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

IN THE MATTER OF:	]	**NO. PSD-10-01**
	]	
BP Cherry Point Refinery	]	**FINAL APPROVAL**
4519 Grandview Road	]	**OF PSD APPLICATION**
Blaine, Washington 98230	]	

This approval is issued pursuant to the regulations for the Prevention of Significant Deterioration (PSD) set forth in the Washington Administrative Code 173-400-700. Based upon the application submitted by the BP Cherry Point Refinery (BP) dated April 2010, and additional information dated July 19, 2010, the technical analysis performed by the Department of Ecology (Ecology), Ecology now finds the following:

FINDINGS

1. BP has applied to implement a Clean Fuels Project (Project). The project is to install and operate new equipment to meet the new federal Ultra-Low Sulfur Diesel (ULSD) specifications for non-road equipment and benzene content for gasoline. The diesel fuel's sulfur content will be reduced from less than 500 to less than 15 part per million.

2. The project will allow removal of up to 15 long tons of sulfur per day from refinery's non-road diesel fuel product.

3. BP is located in Whatcom County approximately seven miles southeast of Blaine, Washington. The coordinates of the project are about UTM Zone 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 Project PSD permit application on about April 21, 2010. BP submitted additional information dated July 21, 2010, in response to questions from Ecology. The application was determined to be complete as of August 24, 2010.

6. The Project has two primary components:

   6.1. A new diesel hydro-desulfurization (#3 DHDS) processing unit to provide additional treatment to up to 25,000 barrels per day of existing diesel fuel production. It has a 28 million BTU per hour (MMBtu/hr) charge heater.

   6.2. A new hydrogen plant (#2 Hydrogen Plant) to produce up to 40 million standard cubic feet (MMSCFD) per day of synthesized hydrogen for the new #3 DHDS and also other existing refinery operations. It will also purify up to four MMSCFD of hydrogen from existing refinery sources. A Steam Methane Reformer (SMR) furnace with a heat input capacity of 496 million BTU/hr is the main source of combustion emissions. The new

hydrogen plant also has a flare system to combust off specification gases associated with start-up, shutdown, and upset conditions. During normal operations this flare will have limited use.

7. The Project will also retrofit the existing First Stage Fractionator Reboiler (one of the four heaters at the hydrocracker) with Ultra Low NO_X Burners (ULNBs).

8. The Project will 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.

9. 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 could be subject to federal PSD review if 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)].

10. BP conducted a two-step PSD applicability analysis where Step 1 determines emissions increases due to the Project (including increases from affected equipment). Step 2 combines these Project increases with other contemporaneous increases and decreases to determine the Project's Significant Net Emissions increase. The details of this analysis are available in the Technical Support Document prepared for this permit.

11. 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 organiccompounds (VOC), particulates less than 10 microns in diameter (PM_{10}), particulates less than 2.5 microns in diameter ($PM_{2.5}$), and particulates of any diameter (PM). For this permit, PM is considered equal to PM_{10}. Under current federal PSD regulations, condensables are not considered as part of PM, PM_{10}, or $PM_{2.5}$. Under current state PSD regulations, condensables are considered part of PM_{10}. The state PSD regulations do not consider $PM_{2.5}$ at all.

Table 1. Summary of Project Emissions and Significant Net Emissions

Pollutant	Emission Rate	SER	Significant?	With Contemporaneous Emission Increases and Decreases	Significant?
	tpy[1]	tpy		tpy	
NO_X	61	40	**Yes**	34	No
CO	77	100	No	-	-
SO_2	36	40	No	-	-
PM (filterable)	9	25	No	-	-
PM_{10}(filterable)	9	15	No	-	-
PM_{10}(total)	32	15	**Yes**	32	**Yes**[2]
$PM_{2.5}$(filterable)	8	10	No	-	-
VOC	35	40	No	-	-
Sulfuric Acid	1.5	7	No	-	-

1. Includes both combustion emissions and fugitive equipment leaks.
2. Significant under Washington State PSD regulations only; not current federal regulations.

12. Regulated pollutants with net emissions increases greater than their PSD SER are subject to regulation under PSD. For this project, the only PSD regulated pollutant is total PM_{10} under WAC 173-400-720.

13. 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 and local air agency regulations by the Northwest Clean Air Agency (NWCAA).

14. The NSPS requirements of 40 CFR 60 Subparts A, J, Ja, GGGa, and QQQ are applicable to the Project. There are no applicable NSPS requirements for PM_{10} emissions.

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

Table 2. BACT Determinations for PM_{10}

Pollutant	Best Available Control	Emission Rate
#3 DHDS Charge Heater	Good Combustion Practices	0.28 lb/hr based on 0.0100 lb/MMBtu
#2 H_2 Plant SMR Furnace	Good Combustion Practices	4.96 lb/hr based on 0.0100 lb/MMBtu
#2 H_2 Plant Flare	Proper combustion, design to NSPS & MACT specifications	

16. 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 that PM_{10} impacts are below their respective NAAQS and SILs.

Table 3. Maximum Predicted Criteria Pollutant Concentrations ($\mu g/m^3$)

Pollutant	Averaging Period	Maximum Concentration	Modeling SIL (a)	Monitoring De Minimis Concentration	Background	Total	Standard	
PM_{10}	24-hour	0.8	5	10	-	-	150	NAAQS
	Annual	0.14	1	None	-	-	50	WAAQS

(a) SIL = Significant Impact Level, per the EPA New Source Review Manual, Draft 1990, Table C-4.

17. Allowable increases in emissions from the Project will not cause or contribute to air pollution in violation of any PSD increment. Since PM_{10} did not break its SIL, no increment analysis is required.

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

Table 4. Predicted Class I Area Criteria Pollutant Concentrations

Class I Area of Interest	Maximum Predicted Concentration (µg/m³)					
	NO_2 [a]	PM_{10}		SO_2		
	Annual Average	24-Hour Average	Annual Average	3-Hour Average	24-Hour Average	Annual Average
Alpine Lakes Wilderness	1.45E-04	0.0115	0.0005	0.0109	0.0041	0.0001
Glacier Peak Wilderness	0.00085	0.0193	0.0010	0.0603	0.0143	0.0005
Goat Rocks Wilderness	1.62E-05	0.0037	0.0001	0.0032	0.0010	3.21e-05
Mount Adams Wilderness	9.15E-06	0.0030	0.0001	0.0019	0.0008	2.34e-05
Mount Baker Wilderness[d]	0.00324	0.0397	0.0024	0.1478	0.0358	0.0018
Mount Rainier National Park	3.44E-05	0.0070	0.0002	0.0045	0.0017	5.26e-05
N Cascades National Park	0.00177	0.0265	0.0019	0.0654	0.0178	0.0011
Olympic National Park	0.00198	0.0680	0.0021	0.0783	0.0221	0.0011
Pasayten Wilderness	0.00096	0.0174	0.0014	0.0268	0.0090	0.0006
Class I Area & Mt. Baker Maximum Concentration	0.00324	0.0680	0.0024	0.1478	0.0358	0.0018
EPA Proposed SIL[b]	0.1	0.3	0.2	1	0.2	0.1
FLM Recommended SIL[b]	0.03	0.27	0.08	0.48	0.07	0.03
Class I Area PSD Increment[c]	2.5	8	4	25	5	2

a. NO_x was conservatively assumed to be 75 percent converted to NO_2 per Section 6.2.3 of EPA's Guideline on Air Quality Models (Appendix W to 40 CFR Part 51).
b. SIL = Significant Impact Level; EPA proposed and FLM recommended from the Federal Register, Vol. 61, No. 142, p. 38292, July 23, 1996.
c. PSD = Prevention of Significant Deterioration; from 40 CFR 52.21(c), adopted by reference in WAC 173-400-720(4)(a)(v)
d. Mount Baker Wilderness Area is not a Class I area. It is included in the analysis because FLMs have requested its inclusion in previous permit applications.

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

19.1. The surrounding Class I areas: The highest modeled impacts were 3.76% and 1.03% 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.

19.2. Nearby Class II wilderness and scenic areas: The highest modeled impact was 1.67% degradation in the Mt. Baker Wilderness Area. Federal land manager guidance considers this to be below the "concern" threshold.

20. The highest modeled deposition in the surrounding Class I areas is 0.0007 kilograms nitrogen and 0.0009 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 18% of the federal land manager "concern" threshold.

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

22. On September 1, 2010, EPA notified Ecology that the EPA has satisfied its obligations 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) relative to this Project.

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

APPROVAL CONDITIONS

For the #2 Hydrogen Plant

1. Fuels combusted in the Steam Methane Reformer Furnace shall be limited to PSA off gas and natural gas.

2. Heat input to the Steam Methane Reformer Furnace shall not exceed 496 MMBtu/hour HHV, based on a 365-day rolling average.

3. Particulate matter (PM_{10}, filterable and condensable) from the Steam Methane Reformer Furnace stack shall not exceed any of the following emission limits:

   3.1. 4.96 lb/hour

   3.2. 0.010 lb/MMBtu

   3.3. Compliance with this condition shall be determined by the average of three test runs conducted during periodic source testing required under Condition 5.

4. BP shall demonstrate initial compliance with Condition 3.

   4.1. BP will have a compliance test conducted by an independent testing vendor within 60 days of achieving the maximum firing rate at which the furnace will be operated, but not later than 180 days after initial start-up.

   4.2. The furnace shall 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.

4.3. 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 an alternative test method if approved in advance by Ecology.

4.4. A typical mix of fuel shall be burned during the test period. This mix shall be listed in the test plan referenced in Condition 4.5.

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

5. BP shall demonstrate routine compliance with Condition 3.

5.1. Testing shall be conducted annually within 11 to 13 months of the anniversary of the initial test using the methods and procedures in Condition 4.

5.2. After three consecutive years of annual tests have demonstrated compliance, testing may be reduced to once every five years. If a test demonstrates noncompliance, a retest (along with resumption of annual testing) is required for the unit until three consecutive years demonstrate compliance.

6. The #2 Hydrogen Plant Flare pilot fuel and header sweep gas shall be limited to natural gas.

7. The #2 Hydrogen Plant Flare flow rate shall be monitored continuously using a flow meter compensated for pressure and temperature. The flow meter shall be used to determine the standard cubic feet per minute (scfm) of gas flow to the flare.

8. The owner/operator shall maintain the following records for the #2 Hydrogen Plant. These records shall be maintained for a period of no less than five years from the time of generation and shall be readily available for review by Ecology and NWCAA.

8.1. Hourly MMBtu HHV heat input rate to the SMR Furnace.

8.2. 365-day rolling MMBtu HHV heat input rate to the SMR Furnace,

8.3. The heat content in Btu/scf, hourly average of gas combusted in the #2 Hydrogen Plant Flare.

8.4. The flow rate in scfm, hourly average, of gas combusted in the #2 Hydrogen Plant Flare.

For the #3 DHDS Unit

9. Fuel combusted in the #3 DHDS Charge Heater shall be limited to refinery fuel gas and natural gas.

10. Heat input to the #3 DHDS Charge Heater shall not exceed 28 MMBtu/hour HHV, based on a 365-day rolling average.

11. Particulate matter (PM_{10}, filterable and condensable) from the #3 DHDS Charge Heater shall not exceed any of the following emission limits:

    11.1. 0.28 lb/hour

    11.2. 0.010 lb/MMBtu

    11.3. Compliance with this condition shall be determined by the average of three test runs conducted during periodic source testing required under Condition 13.

12. BP shall demonstrate initial compliance with Condition 11.

    12.1. BP will have a compliance test conducted by an independent testing vendor within 60 days of achieving the maximum firing rate at which the furnace will be operated, but not later than 180 days after initial start-up.

    12.2. The furnace shall 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.

    12.3. 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 an alternative test method if approved in advance by Ecology.

    12.4. A typical mix of fuel shall be burned during the test period. This mix shall be listed in the test plan referenced in Condition 12.5.

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

13. BP shall demonstrate routine compliance with Condition 11

    13.1. Testing shall be conducted within 3 months of each 36 month anniversary of the initial test using the methods and procedures in Condition 12.

14. The owner/operator shall maintain the following records for the #3 DHDS Unit. These records shall be maintained for a period of no less than five years from the time of generation and shall be readily available for review by Ecology and NWCAA.

    14.1. Hourly MMBtu HHV heat input rate to the #3 DHDS Charge Heater.

    14.2. 365-day rolling MMBtu HHV heat input rate to #3 DHDS Charge Heater.

Notifications

15. The owner/operator shall notify Ecology in writing of the following events. Each notification shall be postmarked no later than 15 days following the date of the event.

    15.1. Commencement of construction date for the Clean Fuels Project. For the purpose of this notification, commencement of construction refers to construction of the #2 Hydrogen Plant and #3 DHDS and does not include any notices relevant to Hydrocracker 1st Stage Fractionator Reboiler ULNB project approved under OAC #1067.

    15.2. Initial firing date of the #2 Hydrogen Plant Steam Methane Reformer Furnace.

    15.3. Initial firing date of the #3 DHDS Charge Heater.

Standard Requirements

16. Sampling ports and platforms shall be provided on the Steam Methane Reformer Furnace and #3 DHDS Charge Heater exhaust 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 start-up of the #2 Hydrogen Plant Steam Methane Reformer Furnace and the #3 DHDS Charge Heater, BP shall identify operational parameters and practices that will constitute "good combustion practices" for each unit. 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. BP's requirements in the following approval conditions to notify or report to or acquire approval or agreement from "Ecology and the Northwest Clean Air Agency" may be satisfied by providing such notification, reporting, or approval request to NWCAA if the approval conditions of this PSD permit have been incorporated in BP's Title V permit (40 CFR Part 70).

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. 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 be suspended until the review and any subsequent appeal against the permit are resolved.

22. 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 the final signature below.

Reviewed by:

Robert C. Burmark

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

12/13/2010
Date

ROBERT C. BURMARK
STATE OF WASHINGTON
29848
REGISTERED PROFESSIONAL ENGINEER

Approved by:

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

12/13/10
Date