From: Blackburn, Terrie A.
To: Wilson, Aimee
Cc: Blackburn, Terrie A.
Subject: RE: (External) Questions on ONEOK GHG Application
Date: Wednesday, April 10, 2013 4:40:36 PM

Aimee,

Below is ONEOK's response to the questions you had regarding our GHG permit application. Please call if you would like to discuss.

Terrie Blackburn
ESH Regulatory Compliance | ONEOK Partners, NGL | (918) 561-8052 office | (918) 237-5239 cell

From: Wilson, Aimee [mailto:Wilson.Aimee@epa.gov]
Sent: Tuesday, April 09, 2013 8:56 AM
To: Blackburn, Terrie A.
Subject: (External) Questions on ONEOK GHG Application

Terrie,

I had a few questions…

Are there any GHG emissions from the tanks? Do these vent to the flare? Are they included in the MSS emissions from the flare?
We do not expect any GHG emissions from the storage tanks. The atmospheric storage tanks are used for spent caustic, wastewater, lube oil, amines, and water treatment chemicals. Other materials such as propane refrigerant and ammonia are stored in pressurized tanks. They are not vented to the flare for normal or MSS operations.

What factors were used in determining the cost of CCS? What interest rate and how many years equipment life?
An initial cost estimate was completed based upon the "Report of the Interagency Task Force on Carbon Capture and Storage" dated August 2010. Two cost factors from that document were used – the cost of CO2 Capture and Compression ($95/tonne CO2 Captured) and the cost of CO2 Transportation ($0.25/tonne CO2 Captured). Appendix A of the referenced document details the bases used to establish the cost factors, which shows in Table A-6 that the equipment was depreciated over a 20 year life in the cost analysis.

Do you have data on what the collateral increase in non-GHG emissions would be if CCS was implemented? Would they increase by 30%, more or less?
Based on our experience in other applications, and a review of other literature, and GHG PSD permit applications from EPA's website, we would expect the collateral increase in non-GHG emissions to be approximately 30%.

On the emergency Diesel engines, can we assume that the actual engines that will be selected will not be larger than 134 HP (generator) and 575 HP (firewater pump)?

While the design has not been finalized, we do not expect the actual engines will have higher horsepower ratings than were represented in the application.

I also need you to look at the BACT for the heaters. Did the BACT limit for the hot oil heaters include the emissions generated from the combustion of the amine regeneration vent stream?
No, the BACT limit for the hot oil heaters (14.25 lb CO2/bbl of Y-Grade feed) does not include emissions generated from the combustion of the process vent streams. Those emissions were addressed separately in the "BACT for Process Vents" section of the application. We have proposed separate monitoring protocols and emission limits for heater fuel gas firing and heater vent gas combustion. We did propose a separate BACT limit for the amine regeneration vent (and other process vents) in the application based on a limit of 15,000 tons CO2e per year on a 365-day rolling average. This was proposed to be monitored separately consistent with the GHG MRR rules in 40 CFR Part 98.

I was comparing the BACT limit you proposed with Lone Star. The permit issued to Lone Star had a calculation error for the BACT limit and is currently being revised. Lone Star has two hot oil heaters each with a heat input rate of 270 MMBtu/hr. Their BACT limit is 7.61 lb CO_2/bbl.

The ONEOK hot oil heaters are 127 MMBtu/hr each (72% smaller than Lone Star) and have a combined heat input of 381 MMBtu/hr (34% higher than Lone Star. But the BACT limit proposed for ONEOK's hot oil heaters (combined) is almost 61% higher than Lone Star's. I would expect the BACT limit to be only 34% higher than the Lone Star BACT Limit, it not even lower since you will have three heaters vs. one. With three I would expect you to be able to run them closer to 100% load (at higher efficiency) for a majority of the time.
Based on process simulations, the output-based CO2 emissions are expected to range from 8.20 to 12.60 lb CO2/bbl of y-grade feed. The feed composition and processing rate were found to have the greatest impact on the proposed output-based limit. We would expect that a facility running at different rates and processing different feed could have a substantially different output-based CO2 emissions limit than the one we proposed. Based on a quick review of the Lone Star application, it appears that the design in that case also includes a separate direct-fired regeneration heater, whereas in ONEOK's design, the heat for the regeneration process is provided from the shared hot oil system. Thus, this comparison is not being made on the same basis.

Given the limitations of the model and the range of scenarios tested, maintaining the proposed limit was determined to be appropriate, in that it covers the cases we anticipated and provides for a 10-15% margin to cover variance from model to actual performance and/or alternative operating cases that we have not anticipated and modeled to date.

Thanks,
Aimee

AW SIg

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