SIERRA CLUB
VALLEY WATCH
CITIZEN ACTION COALITION

December 26, 2007

VIA OVERNIGHT MAIL

Kimberly Cottrell
IDEM, Office of Air Quality
100 North Senate Avenue
MC61-53, Room 1003
Indianapolis, IN 46204-2251

kcottrel@idem.in.gov

Re: Public Comments on Draft Prevention of Significant Deterioration Construction Permit for Duke Energy Indiana-Edwardsport Generating Station, Significant Modification No. 083-23529-00003, Significant Permit Modification No. 083-23531-00003

These comments are submitted on behalf of Valley Watch, Citizen Action Coalition, and Sierra Club and their combined almost 1 million members. The Indiana Department of Environmental Management (IDEM) proposes to issue a permit to Duke Energy (aka Duke Energy Indiana) allowing the company to modify its permits for the Edwardsport Generating Station and to construct new emission sources. This would allow construction of a very large power plant and a huge new source of air pollution. The new pollution sources will subject Indiana, Illinois and Kentucky residents to air

pollution, as well as increase global warming pollution at a time the state of Indiana, the United States, and the rest of the world is working to curb global warming pollution.

According to state and federal clean air laws, the proposed power plant is a fossil fuel-fired steam electric plant of more than two hundred fifty million (250,000,000) British thermal units per hour heat input, which is listed pursuant to 326 IAC 2-2-1(gg)(1). Knox County is designated as attainment (or unclassified) for the criteria pollutants. Therefore, the facility is subject to Prevention of Significant Deterioration (PSD) permitting for all pollutants for which the proposed project would result in a significant net emissions increase. 326 IAC 2-2-1, *et seq.* Among the applicable PSD requirements, the proposed plant must comply with best available control technology (BACT) limits, 326 IAC 2-2-3, demonstrate no exceedances of an ambient air standard or maximum increase over baseline ("increment"), 326 IAC 2-2-5, analyze impacts to visibility, soils, as a result of either the project or as a result of general growth associated with the project. 326 IAC 2-2-8.

Congress intended to ensure that major sources of air pollution not degrade air quality for those forced to live and work in the areas where they are located. Congress recognized that generic national ambient air quality standards ("NAAQS") do not adequately protect people. NAAQS "do not adequately protect against genetic mutations, birth defects, cancer, or diseases caused by long-term chronic exposures or periodic short-term peak concentrations, and hazards due to derivative pollutants and to cumulative or synergistic impacts of various pollutants; and they do not adequately

protect against crop damage and acid rain." *Hawaiian Elec. Co. v. U.S. Envt'l Protection Agency*, 723 F.2d 1440, 1447 (9th Cir. 1984). NAAQS also do not prevent the deterioration of otherwise cleaner air regions from deteriorating to the NAAQS "floor." For these reasons, Congress enacted the Prevention of Significant Deterioration ("PSD") provisions of the Clean Air Act. 42 U.S.C. §§ 7470, *et seq.*

I. THE IDEM FAILED TO CONDUCT A BACT ANALYSIS FOR PM2.5 AND INCLUDE A PM2.5 BACT LIMIT IN THE PERMIT.

The Draft Permit does not include a BACT limit for PM2.5 emissions, despite the fact that Duke's Application and IDEM's review materials note that the new emission sources will increase PM2.5 emissions. This is unlawful and must be corrected before a PSD permit can issue. The controlling law requires a BACT limit "for each regulated NSR pollutant for which the modification would result in a significant net emission increase at the source …." 326 IAC 2-2-3(3); *see also* 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(j)(2). PM2.5 is a "Regulated NSR pollutant" (i.e., a "pollutant subject to regulation under the Act") because EPA established a NAAQS for PM2.5 in 1997. 62 Fed. Reg. 38711; 40 C.F.R. § 50.7. The Court of Appeals rejected industry's collateral attacks of the PM2.5 rule in 2002, upholding the PM2.5 NAAQS. *American Trucking Associations, Inc. v. EPA*, 283 F.3d 355 (D.C. Cir. 2002). Therefore, PM2.5 is a "pollutant that otherwise is subject to regulation under the [Clean Air] Act." 326 IAC 2-2-1(uu)(4). Moreover, PM2.5 will be emitted from the new and modified emission sources at the Ripley plant

in a "significant" amount because it will be emitted at "any emission rate." 326 IAC 2-2-1(xx)(V); *see also* 40 C.F.R. § 52.21(b)(23)(ii).

Because PM2.5 is regulated pollutant that will be emitted in a significant amount, a BACT limit for PM2.5 is required. 326 IAC 2-2-3; 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(j). Nevertheless, the Draft Permit does not contain a BACT limit for PM2.5 emissions. This is a deficiency that must be corrected before a PSD permit can issue. Additionally, any proposed PM2.5 BACT limit must be subject to public review and comment before IDEM issues a final PSD permit.

While some applicants have asserted that U.S. EPA "guidance" allows them to avoid the plain language of the Clean Air Act requiring a PM2.5 BACT limit, such "guidance" is over 10 years old. The guidance memo, itself, estimated 3 to 5 years to implement PSD for PM2.5 and the impracticalities referenced in the memo as the basis for using PM10 as a surrogate (modeling, emission calculations and estimates, etc.) have been largely resolved, as evidenced by EPA's proposal to establish PM2.5 BACT limits. Proposed Rule, 72 Fed. Reg. 54,112 (Sept 12, 2007); see also 70 Fed. Reg. at 66,043 (recognizing that the "practical difficulties" identified in the Seitz memo "have been resolved in most respects."). Indeed, Indiana requires reporting of PM2.5 emissions—demonstrating that the emission calculation and estimation issues have been resolved. 326 IAC 2-6-4(a)(7). Moreover, there is simply no legal basis for ignoring the requirement to implement BACT for PM2.5. The EPA's promulgation of PM2.5 NAAQS is premised upon the finding that PM10 and PM2.5 are not equivalent and a

PM2.5 standard—rather than merely a PM10 standard-- was necessary to protect health and welfare. That finding cannot be effectively undone, by substituting PM10 through a guidance document, based upon administrative expediency.

Further, PM10 is simply not the same as PM2.5. Controls for PM10 are not necessarily controls for PM2.5 and, more importantly for BACT determinations, top-ranked controls for PM10 are not necessarily top-ranked controls for PM2.5. Common control technologies for PM10 are typically less effective at capturing finer-grain PM2.5. PM2.5 emissions are more aggressively controlled by controlling the pollutant's precursors. It is therefore necessary to target PM2.5 specifically in a BACT analysis in order to require the greatest feasible reductions in PM2.5 emissions.

II. THE DRAFT PERMIT LACKS BACT LIMITS FOR CO2 AND N2O.

The Clean Air Act prohibits the construction of a new major stationary source of air pollutants in areas designated as in attainment of the National Ambient Air Quality Standards except in accordance with a prevention of significant deterioration (PSD) construction permit. 42 U.S.C. § 7475(a); 326 IAC 2-2-2; 40 C.F.R. §52.21(a)(2)(iii). One of the requirements, contained in § 165 of the Act, is that every PSD permit must include a BACT emission limit "for each pollutant subject to regulation under this chapter emitted from, or which results from" the facility. 42 U.S.C. § 7475(a)(4); see also 326 IAC 2-2-4. EPA repeated that requirements in the implementing regulations controlling here: BACT is required for "any pollutant that otherwise is subject to regulation under the Act." 40 C.F.R. § 52.21(b)(50)((iv). Carbon Dioxide (CO2) has been

regulated under the Clean Air Act since 1993. And, on April 2, 2007, the Supreme Court held that carbon dioxide and other greenhouse gases are "pollutants" under the Clean Air Act—clarifying that they are, indeed, "*subject to* regulation." *Massachusetts v. EPA*, 127 S.Ct. 1438, 1460 (2007).

A. CO2 Is Currently Regulated.

Section 821(a) of the Act provides:

> Monitoring. – The Administrator of the Environmental Protection Agency **shall promulgate regulations** within 18 months after the enactment of the Clean Air Act Amendments of 1990 **to require that all affected sources subject to the Title V of the Clean Air Act shall also monitor carbon dioxide emissions** according to the same timetable as in Sections 511(b) and (c). **The regulations shall require that such data shall be reported to the Administrator**. The provisions of Section 511(e) of Title V of the Clean Air Act shall apply for purposes of this section in the same manner and to the same extent as such provision applies to the monitoring and data referred to in Section 511.

42 U.S.C. 7651k note; Pub.L. 101-549; 104 Stat. 2699 (emphasis added). In short, Congress specifically ordered EPA "to promulgate regulations" requiring that facilities covered by Title IV of the Act monitor and report their CO_2 emissions in § 821.[1] Further, in section 165 of the Act, Congress required a BACT limit for "any pollutant

[1] EPA's §821 regulations, which were finalized on January 11, 1993, require CO_2 emissions monitoring (40 CFR §§75.1(b), 75.10(a)(3)); preparing and maintaining monitoring plans (40 CFR §75.33); maintaining records (40 CFR §75.57); and reporting such information to EPA, (40 CFR §§75.60 – 64). 40 CFR §75.5 prohibits operation in violation of these requirements and provides that a violation of any Part 75 requirement is a violation of the Act. These requirements, including the requirement to monitor CO2, are also included in various state implementation plans. *See e.g.,* Wis. Admin. Code §§ NR 438.03(1)(a) (requiring reporting of pollutants listed in Table I, including CO2), adopted under the Act at 40 C.F.R. § 52.2570(c)(70)(i); NR 439.095(1)(f) (Phase I and phase II acid rain units… shall be monitored for… carbon dioxide…"), adopted under the Act at 40 C.F.R. § 52.2570(c)(73)(i)(I).

subject to regulation" under the Act. The Supreme Court has already pointed out that information gathering, record keeping, and data publication rules are indisputably within the conventional understanding of "regulation." *Buckley v. Valeo*, 424 U.S. 1, 66-67 (1976) (record keeping and reporting requirements are regulation of political speech). Therefore, the Act plainly requires a BACT limit for CO_2.

The most basic canon of statutory interpretation is that words should be given their plain meaning, and Webster's defines "regulation" as "an authoritative rule dealing with details or procedure; (b) a rule or order issued by an executive authority or regulatory agency of a government and having the force of law." This plain language is controlling. *Lamie v. United States Tr.*, 540 U.S. 526, 534 (2004); *Chevron v. NRDC*, 467 U.S. 837, 842-843 (1984). As the Court in *Alabama Power Co. v. Costle*, 636 F.2d 323, 403 (D.C. Cir. 1979), held, PSD applies to pollutants in addition to those for which air quality standards or other limits have been promulgated:

> The only administrative task apparently reserved to the Agency . . . is to identify those . . . pollutants subject to regulation under the Act which are thereby comprehended by the statute. The language of the Act does not limit the applicability of PSD only to one or several of the pollutants regulated under the Act,
>
> . . .the plain language of section 165 . . .in a litany of repetition, provides without qualification that each of its major substantive provisions shall be effective after 7 August 1977 with regard to each pollutant subject to regulation under the Act, or with regard to any "applicable emission standard or standard of performance under" the Act. As if to make the point even more clear, the definition of BACT itself in section 169 applies to each

> such pollutant. The statutory language leaves no room for limiting the phrase "each pollutant subject to regulation" . . .

The carbon dioxide BACT analysis should consider, inter alia, boiler efficiency, alternate combustion options, and cleaner fuels, including natural gas, biomass, and a blend of biomass and natural gas. The proposed IGCC plant is less efficient that an ultra super-critical pulverized coal boiler, which exceeds 40 percent efficiency. Additionally, gasification of biomass is possible in a conventional IGCC plant and would reduce CO2 emissions. See, for example, the recent announcement by Progress Energy Florida signing another contract with Biomass Gas & Electric LLC (BG&E) to purchase electricity from a second waste-wood biomass plant planned for Florida. BG&E plans to build a power plant in north or central Florida that will use waste wood products – such as yard trimmings, tree bark and wood knots from paper mills – to create electricity. It would generate about 75 MW. The plant will use gasification and projected commercial operation is expected in June 2011.[2]

Furthermore, the plant will capture CO2 from its gas stream. See Application at p. 17. Such capture, and prevention from release into the ambient air (i.e., sequestration) must also be considered in a top-down BACT analysis. While the applicant is apparently required to study this possibility as part of its permission to construct from the Indiana Utility Regulatory Commission, BACT

[2] http://money.cnn.com/news/newsfeeds/articles/prnewswire/CLTU05618122007-1.htm (last visited 12/24/07).

analysis and determinations cannot be postponed in this manner. A BACT limit for CO2 is required "preconstruction."

B. N2O is Currently Regulated.

As noted above for CO2, a BACT limit is required for any pollutant subject to regulation under the Act. The Act includes state implementation plans approved by the EPA. N2O is regulated in at least one State Implementation Plan approved by EPA, and therefore, is not only subject to, but is regulated under the Act. See Wis. Stat. §§ 285.60 (requiring air permits for all sources not otherwise exempted), 285.62(1); Wis. Admin. Code §§ NR 407.05, Table 3 (requiring permit application to include Nitrous Oxides if greater than 2,000 lbs/year). Moreover, nitrous oxide is also regulated under Wis. Admin. Code § NR 438.03(1)(a) and Table 1, adopted under the Act at 40 C.F.R. § 52.2570(c)(70)(i). Therefore, a BACT limit is also required for N2O.

III. IDEM IMPROPERLY CREDITED EMISSIONS DECREASES IN THE "NETTING ANALYSIS" FOR THE PLANT.

In its TSD, IDEM determines that the proposed new power plant at the Edwardsport site will result in emission increases of CO, NOx, PM, PM10, PM2.5, SO2, VOC, H2SO4, Lead Beryllium, Mercury and Fluorides associated with the new equipment. TSD at 11, Table 8 ("Total for Modification"). However, IDEM then attributes as "contemporaneous decrease" to determine that the proposed modification will result in a "net decrease" of NOx, SO2, H2SO4, Lead, Beryllium, Mercury and Fluorides. *Id*. ("Total for Modifications After Netting"). When these increases and "decreases" are calculated based on emissions including startup and shutdown periods, IDEM also calculates a net decrease for PM—attributable to omitting the combustion turbines from the calculation. *See* TSD at 12, Table 9.

The IDEM calculation of net emission decreases for NOx, SO2, H2SO4, Lead, Beryllium, Mercury and Fluorides is in error. IDEM attributes all emission decreases associated with shutdown of the existing boilers and associated equipment (Boiler 6-1, a 510 MMBtu/hour oil-fired boiler; Boiler 7-1, a 510 MMBtu/hour coal-fired boiler; Boiler 7-2, a 510 MMBtu/hour coal-fired boiler; Boiler 8-1, a 510 MMBtu/hour coal-fired boiler; and a coal transfer system with an hourly throughput capacity of 300 tons/hour). TSD at 6-7. IDEM claims to have followed the procedure in 326 IAC 2-2-2(d)(4) in calculating the net emissions increase and decrease. TSD at 4. However, 326 IAC 2-2-2 does not allow IDEM to count *all* emission reductions from the retirement of the existing units in netting.

326 IAC 2-2-2(d)(4) provides for an actual-to-potential test for emission increases for the new emission units. The new emission units proposed for the Edwardsport plant result in a significant increase for CO, NOx, SO2, PM, PM10, PM2.5, VOC, H2SO4, and Beryllium. Pursuant to 326 IAC 2-2-2(d)(1), the project must also result in an significant net emission increase. A "net emissions increase" is defined as:

> The amount by which the sum of the following exceeds zero (0):
>
> (A) The increase in emissions from a particular physical change or change in the method of operation at a stationary source as calculated under [326 IAC 2-2-2(d)].
>
> (B) Any other increases and decreases in actual emission at the major stationary source that are contemporaneous with the particular change and are otherwise creditable. Baseline actual emissions for calculating increases and decreases under this clause shall be determined as provided in subsection (e), except that subsection (e)(1)(C) and (e)(2)(D) shall not apply.

326 IAC 2-2-1(jj)(1). A decrease is only "contemporaneous" if it occurs during the period five (5) years *before construction of the particular change commences* and the date that the increases from the particular change occurs. 326 IAC 2-2-1(jj)(2) (emphasis added). A decrease is only "creditable" if the following conditions, *inter alia*, are met:

1) it has not been relied upon in issuing any previous permit to the source;

2) the decrease did not occur at a clean unit;

3) the old level of actual emissions *or the old level of allowable emissions, whichever is lower*, exceeds the new level of actual emissions;

4) the decrease is enforceable as a practical matter; and

5) the decrease in emissions has "approximately the same *qualitative significance* for public health and welfare as that attributed to the increase from the particular change"

326 IAC 2-2-1(jj)(3), (6) (emphasis added).

Emission decreases are calculated according to 326 IAC 2-2-1(e)(A) and (B). This requires that the "baseline"—from which the new emission rate is subtracted to determine the decrease—equals "the average rate, in tons per year, at which the unit actually emitted the pollutant during any consecutive twenty-four (24) month period selected by the owner or operator within the five (5) year period *immediately preceding when the owner or operator begins actual construction* of the project." 326 IAC 2-2-1(e) (emphasis added). Because 326 IAC 2-2-1(e)(C) does not apply to netting, *see* 326 IAC 2-2-1 (jj)(1)(B), the source is not allowed to use a different 24-month period for each pollutant. The "baseline" can be a period other than 24 months from the 5-years preceding construction if approved by the commissioner to represent "normal source operations." *Id.* Such alternate baseline is rare. More importantly, the baseline *must* be adjusted downward "to exclude any noncompliant emissions that occurred while the source was operating above any emission limitation that was legally enforceable during the consecutive twenty-four (24) month period." 326 IAC 2-2-1(e)(B).

The "netting" analysis done for the proposed project includes a number of errors, including the following:

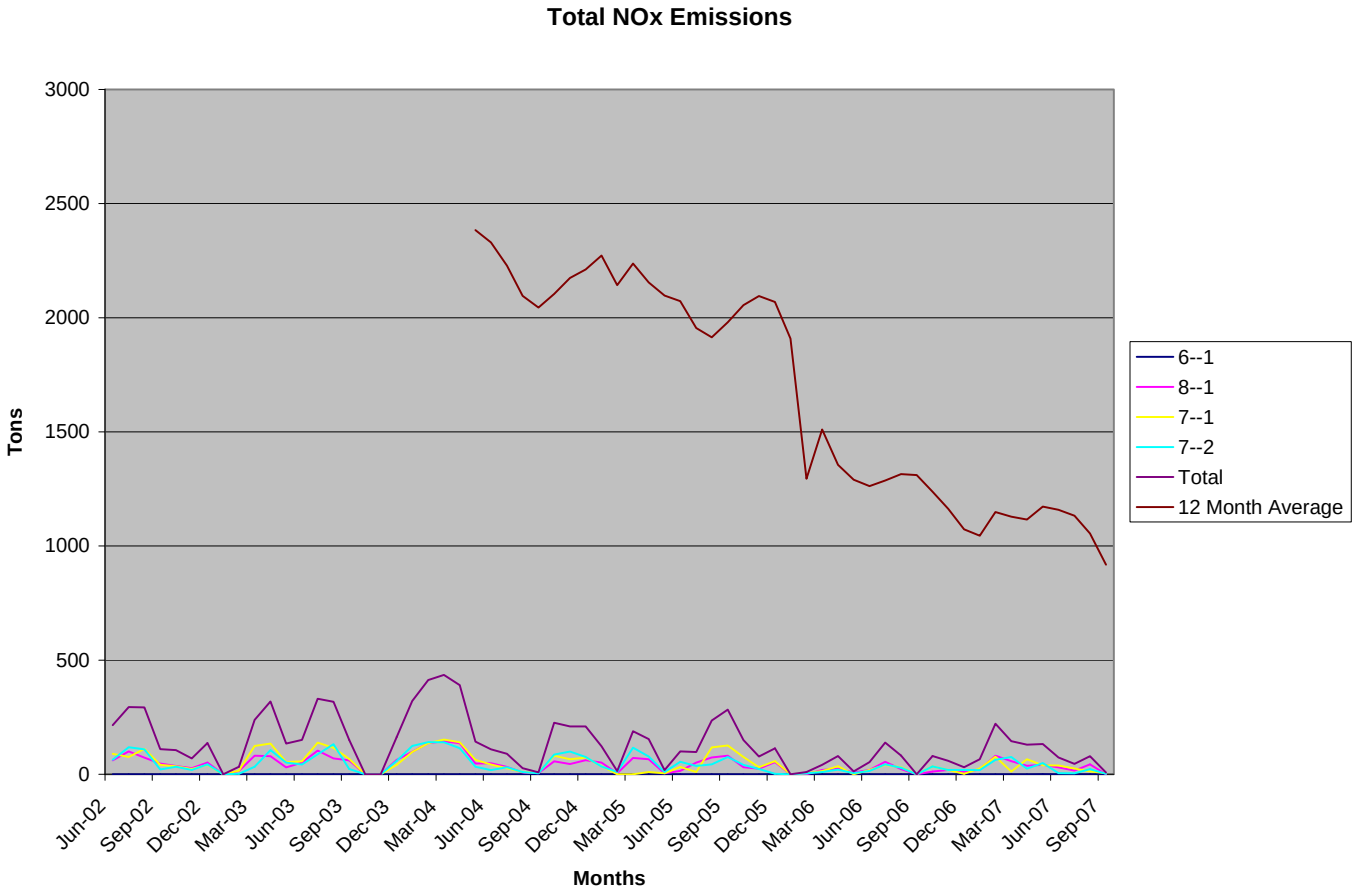
- Use of a "baseline" outside of the 5-years preceding project construction.
- Failure to exclude noncompliance emissions, or those emissions exceeding the "allowable" emissions, from the "baseline" emissions.

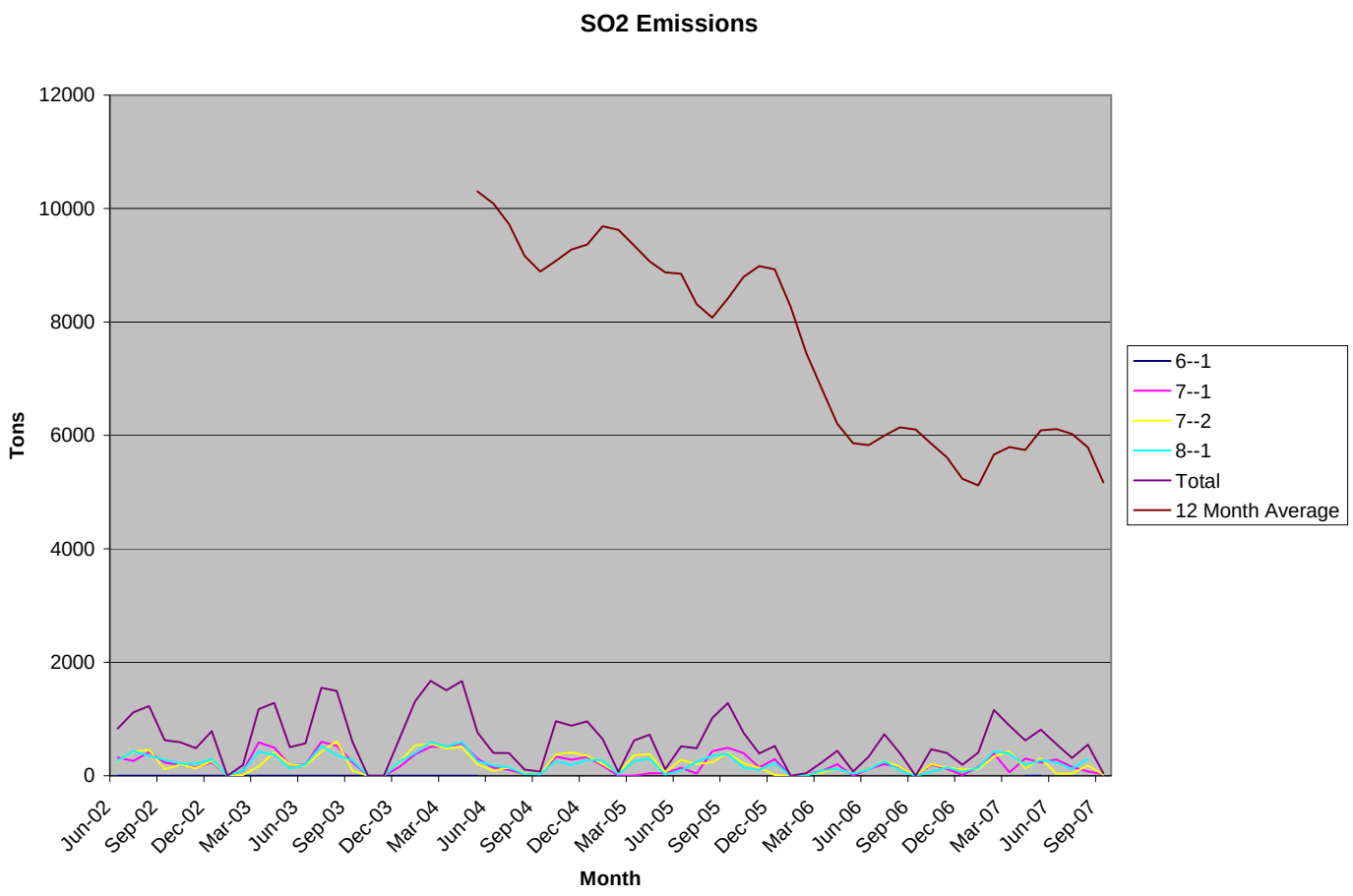
- Failure to account for the fact that the declining emissions from the existing units do not have the same qualitative significance of constant emissions from the new units for their 30+ years of life.

A. IDEM Unlawfully Uses June 2002 through May 2004 as the "Contemporaneous" Period for Calculating a Net Emissions Decrease.

In Appendix A to the TSD, IDEM calculates the "baseline" emissions of SO2 and NOx as the emissions during June, 2002, and May, 2004. TSD at 24. This is unlawful. In its application, Duke misstates the law as allowing the baseline to be any 24-months during the 5 years prior to its *application*. Application at 26 (stating that "As defined in 326 IAC 2-2-1(e), 'baseline emissions' means… Within the 5-year period immediately preceding the date a complete permit application is received by IDEM.") What the law actually states is that the baseline emissions must be "within the five (5) year period immediately preceding when the owner or operator begins actual construction of the project." 326 IAC 2-2-1(e)(1); *see also* 326 IAC 2-2-1(jj)(2)(A) (requiring that a contemporaneous decrease occur within "five (5) years before construction of the particular change occurs.").

This is an important correction from Duke's misrepresentation because the "baseline" period relied upon by Duke and IDEM does not fall within the five years preceding actual construction. Construction can commence, at the earliest, in January, 2008. Therefore, the earliest five year period would be January. 2003 through December, 2007. Presumably construction will not commence immediately after issuance of the PSD permit, resulting in a five year period running from later in 2003. Because the emissions from the existing emission sources (Boilers 6-1, 7-1, 7-2 and 8-1) decreased steadily over time, as shown in the tables below and in the attached tables, updating the "baseline" results in a smaller "decrease" attributable to shutting down the units.


Total NOx Emissions
Tons
3000
2500
2000
1500
1000
500
0
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
Dec-05
Mar-06
Jun-06
Sep-06
Dec-06
Mar-07
Jun-07
Sep-07
Months
6--1
8--1
7--1
7--2
Total
12 Month Average


SO2 Emissions
12000
10000
8000
6000
4000
2000
0
Tons
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
Dec-05
Mar-06
Jun-06
Sep-06
Dec-06
Mar-07
Jun-07
Sep-07
Month
6--1
7--1
7--2
8--1
Total
12 Month Average

Adjusting the "baseline" to the highest 12 month average from 24 months within 5 years preceding the January, 2008, earliest date when construction can commence, results in a reduction in the "decrease" attributable to shutting down the existing units of 114.4 tons of NOx (2,272.5 tons, rather than 2,383.9 tons) and 610.4 tons of SO2 (9,688.7 tons, rather than 10,299.1 tons). If construction on the new units does not begin until sometime in spring of 2008, or later, the creditable decreased emissions from shutting down the existing units are even less. This is likely since "commence construction" for purposes of PSD permitting, requires more than site preparation work, which will generally occur for several months before construction can commence for purposes of PSD.

Moreover, when emissions exceeding the allowable emissions are subtracted, as set forth below, the "creditable" decreases drop even further.

B. Duke Can Only Apply Emission Reductions Attributable to Shutdown of Existing Units To the Extent that the Allowable Emissions Exceed Future Emissions.

As noted above, to claim credit for an emission decrease in an PSD netting analysis, the "baseline" emissions must be at or below the "allowable" emissions. 326 IAC 2-2-1(jj). Put another way, the creditable decrease must be reduced "to exclude any noncompliant emissions that occurred while the source was operating above any emission limitation that was legally enforceable during the consecutive twenty-four (24) month period." 326 IAC 2-2-1(e)(B).

The historic emission rates for the existing Edwardsport units far exceed the NSPS and BACT for those units. It is our understanding that the existing units have been modified numerous times, within the meaning of 42 U.S.C. §§ 7411, 7475 and 326 IAC 2-2-2, prior to or during the 24-month "baseline" period. These modifications would constitute "major modifications" and trigger the NSPS and BACT limits for the units. Consequently, the "allowable" emissions for the units was much lower than the actual emissions and Duke may only take credit for the allowable emissions (excluding any noncompliance emissions). Especially when combined with the updated "baseline" period discussed above, subtracting noncompliant historic emissions from the baseline results in significant net emission increases of NOx and SO2 attributable to the proposed project. BACT limits must be determined and air impacts must be assessed for these pollutants before a PSD permit can issue.

Our inquiry indicates that there are no units of the age and condition of the existing Edwardsport Generating Station units that have not undergone at least one major modification. Moreover, it is also our understanding that Duke and its predecessors at the facility had programs to rebuild existing units through major modifications. Further still, we understand that records of the Indiana Utility Regulatory Commission show modifications of the Edwardsport facility. To the extent that the permit record, thus far assembled, lacks this information and other information showing modifications, Duke's application is incomplete. Neither Duke nor IDEM address prior modifications of the facility as triggering (or not triggering) applicability of New Source Review and New Source Performance Standards. A determination of current compliance is a baseline for all operating permits. 40 C.F.R. § 70.6(a). An application must disclose any violations, as well as all other information necessary to determine whether requirements apply to a source. If an application does not include such information, IDEM is required to request it. 40 C.F.R. § 70.5(a)(2) (information in the application "must be sufficient to evaluate the subject source… to determine all applicable requirements"), (c)(3)(i) ("The permitting authority *shall require* additional information related to the emissions of air pollutants sufficient to verify which requirements are applicable to the source…" (emphasis added)), (c)(4) (requiring that the application cite "all applicable requirements"), (c)(5) (requiring that the application contain any "specific information that may be necessary to implement and enforce other applicable requirements.").

3. The Emissions From the Existing Units Do Not Have the Same Qualitative Significance as the New Emissions.

To be a "creditable decrease," the old emissions must have the same qualitative significance as the new emissions. 325 IAC 2-2-1(jj). The existing units have declined in operating time and emissions. The existing units only operate approximately 30% of the time, whereas the new units intend to operate at a high (85%+) capacity factor. See http://www.duke-energy.com/pdfs/moreland.pdf. Additionally, the emissions for the existing units have been steadily declining over time. The emissions have dropped about one-half (50%) in the last four years. In contrast, the emissions from the new units will likely increase over the first few years of operation and then stay at a high rate for decades (assuming the higher-cost energy from the IGCC units is dispatched). The emissions will also be higher during the ozone season, when the existing units have not experienced high operating rates. These are significant qualitative differences between the old and new emissions that disqualify the old emissions as "creditable."

4. The Emission Reductions From the Old Boilers Are Not Voluntary

Netting is only permitted when the reductions are voluntary. Decommissioning boilers that are at the end of their service life is not voluntary. These boilers are well past the average 30-year life of a boiler, and as Duke's declining use of these boilers demonstrates, these boilers are at the end of their lives. To continue to operate these boilers for the foreseeable future Duke would have to invest significant resources and comply with BACT emission limits. Because these boilers have to be retired or

refurbished, regardless of the current proposal to replace them with an IGCC plant, Duke may not claim any emission reduction associated with retiring these boilers.

IV. THE DRAFT PERMIT DOES NOT INCLUDE SUFFICIENT BACT LIMITS

The new emissions source are subject to stringent air pollution control requirements under the Clean Air Act's Prevention of Significant Deterioration ("PSD") program, 42 U.S.C. § 7470, *et. seq*. Indiana has a PSD program in its EPA-approved state implementation plan (SIP) and therefore IDEM issues permits to PSD sources in Indiana pursuant to the SIP program. Among other duties, IDEM must ensure that all new and modified emission sources at the Edwarsport Generating Station are subject to emission limits that are to be based on the "best available control technology" or "BACT" and that the facility does not exceed ambient air quality standards or maximum increase over baseline (i.e., "increment") during worst-case conditions. 42 U.S.C. § 7475(a)(4); 326 IAC 2-2-2, *et seq*; see also 40 C.F.R. § 52.21(j).

BACT is "one of the most critical elements of the PSD permitting process." *In re Knuaf Fiber Glass, GmbH*, 8 E.A.D. 121, 131 (EAB 1999) ("Knauf I"). BACT is defined as:

> an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or

> innovative fuel combustion techniques for control of such pollutant.

40 C.F.R. § 52.21(b)(12). To ensure that the BACT determination is "reasonably moored" to the Clean Air Act's statutory requirement that BACT represent the maximum achievable reduction through the use of various pollution control techniques, U.S. EPA established a top-down analysis process outlined in the NSR Manual. *Alaska Dept. of Envt'l Conservation v. Envt'l Protection Agency*, 540 U.S. 461, 485 (2004). This process must be followed. *Alaska v. US EPA*, 298 F.3d 814 (9th Cir. 2002).

To ensure that the limits in the final PSD permit ensure "maximum degree of reduction," based on applicable production processes, fuel cleaning, clean fuels, and other pollution control techniques, the permit applicant is required to propose a permit limit that constitutes BACT and to supply sufficient information on the control option used to achieve that limit. Specifically, the applicant must provide a detailed description of the system of continuous emissions reduction planned for the source or modification, emission estimates, and any other information necessary to ensure a detailed analysis leading to a limit ensuring maximum achievable pollution reduction. Each step of the BACT analysis, and especially a decision to reject an effective pollution reduction option in favor of a less effective option when establishing a BACT limit must be adequately explained and justified.

Although the BACT selection process can be complicated, its purpose is simple: to promote the use of the best control technologies. Congress chose to require an

emission limit based on the "maximum degree of reduction … achievable for such source" at the time the source is constructed. 42 U.S.C. §§ 7475(a)(4) (new sources are subject to BACT), 7479(3) (BACT definition). A BACT analysis should always default to the best pollution control option available. Therefore, by design, BACT results in increasingly stringent limits as technology advances and improves the ability to reduce or capture pollutants.

The Draft Permit fails to comply with the requirement that all regulated pollutants be subject to a BACT limit that represents the maximum degree of reduction achievable with available control options. Therefore, the permit must either be denied or the permit limits must be revised, supplemented, and significantly lowered so that the limits represent BACT.

V. THE PROPOSED PLANT WILL EMIT GREEN HOUSE GASES AT RATES THAT DO NOT PROTECT THE HEALTH OF PERSONS OR THE ENVIRONMENT BECAUSE THEY PRESENT A SUBSTANTIAL ENDANGERMENT TO PEOPLES' HEALTH AND THE ENVIRONMENT.

As proposed, the proposed new units at Edwardsport will emit millions of tons of Carbon Dioxide each year for the 30, plus, years of the plant's existence. IDEM has not analyzed whether the threat from these emissions can be ignored by allowing the plant to be built. The proposed coal-fired plant will release huge quantities of carbon dioxide (CO2), a potent greenhouse gas. It is expected that approximately 4-5 million tons of CO2 will be released each year from the proposed units. This type of human-created, or "anthropogenic" CO2 emissions-- especially at the enormous rate that will

occur from the proposed plant dramatically and negatively affects the environment. The experts on the Intergovernmental Panel on Climate Change (IPCC), as well as the U.S. EPA, the National Academy of Sciences, and the U.S. Climate Science Program all agree that:

1. human caused CO2 emissions have significantly increased the atmosphere's CO2 concentration, and will continue to do so;
2. the increased CO2 causes and will continue to cause a significant increase in average global temperatures known as "global warming";
3. that climate changes are already occurring due to global warming; and
4. that future CO2 emissions exacerbate the negative effects of global warming.

Burning fossil fuels is the primary source of CO2 emissions, and, therefore, the primary cause of global warming and resulting climate changes. If built, the proposed plant will accelerate and exacerbate the negative effects of global warming.

The IPCC's Third Assessment Report (TAR), which was completed in 2001, concluded that atmospheric concentration of CO2 have increased by 31% in the last 250 years and are increasing at a faster rate. IPCC, 2001: *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA (hereinafter "TAR: The Scientific Basis."). Scientists began taking direct measurements of CO2 concentration in 1958. Since then, measured atmospheric CO2 concentrations have increased by 17%. In the past 20 years,

75% of human caused contributions of CO2 to the atmosphere is caused by burning fossil fuels. *TAR: The Scientific Basis*, 7; *Climate Change Science: An Analysis of Some Key Questions* (2001); U.S. Climate Change Science Program and Subcommittee on Global Change Research, *Our Changing Planet*, 78-79 (2004). In summary, the scientific consensus is that the human-caused increase in atmospheric CO2 has already strengthened the greenhouse effect and caused an increase in global average temperatures. *IPCC Second Assessment Report, Synthesis Report* (1995), 5 (emphasis added); *see also*, *IPCC Third Assessment Report, Working Group I, Summary for Policymakers* (2001) at 10; National Academy of Science, *Climate Change Science: An Analysis of Some Key Questions*, 3 (2001). *US EPA Global Warming FAQ*.[3]; *Our Changing Planet*, 78, 80.

The greenhouse effect poses serious danger to humans and the environment. Emissions of global warming pollutants have already doubled the risk of extreme heat waves, according to a team of scientists led by Peter Stott at the British Met Office.[4] As the scientific journal *Nature* reported, global warming pollution is linked to the European heat wave of 2003 that killed more than 15,000 people. Similarly, the U.S. EPA concludes that "[a] few degrees of warming increases the chances of more frequent and severe heat waves, which can cause more heat-related death and illness,"[5] as well as "more frequent droughts, … greater rainfall, and possibl[e] change[s in] the strength

---

[3] Available at http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BUN59/$File/gw_faq.pdf

[4] Stott, *et al.*, Human Contribution to the European Heatwave of 2003, *Nature* (432:610), Dec. 2, 2004.

[5] U.S. Environmental Protection Agency, climate change web site, last updated on April 6, 2001, http://www.epa.gov/globalwarming/faq/fundamentals.html.

of storms."[6] These are only a few of the threats posed by global warming. The IPCC identified the following impacts as either "likely" or "very likely" to occur as CO2 concentrations in the atmosphere increase:

- Higher maximum temperatures over most land areas;
- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures and fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- More intense precipitation events over many areas; and
- Increased summer dry conditions and associated risk of drought over most mid-latitude continents.

TAR: The Scientific Basis, 15. The NAS and EPA make similar predictions. *Climate Change Science*; *CAR*, 106. The IPCC quantifies these predictions as between 66 and 99% probable, depending on the specific environmental impact. *TAR: The Scientific Basis*, 2. By any measure, global warming will cause serious negative impacts for humans and the environment.

The extent of negative global warming impacts will depend on the amount of CO2 emitted into the atmosphere. The IPCC's *Third Assessment Report* found that "the impacts of climate change will be more severe the greater the cumulative emissions of greenhouse gases. The various effects of climate change pose risks that increase with

[6] U.S. Environmental Protection Agency, climate change web site, last updated on April 6, 2001, http://www.epa.gov/globalwarming/faq/moredetail.html.

global mean temperature." IPCC, 2001: *Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II, and III to the Third Assessment Report of the Integovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom, and New York, NY, USA (hereinafter *TAR: Synthesis Report*). The NAS similarly found that the "risk [to human welfare and ecosystems] increases with increases in both the rate and the magnitude of climate change." *CAR*, 254. Simply put, the more CO2 humans release into the atmosphere, the more serious the impacts on the environment. The proposed new Edwardsport units will release massive amounts of CO2 into the atmosphere-- causing increased serious impacts.

In 2001, the US Global Change Research Program released *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change,*[7] (*National Assessment*) predicts that "a reduced risk of life-threatening cold and an increased risk of life-threatening heat are likely to accompany warming." *National Assessment Overview*, 55. With the increased heat, air pollution is also likely to worsen. *TAR: Impacts*, 764. "Without strict attention to regional emissions of air pollutants, the undesirable combination of extreme heat and unhealthy air quality is likely to result." *National Assessment Overview*, 55. In other words, bad air quality will result from global warming. Additionally, increases in global temperature may also cause flooding, which poses a direct threat to human health. *TAR: Impacts*, 762. Such floods pose a danger due

[7] National Assessment Synthesis Team, Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change, US Global Change Research Program, Washington DC, 2000 (National Assessment Overview).

to rising flood waters, but also due to the health threat posed by the agricultural and other non-point source pollution washed into surface water and groundwater supplied during floods. *National Assessment Overview*, 54.

While global warming will have a significant impact on the human environment, IDEM appears to not even have considered these effects. This consideration of the direct and collateral effects from construction of the proposed plant must be analyzed before any permit decision is made. This analysis must include, *inter alia*, a consideration of the impact of this proposed power plant's carbon dioxide emissions on the myriad of endangered species that are facing extinction because of global warming. This includes the Elkhorn and Staghorn coral species that were recently added to the federal endangered species list because the U.S. Fish and Wildlife Service concluded that global warming was contributing to their rapid decline.

VI. THE BACT LIMITS FOR CO, PM AND VOC ARE NOT EVEN AS LOW AS OTHER PROPOSED IGCC PLANTS.

BACT is "one of the most critical elements of the PSD permitting process." *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 131 (EAB 1999) ("Knauf I"). BACT is defined as:

> an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or

> innovative fuel combustion techniques for control of such pollutant.

40 C.F.R. § 52.21(b)(12). To ensure that the limits in the final PSD permit ensure "maximum degree of reduction," based on applicable production processes, fuel cleaning, clean fuels, and other pollution control techniques, the permit applicant is required to propose a permit limit that constitutes BACT and to supply sufficient information on the control option used to achieve that limit. *In re Genesee Power Station Ltd.*, 1993 EPA App. LEXIS 23 at *13-14 (EAB 1993). Specifically, the applicant must provide "a detailed description of the system of continuous emissions reduction planned for the source or modification, emission estimates," and any other information necessary to ensure a detailed analysis leading to a limit ensuring maximum achievable pollution reduction. 40 C.F.R. § 52.21(n); *NSR Manual* at B.24. Each step of the BACT analysis, and especially a decision to reject an effective pollution reduction option in favor of a less effective option when establishing a BACT limit "must be adequately explained and justified." *Knauf I*, 8 E.A.D. at 131; NSR Manual at B.26-B.29; *In re General Motors, Inc.*, 10 E.A.D. 360, 379 (EAB 2002); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 206-07 (EAB 2002); *In re Masonite Corp.*, 5 E.A.D. 551, 546-69 (EAB 1994).

To ensure that the BACT determination is "reasonably moored" to the Clean Air Act's statutory requirement that BACT represent the maximum achievable reduction through the use of various pollution control techniques, U.S. EPA established a top-

down analysis process outlined in the NSR Manual. *Alaska Dept. of Envt'l Conservation v. Envt'l Protection Agency*, 540 U.S. 461, 485 (2004).

When another plant has been previously permitted, as the Taylorville Energy Center plant has been, it must be assumed that the emission limits permitted for that source can also be met by the Edwardsport plant. *NSR Manual* at B.24. As demonstrated in the table, below, the BACT limits proposed in the draft permit for the Edwardsport plant are higher than permitted for Taylorville.

	Taylorville Energy Center (lb/MMBtu)	**Duke Edwardsport**
SO2	0.0117 (3-hour average)	No BACT
NOx	0.0246 (24-hour average)	No BACT
PM	0.0063 (3-hour average)	0.019 lb/MMBtu (3 hour average) syngas; 0.009 lb/MMBtu (3 hour) natural gas
CO	0.036 (24-hour average)	0.046 lb/MMBtu (24 hour average) syngas; 0.042 lb/MMBtu (24-hour average) natural gas
VOC	0.0017 (24-hour average)	0.002 lb/MMBtu (3-hour average) syngas and/or natural gas

BACT for the Edwardsport plant should be at least as stringent as for Taylorville and, as noted above, include CO2 and N20 limits.

VII. NATURAL GAS IS A CLEANER FUEL THAN COAL-SYNGAS AND MUST BE USED TO ESTABLISH BACT LIMITS.

Natural-gas results in lower emission rates from the proposed plant. Therefore, the use of natural gas—and the resulting lower emission limits-- must be considered in a BACT determination. Natural gas fired combustion turbines are an "available" option commercial power production applications and at competitive costs, and within the meaning of 42 U.S.C. §7479(3). Both the plain language of the Clean Air Act and the legislative history behind the Act require it. The Clean Air Act requires BACT limits to be "based on the maximum degree of reduction of each pollutant… achievable for such facility through application of production processes and available methods, systems, and techniques, including … innovative fuel combustion techniques…" 42 U.S.C. § 7479(3).

Here, natural gas not only can—but is planned to be burned at the plant. Establishing BACT limits based on natural gas would not "redefine the source." BACT is applied to the "major emitting facility," rather than some different "major emitting facility." *See* 42 U.S.C. § 7475(a). The Clean Air Act states that "[n]o major emitting facility… may be constructed… unless… the proposed facility is subject to the best available control technology for each pollutant subjected to regulation under this chapter emitted from, or which results from, such facility…" *Id.* (emphasis added). As long as BACT is being applied to "the major emitting facility," the "redefining the source" policy is satisfied. Here, the process to generate electricity from natural gas requires same "major emitting facility" as the synthetic gas process. Not only do they both fall within the SIC Manual's "Major Group 49: Electric Services," by which a

"major emitting facility" is defined, but both fuels can and will be used in the combustion turbines used to produce electricity at the Edwardsport plant. In its *Hibbing Taconite* decision, U.S. EPA noted that:

> EPA regulations define major stationary sources by their product or purpose (e.g., "steel mill," "municipal incinerator," "taconite ore processing plant," etc.), not by fuel choice. Here, Hibbing will continue to manufacture the same product (i.e., taconite pellets) regardless of whether it burns natural gas or petroleum coke… The record here indicates that there are other taconite plants that burn natural gas, or a combination of natural gas and other fuels. Thus, it is reasonable for Hibbing to consider natural gas as an alternative in its BACT analysis.

Therefore, where an applicant can produce the same end-product with a cleaner fuel, a BACT determination must account for the emission reductions available from that cleaner fuel. IDEM's BACT analysis does not appear to have addressed the lower emissions achievable with cleaner natural gas. This omission must be corrected.

VIII. THE BACT LIMITS SHOULD BE EXPRESSED BY ENERGY OUTPUT.

BACT must be based on the top-ranked pollution control option. Clean production processes must be considered as a pollution control option. 42 U.S.C. § 7479(3); 40 C.F.R. § 52.21(b)(12). As unit efficiency increases, total pollution decreases. *See* U.S. EPA, *Environmental Footprints and Cost of Coal-Based Integrated Gasification Combined Cycle and Pulverized Coal Technologies* (July 2006). Therefore, BACT must consider efficiency of a unit and total pollution emissions, rather than merely focusing on emissions per unit of energy input. In other words, increased efficiency is a method

of pollution control because it decreases the total amount of pollution emitted into the environment to produce electric power. IDEM should include output based limits in the final PSD permit to ensure that efficient operation is implemented as a pollution control method.

IX. THE BACT ANALYSIS AND BACT LIMIT FOR PM EMISSIONS FROM THE COOLING TOWERS ARE INCOMPLETE.

The particulate matter emissions from the proposed cooling towers are subject to BACT. However, the BACT analysis by IDEM is deficient and does not result in a limit representing BACT. The draft permit requires the Developers install "high efficiency drift eliminators with a drift flow rate less than 0.0005 percent…" This is not BACT for two reasons. First, high efficiency drift eliminators are not the top-ranked pollution control option. Second, a drift rate does not constitute a PM limit. The permit must limit PM emissions—which depends on circulating water rate and the concentration dissolved solids in the circulating water.

A. An Air Cooled Condenser is BACT.

Cooling towers are not the only technology for cooling at the Edwardsport plant. An Air Cooled Condenser ("ACC") is a superior option that has no water demand and has much lower PM emissions. Use of an ACC would reduce overall water consumption by at least 95 to 98 percent. ACCs have been used on large coal-fired power plants for over 25 years. The 330 MW Wyodak coal-fired power plant in

Wyoming has successfully operated with an ACC for over 25 years. The largest ACC-equipped coal fired power plant in the world, the 4,000 MW Matimba facility in South Africa, has been operating successfully for over 10 years. Two coal-fired units in Australia with condenser heat rejection rates nearly identical to those for the proposed cooling tower here have been operational since 2002. A number of new coal-fired power plants have been proposed in New Mexico over the last three years. In all cases the project proponents have voluntarily incorporated ACC into the plant design to minimize plant water use. A 36 MW pulverized coal unit in Iowa, Cedar Falls Utilities Streeter Station Unit 7, was retrofit with dry cooling in 1995 due to highway safety concerns caused by the wet tower plume in winter. In short, the use of dry cooling on pulverized coal fired power plants is well established. Therefore, an ACC must be identified and considered in a top-down BACT analysis. *NSR Manual* at B.10-B.11. This was not done and, therefore, the BACT analysis was deficient. The permit must be denied unless and until a proper BACT analysis is conducted and BACT is either established based on an ACC or the applicant sufficiently justifies rejection of ACC according to the procedures in the top-down process.

In contrast to an ACC, an evaporative wet cooling tower, such as those proposed for the Edwardsport plant, will evaporate approximately millions of gallons per day of water, and produce hundreds of thousands of gallons per day of high salinity cooling tower blowdown. An actual analysis of ACC also refutes common excuses offered by engineering consultants for permit applicants—that ACC results in a significant energy

penalty. In fact, the heat rate penalty from an ACC is only 2 percent annually. Bill Powers, *Peak and Annual Average Energy Efficiency Penalty of Optimized Air-Cooled Condenser on 515 MW Fossil Fuel-Fired Utility Boiler*. This is comparable to a wet cooling tower. "[T]otal auxiliary power demand for the ACC options is slightly higher than the wet tower baseline case at design conditions, and slightly lower on an annual average basis." *Id.* In other words, the energy penalty—if any—from an ACC is negligible and cannot be used to reject the ACC as the top-ranked pollution control option in a top-down BACT analysis. Moreover, an ACC provides a number of additional environmental benefits beyond lower PM emissions from the cooling tower:

- No water use;
- No brine wastewater;
- No need for investment in raw water clarification system or wells;
- No aesthetic issues related to visible vapor plumes; or
- No highway safety or equipment operation issues with vapor plumes in winter.

The BACT limit for PM emissions from the cooling process must be established based on the emissions achievable with the ACC.

B. <u>Even if BACT is established based on a cooling tower, the permit must include a PM limit rather than a drift rate.</u>

Even if cooling towers with drift eliminators is selected as the basis for a PM BACT limit for the cooling tower, the 0.005% drift limit is not sufficient. The PSD permit must contain a numeric PM emission limit. An hourly PM emission rate

corresponding to a 0.0005% drift can be calculated by multiplying the circulating water flow rate, the dissolved solids in the water (which become the PM in the air), and the drift rate. Moreover, by limiting the circulating water flow rate and the concentration of dissolved solid in the circulating water, a lower PM emission rate can be achieved. The Draft Permit requires the source to limit Total Dissolved Solids (TDS) to less than 500 mg/L. This is not sufficient. The final PSD permit for the Cash Creek IGCC plant in Kentucky contains an hourly mass limit (2.16 lb/hr) for cooling tower PM emissions based upon limiting TDS to 2300 mg/L. This was not considered in the BACT analysis by IDEM. Moreover, the permit must require periodic testing of the cooling towers because drift eliminator performance can degrade over time. Therefore, merely requiring that the cooling tower be designed to achieve 0.0005% drift is insufficient to ensure that the cooling tower is actually achieving that rate of drift over time.

X. THE PSD INCREMENT INVENTORY WAS DEFICIENT.

PSD permit applicants are responsible for conducting modeling to demonstrate that they:

1) do not exceed the increment unless adequate offsets are produced;
2) do not contribute to violations in other states (under CAA § 126);
3) do not adversely impact a Class I area; and
4) do not produce an unacceptable growth associated air pollution impact.

After the applicant determines the impact area, it must develop emission inventories which are used to perform dispersion modeling for NAAQS and increment analysis. This must include all stationary sources within the region, as well as recently permitted

sources that have not yet been constructed. The applicant must also create an increment inventory, which must include data from:

- Increment-consuming sources within the impact area;
- Increment-consuming sources outside the impact area that affect increment consumption in the impact area.
- Building dimensions, stack heights, and other factors necessary to determine downwash from increment consuming facilities.

The applicant must determine whether any major sources have increased emissions since the major source baseline date and whether any source, including minor, area, and traffic sources, has increased emissions since the minor source baseline date.

Major sources that are modified after the major source baseline date are not included in the baseline and are increment consuming. 326 IAC 2-2-1(g)(3)(A). There are a number of major sources that will potentially add to the air pollution impacts from the proposed plant. Many of these have undergone at least one major modification since the major source baseline date, including Crawfordsville, Petersburg, Gibson, R. Gallagher, Warrick/Culley, and Rockport (constructed 1984). In fact, U.S. EPA has issued Notices of Violation for PSD violations, pursuant to 42 U.S.C. § 7413(a)(1), for many of these facilities, which constitutes the agency's finding that the plants have undergone major modifications. Therefore, these plants must all be included in the modeling inventory as consuming increment.

XI. THE DRAFT PERMIT DOES NOT INCLUDE ADEQUATE BACT LIMITS FOR THE AUXILIARY BOILER AND EMERGENCY GENERATOR.

A. Auxiliary Boilers

The PM10 limits for the auxiliary boilers is much higher than BACT for other gas-fired boilers. The proposed limit is 0.0075 lb/MMBtu. However, other facilities are subject to lower emission limits. The Longview Power Maidsville plant has a limit of 0.0022 lb/MMBtu, BASF's Freeport Cogeneration Facility has a PM10 limit of 0.0005 lb/MMBtu, and the Pine Bluff Energy has a limit of 0.005 lb/MMBtu. These units all control emissions using clean fuels and good combustion. Therefore, it must be assumed that the proposed new auxiliary boiler at Edwardsport can also achieve the lowest of these limits.

Other facilities are subject to lower VOC limits as well. The Draft Permit includes a limit of 0.005 lb/MMBtu from the auxiliary boilers. However, lower emissions are possible and must be assumed to be BACT for the auxiliary boiler. The Pine Bluff Energy LLC boiler is subject to a VOC limit of 0.002 lb/MMBtu based only on good combustion practices. It must be assumed that the auxiliary boiler proposed for the Edwardsport plant can achieve 0.002 lb/MMBtu and must be subject to that limit as BACT for VOC. *NSR Manual* at B.24

B. Emergency Diesel Generator

The Draft Permit proposes a diesel-powered generator that lacks any BACT limit, except for an assertion that "Emission limitations [are] as defined by NSPS Subpart IIII and that the equipment will be maintained in "good working order" and operate "per manufacturer's specifications." This is not a BACT limit.

BACT should be based on clean fuels and BACT should be a numeric limit based on a case-by-case analysis, not a default to the NSPS "floor." As shown below, the emission limits are significantly lower when natural gas is used as a fuel, rather than diesel. Therefore, BACT must be established based on natural gas, or the applicant must adequately demonstrate—through a top-down BACT analysis—that natural gas can be rejected for energy, environmental, or economic impacts. This is unlikely since other sources use natural gas as a fuel in emergency generators.

Pollutant	**Likely Emissions from Diesel**	**Limits at other Facilities Based on Natural Gas[8]**
NOx	6.9 g/Hp-hr or 1.30 E-02 lb/Hp-hr	1.5 g/bHp-hr or 0.0015 lb/bHp-hr
CO	8.5 g/HP-hr or 5.50 E-03 lb/Hp-hr	0.3700 g/bHp-hr
PM10	0.5 g/HP-hr or 7.00 E-04 lb/Hp-hr	
VOC	1.0 g/HP-hr or 7.05E-04 lb/Hp-hr	0.030 g/bHp-hr.
SO2	1 g/HP-hr or 4.05 E-04 lb/Hp-hr	

XII. MODELING MUST BE REDONE BASED ON THE WORST CASE EMISSIONS.

Worst case emissions must be used to model air impacts.

> For both NAAQS and PSD increment compliance demonstrations, the **emissions rate** for the proposed new source or modification must reflect the <u>maximum allowable</u>

[8] From the EPA's RACT/BACT/LAER Clearinghouse for the following facilities: Duke Energy at Mooreland Cryogenic PLT; Southern Natural Gas Co.; Borough of Chambersburg, Orchard Park Generating Station. Exhibit NNN.

> operating conditions as expressed by the federally enforceable **emissions limit, operating level, and operating factor** for each applicable pollutant and averaging time.

NSR Manual at C.45 (emphasis original). Furthermore, according to the Air Quality Modeling Guideline (Appendix W): "At a minimum, the source should be modeled using the design capacity (100 percent load)." 70 Fed. Reg. 68,218, 68,240 (Nov. 9, 2005). BACT limits established in the permit are typically used for modeling, but it is important to use the least stringent limit during the applicable time period. An annual or 30 day limit is not representative of "worst case emissions" during a shorter period of time. For SO2 and NOx, the proposed plant is only subject to annual "synthetic minor" limits. There is no enforceable limit on the short term emissions. Moreover, periods of startup and shutdown are only subject to annual emission limits for all pollutants—without a maximum hourly emission rate during startup and shutdown. Therefore, maximum theoretical (i.e., uncontrolled) emissions must be used for short-term modeling (3 and 24 hour SO2). For PM, there are no enforceable hourly emission limits on the material handling (limit expressed as concentration only), coal storage, slag storage, roadways. Moreover, the "control" for the material storage and roadways only works if conditions are appropriate and necessary steps (chemical suppressants) are applied on a frequent basis. The permit only requires vague "best practices" and "as-needed" steps, which do not ensure a maximum hourly controlled emission rate. Emissions from these sources must be modeled based on the maximum theoretical—i.e., uncontrolled—emission rate.

The permit must either contain short-term emission limits that apply at all times, or the permit must be denied unless and until the applicant demonstrates compliance with NAAQS and increment during worst-case, uncontrolled conditions. 42 U.S.C. §§ 7473, 7475(a); 40 C.F.R. §§ 52.21(c) and (d).

XIII. THE PERMIT MUST ENSURE THAT THE ASSUMPTIONS MADE FOR MODELING ARE ENFORCEABLE.

Modeling must include worst-case conditions. *NSR Manual* at C.45. Maximum theoretical, uncontrolled, emission rates must be used unless there are enforceable permit conditions that ensure that emissions are controlled during the relevant time period. *NSR Manual* at B.45, C.45 ("For both NAAQS and PSD increment compliance demonstrations, the emission rate… must reflect the maximum allowable operating conditions… for each applicable pollutant and averaging time." (emphasis original)), C.46 (requiring that the source be modeled based on either the maximum allowable emission limit of the federally enforceable limit).

Emissions were modeling from material handling operations as if at a constant rate. This does not represent "worst case" conditions. Material handling operations—such as coal unloading and storage pile maintenance—occur over a short period of a few hours and the hourly emissions are high at those times, while being minimal during other periods.

Additionally, the modeling appears to assume a "controlled" emission rate from coal unloading, roads, and storage piles based on the application of water and other

activities. The modeling appears to assume that such activities result in a high level of control (50% for paved roads, 95% for unpaved roads, 50% for wind erosion from storage piles). However, no testing or monitoring is required to ensure that such high levels of control were, in fact, achieved. Furthermore, as the AP-42 Emission Factors cited (13.2.2- 13.2.5) note, control from activities such as water suppressant is highly variable and requires specific weather conditions, site conditions, and regular application of control measures. In fact, to achieve the 95% assumed control on unpaved roads, the source has to attain and sustain an unrealistically high moisture ratio on all road surfaces at all times. *See* AP-42 13.2.2-11 to 12. Watering storage piles, as the draft permit envisions, does not achieve the 50% control of PM assumed in the modeling. In fact, as AP-42 § 13.2.4-5 notes, "Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions."

Moreover, the emission rates used for modeling assume many factors that are not required by the permit, which means that the emission rates used in the model are not enforceable. These include the following:

- The surface area of the coal storage pile. This has a significant impact on the PM emissions from wind erosion. AP-42 § 13.2.5
- The number of total disturbances of the storage piles each day. Id.
- The shape, height, edge distance, side surface, side length, etc. of the coal pile. Id.

- The maximum dust collection system exhaust rate (in acfm), by which the grains/acf limit for the dust collecting system is multiplied to obtain the emission rate.
- Maximum vehicle miles traveled per year on each road surface, which is necessary to calculate emissions from the road surfaces. AP-42 § 13.2.2.
- Maximum vehicle weight for vehicles on the roadways. Id.
- Maximum load size of vehicles. Id.; AP-42 § 13.2.1
- Minimum moisture content of the coal at the plant.

In summary, despite a total lack of hourly emission limits from the material handling, coal storage, and roadways, the modeling assumes various maximum hourly, monthly, and annual emission rates of particulate matter from material handling processes and fugitive sources. Additionally, the modeling assumes unrealistic control efficiencies, which is further exacerbated by the lack of adequate monitoring of the conditions affecting PM emissions. Lastly, the modeling assumes specific facts that are significant to estimate emissions and also highly variable, such as vehicle trips, moisture of coal and material surfaces, storage pile shape and size, and total amount of work done on storage piles each day. This is an error. The modeling must assume the maximum theoretical emissions during each relevant time period (i.e., hourly, monthly, and annual) unless an enforceable permit limit ensures a lower emission rate.

XIV. OZONE IMPACTS MUST BE DETERMINED.

The Applicant and IDEM omitted an analysis of the plant on both 1-hour and 8-hour ozone levels. The Applicant asserts that none is needed because VOC increases are less than 100 tons per year. There appears to be no legal authority for avoiding the clear legal requirement to determine ozone air quality impact based on a 100 TPY VOC threshold. Ozone impacts must be analyzed and, if the plant causes or contributes to a violation of the standard(s), the permit must be denied.

XV. THE APPLICANT DID NOT CONDUCT THE REQUIRED PRECONSTRUCTION MONITORING.

It does not appear that any preconstruction ambient air monitoring was done for the project. Rather, unspecified ambient air quality data was assumed. This is insufficient monitoring. As a prerequisite to obtaining a permit to construct, an applicant must provide the permitting authority with data about the background ambient air quality in the area that will be impacted by emissions from the new EGU. 326 IAC 2-2-4(c); 40 C.F.R. § 52.21(m). Specifically, the applicable requirements provide that:

> Any application for a permit under this section shall contain an analysis of ambient air quality in the area that the major stationary source or major modification would affect for… each pollutant for which [the project] would result in a significant net emission increase…
>
> With respect to any such pollutant for which no National Ambient Air Quality Standard exists, the analysis shall contain such air quality monitoring data as the Administrator determines is necessary to assess ambient air quality for that pollutant in any area that the emissions of that pollutant would affect.

> With respect to each such pollutant [for which a NAAQS exists], the analysis shall contain continuous air quality monitoring data gathered for purposes of determining whether emissions of that pollutant would cause or contribute to a violation of the standard or any maximum allowable increase.
>
> In general, the continuous air quality monitoring data that is required shall have been gathered over a period of at least one year and shall represent at least the year preceding receipt of the application, except that, if the Administrator determines that a complete and adequate analysis can be accomplished with monitoring data gathered over a period shorter than one year (but not less than four months), the data that is required shall have been gathered over at least that shorter period.

40 C.F.R. § 52.21(m)(1); see also 326 IAC 2-2-4(c)(2), (3) (same). This requires the applicant to install and operate a series of ambient air quality monitors in the area around the proposed facility for at least twelve months prior to submitting its PSD permit application. *NSR Manual* at C.16. To use ambient air monitoring data for a period less than twelve months, IDEM must make an on-the-record determination "that a complete and adequate analysis can be accomplished with monitoring data gathered over a period shorter than one year (but not less than 4 months)…" *Id.* Such decision must be based on a determination that the shorter period provides sufficient air quality data "during a time period, or periods, when maximum concentrations can be expected." *NSR Manual* at C.19. In other words, if fewer than 12 months are used, the time period of data collection should represent the months of maximum ambient air concentration.

An applicant can only avoid collecting site-specific ambient air quality data is if valid, sufficient, and representative ambient air quality data exists from regional monitoring stations. This only occurs in very limited circumstances. *NSR Manual* at C.18.

> To be acceptable, such data must be judged by the permitting agency to be representative of the air quality for the area in which the proposed project would construct and operate. Although a State or local agency may have monitored air quality for several years, the data collected by such efforts may not necessarily be adequate for the preconstruction analysis required under PSD.

NSR Manual at C.19-C.18. In other words, IDEM must determine that data from regional monitoring stations are representative of ambient air quality at the Edwardsport Generating Station site. This requires IDEM to make specific findings on the record. EPA sets forth three criteria for determining when existing ambient monitoring data is sufficient:

1) monitor location;
2) quality of the data; and
3) "currentness" of the data.

NSR Manual at C.19; *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*, EPA-450/4-87-007 (May 1987) (hereinafter "*Guidelines for PSD*"), incorporated by reference at 326 IAC 2-2-4(c)(7). These criteria do not support using existing air quality data for the proposed new emission units.

1) Monitor Location

Pursuant to EPA guidance, to use monitoring data from existing ambient air quality monitors to determine baseline air quality for PSD permitting, the data must be representative of three specific areas:

> (1) the location(s) of maximum concentration increase from the proposed source or modification,
>
> (2) the location(s) of the maximum air pollutant concentration from existing sources, and
>
> (3) the location(s) of the maximum impact area, i.e., where the maximum pollutant concentration would hypothetically occur based on the combined effect of exiting sources and the proposed new source or modification.

Guidelines for PSD § 2.4.1. EPA concludes that existing air quality data is only representative of these three areas when the proposed source will be located in an area that is generally free from existing point source impacts. *Id.* When the new or modified source will be located in an area that has multiple air pollution sources and flat terrain, the applicant can only use existing, representative monitoring data that is from (1) a nearby monitoring site, within 10 km of the points of emissions; or (2) from a monitor that is no more than 1 km away from either the maximum air pollutant concentration from existing sources or from the area(s) of combined maximum impact from existing and proposed sources. *Id.* The monitoring stations from which Duke uses data appear to be well over 10 km from the Edwardsport Generating Station site and well over 1 km from the point of maximum impact from the facility. Therefore, the existing monitoring data cannot be used and the Duke must collect 12 months of site-specific ambient air quality data.

Moreover, even if the existing air quality monitors were located within 10 km of the Edwardsport Generating Station site, the monitoring data could still not be used. The proposed location of the new emission sources is also a "multisource impact area." There are several existing coal-fired units contributing to air pollution in the area, as well as a number of other major, minor and area sources. This disqualifies the use of non-site-specific monitoring gathered for purposes of PSD permitting.

> If the proposed construction will be in an area of multi-source emissions and in an area of complex terrain, aerodynamic downwash complications, or land/water interface situations, existing data could only be used for PSD purposes if it were collected (1) at the modeled location(s) of the maximum air pollution concentration from existing sources, (2) the location(s) of the maximum concentration increase from the proposed construction, and (3) at the location(s) of the maximum impact area. If the monitor is located at only one of the locations mentioned above and the locations do not coincide, the source would have to monitor the other locations.

Id. (emphasis added). In other words, for a site like the Edwardsport Generating Station, existing ambient air quality monitoring data can only be used if the existing monitors happen to coincide, exactly, with the areas of highest impact from the new facility, the areas of highest impact from stationary sources in the area, and the areas of highest combined impact from both new and existing sources. This is not the case for the Edwardsport plant. In summary, Duke, as the applicant, was required to conduct air quality monitoring for at least twelve months, prior to submitting its PSD permit application to the IDEM. This was not done and, therefore, the air quality

determination is deficient and the permit cannot be issued. 326 IAC 2-2-2(c) (prohibiting construction without compliance with, *inter alia*, preconstruction monitoring in 326 IAC 2-2-4); 40 C.F.R. §§ 52.21(i) (prohibiting construction unless all requirements of 52.21(j) through (r) are met), 52.21(m)(1) (requiring preconstruction monitoring).

2) Data Quality

Moreover, even if IDEM's distant existing air quality monitors could be used to determine ambient air quality for permitting the modified Edwardsport Station, the data must meet the same quality standards that on-site monitoring must meet. *Guidelines for PSD* at § 2.4.2. At a minimum, this includes:

1) continuous instrumentation monitoring
2) documented quality control, including calibration, zero and span checks, and control checks;
3) calibration and span gases should be working standards certified by comparison to Nation Bureau of Standards gaseous Standards Reference Material;
4) minimum 80% data recovery

It is not clear that these data quality requirements were met. Again, even if they were, the monitoring locations must still correspond to the requirements above—including location at the points of maximum impact and maximum ambient air concentration.

3) Data "Currentness"

Additionally, if existing ambient air monitoring data could be used to permit the new units at the plant, the data must be current. This means that the data must have

been collected in the most recent three years (2004-2007). *Guidelines for PSD* § 2.4.3. It does not appear that this requirement was met.

Moreover, using non site-specific air monitor data, from existing IDEM sampling sites, violates the Clean Air Act. The plain language of the Clean Air Act requires site-specific air quality monitoring for every PSD permit application. 42 U.S.C. §§ 7475(e)(1) ("The review provided for in [42 U.S.C. § 7475(a)] shall be preceded by an analysis in accordance with regulations of the Administrator… of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant…" (emphasis added)), 7475(e)(2) (providing that ambient air monitoring "shall include continuous air quality monitoring data gathered for purposes of determining whether emissions from such facility will exceed the maximum allowable increases or the maximum allowable concentration permitted under this part.") Specifically, the plain language of the Clean Air Act requires that ambient air quality data be collected at and around the site of the new source, and be collected specifically for the purpose of determining whether the source will cause a violation of NAAQS or increment. The Act does not contemplate using ambient air monitoring from a location eighty miles away as a surrogate. The Act's legislative history further indicates that actual, site-specific ambient air quality should be measured at the permittee's site. S. Rep. No. 127, 95th Cong., 1st Sess. 98 (1977).

Dated this29th day of December, 2007.

GARVEY MCNEIL & MCGILLIVRAY, S.C.

David C. Bender
634 W. Main Street, Suite 101
Madison, WI 53703
Phone: (608) 256-1003
Fax: (608) 256-0933
bender@gmmattorneys.com

SIERRA CLUB
Bruce Nilles
122 W. Washington Avenue, Ste 820
Madison, WI 53703-2200
Phone: (608) 257-4994
Fax: (608) 257-3513
bruce.nilles@sierraclub.org

NOx																						
Unit	Jun-02	Jul-02	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04
6--1	0.4	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8--1	61	100.6	72.3	47	36.6	27.1	50.9	0	15.5	81	79	30.2	51.7	104	69.7	60.5	0	0	63.1	98.8	136.9	144.3
7--1	89.7	75.6	111.4	41.6	35.8	23.2	42	0	15.8	124.3	134.4	53.2	56.2	139.2	115.7	67.5	0	0	41.5	97.1	135.5	151.4
7--2	64.1	118.4	109	21	33.2	19.2	43.9	0	2.2	33.7	105.9	51.2	42.8	87.8	131.9	23.1	0	0	59	124.6	141.1	140
Total	215.2	294.6	292.7	110	105.6	69.5	136.8	0	33.5	239	319.3	134.6	150.7	331	317.3	151.1	0	0	163.6	320.5	413.5	435.7
12 Month Average																						
SO2																						
Unit	Jun-02	Jul-02	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04
6--1	1	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7--1	317.9	263	416.9	232.1	188.8	144.8	236.9	0	86.9	585.8	497.8	189.1	194.7	599.9	527.4	239.7	0	0	152.9	375.6	509.9	512.5
7--2	251.5	422.2	459.1	116.3	192.7	131.4	254.9	0	12.7	163.5	415.5	195.3	177	422.6	608.4	91.7	0	0	245.4	535	566.3	479
8--1	261.1	430.6	350.8	277	208	207.8	291.6	0	89.8	424.7	370.5	121.3	195.8	528.2	358.3	273.5	0	0	252.6	399.8	596.6	514.7
Total	831.5	1115.8	1226.8	626	589.5	484	783.4	0	189.4	1174	1283.8	505.7	567.5	1550.7	1494.1	604.9	0	0	650.9	1310.4	1672.8	1506.2
12 Month Average																						

Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135.8	47.2	47.7	32.1	7.8	5.8	56.8	44.5	61.6	51.3	4.2	71.6	66.6	4.4	15.2	51.3	74.2	81.7	31.3	24.4	53.4	0	0.1
140.5	62.8	42.5	27	9.9	5.9	81.7	66.1	72.6	36.8	0	0	9.8	4.8	31.7	9.5	117.7	125.8	76.3	30.8	58	0	5
114.1	33.3	18.4	30.8	9.2	4.7	87	99	75.9	34.6	9.9	116.3	78	9.3	54.2	36.6	43.8	75.8	41.8	23.3	2.3	0	4.5
390.4	143.3	108.6	89.9	26.9	8.2	225.5	209.6	210.1	122.7	14.1	187.9	154.4	18.5	101.1	97.4	235.7	283.3	149.4	78.5	113.7	0	9.6
	2383.95	2330.65	2228.3	2095.4	2044.5	2104.45	2174.5	2211.15	2272.5	2143.3	2237.25	2154.8	2096.75	2071.95	1955.15	1914.35	1980.45	2055.15	2094.4	2069.45	1909.2	1294.2

Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06
0	0																					
570	300.2	139.5	102.2	34.5	22.1	332.3	282.4	330.1	175.2	0	0	40.9	42.1	143	38.3	432.5	493.9	396.7	146.9	291.2	0	24.4
506.3	202.7	86.4	147.6	43	24	372.9	410.8	352.5	200.2	41.6	358.6	381.1	51	281.6	203.7	234.4	404.1	216.3	140.3	11.5	0	19.4
594.3	257.3	178.2	146.3	31.6	26.7	259.6	189.7	276.6	271.7	22	263	301.2	23	91.2	241.8	351.5	382	143.1	104.6	221.3	0	0.7
1670.6	760.2	404.1	396.1	109.1	72.8	964.8	882.9	959.2	647.1	63.6	621.6	723.2	116.1	515.8	483.8	1018.4	1280	756.1	391.8	524	0	44.5
	10299.1	10085.4	9725.55	9166.7	8890.1	9077.75	9277.2	9365.1	9688.65	9625.75	9349.55	9069.25	8874.45	8848.6	8315.15	8077.3	8414.85	8792.9	8988.8	8925.35	8270.15	7456

Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	0	0	0	0
18.8	25	7.6	18.9	54.7	23	0	12	19.6	9.9	21.9	81.6	58.3	37.9	41.9	29.5	15.7	43.8	0
13.6	35.1	0	19.5	40.3	31	0	34.6	19.5	2.4	26.1	77.2	11.6	66.6	40.1	38.9	26.2	12.9	5.4
9.2	20.3	5.5	15.1	43.6	28.8	0	33.8	19.4	19.2	18.6	63.2	76.1	24.9	49.6	5.4	4.3	22.7	2.2
41.6	80.4	13.1	53.5	138.6	82.8	0	80.4	58.5	31.5	66.6	222	146	129.4	132.4	73.8	46.2	79.4	7.6
1510.2	1355.2	1290.1	1262.55	1286.9	1314.85	1310.75	1238.2	1162.65	1073.35	1045.3	1149.25	1128.3	1115.8	1172.75	1159.1	1133.5	1055.35	917.5

Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07
													0	0.6				
86.1	200.6	0	114.5	207.4	151.7	0	194.2	118.6	14.5	152.8	391.4	58.2	302.9	231.7	286.5	152.7	72.6	24.5
58.1	118.9	37.5	113.8	264.9	154.1	0	206.8	141.3	112.4	120.4	338	434.1	129.3	310.1	33.7	40.1	177.8	17.1
90.7	120.4	35.9	110.9	260.1	90.1	0	67.3	144	66.2	139.5	429.7	388.9	190.4	269.4	234.6	120.4	298.7	
234.9	439.9	73.4	339.2	732.4	395.9	0	468.3	403.9	193.1	412.7	1159.1	881.2	622.6	811.8	554.8	313.2	549.1	41.6
6820.35	6205	5861.6	5829.15	5997.3	6140.7	6104.3	5856.05	5616.55	5233.5	5116.3	5664.05	5793.85	5743.55	6091.4	6110.9	6025.6	5790.95	5171.75