Message

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Sent: 6/10/2016 3:49:14 PM
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Subject: links for SO2 TAD and AERMOD beta memos

All -

Thanks for a very productive call yesterday (6/9), we look forward to working with you.

One of the action items was for me to send links to a few documents. It sounded like you already have 1. Modeling TAD, but I included it for completeness below. Also included 2. AERMOD beta options memo, and the main one of interest, 3. Donlin Modeling Clearinghouse (MCH) memo for the Donlin facility. That relied on AERMOD adjusted u-star (ADJ_U*) beta option, as did the EIS modeling for FCPP and NGS.

My thinking at this point is that we should plan on rerunning AERMOD with updated emissions. Relying on the EIS modeling, even if its emissions are acceptable, would require an Alternative Model demonstration (see notes in #3 below), since the EIS modeling used the ADJ_U* beta option. That demonstration would involve rerunning the model anyway (with and without the beta option), so we might as well plan on remodeling without the beta option, and skipping the demonstration. A benefit of that is that we'd be on more solid ground using up-to-date emissions and the latest model version. A downside is that, since FCPP was pretty close to the SO2 NAAQS even using the beta option, later on we might end up having to do the beta demonstration for it after all.

- Scott B.

1. Modeling TAD
Air Quality Designations for Sulfur Dioxide page
https://www.epa.gov/sulfur-dioxide-designations

Sulfur Dioxide Implementation - Programs and Requirements for Reducing Sulfur Dioxide
https://www3.epa.gov/airquality/sulfurdioxide/implement.html

About half way down on implementation page there is link to Modeling TAD:
Sulfur Dioxide (SO2) National Ambient Air Quality Standards Designations Modeling Technical Assistance Document (February 2016 Draft)
direct link: https://www3.epa.gov/airquality/sulfurdioxide/pdfs/SO2ModelingTAD.pdf

2. AERMOD beta options memo

2015 Beta options memo
SCRAM - Clarification Memos page
https://www3.epa.gov/scram001/guidance_clarificationmemos.htm

Clarification on the Approval Process for Regulatory Application of the AERMOD Modeling System Beta Options (12-10-2015)

Direct link: https://www.epa.gov/ttn/scram/guidance/clarification/AERMOD_Beta_Options_Memo-20151210.pdf

Memorandum, "Clarification on the Approval Process for Regulatory Application of the AERMOD Modeling System Beta Options", Richard A. Wayland, Director, Air Quality Assessment Division, EPA, December 10, 2015

The 2015 memo basically says all AERMOD beta options have to get official approval from the Modeling Clearinghouse (within EPA OAQPS). That involves a demonstration under 40 CFR 51 Appendix W ("Guideline on Air Quality Models", referred to for short as Appendix W or GAQM) section 3.2, "Use of Alternative Models" submitted to EPA Regional Office, which sends with explanatory memo to MCH, which evaluates and then issues concurrence memo. Exceptions are the POINTCAP and POINTHOR options (for capped and for horizontal stacks), for which the Regional Office can issue the approval. The demonstration required can vary, for some of the newer options it would be expected to be fairly involved. For the ADJ_U* (adjusted u-star, friction velocity) beta option, or others for which an MCH concurrence has already been issued, it would be less involved and could rely at least somewhat on the previous concurrence memo. While some of the beta options are expected to be incorporated into the upcoming update to Appendix W, after which there would be no need for the MCH process, that is still uncertain at this point, and we have been advised to always go through the process to be able to defend against any possible challenges to the work later on.

3. Donlin Modeling Clearinghouse (MCH) memo record

Model Clearinghouse page

https://www3.epa.gov/ttn/scram/guidance_clearinghouse.htm

Model Clearinghouse Information Storage and Retrieval System (MCHISRS)

http://cfpub.epa.gov/oarweb/MCHISRS/

The MCHISRS record for the Donlin memo is included below, and includes links to the MCH concurrence memo, the original request, and its supporting documentation (the App. W 3.2 demonstration). The Donline gold mine is in Alaska, in EPA Region 10.

Note that the MCH concurrence memo mentions only sources with low release heights (such as the fugitive PM that dominate the Donlin impacts), so I believe that a parallel demonstration would be needed to use ADJ_U* for tall stacks such as at FCPP and NGS. The Donlin demonstration pulled together information from past ADJ_U* option reviews and evaluations for similar sources, and also included a model performance comparison to monitored data, with and without the option. It is 100 pages long. (By contrast, the justification included by AECOM for the FCP EIS was only 1 and 1/2 pages, but it did not go through the MCH process.) I think a parallel demonstration for tall stacks would be doable, but I doubt it is worth the effort for the SO2 from the FCPP and NGS tall stacks. In order to do the demonstration, the model would have to be run with the beta option turned off, so you might as well run it that way in the first place and skip the beta option and demonstration. If one of the sources ended up being close to the NAAQS, then the option could be pursued later.

"Use of the ADJ_U* Beta Option in the AERMET Meteorological Processor as an Alternative Model", 2016-02-10

Model Clearinghouse Information Storage and Retrieval System Record Details (16_X_01)

http://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=16-X-01

===== begin 2016 Donlin MCHSR record 16-X-01 =====

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Use of the ADJ_U* Beta Option in the AERMET Meteorological Processor as an Alternative
Model
Record No: 16-X-01      Last Update: 02/10/2016


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EPA Region: 10     Fiscal Year: 2016
States: AK
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Record Type: Action
Pollutants: PM-10 Sources: Mine
Models: AERMOD Urban/Rural: Both Urban & Rural
Terrain: Both High & Low Regulations: PSD
Guideline: Guideline Database: Both
Oral/Written: Written Involvement: Review and Comment
Subjects: Technical Credibility of Nonguideline Techniques
Comments:
Issue: Region X is seeking concurrence from the Model Clearinghouse for the approval of an alternative modeling demonstration for the use of the beta adjusted surface friction velocity (ADJ_U*) modeling technique in the AERMET meteorological preprocessor. The ADJ_U* technique will be applied in a compliance demonstration for a PSD permit at the Donlin mine facility located on the western slopes of the Kuskokwin Mountains in the Yukon-Kuskokwin region of southwestern Alaska.

C/H Response:
The Model Clearinghouse concurs that a well-reasoned justification was thoroughly documented and demonstrates that the ADJ_U* Beta option in AERMET selected for the Donlin mine facility compliance demonstration performs better for the given application, i.e., surface mining operations, than the default regulatory version of AERMET and, therefore, is approvable per the second condition of Appendix W, Section 3.2.2. We also concur with the decision to exclude the sigma-theta turbulence parameter when processing the site-specific meteorological data with the ADJ_U* Beta option and with the decision to not include any of the LOW_WIND Beta options in AERMOD for this alternative model approval. Finally, the Model Clearinghouse agrees with the use of the POINTCAP and POINTHOR Beta options for capped and horizontal releases in AERMOD for the Donlin mine facility compliance demonstration and further recommend their use as the best available options for all capped and horizontal stacks subject or not subject to downwash, consistent with our proposed revisions to Appendix W.

Memoranda:

http://www.epa.gov/ttn/scram/guidance/mch/new_mch/16-X-01_MCResponse_Region10_Donlin-02102016.pdf
Memo: Model Clearinghouse Review of the Use of the ADJ_U* Beta Option in the AERMET Meteorological Processor (Version 15181) for the Donlin Mine Compliance Demonstration
Dated: February 10, 2016
From: George Bridgers, Model Clearinghouse Director
Air Quality Modeling Group, EPA
To: Janis Hastings, Acting Director
Office of Air, Waste, and Toxics, Region 10, EPA

http://www.epa.gov/ttn/scram/guidance/mch/new_mch/16-X-01_Donlin_ADJU_MCHRequest-12012015.pdf
Memo: Model Clearinghouse Concurrence Request - Surface Friction Velocity (u*) Non-Default/Beta Option in AERMET Version 15181; Alternative Refined Model Demonstration
Dated: December 1, 2015
From: Kate Kelly, Director
Office of Air, Waste, and Toxics, Region 10, EPA
To: Tyler Fox, Lead
Air Quality Modeling Group, EPA

http://www.epa.gov/ttn/scram/guidance/mch/new_mch/16-X-01_Region10_Approval_Donlin_ADJU_10202015.pdf
Memo: Supporting Documentation - Surface Friction Velocity (u*)

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Non-Default/Beta Option in AERMET Version 15181; Alternative
Refined Model Demonstration
          Dated: December 1, 2015
          From:  Herman Wong, Region 10 Modeling Contact
                   Office of Air, Waste, and Toxics, Region 10, EPA
            To:  Alan Schuler, Engineer, P.E.
                   Alaska Department of Enviromental Conservation
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===== end 2016 Donlin MCHSR record 16-X-01 =====

- Scott B.

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