Georgia Department of Natural Resources

Environmental Protection Division • Air Protection Branch
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Mark Williams, Commissioner
F. Allen Barnes, Director

July 7, 2011

Mr. Jon Hill
Trinity Consultants, Inc.
53 Perimeter Center East, Suite 230
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Forwarded to: Jhill@TrinityConsultants.com
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Subject: **Review of PSD Air Dispersion Modeling Protocol**
Pyramax Greenfield Site PSD, Jefferson Co., Georgia

Dear Mr. Hill:

We have reviewed the air quality dispersion modeling protocol dated June 20, 2011, which addresses the proposed modeled conformance of the Pyramax kaolin processing facility to be located in Jefferson County, Georgia with applicable air quality standards. We find that it generally conforms to the procedures and guidelines we use to assess Prevention of Significant Deterioration (PSD) modeling projects. However, we do have the following comments:

1. EPA/EPD retain purview over Class I Increment consumption, so both agencies should get a copy of any project correspondence you may have with the any FLM. In addition, IF the project is not required to assess Air Quality Related Values at any Class I area, you may use the Class I area Significance screening involving AERMOD, as you proposed. If screening modeling indicates the project will exceed applicable Significance levels at any Class I area, such screening modeling must be repeated using CALPUFF, for which a protocol should be prepared. Such Increment Significance screening modeling should not employ building downwash, nor should it include the assessment of fugitive emissions.

2. Class II Meteorological Data: We have processed Daniel Field NWS hourly meteorological surface observations with daily Peachtree City upper air observations using the recently promulgated, final versions of AERMINUTE and AERMET (both versions 11059). These observations were collected over the period 2006-2010, in case you need to use 2006-2010 concurrent ambient monitoring data. We have confirmed with the EPA Region 4 modeling contact that the use of AERMINUTE is not a data replacement technique, since the data is collected by the same instrumentation at the same location. We have been instructed by Region 4 to avoid filling-in any surface observations beyond AERMINUTE processing.

   We have processed this data using the Daniel Field airport's surface characteristics and the Pyramax site's surface characteristics. Each of these two resulting data sets was initially used to model the project's1-hr and annual-averaged SO_2 impacts over the 5-yr period. This modeling showed slightly higher maximum annual impacts using the Daniel Field site characteristics (at the second significant digit) and slightly higher maximum one-hour impacts using the Pyramax surface characteristics (at the fourth significant figure). The differences in surface characteristics, ie. surface roughness, are most variable at the Pryamax site, and most stable at the Daniel Field site over the period 1992-present.

   Since AERSURFACE can currently only use the 1992 land use/land cover data, and Daniel Field has the greater stability for these parameters, EPD prefers you use the Daniel Field data exclusively for all project AERMOD modeling. Note that when the met data were compiled thru AERMET(11059),

a thirty-yr period of record (1980-2010) of annual precip in Augusta was reviewed, and resolved the 2006-2010 period into years of wet, dry, and average conditions following the latest AERMOD Implementation Guidance. These were:

dry: '07 & '10,
avg: '06 & '08, and
wet: '09

3. Offsite Inventory Preparation: Please provide (in the modeled air quality assessment) dimensions and/or alternate emission source characteristics for any fugitive sources modeled, and indicate how such dimensions are represented in the model(s). Please document all sources of information used to compile any offsite inventories compiled for the project. Please carefully distinguish between NOx and NO_2, and provide your definition of NO_2, in the air quality modeling report. Please follow the generic inventory development and receptor placement guidance you were sent on 6/30/11.

   The Permitting Program will also review and, if acceptable, approve your on- and off-site emissions inventories, including PM2.5, NOx, and SO2 emissions. Rather than use average, or typical, emissions data, we would prefer that you identify missing inventory information and allow EPD the opportunity to provide the information to you or confirm that it is missing and approve your specific missing data handling technique.

4. Air Toxics: Air toxics modeling should be conducted in accordance with the GA EPD Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions, 1998. Air toxics modeling may use either AERMOD, version 11059, with downwash, or ISCST3, version 02035 without downwash. Air toxics model receptors should extend to at least 2 km outward from the project site, and there must be sufficient receptors to resolve the Maximum Ground-Level Concentration (MGLC). If any receptors are located at terrain elevations in excess of the lowest stack height in the model, AERMOD must be used to assess impacts at those receptors. If the ISCST3 model (version 02035) is to be used for air toxics, with receptors assigned terrain elevations, let us know and we will attempt to process an ISCST3-compatible meteorological file from the Daniel Field data we have. This may be useful if Class II visibility is to be assessed beyond Level I. A concatenated 5-yr meteorological data set may be used to assess 1-hr, 24-hr, and/or PERIOD (instead of annual) averaging periods. In this way, EPD expects a single model run for each toxic impact requiring refined modeling. The SCREEN3 model should not be used without specific justification, due to the number of sources and the range of source emission characteristics at the site. The air toxics modeling must be conducted to involve all on-site sources of the same pollutant. Georgia EPD no longer requires derivation of Acceptable Ambient Concentrations (AACs) from NIOSH LD_{50} threshold concentration data.

   The EPD Permitting Program will advise you as to which air toxics contaminants are required to be assessed.

5. Class II criteria pollutant dispersion modeling should use the 11103 version of AERMOD. Standards (referred to here as pre-2008) discussed in the draft 1990 New Source Review Workshop Manual should be evaluated using that draft guidance. Other, more recent standards (post-2007, ie., 1-hr NO_2, 1-hr SO_2, and PM2.5) should be evaluated using the guidance memos listed on page 63 of the updated AERMOD User's Guide, and in conjunction with the modeling guidance you were sent on 6/30/11, in which we provided a discussion of methods we believe to be allowable based on the latter guidance. As provided in the AERMOD User's Guide, any DEFAULT option may be employed in the modeling. Use of Non-Default options is subject to individual approval, preferably from EPA.

The largest Significant Impact Distance (SID) for each pollutant, plus 50 km, will establish the size of any model screening area to be inventoried for offsite sources of pre-2008 pollutants (those addressed in the 1990 Draft NSR Workshop Manual) for cumulative modeling. The "20D" screening technique may be used for eliminating sources from all but the 1-hr averaging period models, but the screening should be conducted using both a short-term "d" and a long-term "D". No source located within the pollutant-specific largest Significant Impact Areas (SIAs) may be screened from the cumulative inventory. The1-hr NO_2 and SO_2 inventories will be developed based on the guidance you were sent on 6/30/11 (see the attachments). When applying the 20D screening method, the pollutant-specific emissions of facilities within 2 km of each other outside the SIA should be added prior to applying the 20D screening test.

6. Increment Issues: The Jefferson Co. Air Quality Control Region (AQCR) minor source baseline date for annual NO2 is 1/10/02, per GA EPD records. This is the only date that has been triggered in the AQCR. If you have alternative information, please submit it for EPD review. The facility will not be required to assess PM2.5 Increment consumption by this project (if the application is deemed complete by 10/20/11).

7. Ambient Concentrations: The project 1- and 8-hr background ambient concentrations of CO are 943 and 802 $\mu g/m^3$, respectively (Paulding Co. monitor, 2010). The annual NO_2 background ambient concentration is 5.2 $\mu g/m^3$, as a 5-yr avg of the annual max, Paulding Co. monitor, 2010. The 1-hr NO_2 background ambient concentration (2008-2010) is 35.8 $\mu g/m^3$, based on the March 1, 2011 EPA memo indicating the 98th %-ile of the daily maximum 1-hr concentration over a 3-yr period may be used for this purpose (Paulding Co. monitor, 2008-2010). The 3-yr average of the daily 98th percentile concentrations of PM2.5 at Bungalow Road in Augusta ('08-'10) is 25.0 $\mu g/m^3$, the annual average PM2.5 concentration at that site is ('08-'10) is 12.7 $\mu g/m^3$. The

   1-hr SO_2 ambient concentration (Macon SE, 2008-2010) is 67 $\mu g/m^3$. The 3-hr SO_2 ambient background (same monitor and period) is 51.5 $\mu g/m^3$, the 24-hr SO_2 ambient background (same monitor and period) is 16.8 $\mu g/m^3$, the annual average SO_2 ambient background (same monitor and period) is 3.89 $\mu g/m^3$.

   The PM10 regional background ambient concentrations for 24-hr and annual are 38 and 20 $\mu g/m^3$, respectively. You indicated you may wish to employ a concurrent PM2.5 hourly ambient background concentrations in the modeling of that pollutant. A 2008-2010 file of such concentrations is available upon request.

8. General Modeling considerations: Please use the applicable procedure cited in the current version of the AERMOD Implementation Guide to address any horizontal emissions and/or rain-capped stacks in the models. Please use BPIPPrm (version 04274) to assess building downwash dimensions and GEP stack heights. Stacks of heights equal to, or in excess of GEP height should be modeled using the GEP height. Stacks below GEP height must be modeled to assess building downwash influences on their plumes. Please use AERMAP (version 11103) to assess all model receptor elevations above sea level with the USGS NED database (all model coordinates, including building corners, should be referenced using the NAD83 datum). Please assess source base elevations using AERMAP, if appropriate, otherwise, use plant grade elevations. For all criteria pollutant modeling, please use AERMOD (version 11103).

9. Model Receptors: For the pre-2008 air quality standards, the extent of the receptors modeled should be 100m at the fenceline and out to 2km from the primary project emission source (PPES), 250m from 2 km to 5 km, and 500m beyond 5km to 10 km, or the extent of the largest SIA. All design concentrations should be resolved to the nearest 100 meters. The SID receptors should have at least

one 100-m spaced receptor located farther from the project than the farthest receptor showing a concentration greater than or equal to the respective SIL. For the post-2007 air quality standards, see the discussion you were sent on 6/30/11 (and attached) as regards receptor placement.

10. Additional Impacts:
    a. All additional impacts studies will be limited to no more than the largest significant impact distance from the project site. Additional impacts studies do not include National Monuments, unless specifically requested by a Federal Land Manager.
    b. Preliminary Class II visibility assessment guidance is attached (also sent on 6/30/11).
    c. Only four trace elements, Cu, B, V, and Zn are included in EPA's 1980 publication, "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" which are not included on the Hazardous Air Pollutants list of Title 3 of the 1990 Clean Air Act Amendments. Additional impacts assessments of those four elements, and the criteria air pollutants should be conducted in accordance with that guidance, more recent literature, and the applicable attached guidance which you were sent on 6/30/11. Note that EPA is expected to propose modifications of the secondary SO2 and NO2 standards in the near future (July 12, 2011) which are projected to be final around March 20, 2012.
    d. Please include a discussion, and if warranted, an assessment of air emissions expected to occur as a result of the project as indicated on pages D.3-D.4 of EPA's Draft 1990 New Source Review Workshop Manual.

11. Fugitives: We would like to accommodate your request to omit fugitive emissions from the modeled assessments. However, we believe we need more information before allowing their omission:
    a. A site plan indicating travel routes use for delivery and removal of materials from the site.
    b. Extent of travel routes to be paved.
    c. Vehicle-miles traveled per day, and per hour conveying materials on site, weights, capacities, and resulting PM10/PM2.5 emission rates.
    d. Specific emission control options to be available on site.
    e. A description of the vehicles traveling the material conveyance routes.
    f. A description of other fugitive emissions sources, projected emission rates, control techniques/equipment.

12. Intermittent Sources: We would like to accommodate your request to omit intermittent source emissions from the modeled assessments. However, we believe we need more information before allowing their omission:
    a. Dates of intermittent equipment manufacture/re-manufacture
    b. Potential NSPS applicability
    c. Fuels
    d. Estimated emissions during maintenance/testing, and under load
    e. Description of anticipated emergency condition(s), including duration.
    f. Typical duration of regular testing/maintenance (1-hour, 30-minutes, 5 hours?)
    g. Frequency of typical regular testing/maintenance (weekly, monthly, 7-times-per-week?)
    h. Necessity of varying the testing/maintenance schedule

13. Alternative Operating Scenarios: Please address any alternative operating scenarios in the modeled assessments as well as in the air permit application. This should include:
    a. A discussion of why alternative operating scenarios are not anticipated, if true
    b. A discussion of the expected variation of emission rates during equipment start-up conditions
    c. The anticipated frequency and duration of start-up conditions
    d. The anticipated frequency and duration of alternative operating capacity scenarios

Please contact me at 404-363-7095 if you have any questions. If EPA issues guidance, or models which you believe may affect the modeling of this project subsequent to this protocol approval letter, please contact me to verify the ability to incorporate such guidance or models in the assessments of this application. If you have specific questions on issues that develop after you receive this protocol approval letter, please contact me. This protocol is valid for 6 months, unless otherwise stipulated.

Sincerely,

Peter S. Courtney, P.E.
Environmental Specialist
GA EPD

Attachments: Generally Applicable Modeling References
Model Receptor Development.doc Guidance
Additional Impact Air Quality Analysis.doc Guidance

Generally Applicable Modeling References

2005, 40 CFR 51, Appendix W, Guideline on Air Quality Models

1990, Draft New Source Review Workshop Manual.

2004, USER'S GUIDE FOR THE AMS/EPA REGULATORY MODEL – AERMOD, Under Revision, (EPA-454/B-03-001, September 2004) (version 04300)

2011, ADDENDUM, USER'S GUIDE FOR THE AMS/EPA REGULATORY MODEL – AERMOD, (EPA-454/B-03-001, September 2004), March 2011 (version 11103)

2009, AERMOD IMPLEMENTATION GUIDE, Last Revised: March 19, 2009

2004, USER'S GUIDE FOR THE AERMOD TERRAIN PREPROCESSOR (AERMAP, version 04300), Under Revision, EPA-454/B-03-003, October 2004.

2011, ADDENDUM, March, 2011, to USER'S GUIDE FOR THE AERMOD TERRAIN PREPROCESSOR (AERMAP version 11103), EPA-454/B-03-003, October 2004.

2004, USER'S GUIDE TO THE BUILDING PROFILE INPUT PROGRAM (BPIP), updated to include the PRIME algorithm (BPIPPRM, version 04274, EPA-454/R-93-038, (Revised April 21, 2004), (Electronic copy only). See also bpiprz1.txt, changes to the BPIPPrm utility.

1995, USER'S GUIDE FOR THE INDUSTRIAL SOURCE COMPLEX (ISC3) DISPERSION MODELS, VOLUME I - USER INSTRUCTIONS, VOLUME II – DESCRIPTION OF MODEL ALGORITHMS. EPA-454/B-95-003a & b, September, 1995.

2002, USER INSTRUCTIONS FOR THE REVISED ISCST3 MODEL (dated 02035), Feb 4, 2002.

1995, SCREEN3 Model User's Guide, EPA-454/B-95-004, model version 96043.

2010, Guidance Concerning the Implementation of the 1-hour NO2 NAAQS for the Prevention of Significant Deterioration Program, EPA Memorandum from Stephen D. Page, Director, OAQPS, to EPA Regional Air Division Directors, June 29, 2010.

2011, Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard, EPA Memorandum from Stephen D. Page, Director, OAQPS, to EPA Regional Air Division Directors, March 1, 2011.

2010, Guidance Concerning the Implementation of the 1-hour SO2 NAAQS for the Prevention of Significant Deterioration Program, EPA Memorandum from Stephen D. Page, Director, OAQPS, to EPA Regional Air Division Directors, August 23, 2010.

2010, Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS, EPA Memorandum from Stephen D. Page, Director, OAQPS, to EPA Regional Modeling Contacts and selected OAQPS Personnel, March 23, 2010.

2010, Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5)--Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC), Final rule, Federal Register vol. 75, No. 202, pgs. 64863-64907, October 20, 2010.

1998, Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions, Revised June 21, 1998, Georgia Environmental Protection Division (GA EPD).

2006, Interim Dispersion Modeling Guidance, Last Revised Dec 28, 2006, GA EPD (georgiaair.org).