Appendix 9 - IDEM Responses to National Park Service Comments

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IDEM Responses to National Park Service Comments

Chapter 2, Regional Planning

Comment:

IDEM has identified 19 Class I areas that are impacted by Indiana emissions. Table 1 in Appendix 1 lists the specific Class I areas that Indiana impacts and cites the technical analyses that support that determination. It would be helpful to include Table 1 in the SIP Chapter 2.

IDEM Response:

IDEM has added Table 1 in Appendix 1 to Chapter 2 in the SIP and subsequent tables have been renumbered as necessary.

Chapter 4, Baseline Conditions, Pollutant Contribution, Uniform Rate of Progress

Comment:

IDEM cites work of MRPO and other states but does not provide any information to illustrate the baseline visibility conditions, the pollutant contributions, and the needed visibility improvement. We recommend that IDEM pick a Class I area from each region and include in Chapter 4 a summary of pollutant contributions in the baseline period for the average of the 20% worst days and monthly or daily time series from the IMPROVE data to illustrate the temporal variation in pollutant contributions.

As part of the contribution assessment IDEM should explicitly state which pollutants would be most effective to control to improve visibility at the impacted Class I areas. We also recommend illustrating the glide paths for the uniform rate of progress for the selected Class I areas or at least adding these data to the Appendices and citing in Chapter 4 where the data can be found.

IDEM Response:

IDEM has included a summary, in Chapter 4, of pollutant contributions in the baseline period for the average of the 20% best and worst days for the northern Class 1 areas. Although pollutant contributions from Class 1 areas in the central, eastern and northeastern regions have been included in the discussion, the summary focused primary on the northern Class 1 areas. Detailed information to illustrate the baseline visibility conditions, the pollutant contributions, the needed visibility improvement and glide paths for the uniform rate of progress have been added in Appendix 9a.

Chapter 5, Emissions Inventory:

Comment:

This chapter very briefly summarizes the methods used by the MRPO to develop the 2005 and future year inventories. Please include the MRPO Technical Support Document as an Appendix.

Table 3 summarizes the Electric Generating Unit (EGU) projections from the Integrated Planning Model (IPM) Version 3.0 for three scenarios. Please provide more detailed explanation how the three scenarios differ and explicitly why sulfur dioxide (SO_2) and nitrogen oxides (NO_x) emissions for Indiana are lower in Scenario 5a than Scenarios 5b and 5c.

IDEM needs to discuss the projected emissions changes between 2005 and 2018 as evidence that Indiana is making reasonable progress. Table 4 does not appear to be cited or discussed in the text, yet this is the most important data for demonstrating Indiana's emission reductions. Please provide emissions summaries in Table 4 as tons/year rather than tons/day to avoid questions how to account for weekly and seasonal variability to scale to tons/year values.

IDEM Response:
IDEM has included the LADCO Technical Support Document "Regional Air Quality Analyses for Ozone, PM2.5, and Regional Haze: Final Technical Support Document" in Appendix 9b. In addition, a more detailed discussion of the three scenarios and the projected emissions changes between 2005 and 2018 has been incorporated. A discussion of the Table 4 data has been incorporated, as well, and emissions summaries in Table 4 have been changed from tons/day to tons/year.

Chapter 6, Modeling Assessment

Comment:
IDEM relies on the MRPO modeling. Please include the MRPO Technical Support Document in an Appendix. A discussion of model performance is necessary to demonstrate confidence in model projections. There is not an Attainment Test for regional haze; you could delete the Section 6.2 header and cover the material under Section 6.1.

The wording in the last paragraph on page 22 is confusing as written. Please clarify your intent. If model results are less than the uniform rate of visibility improvement does that mean greater visibility improvement than the uniform rate?

The scenario terms used in Tables 6 and 7 are not the same as described in Chapter 5 Emissions Inventory. Please explain how the terms for the emissions assumptions in Tables 6 and 7 relate to the scenarios in Table 4. How does "Will Do" compare to Scenario 5a, 5b, or 5c? Do the "Will Do" adjustments pertain only to the EGU sector? Please provide additional clarification on what assumptions are included in the modeled scenarios.

IDEM Response:
IDEM has included the LADCO Technical Support Document "Regional Air Quality Analyses for Ozone, PM2.5, and Regional Haze: Final Technical Support Document" in Appendix 9 b and removed the section heading "Attainment Test for Regional Haze/Visibility." In addition, a better explanation of how the terms for the emissions assumptions in Tables 6 and 7 relate to the scenarios in Table 4 has been provided along with a clearer discussion of the visibility modeling results.

Chapter 7, Reasonable Progress Goals

Comment:
Please add reference to Appendix 1 for contribution assessments from MRPO and other RPOs and Appendix 2 for letters from states requesting consultation.

We agree that based on the contribution assessments presented in Appendix 1 and 3 and in sections 7.2-7.9, Indiana sources have comparatively small contributions to Class I areas in neighboring states.
To comply with the Regional Haze Rule Sections 308(d)(3)(ii) and (iv), IDEM still needs to demonstrate that it has included in its long term strategy all measures needed to achieve its share of emission reductions and to identify all anthropogenic sources of visibility impairment considered in developing the long term strategy. IDEM has cited modeling results of MRPO and neighboring RPOs, but IDEM still needs to evaluate its emission sources and demonstrate using a four factor analysis that Indiana is making reasonable progress in reducing anthropogenic emissions. This demonstration should evaluate the monitoring, emissions inventory, and modeling data to determine which pollutants are most important to control, what reductions are already expected by 2018, what source categories are major contributors in 2018, and evaluate the four factors for those major source categories. The MRPO provided a four factor analysis for major source categories that IDEM could cite in evaluating what control measures are feasible and reasonable for specific stationary sources.

Several states have used emissions (Q) divided by distance (d) as a screening method to prioritize which stationary sources to consider in a reasonable progress analysis. If IDEM considered a Q/d for SO_2+NO_x = 10 for sources with emissions of SO_2+NO_x greater than 200 tons/year, IDEM would likely be able to focus the reasonable progress analysis on specific stationary sources within a few major source categories. The VISTAS and CENRAP Areas of Influence are another method to identify which sources in Indiana should be evaluated for reasonable progress.

IDEM Response:
IDEM has added reference to Appendix 1 for contribution assessments from MRPO and other RPOs and Appendix 2 for letters from states requesting consultation. In addition, IDEM has included additional information related to Indiana's emissions and visibility contributions and a detailed discussion of the measures needed to achieve Indiana's share of reductions in Appendix 9c and LADCO's "Reasonable Progress for Class 1 Areas in the Northern Midwest – Factor Analysis" Document (July 18, 2007)".

Chapter 8 Best Available Retrofit Technology (BART)
Comment:
Please add greater description of the data presented in Table 10, BART-eligible Electric Generating Units (EGU) covered by the Clean Air Interstate Rule (CAIR) and discuss the implications in the text. Does Table 10 cover all EGU in Indiana including those units that are BART-eligible, those units listed by MANE-VU, and all other units? Please clarify what assumptions were used for each column. Does column "2009 + Projected" include only legally enforceable controls? What criteria were used to include a future control date? Does each succeeding column to the right include only controls that were not included in previous columns? If the LADCO column is empty does that mean that the controls assumed by IPM are legally enforceable and included in the LADCO modeling or not legally enforceable and not included in the LADCO modeling? Please make clear in the text that controls modeled by IPM Version 3.0 are estimates and may not be legally required.

IDEM Response:
IDEM has added a more detailed description of the data presented in Table 10 and an explanation of the assumptions made for each column in the table. A discussion of the implications of the various modeling scenarios and the best current information available regarding Indiana EGU controls and the legal enforceability of these controls has been added.

Section 8.4 BART Exemptions for ArcelorMittal-Burns Harbor, ESSROC-Speed, and SABIC

Comment:
Based on our conference call on December 13, 2010, we understand that the ammonia values used in the final BART exemption modeling differed from the values cited in the MRPO BART modeling protocol. We request that IDEM update this section to clarify the revised ammonia values that better reflect measured values in the region. Because the visibility impacts of the three sources did not exceed the contribution threshold using the revised ammonia values, if IDEM updates the cited analytical methods to reflect the revisions, we can support the BART exemptions.

IDEM Response:
IDEM has updated this section to clarify the revised ammonia values that better reflect measured values in the region and added the discussions and data for ArcelorMittal Burns Harbor, ESSROC - Speed and SABIC CALPUFF results using Bondville Ammonia Monitoring Results 2003-2005 in Appendix 9d.

Section 8.7 BART Determination for Alcoa

We question whether it is valid to take credit as a BART Alternative for SO_2 and NO_x reductions that were required under New Source Performance Standards (NSPS) when Alcoa increased the capacities of Boilers 1, 2, and 3. Boilers 2 and 3 are subject to BART; Boiler 1 is not. Boiler 4 is classified as an EGU and is also subject to BART. Wet flue gas desulfurization (FGD) scrubbers were installed on all boilers in 2008. For SO_2, NSPS requires 90% control. IDEM proposes to use SO_2 reductions for Boiler 1 to offset the difference between BART (92% control) and proposed controls (90% control) for Boilers 2 and 3. IDEM credits the scrubber installed on Unit 1 as achieving significantly higher reductions in SO_2, equal to approximately 21,600 tons, than would be achieved by BART. However we understand that because Boiler 1 was required by NSPS to reduce SO_2 emissions by 90%, Alcoa can take credit in the BART Alternative for only the difference between the required 90% reduction and the proposed 91% reduction at Boiler 1. We do not believe that it is valid to use reductions that are required by permit to meet NSPS at Boiler 1 to also satisfy BART for the Boilers 2 and 3.

Alcoa and IDEM have underestimated the efficiency of scrubbers (95%) and Selective Catalytic Reduction, SCR (90%). As well, Alcoa and IDEM are also proposing to increase SO_2 and PM emissions from BART sources (potlines) above current levels. We do believe that the existing analyses support the determination that the BART Alternative is better than BART.

Section 8.7 BART Determination and Modeling for Alcoa

8.7.1 Summary of Alcoa BART Analysis

Comment:

According to IDEM, the alternative achieves a visibility improvement equal to 0.46 dv and an overall improvement in visibility equal to 75% over the baseline and achieves significantly higher reductions in SO_2, equal to approximately 21,600 tons. However, it is likely that the majority of the emission reductions cited by IDEM were the result of efforts by Alcoa to increase the capacities of Boilers 1, 2, and 3 while avoiding review under the Prevention of Significant Deterioration (PSD) regulations. In order to do so, Alcoa installed wet scrubbers to reduce SO_2 emissions from these units, as well as installing Selective Catalytic Reduction on Boiler #4 to offset NO_X emission increases from Boilers 1, 2, and 3. Therefore, we question whether it is valid to take credit as a BART Alternative for reductions made for other purposes, as we shall discuss later.

IDEM Response:

IDEM's approach to BART reductions has been to follow guidance from various parts of the regional haze program. In the 1999 Regional Haze Regulations, Subpart P – Protection of Visibility, it states that reductions must be surplus to required emission reductions up to the baseline date. The established baseline date is 2002. The year 2002 has been used by various states, RPOs, and the EPA regional haze modeling guidance. It is also specified by the Lydia Wegman November 18, 2002 memo, "2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, $PM_{2.5}$ and Regional Haze Programs."

The BART Rule, 70 FR 128, 39143, states that "(2) The EPA does not believe that anything in the CAA or relevant case law prohibits a State from considering emissions reductions required to meet other CAA requirements when determining whether source by source BART controls are necessary to make reasonable progress." and "(3)…in lieu of BART programs be based on emissions reductions 'surplus to reductions resulting from measures adopted to meet requirements as of the baseline date of the SIP.' The baseline date for regional haze SIPs is 2002…" This is extracted from a discussion justifying the use of CAIR, a program used for other purposes, to substitute for BART. Therefore, it is our belief that it is valid to take credit for BART alternatives made for other purposes.

8.7.2 BART-eligible units at Alcoa

Alcoa identified 18 ingot furnaces, three boilers (Boilers 2, 3, and 4), and five aluminum refining furnaces (Potlines 2-6) as meeting the BART-eligibility criteria. Boilers 2 and 3 are classified as industrial boilers. Boiler 4 is classified as an Electric Generating Unit (EGU). Alcoa, in its December analysis addressed PM, SO_2, and NOx for all its BART-eligible units including Boiler 4. According to the Indiana BART rule, 326 IAC 26-1-5, participation of this boiler in the Clean Air Interstate Rule (CAIR) satisfies the SO_2 and NO_X requirements. The BART analysis will therefore address PM only for this boiler.

Boilers 2, 3, and 4 are dry bottom, pulverized coal-fired units. Boiler 2 came online in January 1964, Boiler 3 came online in October 1965, and the construction of Boiler 4 started on March 16, 1968. Boilers 2 and 3 each had a nominal heat input capacity of 1,357 MMBtu/hr prior to a recent upgrade to a nominal heat input capacity of 1,589 MMBtu/hr. Boiler 4 has a nominal heat input capacity of 2,958 MMBtu/hr. Each boiler is equipped with an electrostatic precipitator (ESP) for PM control. Boiler 2 was equipped with a low NO_X burner (LNB) and overfire air (OFA) in 2004, Boiler 3 was equipped with LNB and OFA in 2002, and Boiler 4 was equipped with a LNB in 1998 and a selective catalytic reduction (SCR) system in 2004. Wet flue gas desulfurization (FGD) scrubbers were installed on all boilers in 2008.

Emissions from potlines are captured and controlled with primary controls. Any uncaptured emissions escape through the roof monitors atop the potline buildings. The primary controls consist of a gas treatment system followed by a fabric filtration system. The total fluoride and particulate removal efficiencies of the control systems are estimated to exceed 99%.

Ingot furnace emissions are uncontrolled. There are several material handling operations at the facility that meet the criteria for beginning operation between 1962 and 1977. However, the BART Guidelines require that only those operations at primary aluminum ore reduction plants that meet the NSPS applicability criteria for this source category should be considered for BART controls. These operations are the potroom groups and anode bake plants. IDEM also identified three (3) ingot furnaces in the Alcoa Title V permit that meet the 1962-1977 timeline criteria but were not included in the analysis. According to Alcoa, one of these furnaces has been physically removed and the other two furnaces did not operate in the baseline years. IDEM considers the impact of the other 18- furnaces to be negligible.

8.7.3 BART Analysis

The initial screening model projected the highest visibility impact at Mammoth Cave National Park (MCNP). Other Class I areas screened included Mingo Wilderness Area, Sipsey Wilderness Area, Great Smoky Mountains National Park, Joyce Kilmer – Slick Rock Wilderness Area, Cohutta Wilderness Area, and Shining Rock Wilderness Area. The impact at MCNP exceeded 0.5 dv. Since the visibility impact was highest at MCNP, the BART analysis was solely based on the impact at MCNP.

8.7.4 Control Strategy

IDEM: Alcoa proposed an alternative to BART which requires less emissions reductions on some units for technical or economic reasons. However, it proposes to control emissions from Boiler 1 which is not a BART-eligible unit. For example, Alcoa determined SO_2 BART for Boilers 2 and 3 as 92% reduction, but it proposes to control SO_2 emissions from these boilers by 90% as an alternative. Alcoa currently limits sulfur in the anode grade coke to $\leq$ 2%. Based on a market study, it has determined that the supply of <3% sulfur coke cannot be ascertained beyond 2013. Therefore, it proposes BART as $\leq$ 3% sulfur coke and the alternative as $\leq$ 3.5% sulfur coke. In the alternative, the source proposes to control SO_2 emissions from Boiler 1 by 91% and NOx emissions at 0.38 lb/MMBtu.

Comment:
We do not believe that it is valid to use reductions that are required by permit to avoid PSD[1] and/or meet New Source Performance Standards (NSPS) at Boiler #1 to also satisfy BART for the BART sources. Construction began in 2005 and the FGDs went on-line in 2008 with the start-up of each re-rated unit. The upgraded boilers had to meet NSPS (since they were modified after Feb. 28, 2005) for large boilers (1, 2, and 3). 90% is the requirement for NSPS and Boiler 1 is used to offset the difference with 2 and 3. **Because Boiler #1 was required by NSPS to reduce SO_2 emissions by 90%, we understand that Alcoa can take credit for only the difference between the required 90% reduction at Boiler #1 and the proposed 91% reduction at Boiler #1 in its BART Alternative.**

IDEM Response:
Please see the IDEM response to 8.7.1 above.

Comment:
The majority of the emission reductions and visibility improvement cited by IDEM were the result of efforts by Alcoa to increase the capacities of Boilers 1, 2, and 3 while avoiding PSD. The only emission reductions attributable to BART are due to the 91% SO_2 control on Boiler 1 versus the 90% control required by NSPS. Otherwise, Alcoa/IDEM are proposing to increase SO_2 and PM emissions above current levels.

IDEM Response:
IDEM disagrees with the statement that "Alcoa/IDEM are proposing to increase SO_2 and PM emissions above current levels" because, as stated in the response to 8.7.1 above, it is our belief that it is valid to take credit for BART alternatives made for other purposes. Therefore, emissions will be reduced and visibility improved from the base year as a result of Alcoa's compliance with New Source Review and NSPS requirements.

8.7.5 Discussion

1. Highest Contributors to Visibility Impairment
IDEM: Boilers 2 and 3 are the highest contributors to visibility impairment. In the year of maximum impact, Boilers 2 and 3 contribute approximately 95%, followed by potlines 3%, followed by Boiler 4 equal to 2%, and the contribution from ingot furnaces is zero. Sulfates and nitrates from Boilers 2 and 3 account for 73% and 25% of the impacts, respectively.

2. Boilers 2 and 3 - SO2
Comment:
Alcoa has underestimated the effectiveness of wet scrubbing on its high sulfur coal. Although Alcoa cites "Typical removal efficiencies are 80–95%," for SO_2 scrubbers, Alcoa/IDEM determined BART as wet limestone flue gas desulfurization (FGD) for these boilers at control efficiency equal to 92%. Alcoa appears to have decided that **Best** Available Retrofit Technology is merely the **average** performance level (91.8%) of the scrubbers it found

[1] Limits on overall emissions of PM, NO_X, and H_2SO_4 to avoid PSD were part of the permit.

in the RBLC.[2] Presumptive BART for coal-fired boilers[3] is 95% SO_2 control or 0.15 lb/mmBtu, neither of which was evaluated by Alcoa. BART for these boilers should be at least 95% SO_2 control.

While the BART Guidelines allow special consideration for existing scrubbers achieving greater than 50% SO2 control, we do not believe that the Alcoa scrubbers were in existence at the time of their July 6, 2005 publication. Although we could not find a clear definition of an "existing scrubber" in the BART Guidelines, we suggest that the same reasoning provided by the BART Guidelines for determining if a source is "in existence"[4] would logically apply to a scrubber.

The only record we could find regarding permitting of the Alcoa scrubbers is an IDEM "Notice of Decision" dated December 29, 2005, five months after publication of the BART Guidelines:

On November 17, 2005, the Office of Air Quality (OAQ) received an interim significant source modification petition from Alcoa Power Generating Inc. (APGI) - Warrick Power Plant located at 4700 Darlington Road, Newburgh, Indiana for construction of wet scrubbers for sulfur dioxide reduction and for the accompanying construction of material handling facilities and modifications to the coal pulverizers and the boilers identified as Units 1, 2, 3, and 4.

We conclude that the Alcoa scrubbers were not "existing" at the time the BART Guidelines were published, and BART for Boilers 1 and 2 must be analyzed as if the scrubbers are not "existing." If BART is determined to be greater than the 92% control proposed by Alcoa/IDEM, then it is likely that Alcoa would need to either demonstrate that they will achieve the higher BART level or upgrade them to do so.

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[2] Twenty-four units were identified in the RBLC database that could be consider similar to the boiler units at Alcoa. Of these 24 units, approximately half utilized a form of dry flue gas desulfurization to control SO_2 emissions, seven used wet scrubbing to control SO_2 emissions, and the remaining units used other means such as low sulfur coal and good combustion practices. Of the 24 units in the database, 10 listed an SO_2 removal efficiency in the range of 90% to 95% with an average of 91.8%.

Based on the RBLC database analysis, which indicated an average control efficiency of 91.8% was BACT for SO_2 from industrial boilers, and Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (40 CFR 60 Subpart Db) requires a 92% removal efficiency for this type of source, if reconstructed, it was determined that 92% efficiency would be reasonable for units 2 and 3.

[3] Even though Boilers 2 and 3 are not subject to presumptive BART, it can be presumed that the technology assumed to achieve the presumptive limits for coal-fired EGUs greater than 200 MW can achieve similar results on the smaller coal-fired Alcoa boilers. We note that IDEM has referred to the presumptive BART limits for coal-fired EGUs greater than 200 MW in its review of NO_X BART.

[4] The visibility regulations define "in existence" in 40 CFR 51.301. Under these regulations, promulgated in 1980, "in existence" means that the owner or operator has obtained all necessary preconstruction approvals or permits . . . and either has (1) begun, or caused to begin, a continuous program of physical on-site construction of the facility or (2) entered into binding agreements or contractual obligations.

IDEM Response:
Alcoa used the 92% reduction level for the BART analysis for Boilers 2 and 3. The BART proposal was to control Boiler 1 at 91% and Boiler 2 and 3 at 90%, which still results in an overall improvement in visibility degradation. The actual modifications performed to the boilers were not extensive enough to trigger the 92% removal efficiency level requirements.

3. Boilers 2 and 3 - NOx
IDEM: Alcoa proposes low NOx Burners (LNB) and OFA with an emission limit equal to 0.38 lb/MMBtu as BART and as alternative BART for these boilers. U.S.EPA's presumptive BART limit for these boiler types is equal to 0.39 lb/MMBtu. Baseline modeling without these controls shows the highest visibility impact due to these boilers equal to 0.458 dv, which is projected to decrease to 0.064 dv with the above controls. Alcoa identified Selective Non-catalytic Reduction (SNCRs) and SCRs as feasible technologies to control NOx from these boilers; however, it did not perform visibility impact analysis with these technologies. The capital and annual costs of SNCR controls on these boilers are estimated at $3 million and $2.8 million respectively. The capital and annual costs of SCRs are estimated at $70 million and $13 million. Additional controls on these boilers are likely to yield visibility improvement at a very high cost/benefit ($/dv improvement).

Comment:
Alcoa has underestimated the effectiveness of SCR. Although Alcoa notes that "SCR is capable of NOx reduction efficiencies in the range of 70–90%," it assumed 78% control in its cost analyses. It is generally assumed that a properly designed and operated SCR can achieve at least 90% control.

Comment:
Alcoa did not perform a five-step BART analysis for SNCR and SCR for Boilers 2 and 3 because it did not perform visibility impact analysis with these technologies. The NOx controls proposed as BART are already required.

IDEM Response:
The NOx controls are significantly tighter than NSPS limits (0.38 lb/MMBTu vs. 0.70 lb/MMBTu), which are the "required" controls referenced. In the Alcoa evaluation of possible NOx controls, LNBs were found to be cost effective options for the boilers at about $160/ton of NOx removed. SCNR at approximately $3,300/ton removed and SCR at approximately $5,100/ton removed were not further evaluated as feasible alternatives for NOx removal.

4. Potlines
IDEM: The maximum impact from these sources is 0.231 dv. This includes contributions due to vents and primary controls. Sulfates are the main contributors, at approximately 0.188 dv. Contributions due to other species are less than 0.01 dv. Therefore, any add-on controls for these pollutants will result in insignificant improvements in visibility. Due to insignificant impact from vents (0.013 dv), Alcoa did not perform the 5-step analysis for these sources. Further, these sources are subject to 40 CFR 63, Subpart LL, Maximum Achievable Control Technology

(MACT). In order to comply with these standards, Alcoa follows work practices which minimize emissions escaping roof vents.

Sulfur dioxide from potlines can be controlled by lowering sulfur content in the anode grade coke and/or by installing wet scrubbers. Alcoa presently limits sulfur at ≤ 2%. From a market study, Alcoa has concluded that a supply of coke below 3% sulfur cannot be ensured beyond 2013, the year when the BART controls will be needed. Therefore it proposes ≤ 3% sulfur coke as BART and ≤ 3.5% sulfur coke as alternative BART. The 3.5% sulfur limit in the coke translates into 2.919% sulfur in the baked anode composite, the practice Alcoa follows to measure the sulfur content.

The installed and annual costs of wet scrubbers on potlines are estimated at $300 million and $55 million respectively. Modeling shows that SO2 scrubbers on potlines can improve visibility by 0.138 dv. This improvement will be achieved at a cost/benefit ratio equal to $398 million/dv. Also, there are severe space and access limitations at the facility that would complicate the installation.

Comment:
Alcoa is proposing to increase SO_2 emissions by 75% from this operation.

IDEM Response:
It is true that emissions will be increased due to the unavailability of 2% sulfur content petroleum coke and that is clearly explained in the discussion of the potline alternatives. This projected unavailability of 2% sulfur coke is the primary reason Alcoa proposed the alternative to BART. Taken in the context of a whole BART alternative, these increases, while approximately 75% for pot line emissions, are part of a scenario that results greater emissions reductions than straight BART.

5. Boilers 2, 3 and 4 - PM
IDEM: The maximum baseline impact due to filterable PM emissions from these sources is 0.035 dv. Alcoa proposes ESPs with an emission limit equal to 0.03 lb/MMBtu as BART controls for Boilers 2 and 3. Alcoa determined BART for Boiler 4 as 0.015 lb/MMBtu, but it proposes alternative BART for this boiler as 0.1 lb/MMBtu. This boiler has a LNB and SCR for NOx control. Alcoa has noticed excessive conversion of SO2 to SO3 in the SCR due to the addition of an extra catalyst layer. To reduce SO3, which has the potential to adversely affect the downstream equipment and in order to comply with the sulfuric acid limit in its permit, Alcoa has applied for a permit to install a dry reagent injection system between the SCR and ESP. This system will remove SO3 from the gas stream, but it is expected to adversely affect the performance of the downstream ESP. The impact of this system on the ESP performance is not yet known. To account for this uncertainty, Alcoa proposes 0.1 lb/MMBtu as the alternative BART limit. A recent test, after the startup of the SO2 scrubber on this boiler, measured an emission rate equal to 0.05 lb/MMBtu which includes PM and sulfuric acid.

The above limits are projected to lower the contribution from Boilers 2, 3, and 4 to approximately 0.005 dv. Alcoa identified fabric filters as feasible control technology for these

boilers. However, estimating that these controls will not significantly improve visibility, it did not perform cost and visibility impact analyses with these controls. It roughly estimated the cost of fabric filters on these boilers at $97.18 million. This estimate is based on the cost of a fabric filter installed on a utility boiler. Alcoa estimates that installation of fabric filters on these boilers will improve visibility by 0.024 dv at a cost/benefit ratio equal to $445 million/dv.

Comment:
Alcoa did not perform a five-step BART analysis for PM for Boiler 4. (For example, Alcoa should have investigated low-oxidation catalysts, fabric filtration, and wet ESPs.) Instead, **Alcoa is proposing to increase PM emissions from this unit.**

IDEM Response:
At IDEM's request, Alcoa provided information regarding the cost of adding a baghouse on each unit.

Alcoa evaluated fabric filtration for Boiler 4 , the installation cost on a $ / dv basis was shown to be unreasonable. PM emissions from Boiler 4 would be higher than the BART level of control of 0.015 lb./mm Btu, which is the NSPS for a new utility boiler. However, the alternative to BART emission reductions provided by Boiler #1 offsets the PM emissions that would exceed the BART alone level from Boiler 4, and would therefore meet the regional haze rule requirements.

<u>Impact of Adding Baghouses for Units 2, 3, and 4</u>
Based on information provided by another utility where baghouse control was installed, the capital cost for a baghouse on a 2830 mm Btu/hr. boiler was $49.7 mm. Assuming baghouse capital costs are proportional to heat input, the capital cost for the baseline heat inputs for the BART eligible boilers is estimated to be:

Boiler 2: 1364.41 mm Btu/hr. Estimated baghouse capital cost would be

(1364.41/2830) X $49.7 mm = $23.96 mm

Boiler 3: 1323.51 mm Btu/hr. Estimated baghouse capital cost would be

(1323.51/2830) X $49.7 mm = $23.24 mm

Boiler 4: 2845.79 mm Btu/hr. Estimated baghouse capital cost would be

(2845.79/2830) X $49.7 mm = $49.98 mm

Airflow for boiler 2: 347,149 scfm

Airflow for boiler 3: 335,372 scfm

Airflow for boiler 4: 796,416 scfm

Assuming the lowest emission rate a baghouse vendor will guarantee is 0.005 grains /scf, filterable PM emissions would be:

Boiler 2: (0.005 grains/scf) X (347,149 scf/min) X (60 min. /hr.) X (1 lb. /7000 grains) = 14.88 lbs./hr.

Boiler 3: (0.005 grains/scf) X (335,149 scf/min) X (60 min. /hr.) X (1 lb. /7000 grains) = 14.36 lbs./hr.

Boiler 4: (0.005 grains/scf) X (796,416 scf/min) X (60 min. /hr.) X (1 lb. /7000 grains) = 34.13 lbs./hr.

On an annualized basis, the filterable PM emissions would be 128.07 tons from boilers 2 and 3 combined, and 149.49 tons/yr. from boiler 4.

Because the baghouses will be upstream of wet scrubbers, the assumed baghouse vendor guarantee emissions is conservative because it does not take into account the added filterable PM from the scrubbers.

BART for filterable PM for all 3 boilers was electrostatic precipitators and SO2 scrubbers.

BART was proposed at 0.03 lb./mm Btu for boilers 1 and 2, and 0.015 lb./mm Btu for boiler #4.

BART annual filterable PM emissions would thus be:

Boiler 2: (0.03 lb./mm Btu) X (1364.41 mm Btu/hr.) X (8760 hrs/yr.) X (1 ton/2000 lbs.) = 179.28 tons/yr.

Boiler 3: (0.03 lb./mm Btu) X (1323.51 mm Btu/hr.) X (8760 hrs/yr.) X (1 ton/2000 lbs.) = 173.91 tons/yr.

Boiler 4: (0.015 lb./mm Btu) X (2845.79 mm Btu/hr.) X (8760 hrs/yr.) X (1 ton/2000 lbs.) = 186.97 tons/yr.
Detailed engineering would have to take into consideration the available real estate for installation of baghouses, removal of the precipitators or routing the exhaust gases in series through the precipitators, baghouses then downstream pollution removal equipment, present boiler and pollution control equipment configurations, ash handling from the ash removed by the baghouses, etc. Those factors would increase the capital cost assumptions used above.

For the $/ton and $/dv improvement derived below, and the present prevailing economic conditions, Alcoa Power Generating Inc. – Warrick Power Plant does not understand the usefulness of performance of such a study.

Assuming an annualized cost of 11% of the assumed capital costs, the annualized cost on a $/ton difference between the alternative to BART proposal and baghouses would be:
Boilers 2 and 3: 11% of $47.2 mm = $5,192,000 / yr.

BART emissions: 353.19 tons/yr.

Baghouse: 128.07 tons/yr.

Baghouse additional removal: (353.19 – 128.07) tons/yr. = 225.12 tons/yr.

$ / ton impact: $5,192,000 / 225.12 tons/yr. = $23,063.26 / ton

Boiler 4: 11% of $49.98 mm = $5,497,800 / yr.

BART emissions: 186.97 tons/yr.

Baghouse: 149.49 tons/yr.

Baghouse additional removal: (186.97 – 149.49) tons/yr. = 37.48 tons/yr.

$ / ton impact: $5,497,800 / 37.48 tons/yr. = $146,686.23 / ton

Baseline visibility impact, filterable PM, boilers 2 and 3: 0.027 dv, based on 2003 (See revised table 5-2 in the BART determination report).

The assumed baghouse outlet emissions would result in a filterable PM reduction of:

Baseline: 635.02 lbs/hr.

Baghouse: 63.37 lbs./hr.

Reduction: [(635.02 – 63.37)/635.02] X 100 = 90.02%

A reduction of 90.02% in the visibility impact would represent a dv impact reduction of:

0.027 dv X (90.02/100) = 0.024 dv

The annualized cost for baghouses on a $/dv basis would thus be:

$(5,192,000 + 5,497,800) / 0.024 dv = $445 mm / dv

The above 11% of capital assumption does not consider such operating costs as increased pressure drop represented by the baghouse, possible de-rating of the boiler, and the baghouse being upstream of a wet scrubber. The above cost estimates are thus low, but still show that the extra cost represented by baghouses is unreasonable both from a $/ton and $/dv basis.

6. Ingot furnaces

IDEM: The maximum baseline impact from these sources is 0.003 dv. Due to insignificant impact from these sources, Alcoa did not perform a 5-step BART analysis for these sources.

Comment:
Conclusions & Recommendations
According to IDEM, the proposed BART Alternative achieves a visibility improvement equal to 0.46 dv and an overall improvement in visibility equal to 75% over the baseline and achieves significantly higher reductions in SO_2, equal to approximately 21,600 tons. While we recognize the emission reductions and visibility improvements that result from Alcoa's compliance with New Source Review and NSPS requirements, we believe that the proposed BART Alternative improperly relies upon SO_2 emission reductions that are already required by NSPS.

Instead, it appears that Alcoa is proposing to increase PM emissions from Boiler #4 and SO_2 emissions from the potlines, which is contrary to the fundamental premise of BART, unless it can at least be shown that the additional reductions of SO_2 from Boiler #1—reductions beyond the 90% required by NSPS—result in more visibility improvement than the 1.5 dv that would be achieved if Alcoa met its proposed BART. (If BART is determined to be more stringent than proposed by Alcoa, then additional visibility improvements would be needed.) For example, it may be necessary to model the following scenarios:

1. Baseline, BART-eligible units and Boiler #1@ 90% SO_2 control
2. BART, BART-eligible units and Boiler #1@ 90% SO_2 control
3. Alternative BART

If Scenario #3 achieves greater visibility improvement than Scenario #2, then the Alternative BART would be acceptable.

IDEM Response:
IDEM believes that the emissions reductions associated with the NSPS for Boiler 1 should be included as part of the BART engineering analysis. Therefore, the modeling that has been conducted to date is valid. Review of the modeling results shows that the percent improvement from BART Eligible baseline to the BART control and BART Eligible baseline with Unit #1 to Alternative to BART fall within 4% of each other with a greater deciview improvement from the Alternative to BART scenario, which would average nearly 2 deciview improvement.

Table 6-1 Visibility Impacts at Mammoth Cave National Park – BART Eligible Baseline Emissions

Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	46.13	22.36	3.275	1.852
2002	56.17	23.38	3.722	1.906
2003	37.03	21.40	2.787	1.788
2001-2003	56.17	22.38	3.722	1.849

Table 6-5 Visibility Impacts at Mammoth Cave National Park – BART Control Level Emissions

Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	9.18	4.60	0.850	0.444
2002	10.46	3.07	0.958	0.299
2003	10.75	4.16	0.992	0.402
2001-2003	10.46	3.94	0.933	0.382

Visibility Impacts at Mammoth Cave National Park – Difference between BART Eligible Baseline Emissions and BART Control Level Emissions				
Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	36.95	17.76	2.425	1.408
2002	45.71	20.31	2.764	1.607
2003	26.28	17.24	1.795	1.386
2001-2003	45.71	18.44	2.789	1.467

Percentage Difference between BART Eligible Baseline and BART Control Emissions				
2001	80.10%	79.43%	74.05%	76.03%
2002	81.38%	86.87%	74.26%	84.31%
2003	70.97%	80.56%	64.41%	77.52%
2001-2003	81.38%	82.39%	74.93%	79.34%

Table 6-2 Visibility Impacts at Mammoth Cave National Park – BART Eligible Baseline + Unit 1 Emissions				
Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	60.69	28.81	4.042	2.311
2002	85.38	35.39	4.570	2.774
2003	55.30	31.61	3.329	2.549
2001-2003	85.38	31.94	4.570	2.545

Table 6-3 Visibility Impacts at Mammoth Cave National Park – Alternative to BART Emissions				
Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	13.98	7.24	1.265	0.686
2002	16.33	4.81	1.446	0.463
2003	14.85	5.75	1.323	0.549
2001-2003	16.33	5.93	1.345	0.566

Visibility Impacts at Mammoth Cave National Park – Difference between BART Eligible Baseline + Unit 1 Emissions and Alternative to BART Emissions				
Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	46.71	21.57	2.777	1.625
2002	69.05	30.58	3.124	2.311
2003	40.45	25.86	2.006	2.000
2001-2003	69.05	26.01	3.225	1.979

Percentage Difference between BART Eligible Baseline + Unit 1 and Alternative to BART Emissions				
2001	76.96%	74.87%	68.70%	70.32%
2002	80.87%	86.41%	68.36%	83.31%
2003	73.15%	81.81%	60.26%	78.46%
2001-2003	80.87%	81.43%	70.57%	77.76%

Difference between BART eligible baseline and baseline + Unit 1				
Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	14.56	6.45	0.767	0.459
2002	29.21	12.01	0.848	0.868
2003	18.27	10.21	0.542	0.761
2001-2003	29.21	9.56	0.848	0.696

Difference between Alternative to BART and BART Control				
Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	4.8	2.64	0.415	0.242
2002	5.87	1.74	0.488	0.164
2003	4.1	1.59	0.331	0.147
2001-2003	5.87	1.99	0.412	0.184

Year	Maximum Delta Bext	98th Percentile Delta Bext	Maximum Delta	98th Percentile Delta
	(%)	(%)	(DV)	(DV)
2001	9.76	3.81	0.352	0.217
2002	23.34	10.27	0.36	0.704
2003	14.17	8.62	0.211	0.614
2001-2003	23.34	7.57	0.436	0.512

Table 6-7 Source and Specie Contributions to 8th Highest Extinction changes for BART Eligible Baseline at Mammoth Cave

Source Group	Bext Change	Contribution to Total Bext	Modeled Extinction	SO4 Contribution	NO2 Contribution	Organics Contribution	Elemental Carbon Contribution	PM Coarse Contribution	PM Fine Contribution
	(%)	(%)	Mn^{-1}	Mn^{-1}	Mn^{-1}	Mn^{-1}	Mn^{-1}	Mn^{-1}	Mn^{-1}
All Sources	22.380	100.000	4.818	4.087	0.574	0.066	0.000	0.001	0.089
Lines	0.080	0.367	0.017	1.336	0.000	0.007	0.000	0.001	0.005
GTC	0.493	2.213	0.106	0.098	0.001	0.004	0.000	0.000	0.003
A-398s	0.680	3.073	0.146	0.135	0.001	0.004	0.000	0.000	0.004
Melter/Holders	0.020	0.033	0.002	0.033	0.004	0.000	0.000	0.000	0.001
WPP01	4.870	21.740	1.049	0.890	0.145	0.006	0.000	0.000	0.008
WPP02	15.923	71.130	3.429	2.960	0.425	0.018	0.000	0.000	0.022
WPP03	0.313	1.443	0.067	0.000	0.000	0.023	0.000	0.000	0.045

Chapter 9 Long Term Strategy

Comment:

Indiana needs to provide a more complete discussion of the long term strategy. The Strategy should list all the existing control programs that Indiana is implementing. Does the State have rules to limit emissions from construction sources? Indiana appears to rely on existing controls under CAIR or the proposed Transport Rule and existing federal requirements to reduce mobile sources. The State has not discussed any controls or consideration of controls beyond those required for other regulatory purposes.

The Federal Land Managers request that Indiana acknowledge the connection between new emission permitting under New Source Review and the Regional Haze Rule visibility improvement goals to return to natural background visibility conditions by 2064. We recommend that the State commit to considering the visibility impacts as part of the New Source Review.

IDEM Response:
Indiana has state rules with specific requirements that apply to emissions from construction sources and visibility. First, "rules to limit emissions from construction sources", IDEM thinks that all Class 1 areas are far enough away from any construction sources in Indiana that there would be no impact on visibility. However, Indiana's Article 6 Particulate Rules, Rule 6-4, Fugitive Dust Emissions, limits fugitive emissions from construction activities. Second, "adverse impact on visibility" is defined and the responsibilities of sources impacting federal Class I areas outlined in Indiana's Article 2 Permit Review Rules, Rule 2-2, Prevention of Significant Deterioration (PSD) Requirements. The following sections are taken from Indiana Administrative Code that covers the Air Pollution Control Board.

326 IAC 2-2-1 Definitions
(c) "Adverse impact on visibility" means visibility impairment that interferes with the management, protection, preservation, or enjoyment of the visitor's visual experience of the federal Class I area as defined in section 13 of this rule. This determination must be made on a case-by-case basis taking into account the geographic extent, intensity, duration, frequency, and time of visibility impairment, and how these factors correlate with:
(1) times of visitor use of the federal Class I area; and
(2) the frequency and timing of natural conditions that reduce visibility.

326 IAC 2-2-14 Sources impacting federal Class I areas: additional requirements
Sec. 14. (a) The department shall provide written notice of any permit application for a proposed major stationary source or major modification, the emissions from which may affect a Class I area, to the federal land manager and the federal official charged with direct responsibility for management of any lands within any such area. Such notification shall be given within thirty (30) days of receipt of a permit application and at least sixty (60) days prior to any public hearing on the application for a permit to construct and shall include the following:
(1) A copy of all information relevant to the permit application.
(2) An analysis of the proposed source's anticipated impacts on visibility in the federal Class I area. The department shall also provide the federal land manager and such federal officials with a copy of the preliminary determination required under this section, and shall make available to them any materials used in making that determination, promptly after the department makes the determination. The department shall also notify all affected federal land managers within thirty (30) days of receipt of any advance notification of any such permit application.

(b) The federal land manager and the federal official charged with direct responsibility for management of the Class I area have an affirmative responsibility to protect the air quality related values, including visibility, of the Class I area and to consider, in consultation with U.S. EPA, whether a proposed source or modification will have an adverse impact on such values.

(c) The department shall consider any analysis performed by the federal land manager, provided to the department within thirty (30) days of the notification required by subsection (a), that shows that a proposed new major stationary source or major modification may have an adverse impact on visibility in any federal Class I area. Where the department finds that the analysis does not demonstrate to the satisfaction of the department that an adverse impact on visibility will result in the federal Class I area, the department must, in the notice of public hearing on the permit application, either explain the decision or give notice as to where the explanation may be obtained.

(d) The federal land manager of any Class I area may demonstrate to the department that the emissions from a proposed major stationary source or major modification would have an adverse impact on the air quality-related values, including visibility, of a Class I area, notwithstanding that the change in air quality resulting from emissions from the major stationary source or major modification would not cause or contribute to concentrations that would exceed the maximum allowable increases for a Class I area. If the department concurs with the demonstration, then the department shall not issue the permit.

(e) The owner or operator of a proposed major stationary source or major modification may demonstrate to the federal land manager that the emissions from the source or modification would have no adverse impact on the air quality related values of any Class I areas, including visibility, notwithstanding that the change in air quality resulting from emissions from the major stationary source or major modification would cause or contribute to concentrations that would exceed the maximum allowable increases for a Class I area. If the federal land manager concurs with the demonstration and the federal land manager so certifies, the department may issue the permit provided that the applicable requirements of this section are otherwise met, to issue the permit with emission limitations as may be necessary to assure that emissions of sulfur dioxide, particulate matter, and nitrogen oxides shall not exceed the following maximum allowable increases over minor source baseline concentration for such pollutants:

Pollutant	Maximum Allowable Increase (Micrograms Per Cubic Meter)
Particulate matter:	
PM10, annual arithmetic mean	17
PM10, 24 hour maximum	30
Sulfur dioxide:	
Annual arithmetic mean	20
24 hour maximum	91
3 hour maximum	325
Nitrogen dioxide:	
Annual arithmetic mean	25

(f) The owner or operator of a proposed major stationary source or major modification that cannot be approved under subsection (e) may demonstrate to the department that the source cannot be constructed by reason of any maximum allowable increase for sulfur dioxide for a period of twenty-four (24) hours or less applicable to any Class I area and, in the case of federal mandatory Class I areas, that an exemption under this subsection would not adversely affect the air quality related values of the area, including visibility. The department, after consideration of the federal land manager's recommendation, if any, and subject to the federal land manager's

concurrence, may, after notice and public hearing, grant an exemption from such maximum allowable increase. If such exemption is granted, the department shall issue a permit to such major stationary source or major modification pursuant to the requirements under subsection (h) provided that the applicable requirements of this section are otherwise met.

(g) In any case where the department recommends an exemption in which the federal land manager does not concur, the recommendations of the department and the federal land manager shall be transmitted to the president. The president may approve the department's recommendation if the president finds that the exemption is in the national interest. If the exemption is approved, the department shall issue a permit pursuant to the requirements under subsection (h) provided that the applicable requirements of this section are otherwise met.

(h) In the case of a permit issued pursuant to subsection (f) or (g), the major stationary source or major modification shall
comply with such emission limitations as may be necessary to assure that emissions of sulfur dioxide from the major stationary source or major modification would not, during any day on which the otherwise applicable maximum allowable increases are exceeded, cause or contribute to concentrations that would exceed the following maximum allowable increases over the baseline concentration and to assure that such emissions would not cause or contribute to concentrations that exceed the otherwise applicable maximum allowable increases for periods of exposure of twenty-four (24) hours or less for more than eighteen (18) days, not necessarily consecutive, during any annual period:

Maximum Allowable Increase
(Micrograms Per Cubic Meter) of Sulfur Dioxide

	Terrain Areas	
Period of Exposure	Low	High
24 hour maximum	36	62
3 hour maximum	130	221

(i) The department shall transmit to the U.S. EPA a copy of each permit application relating to a major stationary source or major modification and provide notice to the U.S. EPA of the following actions related to consideration of such permit under this
section:

(1) Receipt of an advanced notification of a permit application affected by this section.

(2) Any written notice provided to the federal land manager under this section.

(3) Public notice of a preliminary determination.

(4) Notices of public hearings.

(5) Decisions to grant or deny exemptions in accordance with this section.

(6) Any decision in accordance with subsection (c) that an analysis submitted by the federal land manager does not demonstrate
to the satisfaction of the department that an adverse impact on visibility will result in the Class I area.

(7) Denial of a permit.

(8) Issuance of a permit.

United States Department of the Interior
NATIONAL PARK SERVICE
Air Resources Division
P.O. Box 25287
Denver, CO 80225

IN REPLY REFER TO:

January 3, 2011

N3615 (2350)

Ken Ritter
Air Programs Branch
IDEM Office of Air Quality
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

Dear Mr. Ritter:

On November 5, 2010, we received Indiana's draft State Implementation Plan to address regional haze. We appreciate the opportunity to work closely with the State through the initial evaluation, development, and review of this plan. Cooperative efforts such as these ensure that, together, we will continue to make progress toward the Clean Air Act's goal of natural visibility conditions at all of our most pristine National Parks and wilderness areas for future generations.

This letter acknowledges that the U.S. Department of the Interior, National Park Service (NPS), in consultation with the U.S. Fish and Wildlife Service (FWS), has received and conducted a substantive review of your revised proposed Regional Haze Rule implementation plan in fulfillment of your requirements under the federal regulations 40 CFR 51.308(i)(2). Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination regarding the document's completeness and, therefore, ability to receive federal approval from EPA.

As outlined in a letter to each State dated August 1, 2006, our review focused on eight basic content areas. The content areas reflect priorities for the Federal Land Manager agencies, and we have enclosed comments associated with these priorities.

We look forward to your response, as per section 40 CFR 51.308(i)(3). For further information regarding our comments, please contact Pat Brewer at (303) 969-2153.

Again, we appreciate the opportunity to work closely with the State of Indiana to improve visibility in our Class I areas.

Sincerely,

John Bunyak
Acting Chief, Air Resources Division

Enclosures

cc:
John Summerhays
U.S. EPA Region 5
77 W. Jackson Blvd.
Chicago, Illinois 60604

National Park Service Comments
Indiana Draft Regional Haze State Implementation Plan (SIP)
January 3, 2011

The National Park Service received Indiana's draft regional haze state implementation plan (SIP) on November 5, 2010. The National Park Service, in consultation with the Fish and Wildlife Service, has reviewed the draft plan consistent with the priorities that we detailed to Indiana in a letter dated August 2006. Our comments below address those priorities. We are available to assist Indiana in addressing our recommendations.

There are no Class I areas within the State of Indiana. Indiana Department of Environmental Management (IDEM) cites the monitoring analyses and regional inventory and modeling by the Midwest Regional Planning Organization (MRPO) and the neighboring Regional Planning Organizations (RPOs) as evidence that Indiana is meeting the requirements of the regional haze rule. However, additional documentation in the Indiana SIP is necessary to describe the pollutant contributions to visibility impairment at Class I areas impacted by Indiana and how emissions controls that are underway or planned in Indiana are sufficient to demonstrate reasonable progress by Indiana in reducing visibility impairment. Specific examples of additional documentation are described below.

Chapter 2 Regional Planning
IDEM has identified 19 Class I areas that are impacted by Indiana emissions. Table 1 in Appendix 1 lists the specific Class I areas that Indiana impacts and cites the technical analyses that support that determination. It would be helpful to include Table 1 in the SIP Chapter 2.

Chapter 4 Baseline Conditions, Pollutant Contribution, Uniform Rate of Progress
IDEM cites work of MRPO and other states but does not provide any information to illustrate the baseline visibility conditions, the pollutant contributions, and the needed visibility improvement. We recommend that IDEM pick a Class I area from each region and include in Chapter 4 a summary of pollutant contributions in the baseline period for the average of the 20% worst days and monthly or daily time series from the IMPROVE data to illustrate the temporal variation in pollutant contributions.

As part of the contribution assessment IDEM should explicitly state which pollutants would be most effective to control to improve visibility at the impacted Class I areas. We also recommend illustrating the glidepaths for the uniform rate of progress for the selected Class I areas or at least adding these data to the Appendices and citing in Chapter 4 where the data can be found.

Chapter 5 Emissions Inventory
This chapter very briefly summarizes the methods used by the MRPO to develop the 2005 and future year inventories. Please include the MRPO Technical Support Document as an Appendix.

Table 3 summarizes the Electric Generating Unit (EGU) projections from the Integrated Planning Model (IPM) Version 3.0 for three scenarios. Please provide more detailed explanation

how the three scenarios differ and explicitly why sulfur dioxide (SO_2) and nitrogen oxides (NO_x) emissions for Indiana are lower in Scenario 5a than Scenarios 5b and 5c.

IDEM needs to discuss the projected emissions changes between 2005 and 2018 as evidence that Indiana is making reasonable progress. Table 4 does not appear to be cited or discussed in the text, yet this is the most important data for demonstrating Indiana's emission reductions. Please provide emissions summaries in Table 4 as tons/year rather than tons/day to avoid questions how to account for weekly and seasonal variability to scale to tons/year values.

Chapter 6 Modeling Assessment

IDEM relies on the MRPO modeling. Please include the MRPO Technical Support Document in an Appendix. A discussion of model performance is necessary to demonstrate confidence in model projections. There is not an Attainment Test for regional haze; you could delete the Section 6.2 header and cover the material under Section 6.1.

The wording in the last paragraph on page 22 is confusing as written. Please clarify your intent. If model results are less than the uniform rate of visibility improvement does that mean greater visibility improvement than the uniform rate?

The scenario terms used in Tables 6 and 7 are not the same as described in Chapter 5 Emissions Inventory. Please explain how the terms for the emissions assumptions in Tables 6 and 7 relate to the scenarios in Table 4. How does "Will Do" compare to Scenario 5a, 5b, or 5c? Do the "Will Do" adjustments pertain only to the EGU sector? Please provide additional clarification on what assumptions are included in the modeled scenarios.

Chapter 7 Reasonable Progress Goals

Please add reference to Appendix 1 for contribution assessments from MRPO and other RPOs and Appendix 2 for letters from states requesting consultation.

We agree that based on the contribution assessments presented in Appendix 1 and 3 and in sections 7.2-7.9, Indiana sources have comparatively small contributions to Class I areas in neighboring states.

To comply with the Regional Haze Rule Sections 308(d)(3)(ii) and (iv), IDEM still needs to demonstrate that it has included in its long term strategy all measures needed to achieve its share of emission reductions and to identify all anthropogenic sources of visibility impairment considered in developing the long term strategy. IDEM has cited modeling results of MRPO and neighboring RPOs, but IDEM still needs to evaluate its emission sources and demonstrate using a four factor analysis that Indiana is making reasonable progress in reducing anthropogenic emissions. This demonstration should evaluate the monitoring, emissions inventory, and modeling data to determine which pollutants are most important to control, what reductions are already expected by 2018, what source categories are major contributors in 2018, and evaluate the four factors for those major source categories. The MRPO provided a four factor analysis for major source categories that IDEM could cite in evaluating what control measures are feasible and reasonable for specific stationary sources.

Several states have used emissions (Q) divided by distance (d) as a screening method to prioritize which stationary sources to consider in a reasonable progress analysis. If IDEM considered a Q/d for SO_2 +NO_x = 10 for sources with emissions of SO_2+NO_x greater than 200 tons/year, IDEM would likely be able to focus the reasonable progress analysis on specific stationary sources within a few major source categories. The VISTAS and CENRAP Areas of Influence are another method to identify which sources in Indiana should be evaluated for reasonable progress.

Chapter 8 Best Available Retrofit Technology (BART)

Please add greater description of the data presented in Table 10, BART-eligible Electric Generating Units (EGU) covered by the Clean Air Interstate Rule (CAIR) and discuss the implications in the text. Does Table 10 cover all EGU in Indiana including those units that are BART-eligible, those units listed by MANE-VU, and all other units? Please clarify what assumptions were used for each column. Does column "2009 + Projected" include only legally enforceable controls? What criteria were used to include a future control date? Does each succeeding column to the right include only controls that were not included in previous columns? If the LADCO column is empty does that mean that the controls assumed by IPM are legally enforceable and included in the LADCO modeling or not legally enforceable and not included in the LADCO modeling? Please make clear in the text that controls modeled by IPM Version 3.0 are estimates and may not be legally required.

Section 8.4 BART Exemptions for ArcelorMittal-Burns Harbor, ESSROC-Speed, and SABIC

Based on our conference call on December 13, 2010, we understand that the ammonia values used in the final BART exemption modeling differed from the values cited in the MRPO BART modeling protocol. We request that IDEM update this section to clarify the revised ammonia values that better reflect measured values in the region. Because the visibility impacts of the three sources did not exceed the contribution threshold using the revised ammonia values, if IDEM updates the cited analytical methods to reflect the revisions, we can support the BART exemptions.

Section 8.7 BART determination for Alcoa

We question whether it is valid to take credit as a BART Alternative for SO_2 and NO_x reductions that were required under New Source Performance Standards (NSPS) when Alcoa increased the capacities of Boilers 1, 2, and 3. Boilers 2 and 3 are subject to BART; Boiler 1 is not. Boiler 4 is classified as an EGU and is also subject to BART. Wet flue gas desulfurization (FGD) scrubbers were installed on all boilers in 2008. For SO_2, NSPS requires 90% control. IDEM proposes to use SO_2 reductions for Boiler 1 to offset the difference between BART (92% control) and proposed controls (90% control) for Boilers 2 and 3. IDEM credits the scrubber installed on Unit 1 as achieving significantly higher reductions in SO_2, equal to approximately 21,600 tons, than would be achieved by BART. However we understand that because Boiler 1 was required by NSPS to reduce SO_2 emissions by 90%, Alcoa can take credit in the BART Alternative for only the difference between the required 90% reduction and the proposed 91% reduction at Boiler 1. We do not believe that it is valid to use reductions that are required by permit to meet NSPS at Boiler 1 to also satisfy BART for the Boilers 2 and 3.

Alcoa and IDEM have underestimated the efficiency of scrubbers (95%) and Selective Catalytic Reduction, SCR (90%). As well, Alcoa and IDEM are also proposing to increase SO_2 and PM emissions from BART sources (potlines) above current levels. We do believe that the existing analyses support the determination that the BART Alternative is better than BART.

Our detailed comments on the BART determination are attached.

Chapter 9 Long Term Strategy

Indiana needs to provide a more complete discussion of the long term strategy. The Strategy should list all the existing control programs that Indiana is implementing. Does the State have rules to limit emissions from construction sources? Indiana appears to rely on existing controls under CAIR or the proposed Transport Rule and existing federal requirements to reduce mobile sources. The State has not discussed any controls or consideration of controls beyond those required for other regulatory purposes.

The Federal Land Managers request that Indiana acknowledge the connection between new emission permitting under New Source Review and the Regional Haze Rule visibility improvement goals to return to natural background visibility conditions by 2064. We recommend that the State commit to considering the visibility impacts as part of the New Source Review.