ConocoPhillips

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December 1, 2011 **Via email (Albright.Rick@epa.gov) and US mail**

Richard Albright, Director
Office of Air, Waste and Toxics, M/S AWT-107
U.S. EPA Region 10 Suite 900
1200 Sixth Avenue
Seattle, WA 98101

Subject: Chukchi Sea, Devil's Paw Exploration Supplemental Modeling

Dear Mr. Albright:

Today, ConocoPhillips submitted to EPA a Devil's Paw Exploration Title V Air Operating Permit Application for a project in the outer continental shelf (OCS) of the Chukchi Sea. Because the application follows ConocoPhillips' withdrawal of an earlier application, EPA and ConocoPhillips previously met to discuss scheduling and other issues regarding the new application. In the course of that meeting, EPA asked ConocoPhillips to submit a modeling demonstration of compliance with the National Ambient Air Quality Standards (NAAQS) at the boundary between the "inner" OCS and the "outer" OCS. In response to that request, ConocoPhillips submits the modeling enclosed as attachments to this letter.

Clean Air Act Section 328 and EPA's OCS rules require a demonstration of compliance with the NAAQS at the state seaward boundary (*i.e.*, 3 miles offshore). Thus, the modeling at the boundary between the inner OCS and the outer OCS is not determinative of our application. Nonetheless, ConocoPhillips submits the modeling as EPA requested. Clearly, the modeling demonstrates compliance with the NAAQs.

Please do not hesitate to contact me to discuss this supplemental submission, or any aspect of our air permit application.

Sincerely,

Bradley C. Thomas
Senior Environmental Scientist

cc: Doug Hardesty, USEPA, Region 10 (US Mail)

Attachment A

Tables of Model Results

Modeled Impacts at State Seaward Boundary (i.e., 3 miles offshore):

Table 1-1 Model Predicted Project Ambient Air Quality Impacts

Pollutant	Period	Predicted Project Impact [1] ($\mu g/m^3$)	SIL ($\mu g/m^3$)	Percent of SIL
Sulfur Dioxide (SO_2)	1-hour	0.033	7.9	0.4
	3-hour	0.032	25	0.1
	24-hour	0.012	5	0.2
	Annual	0.00008	1	0.01
Nitrogen Dioxide (NO_2) [2]	1-hour	6.2	7.5	83
	Annual	0.023	1	2
Carbon Monoxide (CO)	1-hour	10.3	2,000	0.5
	8-hour	5.7	500	1
PM_{10}	24-hour	0.32	5	6
	Annual	0.003	1	0.3
$PM_{2.5}$ [3]	24-hour	0.32	1.2	26
	Annual	0.003	0.3	0.9
Lead [4]	3-month	0.00002	0.006	0.3
	Quarterly	0.00002	0.06	0.03

1 Impacts predicted for only the ConocoPhillips OCS Source.

- With the exception of 1-hour SO_2 and NO_2, and 24-hour $PM_{2.5}$ the SIL is compared to the highest predicted concentration for the specific averaging time.
- For 1-hour SO_2 and NO_2, and 24-hour $PM_{2.5}$, the SIL is compared to the highest of the multi-year averages of the maximum modeled 1-hour, or 24-hour concentrations predicted each year at each receptor, based on three years of available site specific meteorological data (USEPA 2011, USEPA 2010b).

2 As recommended by USEPA for 1-hour NO_2, the 80% ambient ratio method was used to convert NO_x to NO_2 (USEPA 2011). For annual NO_2, the 75% ambient ratio method was used to convert NO_x to NO_2. (40 CFR 51 Appendix W Section 5.2.4c).

3 Multi-year average of the maximum model predicted impact from modeling conducted using three years of representative meteorological input data. For 24-hour $PM_{2.5}$ this represents a screening level approach and accounts for secondary particulate formation according to the USEPA Office of Air Quality Planning and Standards (USEPA 2010b).

4 No SIL has been established for lead; therefore, the SIL represents 4% of the respective NAAQS. This value was set following the approach taken by USEPA where the SIL associated with the 1 hour NO_2 NAAQS was set at 4% of the NAAQS following historical precedence (USEPA 2010a).

Below are the modeled impacts at the inner-outer OCS boundary (i.e., 28 miles offshore):

Table A-1 Model Predicted Project Ambient Air Quality Impacts Compared to the SILs at the Inner/Outer Boundary

Pollutant	Period	Predicted Project Impact [1] ($\mu g/m^3$)	SIL ($\mu g/m^3$)
Sulfur Dioxide (SO_2)	1-hour	0.11	7.9
	3-hour	0.095	25
	24-hour	0.023	5
	Annual	0.0005	1
Nitrogen Dioxide (NO_2) [2]	1-hour	21	7.5
	Annual	0.076	1
Carbon Monoxide (CO)	1-hour	37	2,000
	8-hour	14	500
PM_{10}	24-hour	0.71	5
	Annual	0.007	1
$PM_{2.5}$ [3]	24-hour	0.71	1.2
	Annual	0.007	0.3
Lead (Pb) [4]	3-month	0.00002	0.006
	Quarterly	0.00002	0.06

1 Modeling only includes the ConocoPhillips OCS source.

- With the exception of 1-hour SO_2 and NO_2, and 24-hour $PM_{2.5}$ the SIL is compared to the highest predicted concentration for the specific averaging time.
- For 1-hour SO_2 and NO_2, and 24-hour $PM_{2.5}$, the SIL is compared to the highest of the multi-year averages of the maximum modeled 1-hour, or 24-hour concentrations predicted each year at each receptor, based on two or more years of available site specific meteorological data (USEPA 2011, USEPA 2010b).

2 As recommended by USEPA, for 1-hour NO_2, the 80% ambient ratio method was used to convert NO_x to NO_2 (USEPA 2011). For annual NO_2, the 75% ambient ratio method was used to convert NO_x to NO_2. (40 CFR 51 Appendix W Section 5.2.4c).

3 Multi-year average of the maximum model predicted impact from modeling conducted using 3 years of representative meteorological input data. For 24-hour $PM_{2.5}$ this represents a screening level approach and accounts for secondary particulate formation according to the USEPA Office of Air Quality Planning and Standards (USEPA 2010b).

4 No SIL has been established for lead; therefore, the SIL represents 4% of the respective NAAQS. This value was set following the approach taken by USEPA where the SIL associated with the 1 hour NO_2 NAAQS was set at 4% of the NAAQS following historical precedence (USEPA 2010a).

Only the 1-hour NO2 impact is above the SIL so, below, is a cumulative analysis for that pollutant:

Table A-2 Project Cumulative Air Quality Impact Analysis at the Inner/Outer OCS Boundary

Pollutant	Period	Model Predicted Cumulative Impact [1] ($\mu g/m^3$)	Existing Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
Nitrogen Dioxide (NO_2)	1-hour [2, 3]	5.7	13.2	18.9	188	10

1 Includes the contribution from both the ConocoPhillips and Shell OCS sources.

2 The design value is the 3-year average of the annual 98th-percentile of 1-hour daily maximum concentrations from modeling conducted using 3 years of representative meteorological input data.

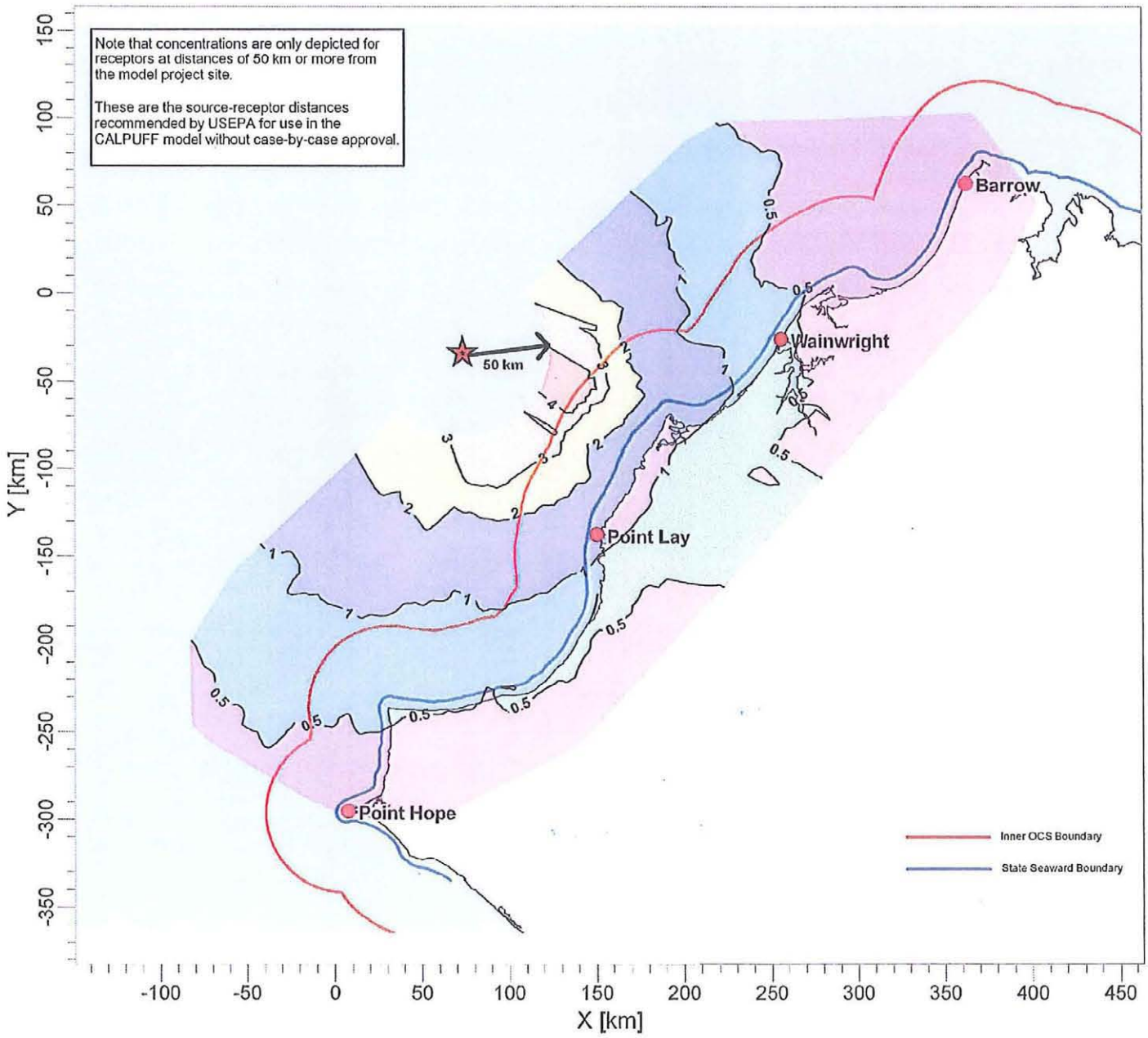
3 As recommended by USEPA, for 1-hour NO_2, the 80% ambient ratio method was used to convert NO_x to NO_2 (USEPA 2011).

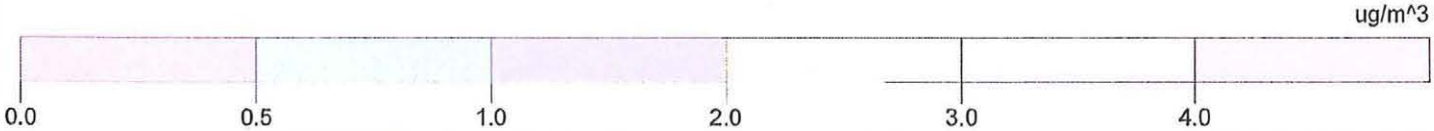
Attachment B

1-Hour NO_2 and 24-Hour $PM_{2.5}$ Contour Plots

FIGURE TITLE:

3-year Average (2007-2009) of the NO2 Annual 98th-Percentile 1-Hour Daily Maximum Concentrations Concentrations are Cumulative Impacts from COP and Shell





COMMENTS:

The 80% ambient ratio method was used to convert NOx to NO2.

Background concentrations not included.

COMPANY NAME:

AECOM Environment

OUTPUT TYPE:

Concentration

SCALE: 1:3,850

0 100 km

MAX:

5.13413 ug/m^3

DATE:

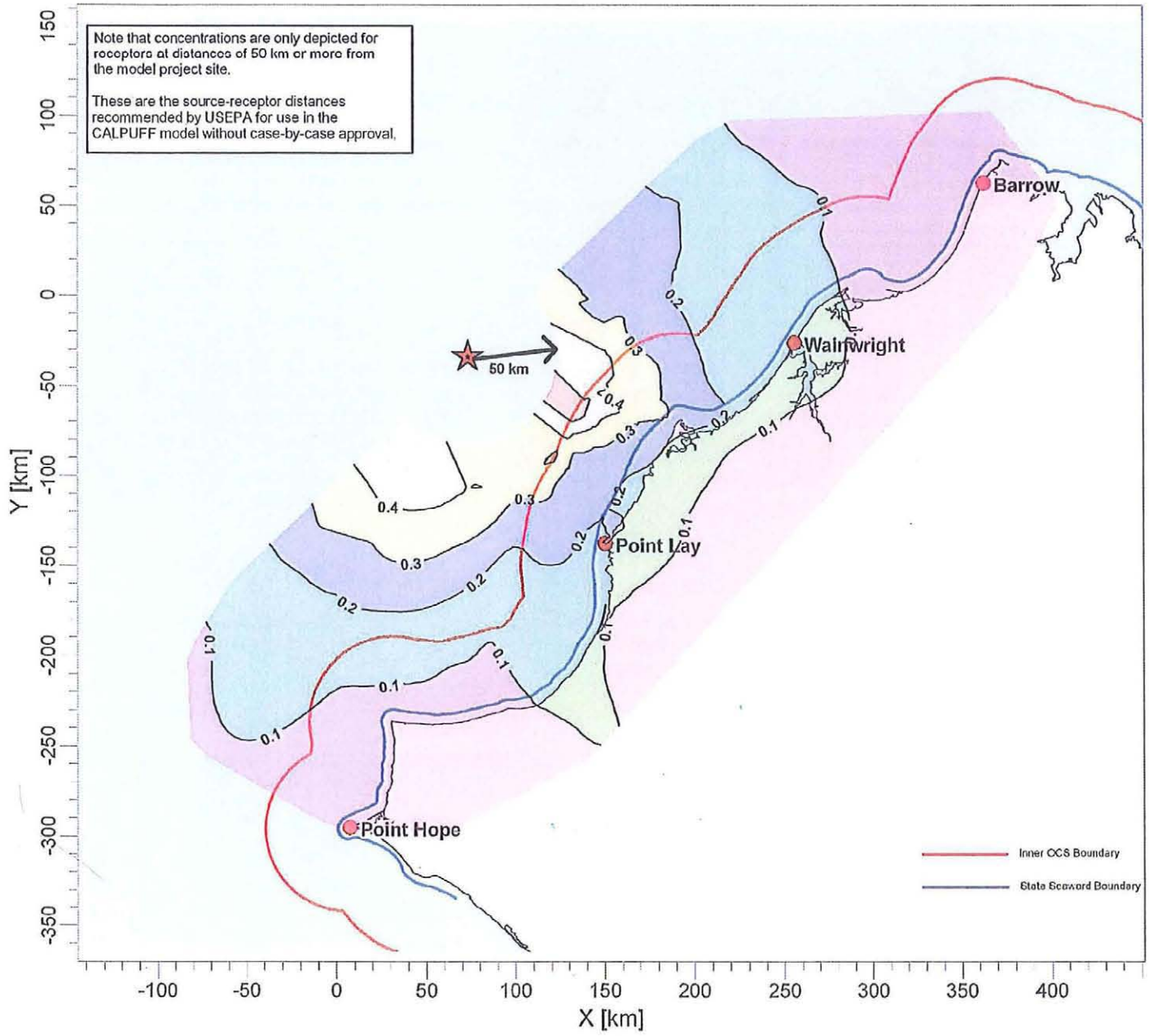
11/29/2011

AECOM

AERMOD View - Lakes Environmental Software

FIGURE TITLE:

3-year Average (2007-2009) of the Maximum PM2.5 24-Hour Concentrations
Concentrations are Cumulative Impacts from COP and Shell



PLOT FILE OF MAXIMUM 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

0.0 0.1 0.2 0.3 0.4 0.5

COMMENTS:		COMPANY NAME:
Background concentrations not included.		AECOM Environment
	OUTPUT TYPE: Concentration	SCALE: 1:3,749 — 0 100 km
	MAX: 0.54689 ug/m^3	DATE: 11/29/2011

AECOM

AERMOD View - Lakes Environmental Software