



Shell Exploration and Production

OCS/PSD Air Quality Permits
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February 19, 2013

**Re: Shell Gulf of Mexico Inc.
Noble *Discoverer* – Chukchi Sea
Air Dispersion Modeling Files and Additional Requests to Revise
OCS PSD Permit to Construct No. R10OCS/PSD-AK-09-01**

On November 29, 2012, Shell Gulf of Mexico Inc. (Shell) submitted an application to revise Outer Continental Shelf (OCS) Prevention of Significant Deterioration (PSD) Permit to Construct No. R10OCS/PSD-AK-09-01 for the Noble *Discoverer* drill ship. Ms. Natasha Greaves with the U.S. Environmental Protection Agency (EPA) issued a draft revised permit for review and comment to Ms. Pauline Ruddy with Shell on February 1, 2013.

Shell provided a list of comments and suggested revisions for the draft revised permit to EPA on February 13, 2013. As indicated under Request No. 13 and No. 14 of the February 13, 2013 submittal, Shell now provides the air dispersion modeling files on a flash drive to support our suggested revisions associated with the draft revised permit. The modeling files demonstrate compliance with ambient air quality criteria with the following changes to the *Discoverer* and fleet emissions units:

- *Discoverer* main generator NO_x emissions at 3.7 g/kW-hr
- No add-on emission controls on the mud line cellar compressor engines (FD9-11)
- No add-on emission controls on the HPU engines (FD12-13)
- Increase allowable incinerator capacity for Icebreaker #2 to 276 lb/hr
- Increase allowable boiler capacity to 5.3 MMBtu/hr

The results of the modeling analyses are summarized in a table attached to this letter.

Additionally, Shell proposes the following changes to the draft revised permit to correct inconsistencies in the capacity of units listed for Icebreaker No. 2, originally called Hull 247 and subsequently renamed to the *Aiviq*. Shell proposes two new requests to correct the permit to allow for the operation of the associated units on the *Aiviq*. Suggested language to include is underlined. Language to be removed is struck out.

- 1. Table 3 and Condition O.3.3; Boilers Capacity** – Shell proposes to revise Condition O.3.3 as follows to increase the total capacity of the boilers installed on the *Aiviq* from 4.00 million British thermal units per hour (MMBtu/hr) to 5.3 MMBtu/hr to reflect the correct rating of the unit installed. Please revise Table 3 accordingly to incorporate the proposed change to the capacity of the boiler. The increased rating has been incorporated into the modeling analysis provided herein.

- 3.3. The total capacity of all boilers on Icebreaker #2 shall not exceed 1.37 MMBtu/hr for the Tor Viking and ~~4.00~~ 5.3 MMBtu/hr for Hull 247.
2. **Table 3 and Condition O.3.4; Incinerators Capacity** – Shell proposes to revise Condition O.3.4 as follows to increase the total capacity of all incinerators installed on the *Aiviq* from 151.23 pounds per hour (lbs/hr) to 276 lbs/hr to reflect the correct rating of the unit installed. Please revise Table 3 accordingly to incorporate the proposed change to the capacity for the incinerator. The increased rating has been incorporated into the modeling analysis provided herein.
- 3.4. The total capacity of all incinerators on Icebreaker #2 shall not exceed ~~151.23~~ 276 lbs/hr.

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in this submission are true, accurate, and complete.

Please contact Pauline Ruddy (907-771-7243) or Chris Lindsey (907-771-7262) if you have any questions.

Thank you,



Susan Childs
Alaska Venture Support Integrator, Manager

Enclosure: Flash drive containing the air dispersion modeling files to support the November 29, 2012 and subsequent permit revision requests

*cc: Chris Lindsey, Shell
Pauline Ruddy, Shell
Lance Tolson, Shell
Natasha Greaves, EPA Region 10
Dave Bray, EPA Region 10*

Table D-5. Summary of Model Results

Air Pollutant	Averaging Period	Shell Only Impacts (without background) ($\mu\text{g}/\text{m}^3$)	PSD Increment ($\mu\text{g}/\text{m}^3$)	Exceeds PSD Increment?	Background Concentration ($\mu\text{g}/\text{m}^3$)	Total Impact Including Background ($\mu\text{g}/\text{m}^3$)	NAAQS or AAQS ($\mu\text{g}/\text{m}^3$)	Exceeds NAAQS?
NO ₂	1-hour	146.5	None	No	13.2	159.7	188	No
	Annual	10.2	25	No	2	12.2	100	No
PM _{2.5}	24-hour	9.0	9	No	11	20.7	35	No
	Annual	1.7	4	No	2	3.7	15	No
PM ₁₀	24-hour	9.2	30	No	79	89.2	150	No
SO ₂	1-hour	16.3	None	No	23	39.3	196	No
	3-hour	11.0	512	No	14	25.0	1300	No
	24-hour	1.8	91	No	5	6.8	365	No
	Annual	0.1	20	No	0.4	0.5	80	No
CO	1-hour	1,085	None	No	959	2,044	40000	No
	8-hour	594	None	No	945	1,539	10000	No

¹The metric used for PM_{2.5} is different for the PSD increment and the NAAQS. For the PSD increment, the highest second high at each receptor is determined for each of the 4 model sequences for PM_{2.5} (2009A, 2009B, 2010A, 2010B) and the highest of these four values is shown in the table at 8.9 $\mu\text{g}/\text{m}^3$. For the NAAQS, the highest value at each receptor for the two 2009 sequences is averaged with the highest value for the two 2010 sequences. The highest of these values across all receptors was 9.6 $\mu\text{g}/\text{m}^3$, which when added to the background concentration of 11.0 is 20.6 $\mu\text{g}/\text{m}^3$ as shown in the table.