFR 60.335.

PSE shall report semiannually to NWCAA (within 30 days after the end of each six-month period): recorded monthly hours of operation on natural gas and distillate oil and calculated rolling 12-month NO_x emissions totals (unless a different testing and reporting schedule has been approved by NWCAA).

In the case of an exceedance, the report shall document the month of the exceedance occurred, the duration and magnitude of the exceedance, the probable cause of the occurrence, correction actions taken or planned, and the name of any other agency contacted. This report shall be submitted to NWCAA with 30-days following month's end of the exceedance.

NWCAA shall be notified as soon as possible and in no case later than twelve hours after a breakdown, upset, startup or shutdown conditions occurs which results in or may have resulted in: a) exceedance of an emission or ambient standard; b) a potential threat to human health or safety.

II. IMPLEMENTATION PLAN

No implementation plan is necessary for stack testing and water-to-fuel ratio monitoring, because these monitoring techniques are already in operation for Unit 2 & 3.