**From:** Peters, Howard S
**To:** Wilson, Aimee
**Subject:** RE: Equistar Corpus Christi Olefins GHG PSD Permit
**Date:** Tuesday, February 25, 2014 11:30:51 AM
**Attachments:** Flare Gas Recovery.pdf
GHG Permit & SOB Questions.pdf

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Aimee,

Per our telephone conversation on Friday (02/21/2014) Equistar is providing the attached information. The first attached, titled "Flare Gas Recovery" describes why flare gas recovery for the maintenance, startup and shutdown emissions for this project is not technically feasible. The second attachment, titled "GHG Permit & SOB Questions" gives responses to the three (3) questions EPA posed regarding the draft GHG permit and statement of basis. The questions were the following:

1. Can the Steam Superheaters meet the exhaust temperature of less than or equal to 420 $^{O}$F on a 365 day rolling average including periods of startup and shutdown?
2. Can the Cracking Furnaces meet the minimum overall thermal efficiency of 87% or greater on a 365 day rolling average basis, excluding periods of decking, but including periods of startup, shutdown and hot standby?
3. What are the indications used to determine when decoking is required on Cracking Furnace?

Please review the attached information and please do not hesitate to contact me if you need additional information or clarification.
Thank you,
H. Scott Peters

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**From:** Wilson, Aimee [mailto:Wilson.Aimee@epa.gov]
**Sent:** Tuesday, February 25, 2014 6:39 AM
**To:** Peters, Howard S
**Subject:** RE: Equistar Corpus Christi Olefins GHG PSD Permit

Scott,

This afternoon is fine.

Thanks,
Aimee

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**From:** Peters, Howard S [mailto:Howard.Peters@lyondellbasell.com]
**Sent:** Monday, February 24, 2014 3:10 PM
**To:** Wilson, Aimee
**Subject:** RE: Equistar Corpus Christi Olefins GHG PSD Permit

Aimee,

I am working on the response and should have something together soon. If we supply the

information by tomorrow afternoon does that meet your schedule needs? If not let me know and I can try to get the responses to you sooner.

I do appreciate you working with us on the permit and will be responding promptly.
Thank you again,
H. Scott Peters

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**From:** Wilson, Aimee [mailto:Wilson.Aimee@epa.gov]
**Sent:** Monday, February 24, 2014 3:04 PM
**To:** Peters, Howard S
**Subject:** Equistar Corpus Christi Olefins GHG PSD Permit

Scott,

I'm being asked to put the draft permit and SOB into concurrence this week. When do you think you will be able to give me the information I requested on meeting the BACT limits at all times, including MSS and decoke information?

Thanks,
Aimee



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**MSS Emissions Not Technically Feasible for Flare Gas Recovery**

The flaring emissions represented in the revised "*Olefins Plant Expansion Project Application for Prevention of Significant Deterioration Greenhouse Gas Emissions ("GHG") Air Permit*" submitted on October 7, 2013 are Maintenance, Startup and Shutdown (MSS) emissions associated with the proposed new equipment for the expansion project. There are no additional routine process flaring emissions or increases to existing process flaring emissions associated with this project. The MSS flaring for the new equipment will occur on an existing flare at the plant and the majority of the MSS emissions for this permit application will be generated when the plant is shutdown and subsequently started up during a plant turnaround, normally occurring once every 5 to 6 years. The increase in the proposed MSS GHG emissions are only for equipment that would be installed as part of this project. The plant is already authorized for MSS emissions from existing equipment to the same flare as well as routine emissions. Based on a 5 year turnaround schedule if the MSS GHG emissions are annualized the proposed MSS emissions in this permit application for the project represents about 3% of the total GHG emissions from the existing flare.

The proposed MSS gases generated and routed to the existing flare are not suitable for a flare gas recovery system. The only technically practical and safe way to manage gas flows from MSS generated gas is through a flare. The quality of the process gas would not be suitable for flare gas recovery since the process gas would be mixed with a large amount of nitrogen and steam used to purge the process equipment. The variability in flow and composition of the MSS generated gases would make design and installation of a recovery and compressor system technically infeasible since such a system would require a consistent flow and composition for compressor and recovery system sizing and engineering. The process gas would only be anticipated to be generated once every five (5) years. The bulk of the emissions will be generated when the plant is being shutdown so there would be no available destination or storage for the MSS gases if recovered, during a shutdown of the Corpus Christi Olefins Plant the entire plant is shutdown for turnaround (unlike a refinery where only sections of a plant are shutdown and others remain operating).

# Equistar Chemicals, LP Corpus Christi Response to EPA Questions on February 21, 2014

EPA Question No. 1

Can the Steam Superheaters meet the exhaust temperature of less than or equal to 420 $^{o}$F on a 365 day rolling average including periods of startup and shutdown?

Equistar Response No. 1:

Yes, Equistar has reviewed the design for the Steam Superheaters (EPN's 5A & 5B) and determined the Steam Superheaters will be able to meet an exhaust temperature of less than or equal to 420 $^{o}$F on a 365 day rolling average basis including periods of startup and shutdown.

EPA Question No. 2

Can the Cracking Furnaces meet the minimum overall thermal efficiency of 87% or greater on a 365 day rolling average basis, excluding periods of decoking, but including periods of startup, shutdown and hot standby?

Equistar Response No. 2:

Yes, Equistar has reviewed the design for the cracking furnaces (EPN's 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1J, 1K, 1L, 1M, 1N, 3A & 3B) and determined the cracking furnaces will be able to meet the minimum overall thermal efficiency of 87% or greater on a 365 day rolling average basis excluding periods of decoking, but including periods startup, shutdown and hot standby.

EPA Question No. 3

What are the indications used to determine when decoking is required on a Cracking Furnace?

Equistar Response No. 3:

Decoking of a cracking furnace is necessary to maintain thermal efficiency. Equistar will monitor the appropriate process parameters and decoke cracking furnaces, when required, to maintain the required thermal efficiency.

There is no single indication or parameter that determines when decoking is required on a cracking furnace. Instead there are several measurements and indicators utilized in the decision to decoke a cracking furnace which is ultimately determined by trained process engineers and plant operation professionals. Below is a list of some of the measurements

used by the process engineers and plant operation professionals to determine when to decoke a furnace:

- A “critical pressure” measurement is performed on each tube in a cracking furnace to verify there is even distribution of flow through the individual tube,
- A pressure drop across each tube is conducted to look for signs of plugging in an individual tube,
- Valve output of product is monitored for overall pressure drop across all the tubes, and
- Tube metal temperature is monitored on radiant coils using a pyrometer in the field on each individual tube

Since there are three (3) types of furnaces at the plant the indication measurement to decoke varies based on the type of furnace. Additionally, these measurements may vary based on the current, past and anticipated feedstock to a cracking furnace, the metallurgy of a cracking furnace’s tubes, time since the last decoke of a cracking furnace, age of the cracking furnace’s tubes and the quality of the feedstock.