From: Eric Quiat [equiat@zephyrenv.com]
Sent: Monday, April 14, 2014 4:12 PM
To: Wilson, Aimee; LeDoux, Erica
Cc: Robinson, Jeffrey; Karen Olson; 'Tammy Lasater'
Subject: RE: Formosa GHG Application: Site-specific CCS Evaluation
Attachments: removed.txt; Appendix C - CCS BACT Analysis, Rev 2.pdf

Aimee, Erica:

In accordance with our phone conversation last Thursday (April 10th) we have revised our CCS
cost evaluation and BACT analysis (please see attachment) with the following items:

* each source type's exhaust stream CO2 concentration has been provided in Table 6-2
* although FPC TX does not consider EOR a sequestration option, at the request of EPA
this cost evaluation has been revised to provide an alternate, non-sequestration option for
transporting captured and compressed CO2 to the proposed West Ranch EOR site in
Jackson county. This alternate evaluation is included as a separate cost option in Tables
6-4B and 6-7
* the total CCS costs are also presented as a percentage of the total FPC TX Expansion
project capital cost
o see Tables 6-6 and 6-7 for this summary

As we explained in our April 10 conference call, FPC TX has already eliminated those
technically infeasible GHG emission sources with respect to CCS. Accordingly, FPC TX
understands (from our April 10 conference call) that they are not required to provide a separate
CCS cost evaluation for each candidate CCS source type.

Regards,

From: Wilson, Aimee [mailto:Wilson.Aimee@epa.gov]
Sent: Wednesday, April 09, 2014 11:38 AM
To: Eric Quiat; LeDoux, Erica
Cc: Robinson, Jeffrey; Karen Olson; 'Tammy Lasater'
Subject: RE: Formosa GHG Application: Site-specific CCS Evaluation

Eric,

The CCS cost analysis still does not meet our needs.

Please provide more details. I would suggest looking at the Occidental application (Appendix D –
beginning on page 67) available at
http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/oxychem-

ethylene-revised-app011614.pdf
Occidental did a cost analysis with the level of detail we are looking for.

Specifically I need the CO2 concentration of each stream you are evaluating for CCS.
For some streams CCS can potentially be eliminated as technically infeasible. If they can, please
provide information that could be used to support elimination as technically infeasible. This may
involve: low CO2 concentration, intermittent or variable flows, back pressure issues, disruptions to the
process, etc.
Also the closest EOR site and pipeline are the proposed Hillco Pipeline serving the West Ranch Oilfield
in Jackson County. Please use this information when estimating the cost of pipeline and geological
storage.

It would be preferable to have a CCS costs for the combustion turbines and the cracking furnaces
combined and separately. I think all the other sources evaluated could potentially be eliminated on
technical infeasibility, but we need information to support such a determination.

Please feel free to call me if you have any questions.

Thanks,
Aimee
Aimee Wilson
U.S. Environmental Protection Agency
Air Permits Section (6PD-R)
1445 Ross Ave. Suite 1200
Dallas, Texas 75202
(214) 665-7596

From: Eric Quiat [mailto:equiat@zephyrenv.com]
Sent: Wednesday, April 09, 2014 9:27 AM
To: LeDoux, Erica
Cc: Robinson, Jeffrey; Wilson, Aimee; Karen Olson; 'Tammy Lasater'
Subject: RE: Formosa GHG Application: Site-specific CCS Evaluation

Erica,

Attached please find a revised BACT evaluation for CCS (Appendix C of the 2012 Expansion
Project GHG applications). The revised CCS evaluation includes site-specific costing based on
the project-specific and site-specific information. The revised cost estimate can be found in
Tables 6-1 through 6-5 at the end of this document.

In response to your question below concerning the flare gas recovery system, this response was
provided in an August 9, 2013 email which we had recently forwarded to your attention (on
March 20, 2014).

Please let me know if you have any questions.

Regards,

Eric Quiat P.E. | Project Engineer
Zephyr Environmental Corporation
2600 Via Fortuna, Ste 450 | Austin, TX 78746
Direct: 512.579.3823 | equiat@zephyrenv.com
ZephyrEnv.com | HazMatAcademy.com

From: LeDoux, Erica [mailto:LeDoux.Erica@epa.gov]
Sent: Wednesday, February 19, 2014 5:05 PM
To: Karen Olson; 'Tammy Lasater'; Eric Quiat
Cc: Robinson, Jeffrey; Wilson, Aimee
Subject: RE: Formosa GHG Application

Tammy and Karen,

Attached is the pdf of the EOR pipeline that I mentioned during our call. Please let me if you would like
to meet next Thursday. As was discussed, it would be difficult for EPA to defend the elimination CCS
for the Formosa project due to economic infeasibility given the detail of cost information we have
today that was provided by Formosa in the applications.

What should be provided is the supporting calculations that were used to derive this cost estimates
present in the application. Please provide the site-specific parameters that were used to evaluate and
eliminate CCS from consideration as an add-on control for BACT. This material should contain detailed
information on the quantity and concentration of CO2 that is in the waste stream and the specific
equipment to be used. This site-specific cost calculations should include, but are not limited to, size
and distance of pipeline to be installed, pumps, compressors, if applicable the amine solution to be
used and the equipment necessary to employ the chosen technology. Please provide the separate
capital cost of construction, operation and maintenance, and the cost analysis for storage or

transportation for the option. Please discuss in detail any site specific safety or environmental impacts
associated with such a removal system and the additional cost associated. Also, please provide any
additional technical or economic details for this project and its potential for installing a CCS system for
recovering CO2 for enhanced oil recovery (EOR) and non-EOR geologic sequestration.

Also, was a flare recovery system considered for this project? Please provide the technical evaluation
that was used to eliminate it.

Please take a look at ExxonMobil's response to comments and supplemental information that was
submitted.

Thank you,

Erica G. Le Doux, Environmental Engineer
U.S. EPA Region 6
Air Permits Section (6PD-R)
1445 Ross Ave.
Dallas, TX 75202
Office: (214) 665-7265
Fax: (214) 665-6762
ledoux.erica@epa.gov

From: Karen Olson [mailto:kolson@zephyrenv.com]
Sent: Wednesday, February 19, 2014 3:08 PM
To: LeDoux, Erica; 'Tammy Lasater'
Cc: Eric Quiat
Subject: RE: Formosa GHG Application

Erica - Tammy and I tried to call a few minutes ago and got your voicemail. Please email us as soon as
you are ready to talk and we will call you.
Thanks.

Karen Olson
Principal
Zephyr Environmental Corporation

kolson@zephyrenv.com

512.879.6618

From: LeDoux, Erica [mailto:LeDoux.Erica@epa.gov]
Sent: Wednesday, February 19, 2014 1:25 PM
To: Karen Olson; 'Tammy Lasater'; Eric Quiat
Subject: Formosa GHG Application

Would it be possible to have a conference call with you this afternoon? You could call me at my office phone just like yesterday. I already have a meeting scheduled from 1:45 to 3:00 today, but I am available from 3:00pm - 5:00pm. What I want to discuss is the possibility of a face-to-face meeting with you later next week on Thursday along with Jeff Robinson and Aimee Wilson. Thank you, Erica

Erica G. Le Doux, Environmental Engineer
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ledoux.erica@epa.gov

From: Karen Olson [mailto:kolson@zephyrenv.com]
Sent: Tuesday, February 18, 2014 1:49 PM
To: LeDoux, Erica
Cc: 'Tammy Lasater'; Austin O'Kelly; Eric Quiat
Subject: Lync Webmeeting info for review of FPC TX expansion project calculation workbooks

Erica - It was great to talk to you today. We were encouraged that you are working on draft permits for FPC's review/comment and that you are planning for the July 2014 permit issuance date (assuming the cross cutting issues do not cause unnecessary delays). As Tammy requested, if you have any technical issues that you need further explained while you are finalizing the first draft of permit conditions, please email Tammy, Eric Quiat and myself. One of use will be able to make sure you get what you need.

We are happy to help you expedite your final review of the emission calculations. We appreciate your

willingness to consider our proposed web-meeting as an alternative to providing you a CD of the
calculation workbook. I am providing information below that you can provide to your IT folks. We have
used this Webmeeting system with TCEQ and they did not have any IT issues.

To join a Lync Webmeeting, you do not have to download any software to your computer.
All you have to do is:

1. Click on “Join online meeting” link that will come in the meeting invitation

2. Join as “ Guest”

3. When you click to Join online meeting, the program may ask you how you would like to join the
meeting.
There are three options.

A. The easiest and our recommended option is to choose “Lync Attendee”.

B. You can also join using one of the following if it is already installed on your computer:
- “Lync” or
- “Silverlight” as required for Lync Web App (which requires admin privileges)

The details about each of these joining options is available if you click on “First online meeting?”
(link below). It will give you probably more information than you or your IT folks could possibly
want.

I am also including Zephyr’s IT contact so if your IT folks want to talk “IT” language they can talk to
Austin O’Kelly at 512-579-3838 or aokelly@zephyrenv.com .

Thanks again. Please let us know how and when you would like to set this up.

Karen N. T. Olson, P.E.
Principal
Zephyr Environmental Corporation
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kolson@zephyrenv.com
512.879.6618
512.329.8253 (fax)

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Join online meeting
https://meet.zephyrenv.com/kolson/TTYP7HM1

First online meeting?
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