WASHINGTON STATE DEPARTMENT OF ECOLOGY
POST OFFICE BOX 47600
OLYMPIA, WASHINGTON 98504-7600

IN THE MATTER OF:	**]**	**NO. PSD-07-01, Amendment 1**
	]	
BP Cherry Point Refinery	**]**	**DRAFT APPROVAL**
4519 Grandview Road	**]**	**OF PSD APPLICATION**
Blaine, Washington 98230	**]**	

This approval is issued pursuant to the United States Environmental Protection Agency (EPA) regulations for the Prevention of Significant Deterioration (PSD) set forth in Title 40 Code of Federal Regulations Part 52, and regulations set forth in the Washington Administrative Code 173-400-700. Based upon the complete application submitted by the BP Cherry Point Refinery (BP) dated May 2007, the complete application for modification received April 1, 2009, and the technical analysis performed by the Department of Ecology (Ecology), Ecology now finds the following:

FINDINGS

1. The BP Cherry Point Refinery (BP) has applied to increase the short-term sulfur dioxide (SO_2) emission limit imposed on the two new boilers by the existing PSD permit. The averaging period for the current hourly SO_2 limit is requested to be changed to annual. No changes to any other air pollutant emission limits are requested. No increase in annual SO_2 emissions is requested. BP proposes no physical or operational changes to the boilers.
2. The original permit allowed the BP Cherry Point Refinery (BP) to shut down two existing boilers (Boiler #1 and Boiler #3) and replace them with two new boilers (Boiler #6 and #7). This is referred to as the Boiler Replacement Project.
3. BP is located in Whatcom County approximately seven miles southeast of Blaine, Washington. The coordinates of the project are about UTM 10 519600E and 5414800N.
4. BP is located within a Class II area that is currently designated in attainment for all national and state air quality standards.
5. Ecology, EPA Region 10, and the Land Managers received the Boiler Replacement Project PSD permit amendment application on about April 1, 2009. The application was determined to be complete as of May 1, 2009.
6. Boilers #1 and #3 are each rated at 330 MMBtu per hour and 150,000 pounds steam per hour. The two new package boilers are each rated at 363 MMBtu per hour and 250,000 pounds steam per hour. Each of the existing boilers and the replacement boilers each provide steam at 750°F and 620 psig.
7. The boilers burn a combination of refinery fuel gas and natural gas. Because there is a limited supply of refinery fuel gas at Cherry Point Refinery, natural gas is routinely blended with refinery fuel gas in the mix drum. When sufficient refinery fuel gas is not available to meet all refinery needs, natural gas is used.

8. Because BP is an existing major stationary source, any net emissions increase of a regulated pollutant greater than its Significant Emission Rate (SER) qualifies the proposed project as a major modification. As a result, the project would be subject to PSD review under WAC 173-400-700 for that pollutant. Additionally, the project is subject to federal PSD review because it qualifies as a major modification under federal rules [40 CFR 52.21(b)(2)(i), 40 CFR 52.21(b)(3)(i), and 40 CFR 52.21(b)(23)(i)].

9. Potential regulated pollutants for the proposed project are shown in Table 1. They are nitrogen oxides (NO_X), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic carbon compounds (VOC), particulates less than 10 microns in diameter (PM_{10}), and particulates of any diameter (PM). Amendment 1 changes the SO_2 short-term emission rate allowed for the two boilers combined from 27.2 to 78.6 pounds per hour on a 3-hour average basis. The significance analysis is for the initial permit, not the amendment. Amendment 1 does not change the annual potential to emit for any pollutant.

Table 1: New Boilers Criteria Pollutant Emissions (Combined)

Pollutant	Emission Rate		SER	Significant?	With Contemporaneous Emission Increases and Decreases	Significant?
	lb/hr	tpy[1]	tpy		tpy	
NO_X	7.9	34.4	40	No		
CO	26.5	116.2	100	**Yes**	298.3	**Yes**
SO_2	78.6	119.3	40	**Yes**	124.9	**Yes**
PM_{10}	6.8	30.0	15	**Yes**	58.3	**Yes**
VOC	3.9	17.2	40	No		
Sulfuric Acid	0.6	2.6	7	No		

1. Includes both combustion emissions and fugitive equipment leaks

10. Regulated pollutants with net emissions increases greater than their PSD Significant Emission Rate (SER) are subject to regulation under PSD. For this project, the PSD regulated pollutants are CO, SO_2, and PM_{10}. Also, all particulates (PM and PM_{10}) are considered to be PM_{10}.

11. The emissions of all air pollutants from BP are subject to review under Chapter 173-400 WAC and Chapter 173-460 WAC. Chapter 173-400 WAC includes provision for PSD review (WAC 173-400-700). This permit considers only PSD pollutants that have a significant net emission increase due to the project when considered under PSD regulations. All other pollutants are regulated under state regulations by the Northwest Clean Air Agency (NWCAA).

12. The NSPS requirements of 40 CFR 60 Subpart Db applies to NO_X emissions, and to monitoring and reporting. Because the fuel is gaseous, Subpart Db does not have applicable PM_{10} requirements. There are no applicable NSPS requirements for CO. 40 CFR 60 Subpart Ja has applicable refinery gas H_2S fuel content limits. BP will also include the proposed boilers in leak detection and repair (LDAR) program based on 40 CFR 60 Subpart GGG and 40 CFR 63 Subpart CC in accordance with a facility wide consent decree.

13. Best Available Control Technology (BACT) determinations are shown in Table 2.

Table 2: Best Available Control Technology (BACT) Determinations

Pollutant	Best Available Control	Emission Rate (per boiler)
Carbon Monoxide (CO)	Proper combustion	13.3 lb/hr based on 0.0365 lb/MMBtu (50 ppm)
Sulfur Dioxide (SO_2)	NSPS quality refinery fuel gas	39.3 lb/hr on a three hour average 13.6 lb/hr annual average based on 0.0375 lb/MMBtu (17.8 gr S/100 scf in fuel gas)
Particulate Matter (PM_{10})	Proper combustion	3.4 lb/hr based on 12.7 lb/MMscf of fuel gas

14. Allowable increases in emissions from the project will not cause or contribute to air pollution in violation of any National Ambient Air Quality Standard (NAAQS). Table 3 shows CO, SO_2, and PM_{10} impacts are below their respective NAAQS and SILs. Short-term SO_2 emissions reflect Amendment 1. Annual SO_2 emissions are unchanged from the original application. All NO_X, CO, and PM_{10} emission rates are unchanged from the original application.

Table 3: Maximum Predicted Criteria Pollutant Concentrations (µg/m^3)

Pollutant	Averaging Time	Maximum Concentration	SIL (a)	Monitoring De Minimis Concentration	Maximum Concentrations BP Refinery and Other Regional Industrial Sources	Background(b)	Total	Standard	
NO_2	Annual	0.22	1	14	0.22	(d)	0.22	100	NAAQS
SO_2	1-hour	127	None	None	127	149	276	1,050	WAAQS[f]
	3-hour	47	25	None	697	92	789	1,300	NAAQS
	24-hour	**9.3**	**5**	**13**	**111**	**43**	**154**	**365**	**NAAQS**
	24-hour	**9.3**	**5**	**13**	**111**	**43**	**154**	**262**	**WAAQS**
	Annual	**1.47**	**1**	**None**	**13.6**	**13**	**26.6**	**80**	**NAAQS**
	Annual	**1.47**	**1**	**None**	**13.6**	**13**	**26.6**	**52**	**WAAQS**
CO	1-hour	63.74	2,000	None	63.7	(c)	63.7	40,000	NAAQS
	8-hour	19.70	500	575	19.7	(c)	19.7	10,000	NAAQS
PM_{10}	24-hour	3.5	5	10	3.5	(c)	3.5	150	NAAQS
	Annual	0.40	1	None	0.40	(c)	0.40	50	WAAQS

(a) SIL = Significant Impact Level, per the EPA New Source Review Manual, Draft 1990, Table C-4.
(b) Background concentrations reflect the highest observations from 2002-2006 collected at a BP SO_2 monitoring station located adjacent to BP's meteorological monitoring tower.
(c) Pollutants for which a NAAQS analysis was not required were not modeled with other regional sources, and were not combined with a background concentration for comparison with the ambient standard.
(d) Pollutants for which the project did not trigger PSD were modeled only with the two replacement boilers and were not combined with a background concentration for comparison with the ambient standard.
(f) NWCAA has 655 ug/m3 one-hour average and 2,096 ug/m3 five-minute average standards for SO_2. Modeling shows compliance with the 1-hour standard. Multiplication of the 1-hour concentration impact by 1.64 (factor recommended by Turner)[1] indicates 453 ug/m3, which meets the 5-minute standard.

15. Allowable increases in emissions from the project will not cause or contribute to air pollution in violation of any PSD increment. Table 4 shows the increment consumption for SO_2

[1] D. Bruce Turner, *Workbook of Atmospheric Dispersion Estimates*, CRC Press. First published in 1970.

emissions. Table 3 shows that no other regulated pollutant triggered their PSD modeling SIL. This removes any further modeling requirements, including increment consumption analysis.

Table 4: Maximum Predicted SO_2 Concentrations and Comparison with Applicable PSD Increments

Averaging Period	BP Refinery and Other Regional Industrial Sources (µg/m^3)	PSD Increment (µg/m^3)
3 hour	389	512
24 hour	75	91
Annual	13.6	20

(a) There is no PSD increment for 1-hour or 5 minute averaging periods.

16. Class I area distances and concentrations are shown in the following table:

Table 5: Predicted Pollutant Concentrations for Class I Areas

Class I Area of Interest	Distance (km)	Maximum Predicted Concentration (µg/m^3)					
		NO_2	PM_{10}		SO_2		
		Annual Average[1]	24-Hour Average	Annual Average	3-Hour Average	24-Hour Average	Annual Average
Alpine Lakes Wilderness	162	0.0000201	0.0202	0.0011	0.0620	0.0171	0.0007
Glacier Peak Wilderness	112	0.0000567	0.0159	0.0012	0.0821	0.0184	0.0009
Goat Rocks Wilderness	262	0.00000236	0.0133	0.0004	0.0167	0.0058	0.0002
Mount Adams Wilderness	300	0.00000151	0.0105	0.0003	0.0140	0.0049	0.0001
Mount Rainier National Park	218	0.00000896	0.0250	0.0008	0.0230	0.0113	0.0005
N Cascades National Park	80	0.000197	0.0199	0.0016	0.0975	0.0416	0.0015
Olympic National Park	106	0.000307	0.0516	0.0022	0.1592	0.0505	0.0023
Pasayten Wilderness	126	0.0000759	0.0146	0.0010	0.0494	0.0206	0.0008
Maximum Concentration in Mandatory Class I Areas	**NA**	**0.00037**	**0.0516**	**0.0022**	**0.1592**	**0.0505**	**0.0023**
Mount Baker Wilderness[2]	60	0.000421	0.0342	0.0029	0.3037	0.1149	0.0031
EPA Proposed SIL[3]		*0.1*	*0.3*	*0.2*	*1*	*0.2*	*0.1*
FLM Recommended SIL[3]		*0.03*	*0.27*	*0.08*	*0.48*	*0.07*	*0.03*
Class I Area PSD Increment[4]		*2.5*	*8*	*4*	*25*	*5*	*2*

1 NO_X was conservatively assumed to be 75% converted to NO_2, per Section 6.2.3 of EPA's Guideline on Air Quality Models (Appendix W to 40 CFR Part 51).

2 Mount Baker Wilderness Area is not a Class I area, it is included in the analysis because FLMs have requested its inclusion for their information.

3 SIL = Significant Impact Level; EPA proposed and FLM recommended from the Federal Register, Vol. 61, No. 142, p. 38292, July 23, 1996.

4 40 CFR 52.21(c), adopted by reference in WAC 173-400-720(4)(a)(v).

17. Allowable emissions will not cause a significant visibility impact in:

17.1. The surrounding Class I areas: The highest modeled impacts were 2.39% and 1.46% degradation in the Olympic National Park and North Cascades National Park respectively. Federal land managers reviewed both the original and amended permit applications and considered the project to be below their "concern" threshold.

17.2. Nearby Class II wilderness and scenic areas: The highest modeled impact was 2.90% degradation in the Mt. Baker Wilderness Area. Federal land manager guidance considers this to be below the "concern" threshold.

18. The highest modeled deposition in the surrounding Class I areas is 0.0007 kilograms nitrogen and 0.0021 kilograms sulfur per hectare per year in the North Cascades National Park. The nitrogen deposition level is 14% of the "concern" threshold in federal land manager guidance. The sulfur deposition level is 42% of the federal land manager "concern" threshold. Amendment 1 does not change annual emissions, so it does not affect this analysis.

19. No significant effect on industrial, commercial, or residential growth in the area is anticipated as a result of this project.

20. Ecology finds all requirements for PSD have been satisfied. Approval of the PSD application is granted subject to the following conditions.

APPROVAL CONDITIONS

Fuels

1. Boilers #6 and #7 shall burn only refinery fuel gas or natural gas.

Emission Limits

2. CO emissions from boilers #6 or #7 (each) shall not exceed:

   2.1. 13.3 lb/hr based on a calendar day average.

3. SO_2 emissions from boilers #6 or #7 (each) shall not exceed:

   3.1. 39.3 lb/hr based on a three hour average.
   3.2. 21.4 lb/hr based on a calendar day average.
   3.3. 59.6 tons per year based on a twelve month rolling average.

4. PM_{10} emissions from boilers #6 or #7 (each) shall not exceed:

   4.1. 3.4 lb/hr on a calendar day average.

Initial Compliance Demonstration and Notification

5. BP shall notify Ecology and NWCAA in writing at least 30 days prior to initial startup of Boilers #6 and #7.

6. For CO emissions from Boilers #6 and #7 exhaust stacks, BP will demonstrate initial compliance with Condition 2.1.

   6.1 BP will have a compliance test conducted by an independent testing vendor within 60 days of achieving the maximum firing rate at which Boilers #6 and #7 will be operated, but not later than 180 days after initial startup.

6.2 Boilers #6 and #7 are to be operated at an average firing rate as close to the rated capacity during the compliance test as practical. If this is less than 90% of the rated capacity, the reason shall be explained in the test report.

6.3 Determine compliance using 40 CFR 60 Appendix A Method 10, 10A, 10B, or equivalent test method if approved in advance by Ecology.

6.4 A typical mix of normal refinery gas and natural gas fuel shall be burned during the test period. This mix shall be listed in the test plan referenced in Condition 6.5.

6.5 BP will submit a test plan to Ecology and NWCAA for approval at least 30 days prior to initial performance testing.

7. For SO_2 emissions from Boilers #6 and #7 exhaust stacks, BP will demonstrate initial compliance with Condition 3.1.

7.1 BP will have a compliance test conducted by an independent testing vendor within 60 days of achieving the maximum firing rate at which Boilers #6 and #7 will be operated, but not later than 180 days after initial startup.

7.2 Boilers #6 and #7 are to be operated at an average firing rate as close to the rated capacity during the compliance test as practical. If this is less than 90% of the rated capacity, the reason shall be explained in the test report.

7.3 Determine compliance using 40 CFR 60 Appendix A Method 6 or 6C, or equivalent test method if approved in advance by Ecology.

7.4 A typical mix of normal refinery gas and natural gas fuel shall be burned during the test period. This mix shall be listed in the test plan referenced in Condition 7.5.

7.5 BP will submit a test plan to Ecology and NWCAA for approval at least 30 days prior to initial performance testing.

8. For PM/PM_{10} emissions from Boilers #6 and#7 unit exhaust stacks, BP will demonstrate initial compliance with Condition 4.1.

8.1 BP will have a compliance test conducted by an independent testing vendor within 60 days of achieving the maximum firing rate at which Boilers #6 and #7 will be operated, but not later than 180 days after initial startup.

8.2 Boilers #6 and #7 are to be operated at an average firing rate as close to the rated capacity during the compliance test as practical. If this is less than 90% of the rated capacity, the reason shall be explained in the test report.

8.3 Determine compliance using 40 CFR 60 Appendix A Method 5 front half, and 40 CFR 51 Appendix M Method 202 for the back half, or equivalent test method if approved in advance by Ecology.

8.4 A typical mix of normal refinery gas and natural gas fuel shall be burned during the test period. This mix shall be listed in the test plan referenced in Condition 8.5.

8.5 BP will submit a test plan to Ecology and NWCAA for approval at least 30 days prior to initial performance testing.

Compliance Monitoring and Testing

9. For CO emissions from Boilers #6 and #7 exhaust stacks, BP will demonstrate compliance with Condition 2.1.

    9.1 Monitor using a CEMS that measures and records CO emissions from Boilers #6 and #7 exhaust stacks and that meets the requirements of Condition 12.1.

10. For SO_2 emissions from Boilers #6 and #7 exhaust stacks, BP will demonstrate routine compliance with Condition 3.1.

    10.1 Test once per calendar month for total sulfur in the boiler fuel using ASTM Test Method D-5504 or another method approved by Ecology. A minimum of 3 samples, taken at least an hour apart, shall be run per monthly test.

    10.2 Monitor fuel H_2S content using a CEMS that continuously monitors and records the concentration (dry basis) of H_2S in the fuel gas. It shall meet the requirements of Condition 12.2.

    10.3 As an alternative to Conditions 10.1 and 10.2, BP may monitor using a CEMS that measures and records SO_2 emissions from the Boilers #6 and #7 exhaust stacks and meets the requirements of Condition 12.3.

11. For particulate emissions from the Boilers #6 and #7 exhaust stacks, BP will demonstrate routine compliance with Condition 4.1.

    11.1 Continuous compliance shall be demonstrated by an annual emissions test on each exhaust stack using the methods indicated in Condition 8.3. After 3 consecutive years of annual tests on each boiler stack have demonstrated compliance, testing of each boiler stack may be reduced to once every 5 years. If a test demonstrates noncompliance, a retest along with resumption of annual testing is required for the unit until 3 consecutive years demonstrate compliance.

12. Continuous Emission Monitoring Systems:

    12.1 CEMS for CO shall satisfy the requirements contained in 40 CFR, Part 60, Appendix B, Performance Specification 4 and 40 CFR Part 60, Appendix F, Quality Assurance Procedures.

    12.2 CEMS for H_2S shall satisfy the requirements contained in 40 CFR, Part 60, Appendix B, Performance Specification 7 and 40 CFR Part 60, Appendix F, Quality Assurance Procedures. Method 11, 15, 15A, 16, or an alternative approved by Ecology shall be used for conducting the relative accuracy evaluations.

    12.3 CEMS for SO_2 shall satisfy the requirements contained in 40 CFR, Part 60, Appendix B, Performance Specification 2 and 40 CFR Part 60, Appendix F, Quality Assurance Procedures.

    12.4 CEMS for O_2 shall satisfy the requirements contained in 40 CFR, Part 60, Appendix B, Performance Specification 3 and 40 CFR Part 60, Appendix F, Quality Assurance Procedures.

Startup Conditions

13. Startup is defined as starting the boiler from an inactive cold state, and ending when operating above 91 MMBtu HHV/hour or after 8 hours of operation, whichever is sooner.

    13.1 Emission limits for CO in Condition 2 are relieved during startup periods.

    13.2 Emissions of CO during startup periods shall be limited to 50 pounds per hour averaged over the startup period.

    13.3 Emissions of CO during startup periods shall be monitored and included in the annual emissions reported each year pursuant to WAC 173-400-105(1).

Recordkeeping, Notification and Reporting

14. BP shall submit the following reports and monitoring data to NWCAA and Ecology. Once this permit has been incorporated in to BP's Title V permit, these submittals no longer need to be sent to Ecology.

    14.1 Submit a report monthly, within 30 days of the end of the calendar month, or on another schedule agreed to by Ecology and NWCAA. At the least, the report shall include the following:

        14.1.1 Calendar date or monitoring period.

        14.1.2 Monthly maximum of CO, SO_2, and PM_{10} emissions for each boiler for the reporting month in accordance with Approval Conditions 2, 3, and 4, respectively.

        14.1.3 Monthly total sulfur analysis results and annual SO_2 emissions on a twelve monthly rolling average in accordance with Approval Condition 3.3.

    14.2 In addition, required report shall include:

        14.2.1 Days and duration for which data was not collected.
        14.2.2 Reasons for which data was not collected.

    14.3 BP shall maintain monitoring records on site for at least five years, and shall submit:

        14.3.1 Excess emission reports to NWCAA, as discussed in Approval Condition 14.4.
        14.3.2 Results of any compliance source tests.
        14.3.3 Results of any CEM RATAs.

    14.4 For each occurrence of monitored emissions in excess of any condition, the monthly emissions report shall include the following:

        14.4.1 The time of the occurrence.
        14.4.2 Magnitude of the emission or process parameters excess.
        14.4.3 The duration of the excess.
        14.4.4 The probable cause.
        14.4.5 Corrective actions taken or planned.
        14.4.6 The name of any agency contacted.

Special Requirements

15. When the final NSPS 40 CFR 60 Subpart Ja is published in the Federal Register, its provisions will become applicable to Boilers #6 and #7. Within 30 days of publication, BP will contact Ecology and NWCAA to begin a process to meet these new requirements and modify the applicable conditions of this permit.

Standard Requirements

16. Sampling ports and platforms shall be provided on the Boilers #6 and #7's stacks, after any final pollution control device. The ports shall meet the requirements of 40 CFR 60 Appendix A, Method 1. Adequate, permanent, and safe access to the test ports shall be provided.

17. Within 90 days of startup of the boilers, BP shall identify operational parameters and practices that will constitute "good combustion practices" for Boilers #6 and #7. These operational parameters and practices shall be included in an O&M manual for the facility. The O&M manual shall be maintained and followed by BP and shall be available for review by Ecology, NWCAA or the EPA. If a failure to follow the requirements of the manuals results in excess emissions, that failure may be considered credible evidence that the event was caused by poor or inadequate operation or maintenance.

18. Access to the source by Ecology, NWCAA, or the EPA shall be permitted upon request. Failure to allow such access is grounds for an enforcement action under the federal Clean Air Act and the Washington State Clean Air Act.

19. This approval shall become invalid if construction of the project is not commenced within eighteen (18) months after receipt of the final approval, or if construction of the facility is discontinued for a period of eighteen (18) months, unless Ecology extends the 18-month period, pursuant to 40 CFR 52.21(r)(2) and applicable EPA guidance.

20. The effective date of this permit shall not be earlier than the date upon which the EPA notifies Ecology that the EPA has satisfied its obligations, if any, under Section 7 of the Endangered Species Act 16 U.S.C. § 1531 et seq., 50 C.F.R. part 402, subpart B (Consultation Procedures) and Section 305(b)(2) of the Magnuson-Stevens Fishery and Conservation Act 16 U.S.C. § 1801 et seq., 50 C.F.R. part 600, subpart K (EFH Coordination, Consultation, and Recommendations).

21. For federal regulatory purposes and in accordance with 40 CFR 124.15 and 124.19: If there was a public comment requesting a change in the preliminary determination or a proposed permit condition during the public review and comment period, the effective date of this permit shall not be earlier than 30 days after service of notice to the commenters and applicant on the preliminary determination.

    21.1 If a review of the final determination is requested under 40 CFR 124.19 within the 30-day period following the date of the final determination, the effective date of the permit is suspended until the review and any subsequent appeal against the permit are resolved.

21.2 If there was no public comment requesting a change in the preliminary determination or a proposed permit condition during the public review and comment period, this permit is effective upon the date of finalization subject to consideration of Condition 20 (EPA's ESA requirement) above.

Reviewed by:

Robert C. Burmark, P.E.
Science and Engineering Section
Air Quality Program

Date

Approved by:

Stuart A. Clark
Air Quality Program Manager
Washington State Department of Ecology

Date

Ecology was notified by the U.S. EPA that the U.S. EPA has satisfied its obligations under the Endangered Species and Magnuson-Stevens Acts relative to PSD Permit 07-01 issued to BP Cherry Point Refinery on:

May 21, 2007
Date of U.S. EPA Notification

Stuart A. Clark
Air Quality Program Manager
Washington State Department of Ecology