

## **Exhibit 4**

AR-EPA-QQQ-3

U.S. Environmental Protection Agency Region 10,  
Supplemental Statement of Basis for Proposed Outer Continental Shelf  
Prevention of Significant Deterioration Permits Noble Discoverer  
Drillship, Shell Offshore Inc., Beaufort Sea Exploration Drilling  
Program, Permit No. R10OCS/PSD-AK-2010-01, Shell Gulf of Mexico  
Inc., Chukchi Sea Exploration Drilling Program, Permit No.  
R10OCS/PSD-AK-09-01  
(July 6, 2011)

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
SEATTLE, WASHINGTON**

**SUPPLEMENTAL STATEMENT OF BASIS  
FOR PROPOSED  
OUTER CONTINENTAL SHELF  
PREVENTION OF SIGNIFICANT DETERIORATION PERMITS  
NOBLE DISCOVERER DRILLSHIP**

**SHELL OFFSHORE INC.  
BEAUFORT SEA EXPLORATION DRILLING PROGRAM  
PERMIT NO. R10OCS/PSD-AK-2010-01**

**SHELL GULF OF MEXICO INC.  
CHUKCHI SEA EXPLORATION DRILLING PROGRAM  
PERMIT NO. R10OCS/PSD-AK-09-01**

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Date of Proposed Permit: July 6, 2011

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5. The Board acknowledged that Region 10 had not asked the Board to decide the issue of the sufficiency of the preconstruction monitoring data and stated that the sufficiency of the preconstruction monitoring data is included within the scope of its general remand of the 2010 Permits (Clarification Order at 11-12).

With respect to the scope of review following issuance of revised permits in response to the EAB Orders, the Board stated that anyone dissatisfied with the revised permits must file a petition seeking the Board’s review pursuant to 40 CFR § 124.19(f)(1)(iii). The Board limited the scope of petitions on the revised permits to be issued on remand “to issues addressed by the Region on remand and to issues otherwise raised in the petitions before the Board in this proceeding but not addressed by the Region on remand.” The Board specifically stated that “No new issues may be raised that could have been raised but were not raised in the present appeals [of the 2010 Permits]” (Remand Order I at 82).

### **1.3 Supplemental Application Materials**

Shell has submitted the following supplemental application materials and requests for changes to the 2010 Permits since issuance of the EAB Orders: <sup>8</sup>

June 10, 2011	Supplemental Permit Application Materials
June 22, 2011	Shell Alaska Exploratory Drilling Program Air Quality Permit Application Air Quality Modeling Files for Analysis of Anchor Handler Operations During open Water Conditions
June 23, 2011	Greenhouse Gas Calculation Information

### **1.4 Key Changes in 2011 Revised Draft Permits**

In addition to changes made in response to the EAB Orders, Region 10 is also proposing changes in response to additional information and requests from Shell. The key changes to the 2011 Revised Draft Permits, both in response to the EAB Orders and in response to additional requests and information from Shell, are as follows:

- A determination that the Discoverer is an OCS source when attached by at least one anchor at a drill site.

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<sup>8</sup> The Administrative Record also contains numerous emails and correspondence between Shell and its consultants and EPA clarifying aspects of these materials.

- A condition based on Shell's permit application for a Coast Guard Safety zone prohibiting public access to areas within 500 meters of the Discoverer and a public access control program.
- A reduction in the total days of operation under each permit from 168 days during any rolling 12-month period to 120 days during the drilling season, with a maximum of 20 days (in hours) of that time drilling mud line cellars (MLCs) and 48 days of that time (in hours) drilling wells.
- A reduction of the drill season from July 1 through December 31 to July 1 through November 30.
- An increase from 10 days to six months in the time required for prior notification before locating at a new drill site.
- A limit on emissions of GHGs to ensure such emissions from the Discoverer and the Associated Fleet remain below the major source thresholds for GHGs and that the Discoverer does not trigger PSD permitting requirements for that pollutant.
- Substantial reductions in emissions from the main propulsion engines and generators on Icebreaker #1 through the installation of selective catalytic reduction (SCR) and oxidation catalyst (OxyCat).
- An increase of annual NO<sub>x</sub> emissions from Icebreaker # 2 to reflect emission rates assumed in Shell's supplemental modeling analysis. The amount of this increase is substantially less than the decrease in NO<sub>x</sub> emissions resulting from the installation of controls on Icebreaker #1.
- 1-hour NO<sub>x</sub> limits to ensure that emissions from the Discoverer and the Associated Fleet do not cause or contribute to a violation of the new 1-hour NO<sub>2</sub> standard.
- Additional monitoring requirements for the SCR and OxyCat pollution control systems.
- Revisions to the 24-hour PM<sub>10</sub>, and PM<sub>2.5</sub> emissions limits to reflect Shell's supplemental air quality modeling to assure NAAQS and increment protection.
- The option of resupplying the Discoverer with the Supply Ship operating in the dynamic positioning (DP) mode in addition to resupplying by attaching the Supply Ship to the Discoverer (as was already authorized under the 2010 Permits). This results in an increase in emissions from the Supply Ship when operating in this mode as compared to the 2010 Permits.
- Replacement of the emergency generator on the Discoverer with a larger generator, but subject to additional restrictions on hours of operation and emissions as compared to the 2010 Permits.
- Identification of and fuel limits on seldom used engines on the Discoverer, Icebreaker #1 and #2, the Nanuq, and, for the Beaufort permit, the Point Class Tug (previously referred to as the Point Barrow Tug).

- Removal of several restrictions on the relative positions of vessels of the Associated Fleet with respect to the Discoverer based on Shell’s supplemental air quality modeling showing such restrictions are not needed to assure compliance with the NAAQS.
- Removal of a condition limiting visible emissions from the Associated Fleet based on Region 10’s determination that such requirement does not apply to vessels that are not an OCS source.
- A requirement to include in the operating report information required to be recorded under the permit, such as all emission calculations.

The 2011 Revised Draft Permits are supported by supplemental technical support and analyses that includes:

- A revised air quality analysis and supporting modeling, focusing in particular on the new 1-hour NO<sub>2</sub> and SO<sub>2</sub> NAAQS.
- A demonstration that the 2011 Revised Draft Permits meet all NAAQS, increments, and other applicable standards in effect at the time of proposal of the 2011 Revised Draft Permits.
- Supplemental information on and an analysis of secondary PM<sub>2.5</sub> formation.
- An analysis of air monitoring data collected since issuance of the 2010 Permits.
- A Supplemental Environmental Justice Analysis addressing the Board’s concerns and demonstrating that the 2011 Revised Draft Permits will not have a disproportionately high and adverse human health or environmental effects on minorities or low income populations.

Overall, emissions of all regulated PSD air pollutants allowed under the 2011 Revised Draft Permits will decrease substantially in comparison to the 2010 Permits, largely as a result of the additional controls on Icebreaker #1 and the shortened operating season. Overall, annual emissions of key pollutants will decrease by more than 50%, with a small increase in ammonia as a result of the installation of SCR on Icebreaker #1.

## **1.5 Public Participation**

### **1.5.1 Opportunity for Public Comment**

The OCS regulations state that issuance of both OCS and PSD permits are governed by 40 CFR Part 124, Subparts A and C. See 40 CFR § 55.6(a) (3) and 124.1. Accordingly, Region 10 has followed the procedures of 40 CFR Part 124 in issuing the 2011 Revised Draft Permits.

Region 10 is seeking public comment on the provisions of the 2011 Revised Draft Permits that have been changed since issuance of the 2010 Permits and the information and analysis added to the record to support those changes. The public comment period runs until August 5, 2011 and all written comments must be emailed or postmarked by that date.

other technical analyses and resulted to changes in numerous permit conditions. Given the extent of these changes, Region 10 believes it is appropriate to require that the 2011 Revised Draft Permits meet all new requirements that have come into effect since issuance of the 2010 Permits. As discussed in more detail below, the 2011 Revised Draft Permits meet these requirements.

### **3 CHANGES IN PROJECT EMISSIONS AND PERMIT TERMS AND CONDITIONS**

#### **3.1 The OCS Source**

As discussed in Section 2.2 above, Region 10 proposes that the Discoverer be considered an OCS source when attached by at least one anchor at a drill site. The 2011 Revised Draft Permits have been revised accordingly.

This change does not increase the PTE of the Discoverer and the Associated Fleet because the total number of operating days has been reduced from 168 to 120 and the anchor setting and retrieval is counted in that 120 day period. Total emissions under the 2011 Revised Draft Permits have been reduced significantly as compared to the 2010 Permits. Emissions during anchor handling have been modeled and determined to be less than the worst case operating scenario, which occurs during MLC drilling.

Note that, as under the 2010 Permits, Condition D.1 prohibits operation of the Propulsion Engine (FD-7) while the Discoverer is an OCS source.

#### **3.2 Coast Guard Safety Zone**

The air quality analysis submitted by Shell modeled emissions from the Discoverer beginning 500 meters from the center of the Discoverer and assumes that the Coast Guard will impose a safety zone of this distance around the Discoverer to exclude the public from the area in which the Discoverer's anchor array will be deployed and in which Shell will be conducting its main operations. See Shell March 18, 2011 Submittal at 38, n. 15. Shell has agreed that Region 10 will include in the 2011 Revised Draft Permits a requirement that Shell have in place during all times of operation as an OCS source a safety zone of at least 500 meters within which the Coast Guard prohibits public access. Shell has also stated in its application materials that Shell will develop in writing and implement a public access control program to locate, identify and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the area within 500 meters of the Discoverer. Region 10 has included these provisions as consistent with Shell's demonstration that emissions from their exploratory operations will not cause or contribute to a violation of the NAAQS or applicable increment in any location that constitutes ambient air.

Thus, Shell’s permit application demonstrates that it complies with the PSD regulations, regardless of EPA’s ultimate decision about the point of compliance.<sup>15</sup>

### **3.3 Drillship Name Change**

Due to a change in ownership of the Discoverer in the summer of 2010, the name of the vessel changed from the Frontier Discoverer to the Noble Discoverer.<sup>16</sup> As a result, Region 10 made several changes though out the draft permits to change the name of the drillship from Frontier Discoverer to Noble Discoverer.

### **3.4 Drill Site Notification**

Region 10 has increased the time for giving prior notice of the location at a drill site from 10 days to six months. Although there are currently no other permitted exploratory drilling operations in the OCS north of Alaska, Region 10 is aware of additional permit applications for activity that could potentially operate in the Beaufort or Chukchi Seas. Region 10 intends to require all permitted operations to notify Region 10 regarding their anticipated drilling locations far in advance of each drilling season (six months) so that Region 10 can evaluate whether there is a need for additional air quality impact analyses.

### **3.5 Restrictions on Duration of Exploration Operations**

Shell requested a reduction in the number of days the Discoverer is authorized to operate as an OCS source from 168 days during any rolling 12-month period to 120 days during any drilling season, as well as a one-month reduction in the drilling season (from July 1 to November 30). Shell based its air quality analysis on the 120-day limit on OCS activity and its requested drilling season. This reduction in the duration of exploration operations results in a substantial overall decrease in air pollutants authorized under the permit. Because this restriction is designed to ensure compliance with the NAAQS and because the annual NAAQS are set based on calendar years, the restriction can similarly apply on a calendar year basis (or, in the case of these permits, a drilling season which is limited by the permit to a specific 5 month period out of any calendar year). The decrease in the duration of exploration operations has resulted in a reduction in the annual NO<sub>x</sub> emission limits for most sources.

Shell also requested restrictions on the type of activity conducted during the 120-day period of operations. Emissions are highest during the drilling of MLCs and Shell’s air quality analysis is

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<sup>15</sup> Ambient air is defined as “...that portion of the atmosphere, external to buildings, to which the general public has access.” 40 CFR § 50.1(e). Ambient air does not include atmosphere over land owned or controlled by a source and to which the public access is precluded by a fence or physical barrier. See Letter from Douglas M. Costle, EPA Administrator to The Honorable Jennings Randolph, re: Ambient Air dated December 19, 1980; Letter from Steven C. Riva, EPA Region 2, to Leon Sedefian, New York State Department of Conservation, re: Ambient Air for the Offshore LNG Broadwater Project, October 9, 2007.

<sup>16</sup> Noble Corporation Press Release. Noble Corporation Closes Acquisition of Frontier Drilling. July 28, 2010. <http://phx.corporate-ir.net/phoenix.zhtml?c=98046&p=irol-newsArticle&ID=1453351&highlight>

based on the limited duration of this activity. Shell therefore requested an operational limit on “MLC activity” to 480 hours during any drilling season. “MLC activity” is defined as any time any MLC engine (FD-9 – 11) or hydraulic power unit (HPU) engine (FD-12 – 13) is operating. The draft permits also prohibit operation of the cementing and logging winch engines (FD-17 – 20) during “MLC activity.”

Shell’s air quality analysis is also based on limiting the duration of total “drilling activity” to 1,623 hours during any drilling season and the draft permits therefore also contain this restriction. Drilling activity is defined as any time when the top drive is engaged and turning the conventional rotary bit, as well as any period of MLC activity. This ensures that, to the extent MLC activity is less than 480 hours during the drilling season, the remaining time can be counted toward the overall limit on drilling activity.

### **3.6 Limits on Potential to Emit/Owner Requested Limits**

#### **3.6.1 Sulfuric Acid Mist**

The 2010 Beaufort Permit imposed an Owner Requested Limit (ORL) under the COA regulations and a limit on PTE in all areas of the Outer OCS to limit the PTE for sulfuric acid mist so as to avoid PSD applicability for this pollutant. The 2010 Chukchi Permit has a similar limit, but it was erroneously characterized as a limit on PTE for SO<sub>2</sub> rather than for sulfuric acid mist. This error in the Chukchi permit has been corrected.

#### **3.6.2 Greenhouse Gases**

Beginning January 2, 2011, greenhouse gases (GHGs) are subject to regulation under the PSD permitting regulations if:

1. The stationary source is a new major stationary source for a regulated NSR pollutant that is not GHGs, and also will emit or will have the PTE 75,000 tpy CO<sub>2</sub>e or more; or
2. The stationary source is an existing major stationary source for a regulated NSR pollutant that is not GHGs, and also will have a significant and net significant emissions increase of a regulated NSR pollutant that is not GHGs, and an emissions increase of 75,000 tpy CO<sub>2</sub>e or more.

Beginning July 1, 2011, GHGs are also subject to regulation:

1. At a new stationary source that will emit or have the PTE 100,000 tpy CO<sub>2</sub>e or more; or
2. At an existing stationary source that emits or has the PTE 100,000 tpy CO<sub>2</sub>e, or more when such stationary source undertakes a physical change or change in the method of operation that will result in a significant and net significant emissions increase of 75,000 tpy CO<sub>2</sub>e or more.