

# **Shell Exhibit 1**

From: [Skadowski.Suzanne@epamail.epa.gov](mailto:Skadowski.Suzanne@epamail.epa.gov) [<mailto:Skadowski.Suzanne@epamail.epa.gov>] On Behalf Of  
[OCS\\_Air\\_Permits@epamail.epa.gov](mailto:OCS_Air_Permits@epamail.epa.gov)  
Sent: Monday, October 03, 2011 2:56 PM  
To: Childs, Susan A SEPCO-UAX/A/SD  
Cc: Ruddy, Pauline M SEPCO-UAX/A/SD  
Subject: Re: "ConocoPhillips Jackup Drill Rig - Chukchi Sea Exploration Drilling Program" (Permit No. R10OCS020000)

#### EPA NOTICE TO CONOCOPHILLIPS COMMENTERS 10/3/11

On July 22, 2011, EPA Region 10 proposed a draft Title V, Clean Air Act permit for ConocoPhillips to explore for oil and gas on the Outer Continental Shelf in the Chukchi Sea northwest of Alaska. Public hearings were held in Barrow and Anchorage, Alaska, on August 24 and 26, 2011, and the public comment period ended September 21, 2011. On September 26, 2011, ConocoPhillips withdrew their permit application. ConocoPhillips has stated that they want more operational flexibility, for safety and other reasons, than the draft permit would allow. EPA Region 10 will not be responding to public comments submitted.

ConocoPhillips has advised EPA Region 10 that within two months they plan to submit a new permit application for their jack-up drill rig with a new ambient air impact analysis. In the new ambient air impact analysis, rather than demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) beginning at a 500 meter radius around the drill rig as in the draft permit, ConocoPhillips intends to propose a new NAAQS point of compliance closer to shore.

After ConocoPhillips submits their new application, EPA Region 10 will evaluate the application for compliance with the Clean Air Act, develop a new draft permit, and provide an opportunity for the public to comment.

From: <[Susan.Childs@shell.com](mailto:Susan.Childs@shell.com)>  
To: R10OCSAirPermits@EPA  
Date: 09/20/2011 05:57 PM  
Subject: "ConocoPhillips Jackup Drill Rig - Chukchi Sea Exploration Drilling Program" (Permit No. R10OCS020000)

#### Methane Emission Estimates

On page 35 of the Statement of Basis for the "ConocoPhillips Jackup Drill Rig – Chukchi Sea Exploration Drilling Program" (Permit No. R10OCS020000), EPA refers to ConocoPhillips' assumptions in estimating greenhouse gas (GHG) emissions from its proposed project. Because ConocoPhillips' estimate is significantly higher than the estimate Shell provided in support of its Arctic OCS applications, Shell is providing this comment to explain how different assumptions led to the different results, and why Shell believes that ConocoPhillips' estimate is unrealistically high.

Oil exploration involves drilling through many thousands of feet below the surface to find “hydrocarbon-bearing” deposits. In the Arctic, these deposits are typically narrow layers that together average an aggregate thickness of about 100 feet per exploration well. These hydrocarbon-bearing zones generally can lie over 5,000 feet below the surface. When drilling at a particular well location reaches the depth of the hydrocarbon-bearing zone, the drilling mud and cuttings that are brought to the surface may contain some volume of compressed natural gas, including methane, which would be released as a fugitive emission in a process called “drilling mud degassing.” Because methane is a GHG, it is necessary to estimate the quantity of methane emissions from this activity.

The basis for Conoco-Phillips’ calculation is a 2009 American Petroleum Institute (API) document.[1] The method referenced in that document traces back to a 1977 EPA study.[2] Conoco-Phillips used generic or typical values from the API Compendium, which assume hydrocarbon-bearing zones of 400 feet thickness. Shell, on the other hand, based its estimate on Arctic-specific data – conservatively assuming hydrocarbon bearing zones of 150 feet, when data shows average hydrocarbon bearing zones of 100 feet in the Arctic. Taken alone, this difference in assumptions would result in a higher emissions estimate by ConocoPhillips (by a factor of 2-3). But a second difference in assumptions makes ConocoPhillips’ estimate significantly higher than Shell’s.

The major difference between Shell’s estimate and Conoco-Phillips’ estimate is that Shell took into account the fact that it is limited by its permit to drill no more than 4 holes in a single drilling season. Shell, therefore based its single season estimate assuming a total of 600 feet of aggregate hydrocarbon-bearing zone drilling (4 wells, so 4 hydrocarbon-bearing zones, each with an assumed thickness of 150 feet). Conoco-Phillips, on the other hand, assumed it would drill through 400-foot thick hydrocarbon-bearing zones every day of its 100 day drilling season – essentially assuming that 40,000 feet of hydrocarbon-bearing zone drilling would occur during a single drilling season. This resulted in Conoco-Phillips calculating an emission estimate that was more than 50 times higher than Shell’s.

Shell is confident that it would be basically impossible to drill through 40,000 feet of hydrocarbon-bearing deposits in a single season in the Arctic with a single drill ship, as it would entail drilling over 260 holes of over 5,000 foot depth in a single year. Even if a less-thick hydrocarbon zone was assumed to more realistically account for Arctic conditions, assuming drilling within a hydrocarbon zone on a daily basis is simply not realistic. Reaching such zones requires drilling through an average of 5,000 feet of non-hydrocarbon-bearing area, making it impossible to drill within a hydrocarbon-bearing zone on a daily basis over an extended time.

As a result, Shell believes that the ConocoPhillips estimate is potentially misleading. Conoco-Phillips' estimate is similar to a person using the size of a baseball stadium as a conservative upper bound when asked to estimate the size of a baseball. While it is obviously true that a baseball stadium is larger than a baseball, it is not a comparison that informs the question and could lead a reader not familiar with the game to an incorrect conclusion about how big a baseball really is.

In other respects, Shell's and ConocoPhillips' assumptions are similar and reasonable. Both methods follow a straightforward calculation involving the physical volume of muds and cuttings carried to the surface as drilling proceeds through the hydrocarbon-bearing zone. An assumption is made concerning the porosity of the material and it is assumed that this porous volume is filled with gas. From this volume of gas, and a few other assumptions including the pressure of the gas in the muds and cuttings before the material is brought to the surface and the fraction of the gas that is composed of methane, an estimate of the methane release rate can be calculated.

Shell's estimate provided a conservatively high estimate of emissions based on actual Arctic data. Shell built conservatism in to its estimate by using the high end of possible values, rather than average or typical values. In other words, Shell used the high end of possible values. For example, in addition to assuming a higher average of 150 feet aggregate thickness for the hydrocarbon-bearing zone, Shell assumed a drill bit size larger than it intends to use in hydrocarbon-bearing zones. Assuming a larger diameter drill bit resulted in a greater volume of muds and cuttings being brought to the surface, and hence higher emissions than will occur in reality.

Conoco-Phillips' estimate is clearly much higher than any methane emissions they will actually release, and in that sense can be viewed as an "upper bound" on potential emissions. But for the reasons described, Shell is concerned that such an unreasonably high estimate overstates potential emissions from drilling mud degassing to the point that it could lead to misleading conclusions about the quantity of potential methane that may be released as a result of drilling mud degassing during Arctic OCS operations.

# **Shell Exhibit 2**



EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
WASHINGTON, D.C. 20503

ADMINISTRATOR  
OFFICE OF  
INFORMATION AND  
REGULATORY AFFAIRS

September 2, 2011

Dear Administrator Jackson:

On July 11, 2011, the Environmental Protection Agency (EPA) submitted a draft final rule, "Reconsideration of the 2008 Ozone Primary and Secondary National Ambient Air Quality Standards," for review by the Office of Information and Regulatory Affairs (OIRA) under Executive Orders 13563 and 12866. The President has instructed me to return this rule to you for reconsideration. He has made it clear that he does not support finalizing the rule at this time.

OIRA shares EPA's strong and continued commitment to using its regulatory authorities, including the Clean Air Act (the Act), to protect public health and welfare. Over the last two and a half years, EPA has issued a significant number of rules to provide such protection. We also recognize that the relevant provisions of the Clean Air Act forbid EPA to consider costs in deciding on the stringency of national ambient air quality standards, both primary and secondary.

Nonetheless, we believe that the draft final rule warrants your reconsideration. We emphasize three related points:

1. Under the Act, finalizing a new standard now is not mandatory and could produce needless uncertainty. The Act explicitly sets out a five-year cycle for review of national ambient air quality standards. The current cycle began in 2008, and EPA will be compelled to revisit the most recent standards again in 2013. The new scientific work related to those forthcoming standards has already started (see point 2 below). A key sentence of Executive Order 13563 states that our regulatory system "must promote predictability and reduce uncertainty." In this light, issuing a final rule in late 2011 would be problematic in view of the fact that a new assessment, and potentially new standards, will be developed in the relatively near future.
2. The draft reconsideration necessarily depends on the most recent recommendations of the Clean Air Scientific Advisory Committee (CASAC), which in turn rely on a review of the scientific literature as of 2006. Executive Order 13563 explicitly states that our regulatory system "must be based on the best available science." As you are aware, work has already begun on a new and forthcoming scientific review, "based on the best available science." We urge you to reconsider whether to issue a final rule in late 2011, based on evidence that is no longer the most current, when a new scientific assessment is already underway.
3. Under your leadership, EPA has taken a series of strong and unprecedented steps to protect public health by reducing harmful air pollution in general and ozone in particular. For example, EPA and the Department of Transportation recently finalized the first joint rule reducing air pollution (including ozone) from heavy-duty

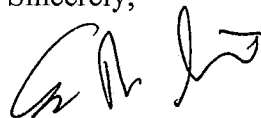
trucks, with overall net benefits of \$33 billion. EPA also recently finalized its Cross-State Air Pollution Rule, which will reduce air pollution (including ozone) and which is projected to prevent 13,000 to 34,000 deaths annually, producing annual estimated net benefits in excess of \$100 billion. In addition, EPA has proposed national standards for mercury and other toxic pollutants; EPA's preliminary estimates, now out for public comment, suggest that these standards will prevent 6,800 to 18,000 premature deaths annually. These standards, whose annual net benefits are currently estimated to exceed \$40 billion, are projected to reduce ozone as well. Cumulatively, these and other recently proposed and finalized rules count as truly historic achievements in protecting public health by decreasing air pollution levels, including ozone levels, across the nation.

As noted, Executive Order 13563 emphasizes that our regulatory system "must promote predictability and reduce uncertainty." Executive Order 12866, incorporated in Executive Order 13563, states that each "agency shall avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations . . . ." Executive Order 12866 also states that the "Administrator of OIRA shall provide meaningful guidance and oversight so that each agency's regulatory actions are consistent with . . . the President's priorities . . . ." In light of these requirements, and for the foregoing reasons, I am requesting, at the President's direction, that you reconsider the draft final rule.

More generally, the President has directed me to continue to work closely with all executive agencies and departments to implement Executive Order 13563 and to minimize regulatory costs and burdens, particularly in this economically challenging time. The President has instructed me to give careful scrutiny to all regulations that impose significant costs on the private sector or on state, local, or tribal governments.

We look forward to continuing to work with you to create, in the words of Executive Order 13563, a regulatory system that will "protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation."

Sincerely,

A handwritten signature in black ink, appearing to read "Cass R. Sunstein". The signature is fluid and cursive, with a prominent initial "C" and a long, sweeping tail.

Cass R. Sunstein