UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 01 2011

REPLY TO THE ATTENTION OF:

Keith Baugues
Assistant Commissioner
Office of Air Quality
Indiana Department of Environmental Management
100 North Senate Avenue
Indianapolis, Indiana 46204

Dear Mr. Baugues:

This letter is in response to your May 26, 2011, letter regarding new source review (NSR) interpollutant offset and precursor requirements for particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). Your letter summarized your understanding of the May 19, 2011, conference call between the U. S. Environmental Protection Agency and the Indiana Department of Environmental Management (IDEM) which, in turn, was in response to IDEM's March 23, 2011, letter to EPA. The March 23, 2011, letter raised the following seven questions regarding $PM_{2.5}$ NSR offset and precursor requirements. While we generally agree with your characterization of our discussion of these issues, we have the following comments and clarifications.

1. Can offset ratios be seasonal or only annual?

IDEM's summary: *"Due to the fact that the standard is annual, offset ratios would need to be annual as well, with the same ratio applying year round."*

Since all current $PM_{2.5}$ nonattainment areas in Indiana are for the annual $PM_{2.5}$ standard, we agree that offset ratios must be for annual emissions. That said, the ratios should reflect or be consistent with the seasonal nature of $PM_{2.5}$ formation in the area of interest.

2. Can offset ratios vary among portions of the state, or must one ratio apply to the entire state?

IDEM's summary: *"If the state makes a sound technical demonstration to support the ratios it devises, the ratios can vary among geographic regions within the state. The boundaries of the regions do need to be clearly defined."*

EPA agrees with IDEM's summary of our May 19, 2011, discussion of this question.

3. **If data supports it, can precursor pollutants addressed in Indiana's rule vary among portions of the state?**

   IDEM's summary: *"Not for sulfates. The state must conduct an analysis to determine if nitrates should be treated as a regulated precursor for portions or all of the state."*

   For NSR purposes, pursuant to 40 CFR 51.165(a)(1)(xxxvii)(C), sulfur dioxide (SO_2) is always considered a precursor while states may "opt out" of treating nitrogen oxides (NO_X) as a precursor in certain regions of the state based on a technical demonstration. An analysis is only necessary if a state wants to "opt out" NO_X as a $PM_{2.5}$ precursor for portions or all of the state.

4. **How consistent must the ratios and precursor pollutants Indiana selects be in comparison to neighboring states?**

   IDEM's summary: *"EPA is not concerned about inconsistency among state submittals. Indiana simply must ensure that its submittal adequately addresses the minimum requirements and consists of technically sound justification."*

   EPA agrees that approval of a state's ratios and precursor pollutants will be based on an adequate technical demonstration that analyzes the air quality within that state. However, if more than one state is pursuing the development of ratios, multi-state collaboration would be desirable for border regions.

5. **Can Indiana's demonstration rely on speciated ambient monitoring data or must it rely solely on dispersion modeling?**

   IDEM's summary: *"Monitoring data can be used to supplement an evaluation, as can dispersion modeling output. However, EPA views photochemical modeling to serve as the core to the technical demonstration."*

   We see a limited role for monitoring data, and expect existing air quality models and techniques to be necessary for states to conduct local demonstrations leading to the development of area-specific ratios for $PM_{2.5}$ nonattainment areas. For the geographic areas of interest, we expect the state will need to conduct a series of sensitivity runs with appropriate air quality models to develop a database of modeled $PM_{2.5}$ concentration changes associated with reductions of direct $PM_{2.5}$ emissions and $PM_{2.5}$ precursor emissions (i.e., SO_2 and NO_X) from anthropogenic point sources within the area of interest. For precursor emissions, a photochemical model such as CMAQ or CAMx at grid resolution of 12 kilometers (km) or less is recommended to predict changes in $PM_{2.5}$ concentrations. For direct $PM_{2.5}$ emissions, a dispersion model such as AERMOD or photochemical model at grid resolution of 4 km or less is recommended to predict changes in $PM_{2.5}$ concentrations. The offset ratios for $PM_{2.5}$ between direct $PM_{2.5}$ emissions and precursor emissions can then be calculated in a manner similar to the ratio of impact metrics from EPA's 2007 technical assessment.

6. **If speciated ambient monitoring data is used to support a demonstration, how would U.S. EPA expect Indiana to treat the precursor pollutants that account for a more significant portion of the mass than sulfur dioxide and nitrogen oxides?**

   IDEM's summary: *"EPA's review will be limited to the precursor pollutants identified within the federal rule. Contributing pollutants like organic carbon, ammonia, and elemental carbon are assumed to be excluded unless the state opts to regulate them as a precursor."*

   To clarify, regarding $PM_{2.5}$ species composition and treatment in the state's technical demonstration, direct $PM_{2.5}$ emissions include organic and elemental carbon that is directly emitted from sources. Please refer to EPA response to #5 above in terms of the focus on air quality modeling as the technical basis for an offset ratio demonstration.

7. **If modeling is required, what model is acceptable since secondary formation of precursor pollutants is essential to such a demonstration?**

   IDEM's summary: *"EPA views the use of a photochemical model like CMAQ or CAMx to be necessary to properly evaluate and provide the technical support for offset ratios."*

   EPA agrees with IDEM's summary of our May 19, 2011, discussion of this question.

In addition to the summary of our discussion on these questions, IDEM states in its May 26, 2011, letter that it must receive written guidance concerning photochemical modeling procedures in order to establish offset ratios. It is also IDEM's understanding that EPA is working on such guidance and that this guidance is scheduled to be completed in December 2011. While such guidance is not currently under development, we will be available to provide technical assistance to you as requested. As stated in the July 21, 2011, EPA memorandum from Gina McCarthy titled "Revised Policy to Address Reconsideration of Interpollutant Trading Provisions for Fine Particles ($PM_{2.5}$)," EPA encourages states to work with the Regional Office modeling contacts for technical consultation. This would include our review and comment on modeling protocols, review and interpretation of modeling results, and derivation of offset ratios.

The May 26, 2011, letter concludes by saying that "in the absence of documented and detailed modeling guidance, it is impossible for states to prepare a rule-supported state implementation plan (SIP) that meets a series of criteria that are yet to be defined. Therefore, Indiana is unable to proceed with its rulemaking and SIP submittal to address NSR for fine particles until it receives the necessary guidance from EPA to conduct the necessary photochemical modeling and supplemental technical analysis to ensure SIP approval. Upon receipt of this written guidance, Indiana commits to provide EPA with a SIP within one year." While EPA understands that state development of interpollutant NSR offset ratios for $PM_{2.5}$ may be technically complex, as stated in the July 21, 2011, McCarthy memorandum, these ratios are not a mandatory element for implementing $PM_{2.5}$ as a pollutant under NSR.

We are available to provide assistance to you in developing appropriate offset ratios for Indiana. We thus disagree that this issue requires a delay in the SIP submittal to address $PM_{2.5}$ NSR requirements, and affirm that the May 16, 2011, SIP submittal deadline provided in the May 16, 2008, $PM_{2.5}$ NSR Implementation rule (73 FR 28341) remains applicable.

If you have any further questions, please contact me, or Sam Portanova, of my staff, at (312) 886-3189.

Sincerely,

Cheryl L. Newton
Director
Air and Radiation Division