Appendix 3 - Assessment of Class 1 Areas Impacted by Indiana Sources

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Background

IDEM assessed each of the areas identified in the MRPO report (Appendix 1) as being impacted by Indiana sources. Information provided by the MRPO, technical documents from the other RPOs, and letters received from other states indicating their decisions regarding reasonable further progress goals were used to make these assessments.

Class 1 areas outside the comprehensive lists in Section 5 were not analyzed further, as there was no impact from Indiana sources shown. Further, no impacts from Indiana were noted in the WRAP states and no requests for controls were initiated by those states.

In the following sections, these analyses are presented.

App. 3 - 1. Voyageurs National Park and Boundary Waters Canoe Area Wilderness

Indiana sources have shown an impact on these Class 1 areas through some modeling studies. Minnesota has determined that several states, not including Indiana, are significant contributors to visibility impairment in these areas at this time and is working with them as they develop their reasonable progress goals.

The following cover letter from the Minnesota Pollution Control Agency contains this information. Indiana has participated in the consultation calls and the MRPO modeling process used by Minnesota to reach their conclusions.

As can be seen in the map on page 6 of the letter, Indiana is barely in the Area of Influence that impact their Class 1 areas. Minnesota has developed a long term strategy sufficient to meet their 2018 reasonable progress goals.

Indiana concurs that this is the best approach for addressing visibility impairment at Voyagers and Boundary Waters Class 1 areas at this time. Therefore, no further analysis for this SIP is necessary.

Minnesota Pollution Control Agency
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September 19, 2007

TO: Participants in the Northern Class I Areas Consultation Process

RE: Northern Class I Areas Consultation Conclusion

As you are aware, Minnesota is home to two federal Class I areas, Voyageurs National Park (VNP) and the Boundary Waters Canoe Area Wilderness (BWCAW), located in the northern portion of the state. Under the federal Regional Haze Rule (40 CFR 51.300-309), the State of Minnesota is required to work to improve visibility in these two areas, with a goal of no man-made visibility impairment by 2064.

Under the portion of the Regional Haze regulations at 40 CFR 51.308(d)(1)(iv), states with Class I areas are required to develop reasonable progress goals (RPG) for visibility improvement at their Class I areas and associated measures to meet those goals, in consultation with any other State or Tribe that may reasonably cause or contribute to visibility impairment in those areas. This letter provides information on how Minnesota intends to address the reasonable progress goals, identification of the states that cause or contribute to visibility impairment in Minnesota's Class I areas, and our expectations for continued coordination with those states on haze-reducing strategies.

Beginning in 2004 and 2005, a number of discussions were held between state and tribal representatives in the upper Midwest concerning air quality planning to address regional haze in the four Class I areas in Michigan and Minnesota. Formal discussions geared toward the State Implementation Plans (SIP) consultation requirements began in July 2006, in a conference call among representatives from Iowa, Michigan, Minnesota, North Dakota, Wisconsin, the Mille Lacs and Leech Lake bands of Ojibwe, and Federal Land Managers (FLM), Regional Planning Organization (RPO) and U.S. Environmental Protection Agency (EPA) personnel. It was decided that other potentially contributing states should be asked to participate in the consultation process, and that consultation should continue through ongoing conference calls during the development of the regional haze SIP. Minutes of the conference calls and other documentation can be found on the Lake Michigan Air Directors Consortium/Midwest Regional Planning Organization (LADCO/MRPO) Web site.[1]

The group consulted on technical information, producing a document entitled *Regional Haze in the Upper Midwest: Summary of Technical Information*, which lays out the basic sources that cause and contribute to haze in the four Northern Class I areas, as agreed to by all the participating states.[2]

[1] http://www.ladco.org/Regional_haze_consultation.htm
[2] http://www.ladco.org/Final%20Technical%20Memo%20-%20Version%205d1.pdf

Based on the technical information contained in this document and other supporting analyses, Minnesota has determined that, in addition to Minnesota, Illinois, Iowa, Missouri, North Dakota, and Wisconsin are significant contributors to visibility impairment in VNP and the BWCAW. Attachment 1 to this letter provides a summary of how Minnesota reached this conclusion.[3]

The Minnesota Pollution Control Agency (MPCA) has not yet completed modeling to determine the RPG for these two Class I Areas. However, because of the varying timelines and different non-attainment issues impacting Minnesota and other contributing states, Minnesota intends to submit a RPG resulting from implementation of the minimum interim control measures Minnesota would consider to be reasonable. This decision reflects the need for more in-depth analysis before additional control measures can be determined to be reasonable. The RPG would be revised in the Five Year SIP Assessment to reflect final control measures.

In addition to on-the-books controls, such as the Clean Air Interstate Rule (CAIR), Minnesota expects the RPG to reflect Best Available Retrofit Technology (BART) determinations in Minnesota and surrounding states (where known), the plan for a 30 percent reduction in combined sulfur dioxide (SO_2) and nitrogen oxides (NO_X) emissions in Northeastern Minnesota, voluntary emission reductions planned by Minnesota utilities beyond those predicted from CAIR, and, where known, any additional control measures undertaken in other states for regional haze or attainment purposes. The MPCA expects that the modeling information needed to set the RPG would be available by October 2007.

Minnesota commits to evaluating additional control measures and implementing those that are reasonable under the four factors listed in 40 CFR 51.308(d)(1)(i)(A) in the 2008 SIP. Minnesota expects that additional control measures may be found to be reasonable, and commits to including a plan for implementation of those additional reasonable measures in the Five Year SIP Assessment. Minnesota asks the five other significantly contributing states to make these same commitments for further evaluation and implementation of reasonable control measures.

In particular, Minnesota asks Iowa, Missouri, North Dakota, and Wisconsin to evaluate further reductions of SO_2 from electric generating units (EGU) in order to reduce SO_2 emissions by 2018 to a rate that is more comparable to the rate projected in 2018 for Minnesota, approximately 0.25 lbs/mmBtu. Minnesota believes that Illinois is already in the process of meeting this goal. Emission reductions in Wisconsin are particularly important, as Wisconsin is the highest contributor outside Minnesota to visibility impairment in Minnesota's Class I areas.

Minnesota also asks North Dakota to evaluate the potential for reductions of NO_X from EGUs due to predicted higher NO_X emission rates compared with Minnesota and other contributing states. Illinois, Missouri, and Wisconsin are in the process of evaluating NO_X emission

[3] Minnesota is relying primarily on data analysis and technical work done by MRPO and CENRAP.

reductions for their ozone SIPs. Minnesota would expect these three states to share information on the NO_X controls being undertaken as part of those ozone SIPs.

Minnesota acknowledges that each state is in a unique position; for example, North Dakota has a different regulatory background and a different fuel mix than other contributing states. Minnesota's use of emission rates to point towards areas where additional emission control strategies should be investigated does not mean that Minnesota expects all the contributing states to achieve the same emission rates. However, the contributing states with higher emission rates should evaluate potential control measures, and should, in their initial SIPs or Five Year SIP Assessments, show either enforceable plans to reduce emissions or a rationale for why such emission reductions are not reasonable (e.g., an overly high cost in $/ton or $/deciview, or lack of visibility improvement).

Minnesota, in turn, also commits to a more detailed review of potential emission reductions from large Industrial, Commercial, and Institutional (ICI) Boilers and other point sources (such as reciprocating engines and turbines) with regulations or permit limits developed by 2013 and included in the Five Year SIP Assessment if control measures on these source categories appear to be reasonable. Minnesota asks the five contributing states to make a similar commitment.

It is the intent of Minnesota to proceed with the development and submittal of a Regional Haze Plan which includes the aforementioned RPG and expectations for contributing states. Minnesota commits to continuing work with the other states to review and analyze potential region-wide control strategies and emission reductions plans and to continue on-going assessments of progress towards visibility improvement goals.

Minnesota asks that any additional control measures found to be reasonable will be included in each state's SIP or Five Year SIP Assessment in an enforceable form. This will ensure that the control measures are on track to be implemented by the 2018 deadline for submittal of SIPs covering the second phase of the Regional Haze process.

Minnesota believes that the consultations conducted to date satisfy the consultation process requirements, providing for consistency between state SIPs and allowing each state to move forward with SIP preparation and submittal. As necessary, Minnesota will engage in future consultation to address any issues identified in the review of the Regional Haze SIPs, any additional technical information, and to ensure continued coordinated efforts among the Midwestern states.

Attached to this letter is an outline of the reasonable progress discussion to appear in our SIP and additional supporting tables and graphs.

In order to document the consultation process, the MPCA is asking that the State and Tribal recipients of this letter respond within 30 days with a letter documenting that these consultations have taken place to the satisfaction of your State or Tribe, or detailing areas where additional

consultation should occur. Those states that Minnesota has identified as additional contributing states should respond with your agreement or disagreement with the determination of contributing states and the additional controls strategies that will be evaluated.

Thank you for your participation and contributions in this consultation process. Your time and efforts are appreciated. If you require additional information regarding this matter, please contact John Seltz at 651-296-7801 or john.seltz@pca.state.mn.us.

Sincerely,

Brad Moore
Commissioner

BM/CN:ld:tgr

Attachments

Attachments Showing Minnesota RPG Analysis

Attachment 1: Supporting Technical Information – Determination of Contributing States

Minnesota used the LADCO 2002 – 2003 Trajectory Analyses and the LADCO 2018 PSAT analysis, using a 5% threshold of contribution from either analysis to either of Minnesota's Class I areas, to define a contributing state. Based on this information, the States identified as contributing to visibility impairment in Minnesota's Class I Areas are: Minnesota, Wisconsin, Illinois, Iowa, Missouri, and North Dakota.

The table below documents the percent contribution to visibility impairment by the States that have participated in the Northern Class I consultation process, estimated from 2000 – 2003 LADCO trajectory analysis, with supporting information from the CENRAP 2002 PSAT model of the 20% worst days.[4]

State Impacts on Minnesota's Class I Areas – Baseline Period

	LADCO Trajectory Analyses (2000-2003)		CENRAP PSAT Modeling (2002)	
	BWCAW	VNP	BWCAW	VNP
Michigan	0.7%	1.6%	2.6%	1.4%
Minnesota	37.6%	36.9%	25.4%	27.6
Wisconsin	11.1%	9.7%	8.6%	5.6%
Illinois	2.7%	1.2%	7.3%	3.7%
Indiana	1.2%		3.8%	1.8%
Iowa	7.4%	10.2%	3.9%	3.8%
Missouri	3.3%	0.3%	2.7%	2.1%
N. Dakota	5.9%	7.1%	4.8%	7.1%
TOTAL	69.9%	67.0%	59.2%	53.1%

The following table documents the percent contribution from these same states projected for the future based on LADCO's 2018 Particulate Matter Source Apportionment Technology (PSAT) analysis, with supporting information from the CENRAP 2018 PSAT model of the 20% worst days.[5] Although in some cases the percentage impacts predicted by CENRAP are lower than those predicted by the MRPO PSAT analysis (Iowa, Missouri), the identified states remain the higher contributors. The relative order of contributing states does not change much between 2002 and 2018.

[4] Environ. (2007, July 18). *CENRAP PSAT Visualization Tool.* (Corrected Version). Available on the CENRAP Projects webpage

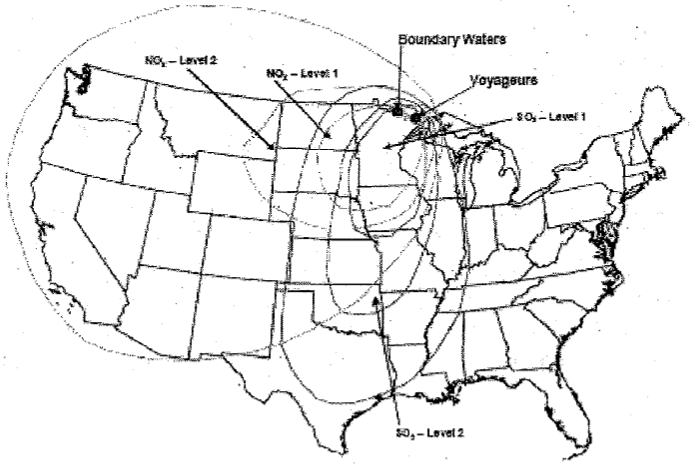
[5] Ibid.

State Impacts on Minnesota's Class I Areas – Future Year (2018 PSAT)

	LADCO PSAT Modeling (2018)		CENRAP PSAT Modeling (2018)	
	BWCAW	VNP	BWCAW	VNP
Michigan	2.6%	1.3%	2.2%	1%
Minnesota	30.5%	35.0%	19.8%	18.0%
Wisconsin	10.4%	6.3%	6.0%	3.1%
Illinois	5.2%	3.0%	3.7%	1.6%
Indiana	2.9%	1.6%	1.8%	0.8%
Iowa	7.6%	7.4%	2.9%	2.5%
Missouri	5.2%	4.3%	2.3%	1.6%
N. Dakota	5.7%	10.3%	3.7%	4.7%
TOTAL	70.1%	69.2%	42.5%	33.3%

The states with contributions over 5% to the Class I areas in these analyses generally match well with the impacting states shown in the Area of Influence (AOI) analysis done by Alpine Geophysics for CENRAP.

AOIs for Minnesota's Class I Areas[6]



[6] Stella, G.M et al. (2006, May 9). *CENRAP Regional Haze Control Strategy Analysis Plan.* Prepared by Alpine Geophysics. Available on the CENRAP Projects webpage http://www.cenrap.org/projects.asp

Attachment 2: Outline of an Approach to Defining Reasonable Progress for Minnesota Class I Areas in the Minnesota Regional Haze SIP

Under EPA rules, Minnesota has a responsibility to set a Reasonable Progress Goal (RPG) for visibility in the Boundary Waters and Voyageurs Park. Because the states that contribute to our Class I areas will submit their SIPs at different times, Minnesota sets forth the following proposal for setting a RPG for our two Class I areas. This document lays out the elements that we plan to include.

Minnesota's Long Term Strategy section will include those control strategies which we plan to undertake and which we consider to be reasonable. It will also include any known controls that are being undertaken in the nearby states, particularly the five states (IL, WI, ND, IA, and MO) that have been identified as contributors to BWCAW and VNP.

- Minnesota's LTS Contains
  - BART
    - For Minnesota: Minimal emission reductions
    - As known for other states
  - CAIR and resulting EGU reductions
    - For Minnesota
    - As known for other states
  - Control strategies for $PM_{2.5}$ and Ozone attainment SIPs
    - As known for other states
  - Other federal on-the-books (OTB) controls:
    - Tier II for on-highway mobile sources
    - Heavy-duty diesel (2007) engine standards
    - Low sulfur fuel standards
    - Federal control programs for nonroad mobile sources
  - Additional Emission Limitations
    - NE Minnesota Plan (30% reduction in combined SO_2/NO_X as a fair share)
    - Additional voluntary reductions as a result of MN Statutes 216B.1692 (emission reduction rider)
    - Anything known for other states
  - Other long term strategy (LTS) Components (without specific emission reductions)
    - Measures to mitigate emissions from construction
    - Source retirement and replacement
    - Smoke management for prescribed burns in Minnesota

After documenting all the components of the LTS, Minnesota will lay out the RPG determined for the best and worst days at VNP and BWCAW.

Reasonable Progress Goals

Once determined, the RPG submitted in Minnesota's SIP will represent an **interim, minimum** visibility improvement Minnesota would consider to be reasonable, and contain emission reductions resulting from the elements of the long term strategy.

At this time, Minnesota believes that this is an appropriate goal because other impacting states are working on a multi-SIP approach and have yet to determine what reductions are reasonable in their states for both haze and attainment purposes. Although we cannot compel the states to undertake reductions, Minnesota would expect further emissions reductions than are documented here, resulting in larger visibility improvement. Minnesota intends to revise the RPG for 2018 in the Five Year SIP Assessment, in order to reflect the additional control strategies found to be reasonable.

Steps in Reviewing Control Strategies and Revising RPG

In reviewing additional control strategies to determine those that are reasonable under the Regional Haze rule, Minnesota will focus on strategies that will result in emission reductions in those states that are significant contributors to visibility impairment in either BWCAW or VNP: Minnesota, Wisconsin, Iowa, N. Dakota, Missouri and Illinois.

The MPCA commits to further evaluation of reasonable control strategies that are possible within Minnesota. Minnesota will work with the other contributing states through their submittals of the first haze SIP and through 2013 to develop reasonable control strategies.

In the Five Year SIP Assessment, the MPCA would submit enforceable documents for any additional control measures found to be reasonable within Minnesota. In addition, that report would contain a listing of the additional control measures to be implemented by the other contributing states. Minnesota would then submit modeling that includes all these enforceable measures and would revise the 2018 RPG to reflect the larger degree of visibility improvement expected from the chosen control strategies.

Specific Control Strategies to Be Reviewed

Minnesota will use the EC/R five factor analysis report, the control cost analysis carried out by Alpine Geophysics for CENRAP and the CENRAP Control Sensitivity Model run to identify reasonable region-wide emission reduction strategies. (*See Attachment 3*).

The specific strategies that at this time appear to potentially be reasonable, and Minnesota's expectation for each of these strategies for other states, are outlined below.

EGU SO_2 Reductions

Minnesota will ask the contributing states to look at their EGU emissions of SO_2; Minnesota will particularly focus on possible reductions in states with emission rates that appear to be higher than the average among the Midwestern states. Since contributor states face a variety of regulatory demands and fuel types, it may not be possible to attain uniform emission performance. An emission rate of about 0.25 lb/mmBTU should be achievable in a cost-effective manner; this is the level being achieved in Minnesota and Illinois, and the EC/R report

shows that the "EGU1" scenario, a 0.15 lb/mmBTU emission rate, is generally achievable in the Midwest at a reasonable $/ton figure. (See Attachment 3).

Minnesota asks the identified states to demonstrate that reductions are occurring or being undertaken that will allow the state to reach at least the 0.25 lb/mmBTU emission rate, or to describe in their SIPs or Five-Year SIP Assessments why further reductions of SO_2 from EGU are not reasonable. Further reductions may not be reasonable due to the cost of implementation in $/ton or $/deciview or lack of impact on visibility impairment, but they should be evaluated.

At present, it appears as though Illinois has planned or proposed reductions that appear reasonable. It appears that more cost effective reductions are possible in Iowa, Missouri, North Dakota, and Wisconsin. Since Wisconsin is the largest non-Minnesota contributor to Minnesota's Class I areas, their efforts to reduce EGU SO_2 emissions are particularly important.

EGU NO_X Reductions

Wisconsin, Missouri, and Illinois have already reduced NO_X emissions to alleviate ozone standard violations, and Iowa appears to already have relatively low EGU NO_X emissions.

Minnesota will ask North Dakota to look at their EGU emissions of NO_X and to describe in their SIP or Five-Year SIP Assessment why further reductions of NO_X from EGU are not reasonable. Again, an emission rate of approximately 0.25 lb/mmBTU appears to be a reasonable benchmark. Further reductions may not be reasonable due to the cost of implementation in $/ton or $/deciview or lack of impact on visibility impairment, but they should be evaluated.

ICI Boiler Emission Reductions

Minnesota will commit to a more detailed review of potential NO_X and SO_2 reductions from large ICI boilers. Regulations or permit limits will be developed by 2013 if significant cost effective reductions prove feasible from this sector. Minnesota will expect the five contributing states to make at least this level of commitment.

Other Point Source Emission Reductions

Reciprocating engines and turbines appear to be a sector with potential cost effective NO_X controls. Minnesota commits to review this sector in more detail and if, after consideration of planned federal control programs, cost effective reductions appear feasible, Minnesota commits to develop regulations or permit limits for major sources by 2013. Minnesota will expect the five contributing states to make a similar commitment.

Mobile Source Emission Reductions

There appear to be relatively few cost effective NO_X controls for transportation available to states. Minnesota commits to work with LADCO states to implement appropriate cost effective NO_X controls to improve visibility and lower ozone levels in non-attainment areas.

NO_X Modeling, Ammonia, Agricultural Sources

It is not appropriate to commit to control of ammonia sources at this time. However, there is a clear need to improve 1) our understanding of the role of ammonia in haze formation, 2) our understanding of potential ammonia controls, and 3) the accuracy of particulate nitrate

predictions. Minnesota does not consider it our responsibility to conduct such research. Minnesota therefore encourages EPA and the regional planning organizations to continue work in these areas and commits to work with EPA and the RPOs to these ends.

Timeline for Reviewing Control Strategies

Minnesota commits to reviewing these control strategies on such a timeline that the 2013 SIP Report will include the four factor analysis for these control strategies, and that any control strategies deemed to be reasonable will be in place with an enforceable document (state rule, order, or permit conditions). Although any control measures ultimately deemed to be reasonable may not be fully implemented by 2013, they will be clearly "on the way" and the SIP Report will include estimates of emission reductions and projected 2018 visibility conditions.

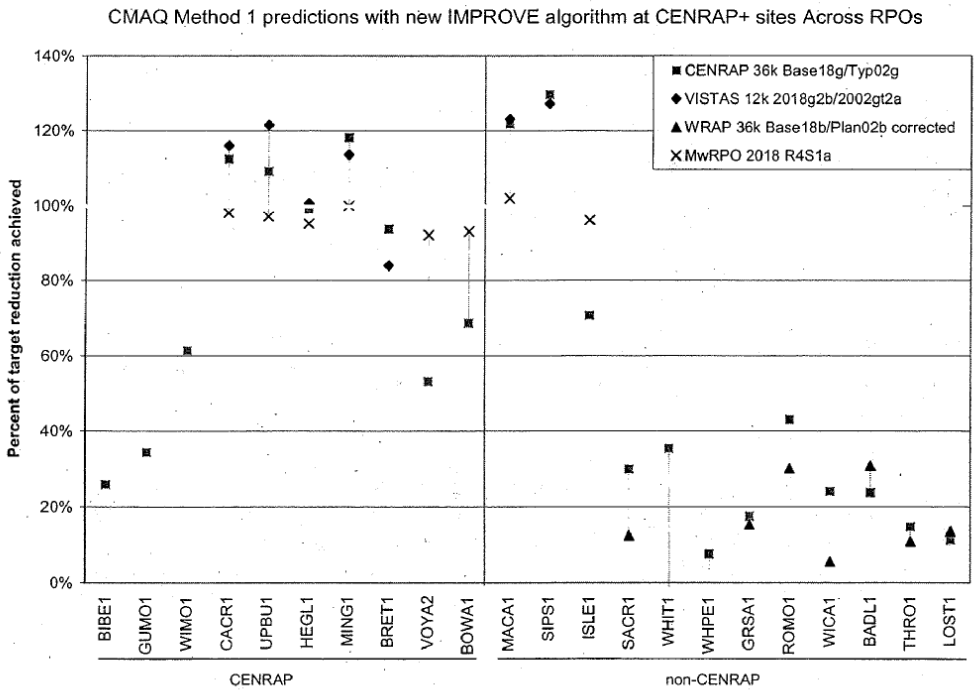
Acknowledging that most states are far along in the process of writing their Regional Haze SIPs, Minnesota would expect that all other contributing states would commit to a timeline that would allow reasonable predictions of the emission reductions and visibility improvement by 2018 from those states in the 2013 SIP Report.

Attachment 3: Supporting Technical Information – Need for Additional Control Strategies

Although there are some fairly major differences in the degree of visibility improvement expected at VNP and BWCAW due to on- the- books controls, projections by both CENRAP and Midwest RPO show that Minnesota's Class I areas are not yet projected to meet the Uniform Rate of Progress, as shown in the graph below.[7] In this graph, the URP is the "target reduction."

EPA's recent guidance on determining the reasonable progress goal (RPG) indicates that states may set a RPG that provides for more, less, or equivalent improvement as the URP. However, the guidance continues to emphasize that an analysis of control strategies with the four factors is necessary; Minnesota believes this is particularly true in light of the lesser degree of visibility improvement shown from on- the- books controls in Minnesota's Class I Areas.

The EGU 2018 Summary table, following, shows projected 2018 EGU SO2 and NOX emissions. Highlighted cells indicate specific states and pollutants of concerns, where Minnesota has requested evaluation of potential reasonable control measures.[8]



[7] Morris, R. (2007, July 24). *CENRAP Emissions and Modeling Technical Support Document,* Prepared by Environ. Presentation Given at CENRAP Workgroup/POG Meeting.
[8] Provided by Midwest RPO from the IPM 3.0 base run and edits made by certain states.

EGU Summary for 2018

	Heat Input (MMBTU/year)	Scenario	SO2 (tons/year)	SO2 % Reduction (From 2001 - 03 Average)	SO2 (lb/MMBTU)	NOx (tons/year)	NOx % Reduction (From 2001 - 03 Average)	NOx (lb/MMBTU)
IL	**980,197,198**	**2001 - 2003 (average)**	**362,417**		**0.74**	**173,296**		**0.35**
	1,310,188,544	IPM3.0 (base)	277,337	23.5	0.423	70,378	59.4	0.107
		IPM3.0 - will do	140,296	61.3	0.214	62,990	63.7	0.096
		IPM3.0 - may do	140,296	61.3	0.214	62,990	63.7	0.096
IA	**390,791,671**	**2001 - 2003 (average)**	**131,080**		**0.67**	**77,935**		**0.40**
	534,824,314	IPM3.0 (base)	115,938	11.6	0.434	59,994	23.0	0.224
		IPM3.0 - will do	115,938	11.6	0.434	59,994	23.0	0.224
		IPM3.0 - may do	100,762	23.1	0.377	58,748	24.6	0.220
MN	**401,344,495**	**2001 - 2003 (average)**	**101,605**		**0.50**	**85,955**		**0.42**
	447,645,758	IPM3.0 (base)	61,739	39.2	0.276	41,550	51.7	0.186
		IPM3.0 - will do	54,315	46.5	0.243	49,488	42.4	0.221
		IPM3.0 - may do	51,290	49.5	0.229	39,085	54.5	0.175
MO	**759,902,542**	**2001 - 2003 (average)**	**241,375**		**0.63**	**143,116**		**0.37**
	893,454,905	IPM3.0 (base)	243,684	(1.0)	0.545	72,950	49.0	0.163
		IPM3.0 - will do	237,600	1.6	0.532	72,950	49.0	0.163
		IPM3.0 - may do	237,600	1.6	0.532	72,950	49.0	0.163
ND	**339,952,821**	**2001 - 2003 (average)**	**145,096**		**0.85**	**76,788**		**0.45**
	342,685,501	IPM3.0 (base)	41,149	71.6	0.240	44,164	42.5	0.258
		IPM3.0 - will do	56,175	61.3	0.328	58,850	23.4	0.343
		IPM3.0 - may do	56,175	61.3	0.328	58,850	23.4	0.343
WI	**495,475,007**	**2001 - 2003 (average)**	**191,137**		**0.77**	**90,703**		**0.36**
	675,863,447	IPM3.0 (base)	127,930	33.1	0.379	56,526	37.7	0.167
		IPM3.0 - will do	150,340	21.3	0.445	55,019	39.3	0.163
		IPM3.0 - may do	62,439	67.3	0.185	46,154	49.1	0.137

Minnesota also used the cost-curve analysis performed for CENRAP by Alpine Geophysics, originally included in the *CENRAP Regional Haze Control Strategy Analysis Plan* and updated in March 2007, to determine which states might have additional reasonable control strategies. The cost curves were used to perform a modeling run (the "Control Sensitivity Run") in order to determine the visibility improvement that could result from implementing certain control strategies.[9]

The following tables show which point sources are controlled in the CENRAP states that the MPCA has identified as contributing to visibility impairment in BWCAW and VNP (Iowa, Minnesota, Missouri) under the following assumptions: 1) a cost less than $5000/ton, and 2) facility emissions divided by the facility's distance from any Class I area, is greater than or equal to five (often called the Q/5D criteria). The tables include sources that are within Q/5D of either VNP or BWCAW.

The report prepared for the MPCA and Midwest RPO by EC/R, entitled "Reasonable Progress for Class I Areas in the Northern Midwest – Factor Analysis," also provides documentation that the various control strategies mentioned in Attachment 2 are likely to be reasonable, at least for some states. A summary table follows the tables of units controlled in the CENRAP control sensitivity run.[10]

[9] Information on the Control Sensitivity run is available on CENRAP's Project website, http://www.cenrap.org/projects.asp, under the link entitled *Results from Control Sensitivity Run, Base18Gc1 - Cost Curve Criteria of 5k per ton, Q over 5D*

[10] Battye, W. et al (2007, July 18). Reasonable Progress for Class I Areas in the Northern Midwest – Factor Analysis. Prepared for MPCA and MRPO by EC/R. http://www.ladco.org/MRPO%20Report_071807.pdf. See Table 6.5-3, page 110.

NO_X Controls, Q/5D for BWCAW and VNP

State	County	Plant Name	Point ID	Source Type for Control	Control Measure	Tons Reduced	Annualized Cost ($2005)	Cost Per Ton Reduced
Iowa	Woodbury	MIDAMERICAN ENERGY CO. - GEORGE NEAL NOR	148766	Utility Boiler - Coal/Wall	SCR	3739	$5,252,502	$1,405
Iowa	Woodbury	MIDAMERICAN ENERGY CO. - GEORGE NEAL SOU	147140	Utility Boiler - Coal/Wall - Other Coal	LNBO	1191	$2,900,440	$2,435
Iowa	Wapello	IPL - OTTUMWA GENERATING STATION	143977	Utility Boiler - Coal/Tangential	SCR	4708	$13,000,038	$2,761
Iowa	Pottawattamie	MIDAMERICAN ENERGY CO. - COUNCIL BLUFFS	143798	Utility Boiler - Coal/Wall - Other Coal	LNBO	671	$2,960,866	$4,413
Minnesota	Cook	MINNESOTA POWER - TACONITE HARBOR ENERGY	EU001	Utility Boiler - Coal/Tangential	SCR	411	$1,536,959	$3,737
Minnesota	Cook	MINNESOTA POWER - TACONITE HARBOR ENERGY	EU002	Utility Boiler - Coal/Tangential	SCR	411	$1,574,337	$3,828
Minnesota	Cook	MINNESOTA POWER - TACONITE HARBOR ENERGY	EU003	Utility Boiler - Coal/Tangential	SCR	411	$1,592,948	$3,873
Minnesota	Itasca	MINNESOTA POWER INC - BOSWELL ENERGY CTR	EU004	Utility Boiler - Coal/Tangential - POD10	LNC3	806	$1,413,275	$1,753
Minnesota	Itasca	MINNESOTA POWER INC - BOSWELL ENERGY CTR	EU003	Utility Boiler - Coal/Tangential - POD10	LNC3	600	$884,162	$1,474
Minnesota	Koochiching	Boise Cascade Corp - International Falls	EU320	Sulfate Pulping - Recovery Furnaces	SCR	361	$939,170	$2,603
Minnesota	St. Louis	MINNESOTA POWER INC - LASKIN ENERGY CTR	EU001	Utility Boiler - Coal/Tangential	SCR	1064	$1,346,571	$1,265
Minnesota	St. Louis	MINNESOTA POWER INC - LASKIN ENERGY CTR	EU002	Utility Boiler - Coal/Tangential	SCR	1063	$1,346,571	$1,267
Minnesota	St. Louis	EVTAC Mining - Fairlane Plant	EU042	ICI Boilers - Coke	SCR	1365	$3,142,325	$2,302
Minnesota	Sherburne	NSP - SHERBURNE GENERATING PLANT	EU002	Utility Boiler - Coal/Tangential - POD10	LNC3	998	$1,873,316	$1,877
Minnesota	Sherburne	NSP - SHERBURNE GENERATING PLANT	EU001	Utility Boiler - Coal/Tangential - POD10	LNC3	701	$1,880,449	$2,682
Missouri	Pike	HOLCIM (US) INC-CLARKSVILLE	16745	Cement Manufacturing - Wet	Mid-Kiln Firing	1808	$149,510	$83
Missouri	Randolph	ASSOCIATED ELECTRIC COOPERATIVE INC-THOM	17575	Utility Boiler - Coal/Wall - Other Coal	LNBO	682	$3,114,256	$4,563

SO_2 Controls, Q/5D for BWCAW or VNP

State	County	Plant Name	Point ID	Source Type for Control	Control Measure	Tons Reduced	Annualized Cost ($2005)	Cost Per Ton Reduced
Iowa	Muscatine	CENTRAL IOWA POWER COOP. - FAIR STATION	100125	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	4504	$5,854,468	$1,300
Iowa	Woodbury	MIDAMERICAN ENERGY CO. - GEORGE NEAL NOR	148766	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	11440	$20,886,351	$1,826
Iowa	Woodbury	MIDAMERICAN ENERGY CO. - GEORGE NEAL NOR	148765	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	7020	$13,365,237	$1,904
Iowa	Woodbury	MIDAMERICAN ENERGY CO. - GEORGE NEAL SOU	147140	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	14255	$35,558,570	$2,494
Iowa	Wapello	IPL - OTTUMWA GENERATING STATION	143977	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	15894	$40,687,209	$2,560
Iowa	Louisa	MIDAMERICAN ENERGY CO. - LOUISA STATION	147281	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	12964	$36,698,267	$2,831
Iowa	Pottawattamie	MIDAMERICAN ENERGY CO. - COUNCIL BLUFFS	143798	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	12141	$36,299,373	$2,990
Iowa	Des Moines	IPL - BURLINGTON GENERATING STATION	145381	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	5384	$17,059,783	$3,169
Iowa	Allamakee	IPL - LANSING GENERATING STATION	145136	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	5926	$19,213,055	$3,242
Iowa	Clinton	IPL - M.L. KAPP GENERATING STATION	144559	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	5036	$17,331,069	$3,441
Iowa	Linn	IPL - PRAIRIE CREEK GENERATING STATION	144096	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	3753	$13,730,673	$3,658
Minnesota	Itasca	MINNESOTA POWER INC - BOSWELL ENERGY CTR	EU001	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	2329	$9,472,980	$4,068
Minnesota	Itasca	MINNESOTA POWER INC - BOSWELL ENERGY CTR	EU002	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	2315	$9,472,980	$4,092
Minnesota	Itasca	MINNESOTA POWER INC - BOSWELL ENERGY CTR	EU004	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	7403	$30,486,914	$4,118
Missouri	Clay	INDEPENDENCE POWER AND LIGHT-MISSOURI CI	5430	Utility Boilers - Very High Sulfur Content	FGD Wet Scrubber	8058	$6,232,581	$774
Missouri	Franklin	AMERENUE-LABADIE PLANT	6964	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	14741	$34,190,931	$2,319

State	County	Plant Name	Point ID	Source Type for Control	Control Measure	Tons Reduced	Annualized Cost ($2005)	Cost Per Ton Reduced
Missouri	Franklin	AMERENUE-LABADIE PLANT	7408	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	14988	$34,874,750	$2,327
Missouri	Franklin	AMERENUE-LABADIE PLANT	7262	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	14912	$34,874,750	$2,339
Missouri	Jefferson	AMERENUE-RUSH ISLAND PLANT	11565	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	13979	$32,994,250	$2,360
Missouri	Franklin	AMERENUE-LABADIE PLANT	7087	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	14285	$34,019,977	$2,382
Missouri	Henry	KANSAS CITY POWER & LIGHT CO-MONTROSE GE	7847	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	6362	$15,425,097	$2,425
Missouri	Henry	KANSAS CITY POWER & LIGHT CO-MONTROSE GE	7849	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	6191	$15,134,675	$2,445
Missouri	Jefferson	AMERENUE-RUSH ISLAND PLANT	11563	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	13276	$32,994,250	$2,485
Missouri	Henry	KANSAS CITY POWER & LIGHT CO-MONTROSE GE	7848	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	5928	$14,840,835	$2,504
Missouri	St. Louis	AMERENUE-MERAMEC PLANT	21421	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	8494	$21,733,761	$2,559
Missouri	St. Louis	ANHEUSER-BUSCH INC-ST. LOUIS	20274	Bituminous/Subbituminous Coal (Industrial Boilers)	SDA	1996	$5,303,934	$2,658
Missouri	Platte	KANSAS CITY POWER & LIGHT CO-IATAN GENER	16912	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	14332	$38,179,875	$2,664
Missouri	Jackson	AQUILA INC-SIBLEY GENERATING STATION	9953	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	9166	$24,430,935	$2,665
Missouri	St. Louis	AMERENUE-MERAMEC PLANT	21423	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	7081	$19,721,240	$2,785
Missouri	Randolph	ASSOCIATED ELECTRIC COOPERATIVE INC-THOM	17575	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	9469	$38,179,875	$4,032
Missouri	New Madrid	ASSOCIATED ELECTRIC COOPERATIVE INC-NEW	14944	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	8132	$33,051,234	$4,064
Missouri	New Madrid	ASSOCIATED ELECTRIC COOPERATIVE INC-NEW	14942	Utility Boilers - Medium Sulfur Content	FGD Wet Scrubber	8026	$33,051,234	$4,118
Missouri	Jefferson	DOE RUN COMPANY-HERCULANEUM SMELTER	11722	Primary Metals Industry	Sulfuric Acid Plant	10653	$46,396,391	$4,355

Table 6.5-3. Summary of Visibility Impactes and Cost Effectiveness of Potential Control Measures

Emission category	Control strategy	Region	Pollutant	Average estimated visibility improvement for the four Midwest Class I areas (deciviews)	Cost effectiveness ($/ton)	Cost effectiveness per visibility improvement ($million/deciview)
EGU	EGU1	3-State	SO2	0.32	1,540	2,249
			NOX	0.06	2,037	2,585
		9-State	SO2	0.74	1,743	2,994
			NOX	0.17	1,782	2,332
	EGU2	3-State	SO2	0.41	1,775	2,281
			NOX	0.09	3,016	3,604
		9-State	SO2	0.85	1,952	3,336
			NOX	0.24	2,984	4,045
ICI boilers	ICI1	3-State	SO2	0.055	2,992	1,776
			NOX	0.043	2,537	1,327
		9-State	SO2	0.084	2,275	2,825
			NOX	0.068	1,899	2,034
	ICI Workgroup	3-State	SO2	0.089	2,731	1,618
			NOX	0.055	3,814	1,993
		9-State	SO2	0.136	2,743	3,397
			NOX	0.080	2,311	2,473
Reciprocating engines and turbines	Reciprocating engines emitting 100 tons/year or more	3-State	NOX	0.015	538	282
		9-State	NOX	0.052	506	542
	Turbines emitting 100 tons/year or more	3-State	NOX	0.008	754	395
		9-State	NOX	0.007	754	810
	Reciprocating engines emitting 10 tons/year or more	3-State	NOX	0.037	1,286	673
		9-State	NOX	0.073	1,023	1,095
	Turbines emitting 10 tons/year or more	3-State	NOX	0.011	800	419
		9-State	NOX	0.012	819	880
Agricultural sources	10% reduction	3-State	NH3	0.10	31 - 2,700	8 - 750
		9-State	NH3	0.16	31 - 2,700	18 - 1,500
	15% reduction	3-State	NH3	0.15	31 - 2,700	8 - 750
		9-State	NH3	0.25	31 - 2,700	18 - 1,500
Mobile sources	Low-NOX Reflash	3-State	NOX	0.007	241	516
		9-State	NOX	0.010	241	616
	MCDI	3-State	NOX	0.015	10,697	7,595
		9-State	NOX	0.015	2,408	4,146
	Anti-Idling	3-State	NOX	0.009	(430) - 1,700	(410) - 1,600
		9-State	NOX	0.006	(430) - 1,700	(410) - 1,600
	Cetane Additive Program	3-State	NOX	0.009	4,119	3,155
		9-State	NOX	0.008	4,119	10,553

Attachment 4: Organizations Participating in Northern Class I Consultation Process

States and Provinces
Illinois Environmental Protection Agency
Indiana Department of Environmental Management
Iowa Department of Natural Resources
Michigan Department of Environmental Quality
Minnesota Pollution Control Agency
Missouri Department of Natural Resources
North Dakota Department of Health
Wisconsin Department of Natural Resources
Ontario Ministry of the Environment

Tribes
Leech Lake Band of Ojibwe
Fond du Lac Band of Lake Superior Chippewa
Mille Lacs Band of Ojibwe
Upper and Lower Sioux Community
Red Lake Band of Chippewa
Grand Portage Band of Chippewa
Nottawaseppi Huron Band of Potawatomi

Regional Planning Organizations
Midwest Regional Planning Organization
Central Regional Air Planning Association

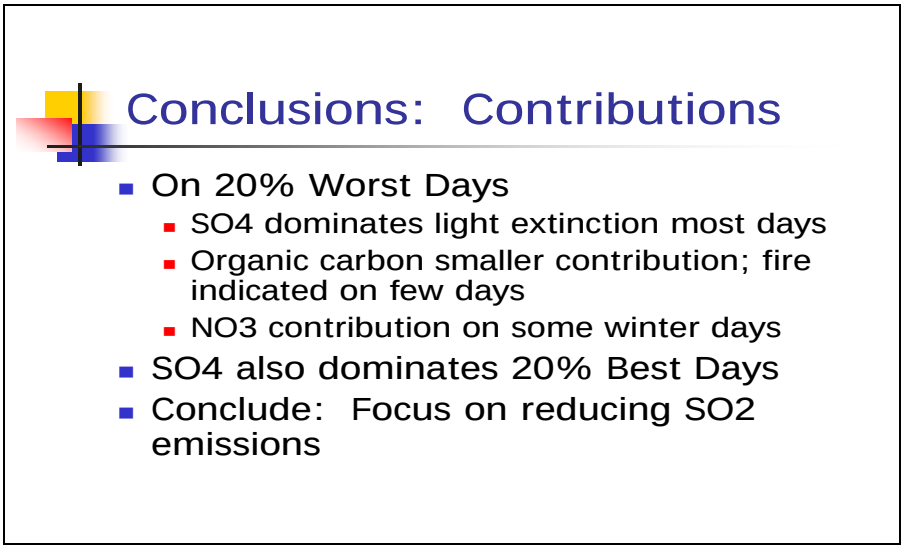
Federal Government
USDA Forest Service
U.S. Fish and Wildlife Service
National Park Service
USDA Forest Service
Environmental Protection Agency, Region 5

App. 3 - 2. Mammoth Cave

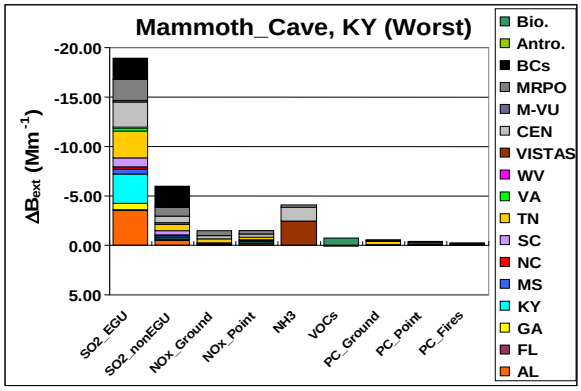
Indiana sources have shown an impact on this Class 1 area through some modeling studies. However, since sources in Kentucky and Indiana must comply with CAIR requirements, the Kentucky analysis has determined that these controls are sufficient to address visibility in this area. Further, VISTAS modeling has shown that Mammoth Cave is more than meeting its uniform rate of progress (glidepath) and has determined that no additional reductions are needed from Indiana at this time.

The attached cover letter from the Kentucky Department for Environmental Protection contains this information.

The following slides from the VISTAS report, "Contribution Assessment Mammoth Cave", draft May 29, 2007, show some analyses performed to reach these conclusions.

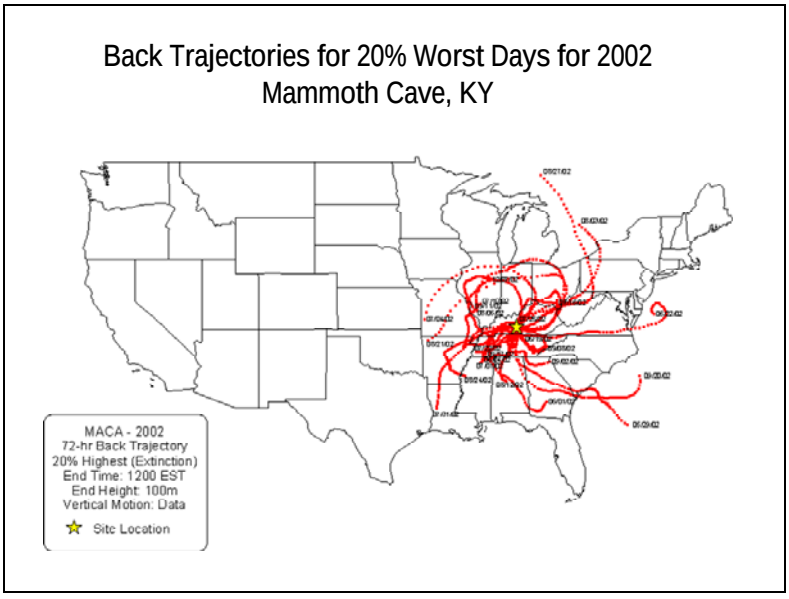


The following chart illustrates the impairment contribution from Sulfates. Note that the contribution from the Midwest RPO states, in total, is small. Indiana is not individually apportioned.



The following maps show contributions to visibility impairment on the 20% worst days during the 2000 - 2004 timeframe.

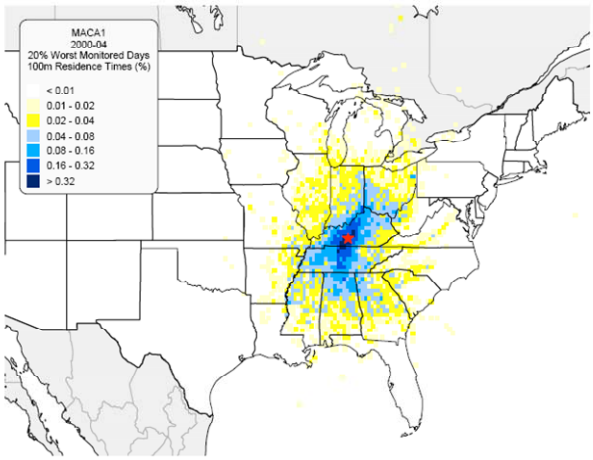
The following map is a meteorological back trajectory analysis for IMPROVE monitoring sites in 2000 - 2004. Using the descriptions from VISTAS, back trajectory analyses use interpolated measured or modeled meteorological fields to estimate the most likely central path of air masses that arrive at a receptor at a given time. The method essentially follows a parcel of air backward in hourly steps for a specified length of time. This map is for Mammoth Cave for the 20% worst days in 2002



The following map is a residence time plot. This was created using five years of back trajectories for the 20% worst visibility days in 2000-2004. Residence time is the frequency that winds pass over a specific geographic area on the path to a Class 1 area.

Residence Time for 20% Worst Days in 2000-2004

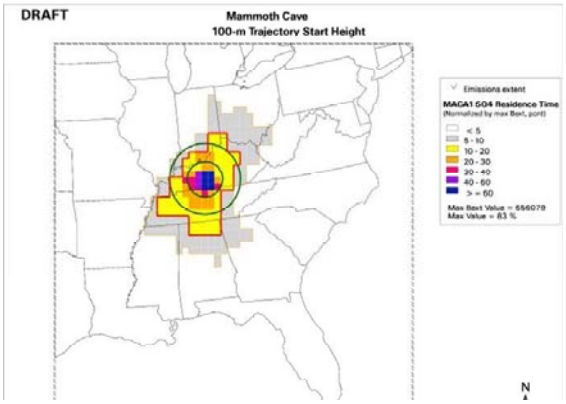
Mammoth Cave, KY



It can be seen that there are lesser impacts from most MRPO states. However, the greatest impacts are coming from sources closer to Mammoth Cave and south.

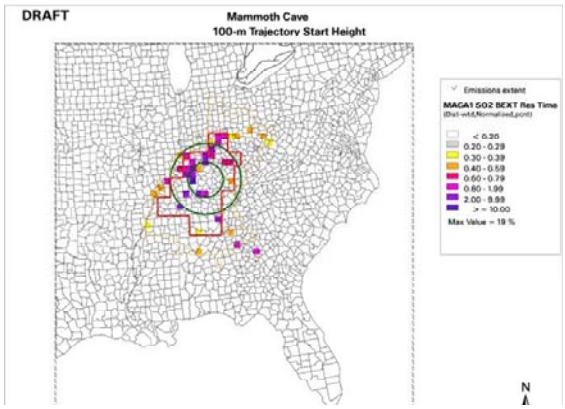
Sulfate extinction weighted residence time plots were developed to define the geographic area with the highest probability of influencing the receptor on the 20% worst days in 2000 - 2004 that were dominated by sulfate. Each back trajectory was weighted by sulfate extinction for that day. The resulting plots were used to define the geographic Area of Influence for sources of SO_2 emissions. In the following plot, the area representing 10% or greater residence time is outlined in red, and the area representing 5% or greater residence time is outlined in gray. The VISTAS states focused their analyses on the Area of Influence defined 5% or greater sulfate extinction weighted residence time.

SO2 Area of Influence for Mammoth Cave, KY



Green circles indicate 100-km and 200-km radii from Class I area.
Red line perimeter indicate Area of Influence with Residence Time ≥ 10%
Orange line perimeter indicate Area of Influence with Residence Time ≥ 5%.

2018 SO2 Emissions weighted by Residence Time
Mammoth Cave, KY

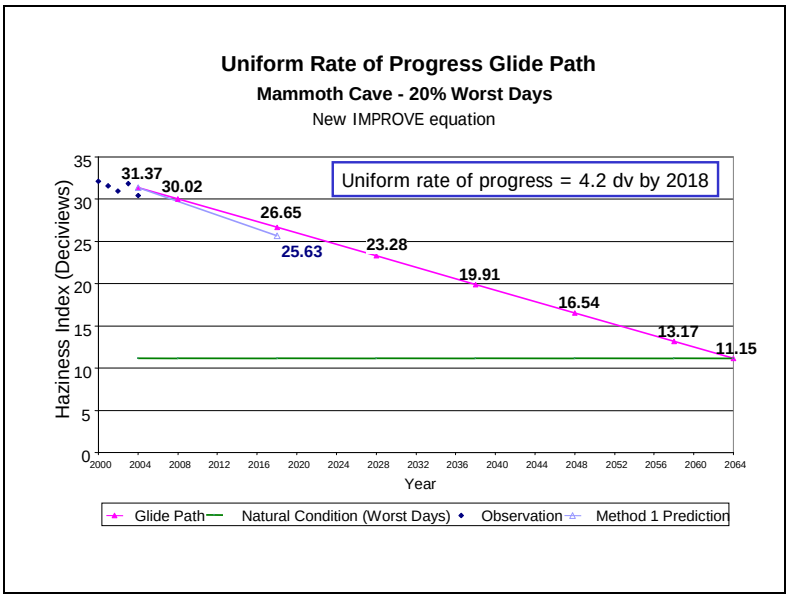


Green circles indicate 100-km and 200-km radii from Class I area.
Red line perimeter indicate Area of Influence with Residence Time ≥ 10%.
Orange line perimeter indicate Area of Influence with Residence Time ≥ 5%.

VISTAS further examined emissions sources within the SO_2 Areas of Influence. Residence time plots were combined with geographically-gridded emissions data based upon the 2002 baseline and 2018 projected inventories. As a way of incorporating the effects of transport, deposition, and chemical transformation of point source emissions along the path of the trajectories, those data were weighted by 1/d, where d was calculated as the distance between grid cell centers, in kilometers. The distance-weighted point source SO_2 emissions were then combined with the gridded extinction-weighted back-trajectory residence times at a spatial resolution of 36-km. The residence times and gridded emissions data were combined into plots. The distance weighted (1/d) gridded point source SO_2 emissions were multiplied by the total extinction-weighted back-trajectory residence times on a grid cell by grid cell basis. These results were then normalized by the domain-wide total and displayed as a percentage.

The resulting plots show the relative importance of sources contributing to visibility impairment within the Area of Influence. The above plot illustrates this information for 2018 projected emissions.

The results of the long term strategy developed by Kentucky and VISTAS provide anticipated visibility improvements below the glidepath.



Analyses performed by the MWRPO show similar results. Indiana concurs that this is the best approach for addressing visibility impairment at Mammoth Cave at this time. Therefore, no further analysis for this SIP is necessary.

As could be seen from the above maps and plots, sources in Indiana do contribute less significant amounts of sulfate on the 20% worst visibility days. For the 2013 five-year review, Indiana will work with the RPOs to determine that projected emissions reductions are occurring, and perform analyses to determine whether or not further SO_2 reductions from any sectors are reasonable or whether other pollutants such as NO_x should be controlled.

Letter from Kentucky Department for Environmental Protection

Ken R.

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

Ernie Fletcher
Governor

Department for Environmental Protection
Division for Air Quality
803 Schenkel Lane
Frankfort, Kentucky 40601-1403

Teresa J. Hill
Secretary

September 20, 2007

RECEIVED
State of Indiana
SEP 27 2007
Deptartment of Environmental Management
Office of Air Quality

Mr. Daniel Murray, Assistant Commissioner
Indiana Office of Air Quality
100 N. Senate Avenue
Indianapolis, Indiana 46204

Dear Mr. Murray:

Pursuant to previous communications with the Mr. Michael Koerber, with LADCO, regarding regional haze issues concerning Kentucky's Class I area Mammoth Cave National Park, Kentucky does not find a need to request additional emission reductions from Indiana sources at this time.

Based on its work with VISTAS, Kentucky has identified sources that may impact visibility at Mammoth Cave National Park based on the emission unit's Q/d multiplied by the RTMax being greater than or equal to 1% for all sources in the Mammoth Cave area of influence. Of the significant sources identified in the area of influence around Mammoth Cave, electric generating units (EGUs) reflect the most potential impact. For Indiana, six EGU units were identified with a value greater than 1% for all the Q/d times RTMax values (*Please see the enclosed list of the significant area of influence sources for Mammoth Cave*). However, as in Kentucky, EGUs must comply with CAIR and as a result air quality is expected to improve in the eastern U.S. In addition, given that VISTAS modeling indicates that Mammoth Cave is more than meeting its uniform rate of progress (glidepath) for regional haze, Kentucky will not be seeking additional emission controls for sources in Indiana at this time.

Kentucky believes that the consultations conducted regarding Mammoth Cave and Indiana sources provided and documented by this letter satisfy the consultation process requirements described in the Regional Haze Rule. If you have any questions or require additional information regarding this matter, please contact Lona Brewer or Martin Luther, of my staff, at 502-573-3382 or at lona.brewer@ky.gov or martin.luther@ky.gov.

Sincerely,

John S. Lyons
Director

JSL:mrl
Enclosure

KentuckyUnbridledSpirit.com

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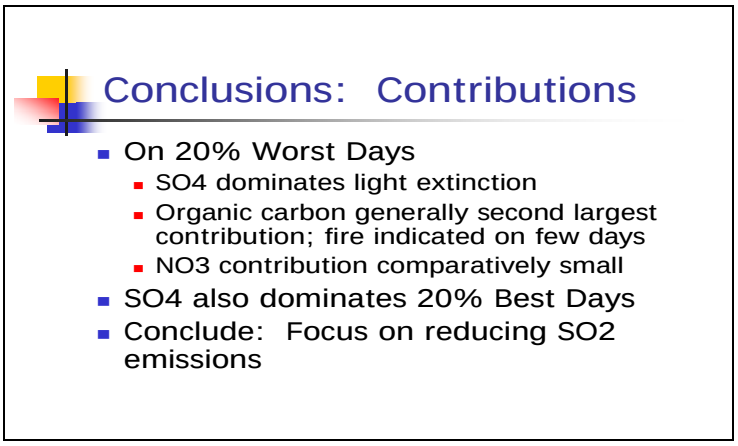
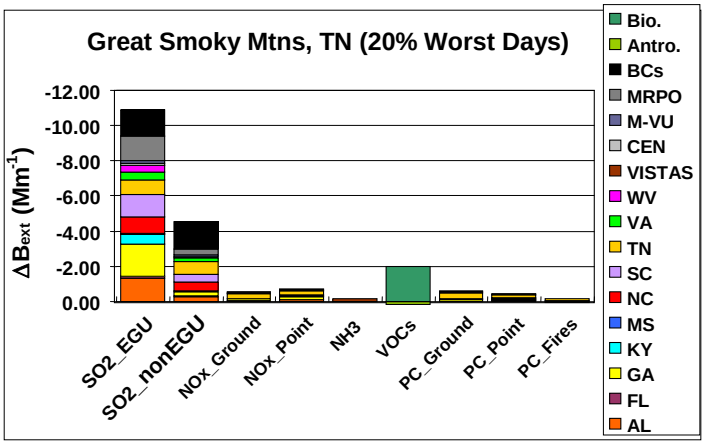
App. 3 - 3. Great Smoky Mountains National Park

In the MRPO summary of Class 1 areas impacted by sources from within the MRPO (Appendix 1), Indiana was determined to contribute to visibility impairment in this Class 1 area. Since that time, VISTAS has conducted several analyses to assist in developing reasonable progress goals. The following slides are from the VISTAS analysis, "Great Smoky Mountain Group Contribution Assessment", Draft, May 29, 2007. The text explaining the plots and charts is from "Technical Analyses Supporting Regional Haze State Implementation Plan", June 8, 2007, North Carolina Department of Environment and Natural Resources (NCDENR).

Sulfate reductions are the major focus.



This chart below shows the sources of SO_2 emissions by source sectors and regions. Indiana is not addressed individually. The MRPO states have a small contribution.

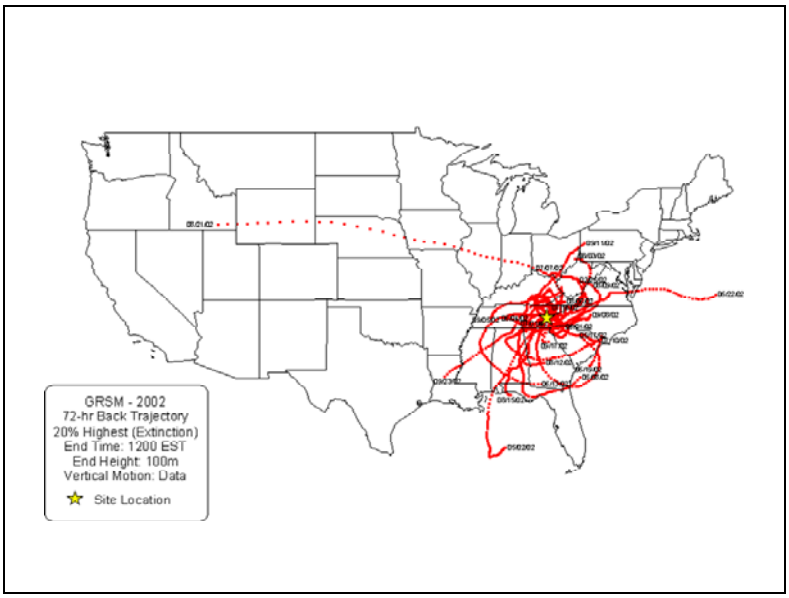


Greatest benefits from SO2 reductions from Utilities and Industries

The following three maps show analyses of areas impacting the Great Smoky Mountains National Park. They show contributions to visibility impairment on the 20% worst days during

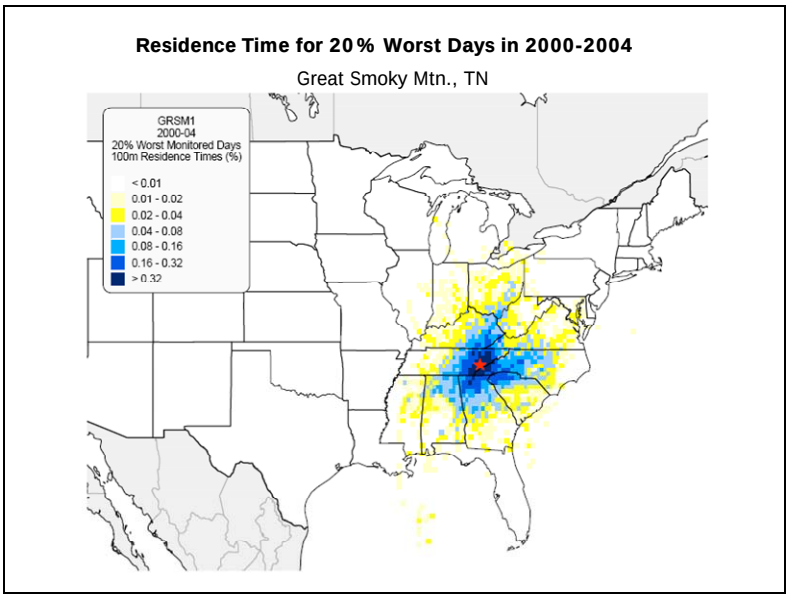
the 2000-2004 timeframe. As can be seen, Indiana sources do not have significant impacts on this area.

The following map is a meteorological back trajectory analysis for IMPROVE monitoring sites in 2000-2004. Using the descriptions from VISTAS and the NCDENR, back trajectory analyses use interpolated , measured, or modeled meteorological fields to estimate the most likely central path of air masses that arrive at a receptor at a given time. The method essentially follows a parcel of air backward in hourly steps for a specified length of time. This map is for the Great Smoky Mountain National Park for the 20% worst days in 2002.

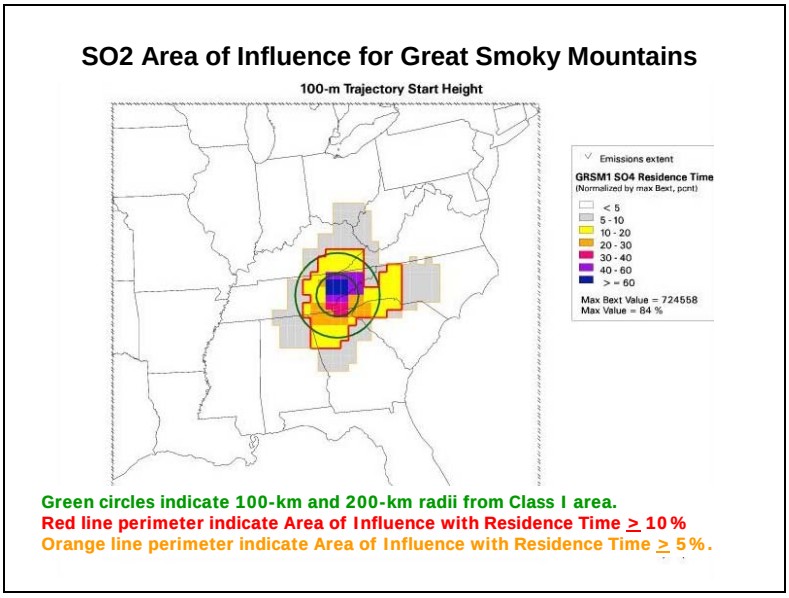


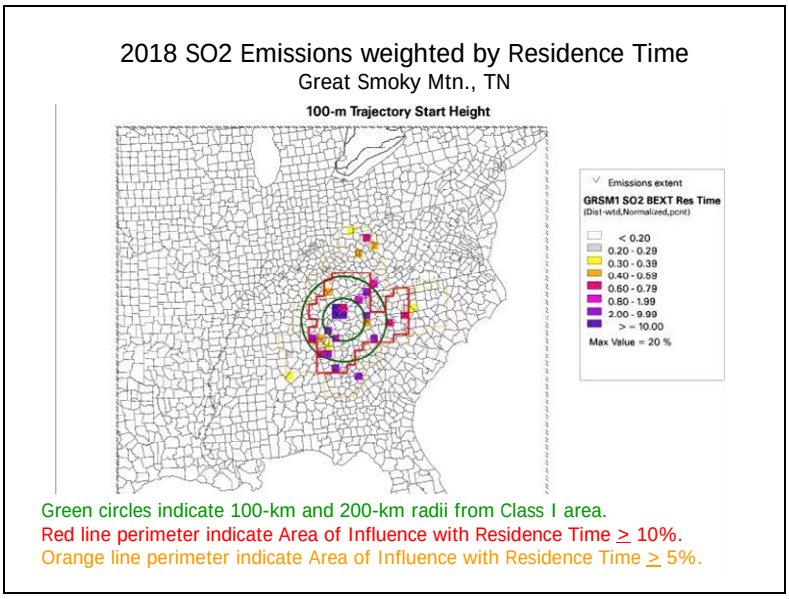
Back Trajectory Analysis for 20% Worst Days in 2002 - Great Smoky Mountains

The following map is a residence time plot. This was created using five years of back trajectories for the 20% worst visibility days in 2000-2004. Residence time is the frequency that winds pass over a specific geographic area on the path to a Class 1 area.



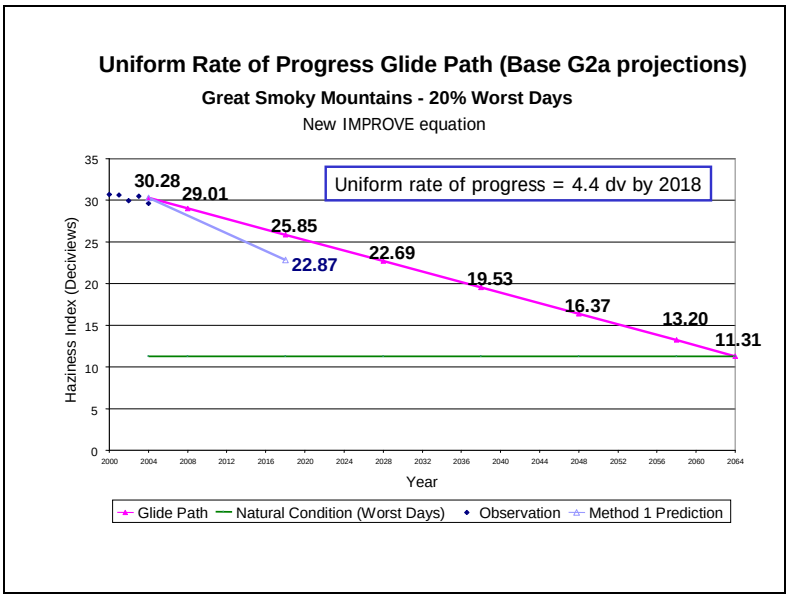
Sulfate extinction weighted residence time plots were developed to define the geographic area with the highest probability of influencing the receptor on the 20% worst days in 2000-2004 that were dominated by sulfate. Each back trajectory was weighted by sulfate extinction for that day. The resulting plots were used to define the geographic Area of Influence for sources of SO_2 emissions. In the following plot, the area representing 10% or greater residence time is outlined in red, and the area representing 5% or greater residence time is outlined in gray. The VISTAS states focused their analyses on the Area of Influence defined 5% or greater sulfate extinction weighted residence time.





VISTAS further examined emissions sources within the SO_2 Areas of Influence. Residence time plots were combined with geographically-gridded emissions data based upon the 2002 baseline and 2018 projected inventories. As a way of incorporating the effects of transport, deposition, and chemical transformation of point source emissions along the path of the trajectories, those data were weighted by 1/d, where d was calculated as the distance between grid cell centers, in kilometers. The distance-weighted point source SO_2 emissions were then combined with the gridded extinction-weighted back-trajectory residence times at a spatial resolution of 36 km. The residence times and gridded emissions data were combined into plots. The distance weighted (1/d) gridded point source SO_2 emissions were multiplied by the total extinction-weighted back-trajectory residence times on a grid cell by grid cell basis. These results were then normalized by the domain-wide total and displayed as a percentage. The resulting plots show the relative importance of sources contributing to visibility impairment within the Area of Influence. The above plot illustrates this information for 2018 projected emissions.

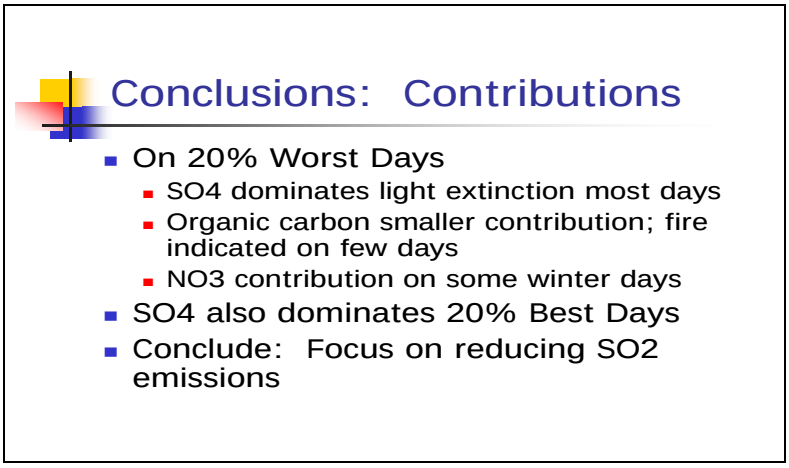
Further, the slide below shows that the long term strategy for this Class 1 area easily meets the glidepath through 2018.



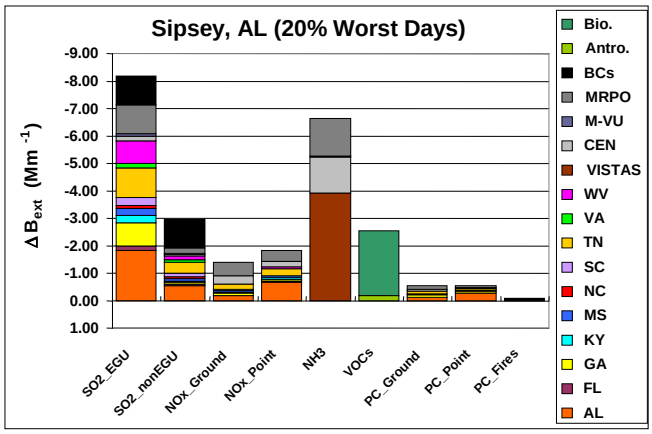
In the "Technical Analyses Supporting Regional Haze State Implementation Plan," June 8, 2007, NCDENR stated that contributions from other RPOs are comparatively small and the greatest benefits would likely be from further EGU reductions within the VISTAS states. Indiana was not contacted by Tennessee or North Carolina regarding consultations for this area and believes that no further analysis for a long term control strategy is necessary at this time.

App. 3 - 4. Sipsey Wilderness Area

In the MRPO summary of Class 1 areas impacted by sources from within the MRPO (Appendix 1), Indiana was determined to contribute to visibility impairment in this Class 1 area. Since that time, VISTAS has conducted several analyses to assist in developing reasonable progress goals. The following slides are from the VISTAS analysis, "Sipsey Contribution Assessment", Draft, May 29, 2007. As in most VISTAS areas, sulfate reductions are the major focus, although in this case, NH_3 is a significant contributor. The text explaining the plots and charts is from "Technical Analyses Supporting Regional Haze State Implementation Plan", June 8, 2007, NCDENR, another VISTAS state.

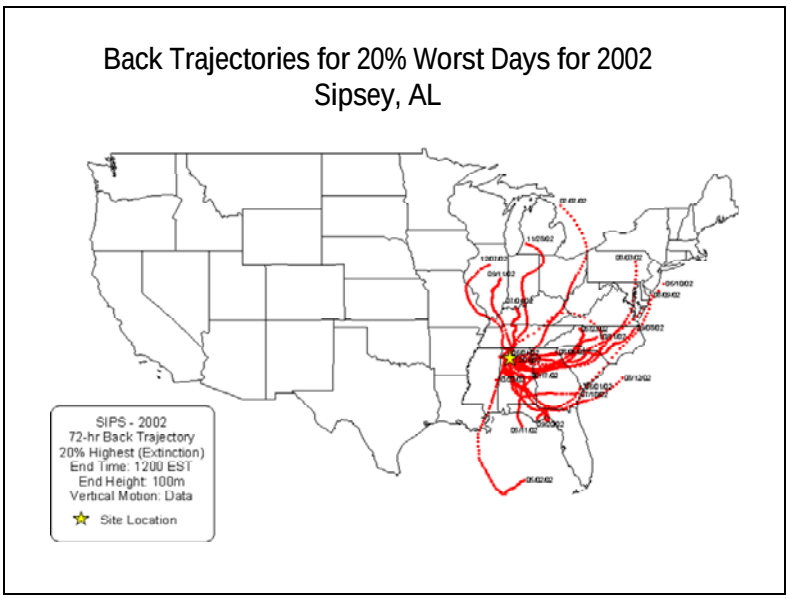


The following charts and maps show contributions to visibility impairment in this Class 1 area. Note that the MRPO states, in total, have a small contribution. Indiana is not listed individually.

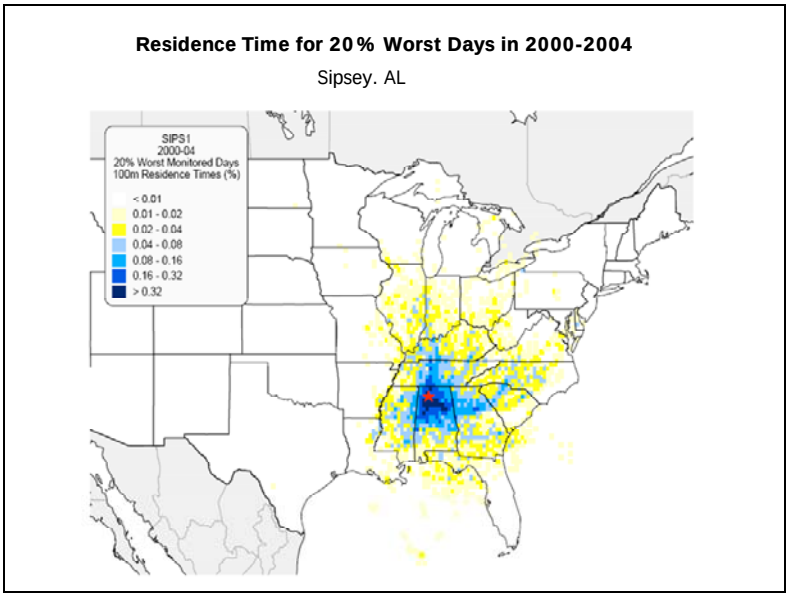


The following three maps show analyses of areas impacting the Sipsey Wilderness Area. They show contributions to visibility impairment on the 20% worst days during the 2000-2004 timeframe. As can be seen, Indiana sources do not have significant impacts on this area.

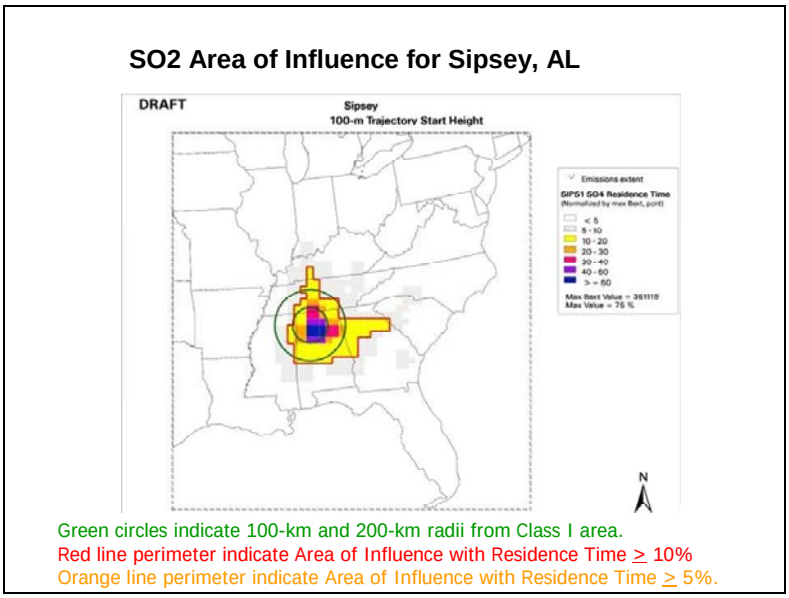
The following map is a meteorological back trajectory analysis for IMPROVE monitoring sites in 2000-2004. Using the descriptions from VISTAS and NCDENR, back trajectory analyses use interpolated, measured, or modeled meteorological fields to estimate the most likely central path of air masses that arrive at a receptor at a given time. The method essentially follows a parcel of air backward in hourly steps for a specified length of time. This map is for the Sipsey Wilderness area for the 20% worst days in 2002.



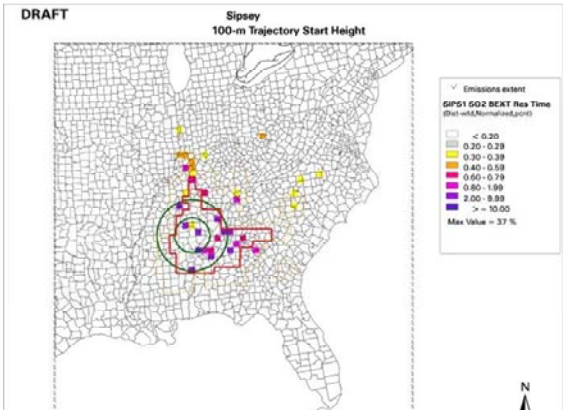
The following map is a residence time plot. This was created using five years of back trajectories for the 20% worst visibility days in 2000-2004. Residence time is the frequency that winds pass over a specific geographic area on the path to a Class 1 area.



Sulfate extinction weighted residence time plots were developed to define the geographic area with the highest probability of influencing the receptor on the 20% worst days in 2000-2004 that were dominated by sulfate. Each back trajectory was weighted by sulfate extinction for that day. The resulting plots were used to define the geographic Area of Influence for sources of SO_2 emissions. In the following plot, the area representing 10% or greater residence time is outlined in red, and the area representing 5% or greater residence time is outlined in gray. The VISTAS states focused their analyses on the Area of Influence defined 5% or greater sulfate extinction weighted residence time.



2018 SO2 Emissions weighted by Residence Time
Sipsey, AL

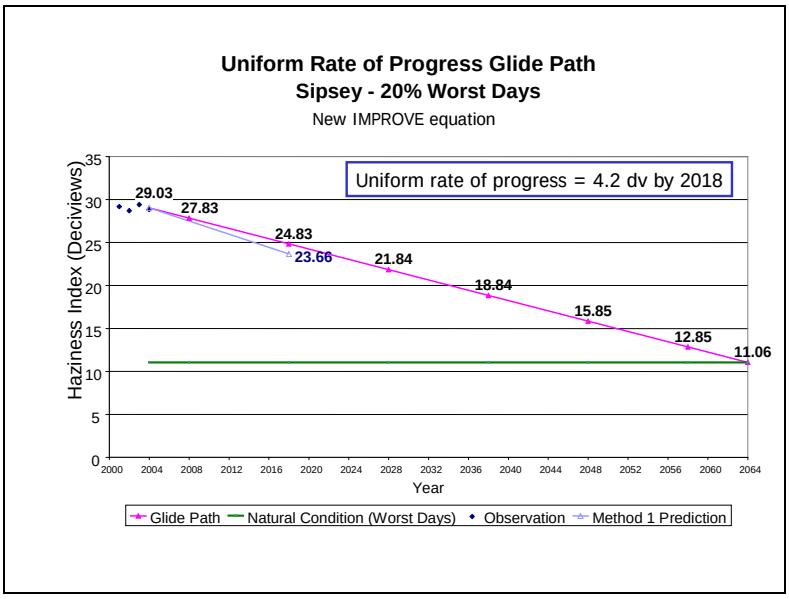


Green circles indicate 100-km and 200-km radii from Class I area.
Red line perimeter indicate Area of Influence with Residence Time ≥ 10%.
Orange line perimeter indicate Area of Influence with Residence Time ≥ 5%.

VISTAS further examined emissions sources within the SO_2 Areas of Influence. Residence time plots were combined with geographically-gridded emissions data based upon the 2002 baseline and 2018 projected inventories. As a way of incorporating the effects of transport, deposition, and chemical transformation of point source emissions along the path of the trajectories, those data were weighted by 1/d, where d was calculated as the distance between grid cell centers, in kilometers. The distance-weighted point source SO_2 emissions were then combined with the gridded extinction-weighted back-trajectory residence times at a spatial resolution of 36 km. The residence times and gridded emissions data were combined into plots. The distance weighted (1/d) gridded point source SO_2 emissions were multiplied by the total extinction-weighted back-trajectory residence times on a grid cell by grid cell basis. These results were then normalized by the domain-wide total and displayed as a percentage. The resulting plots show the relative importance of sources contributing to visibility impairment within the Area of Influence. The above plot illustrates this information for 2018 projected emissions.

Further, the slide below shows that the long term strategy for this Class 1 area meets the glidepath through 2018.

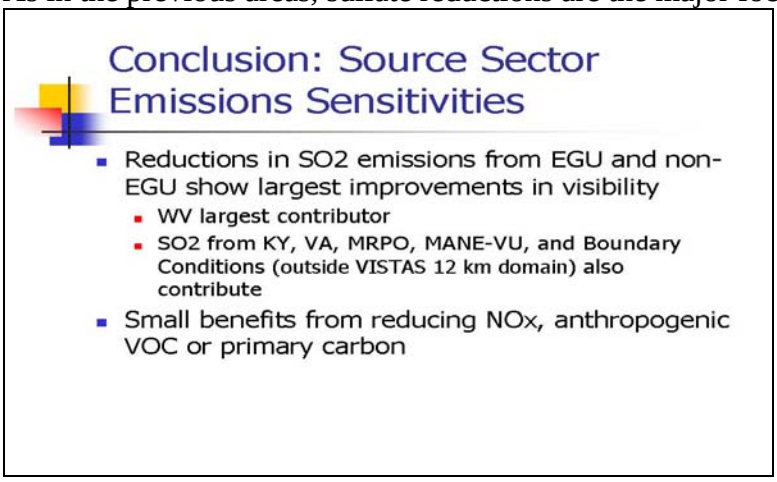
Indiana has not been contacted by Alabama regarding consultations for this area and believes that no further analysis for a long term control strategy is necessary at this time.



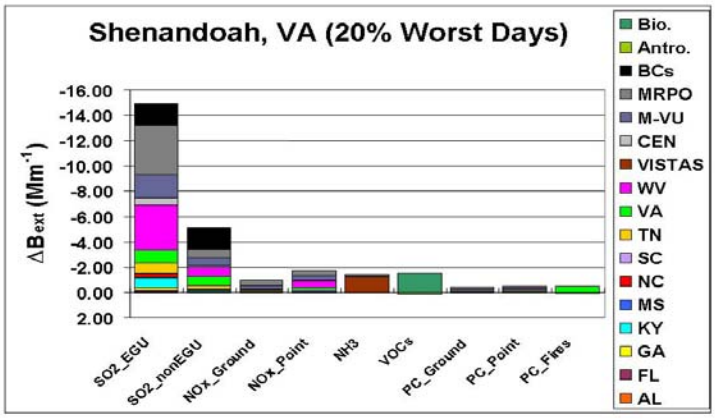
App. 3 - 5. James River Face Wilderness, Shenandoah National Park, Dolly Sods/Otter Creek Wilderness

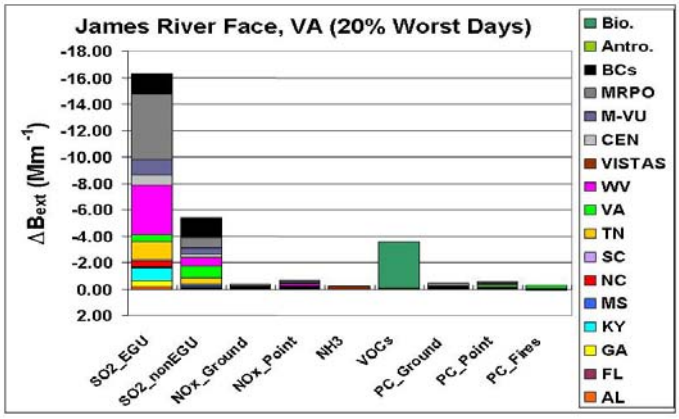
In the MRPO summary of Class 1 areas impacted by sources from within the MRPO (Appendix 1), Indiana was determined to contribute to visibility impairment in these more distant Class 1 areas. Since that time, VISTAS has conducted several analyses to assist in developing reasonable progress goals. The following slides are from the VISTAS analysis, "Shenandoah Group Contribution Assessment", Draft, May 29, 2007. Since these areas are analyzed together in the VISTAS work, it is easier to consider them together in this document. The charts and plots are the same type as in the previous sections, and so the text is omitted to keep this section short.

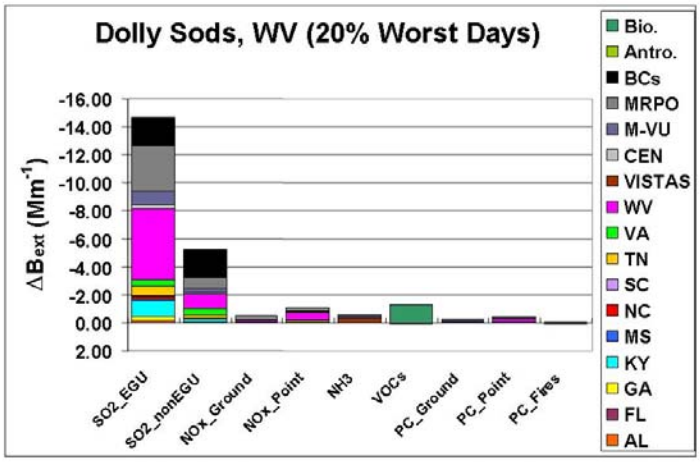
As in the previous areas, sulfate reductions are the major focus.



The following charts show the emissions by sector and location contributing to impaired visibility on the 20% worst days.



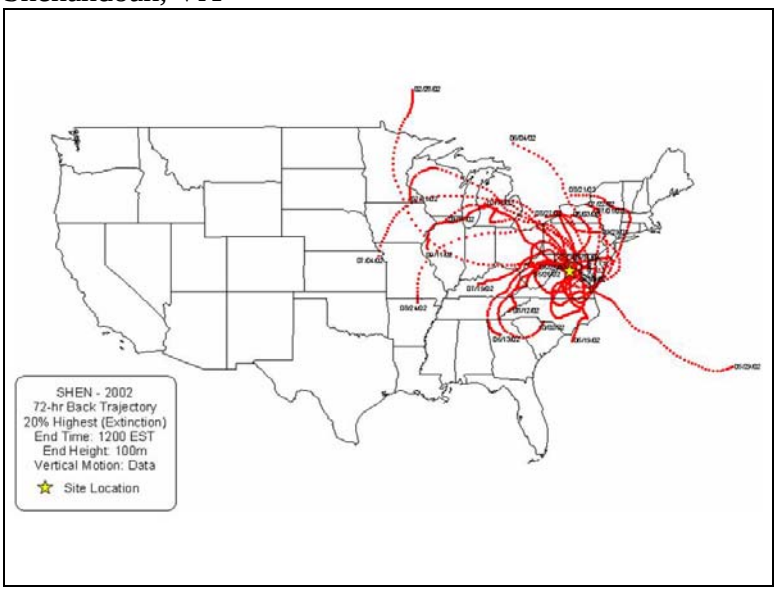




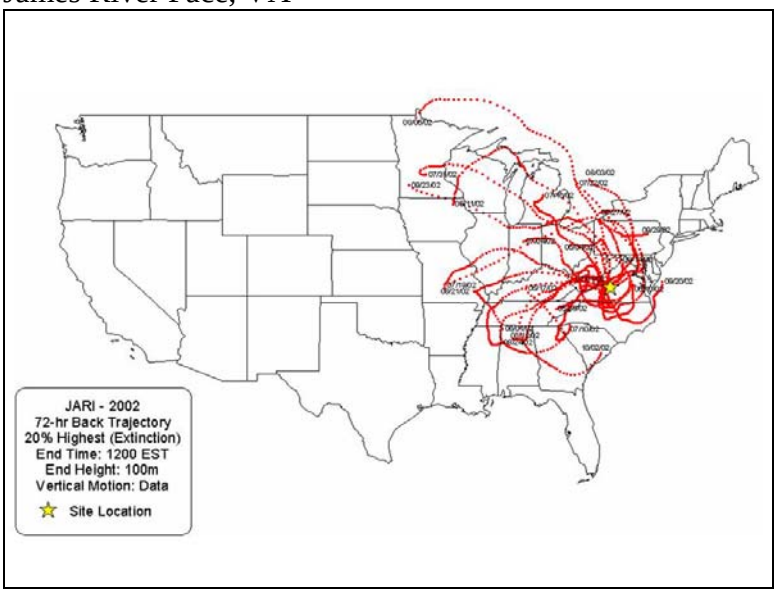
Emissions sensitivities for Otter Creek are the same as for Dolly Sods

The following maps show back trajectories for the 20% Worst Days for 2002.

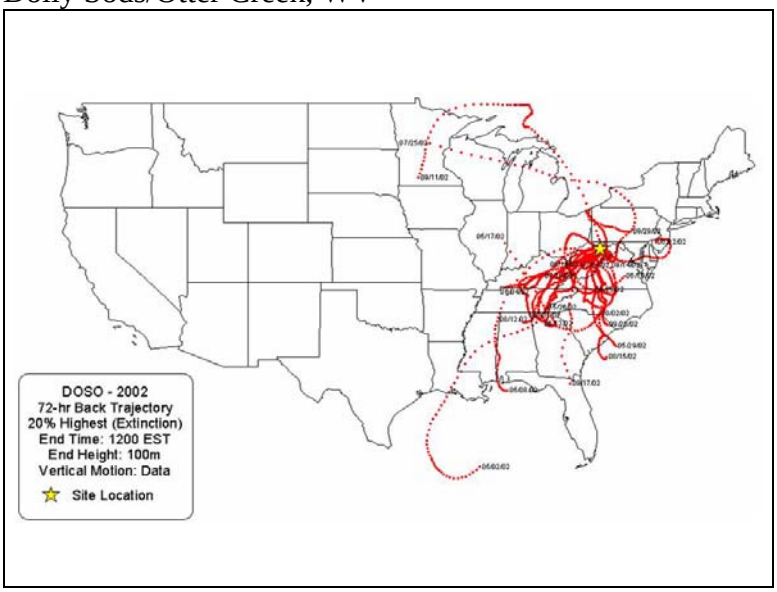
Shenandoah, VA



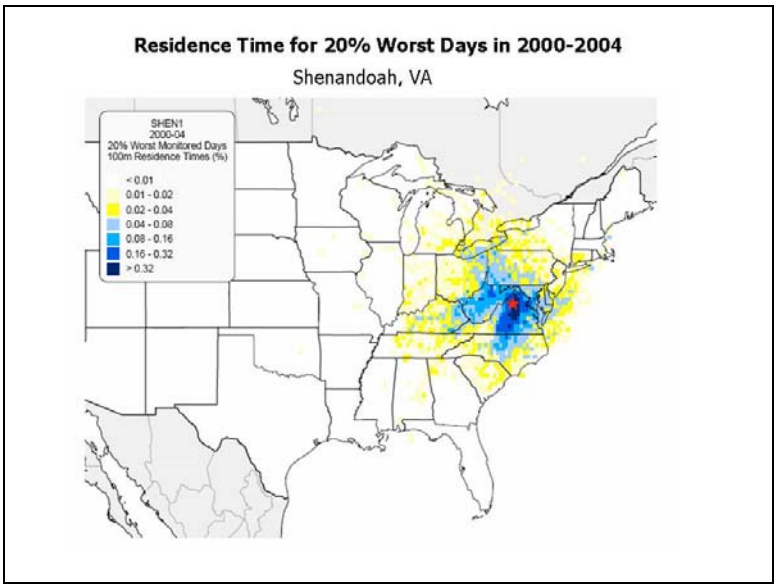
James River Face, VA

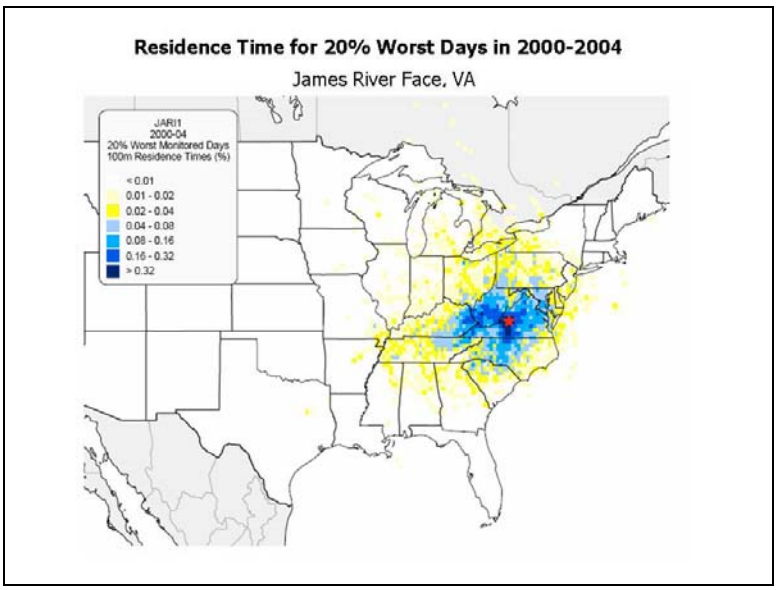


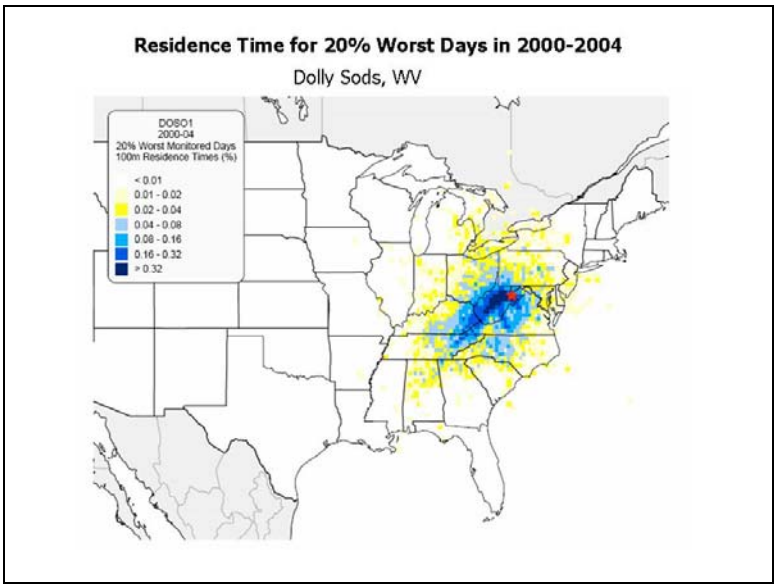
Dolly Sods/Otter Creek, WV



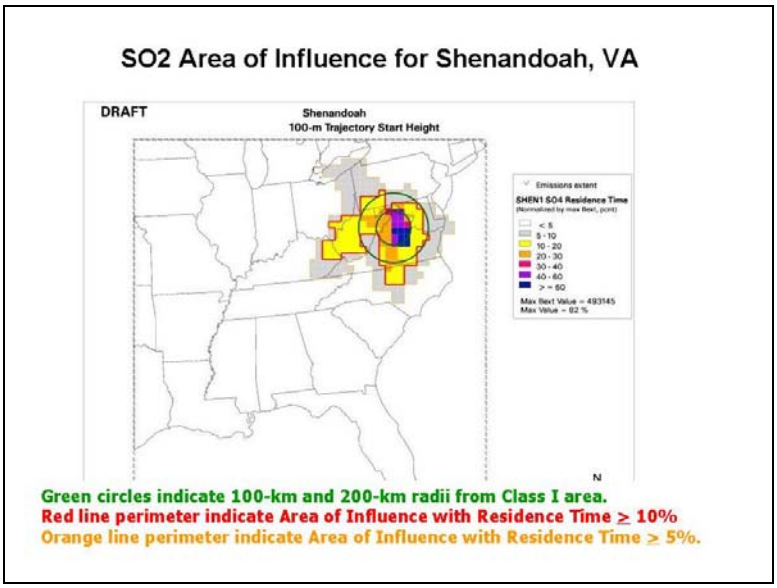
The residence times for the 20% worst days in 2000-2004 are shown for the areas in the next three plots.



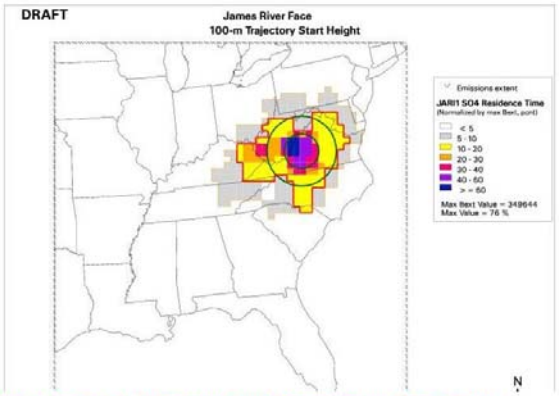




The SO_2 Areas of Influence are shown in the next three plots.



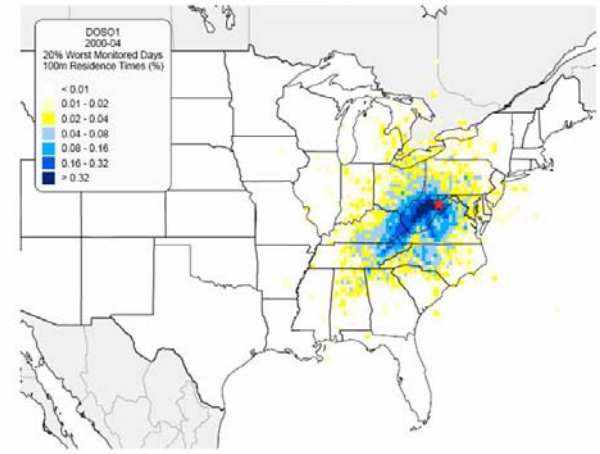
SO2 Area of Influence for James River Face, VA



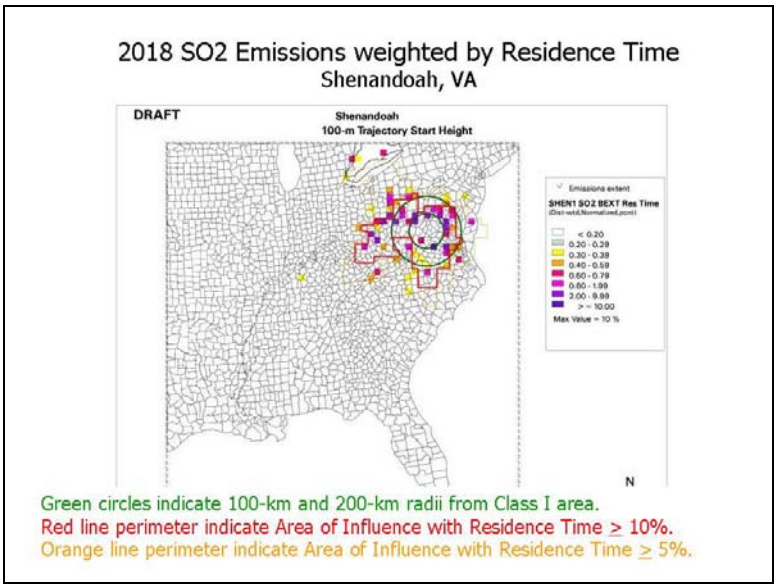
Green circles indicate 100-km and 200-km radii from Class I area.
Red line perimeter indicate Area of Influence with Residence Time ≥ 10%
Orange line perimeter indicate Area of Influence with Residence Time ≥ 5%.

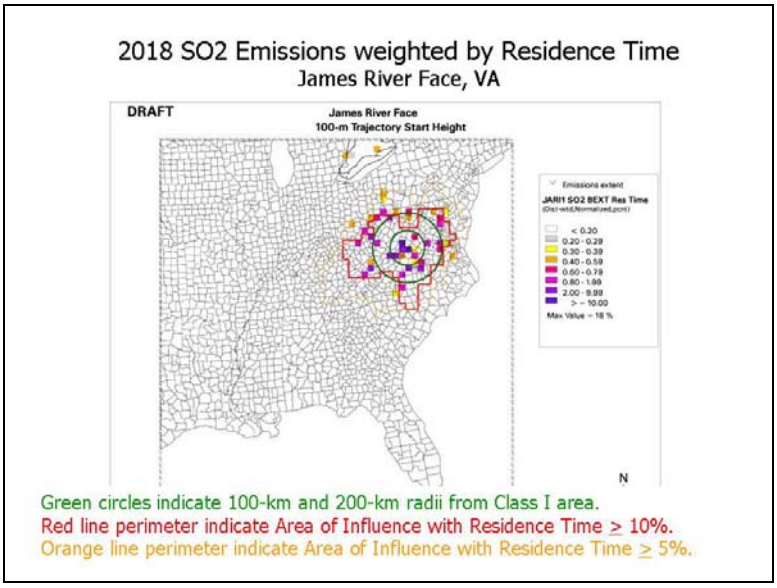
Residence Time for 20% Worst Days in 2000-2004

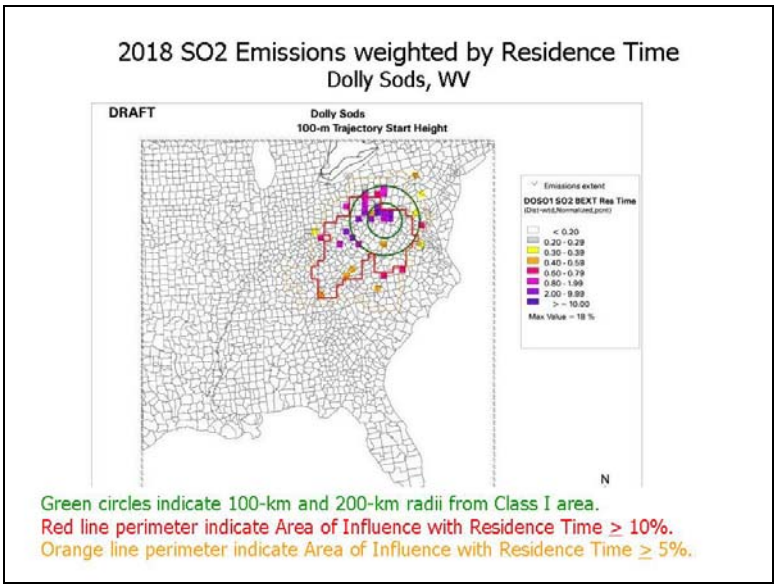
Dolly Sods, WV



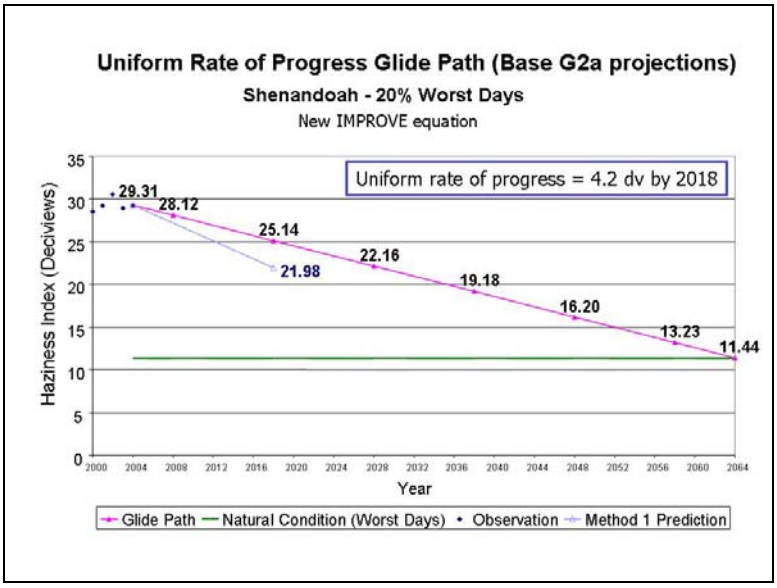
The 2018 Emissions weighted by Residence Time plots are shown for all three areas. These show the relative importance and locations of sources impacting a given area.

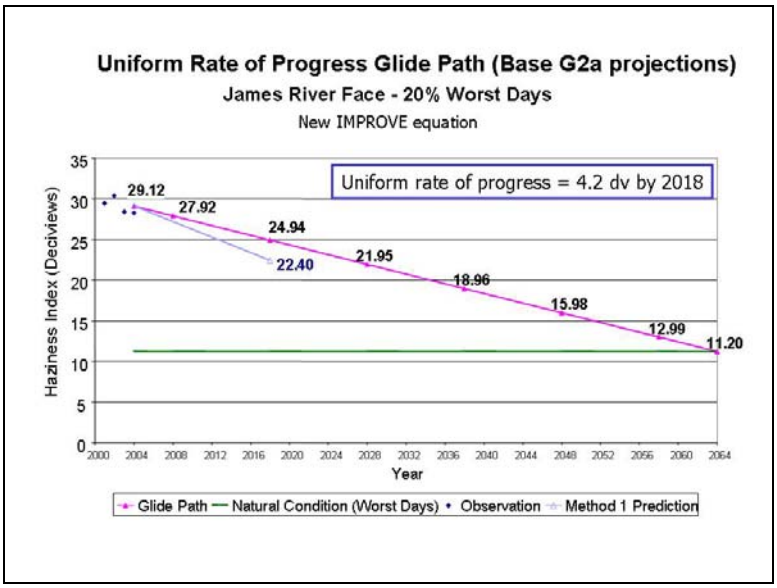


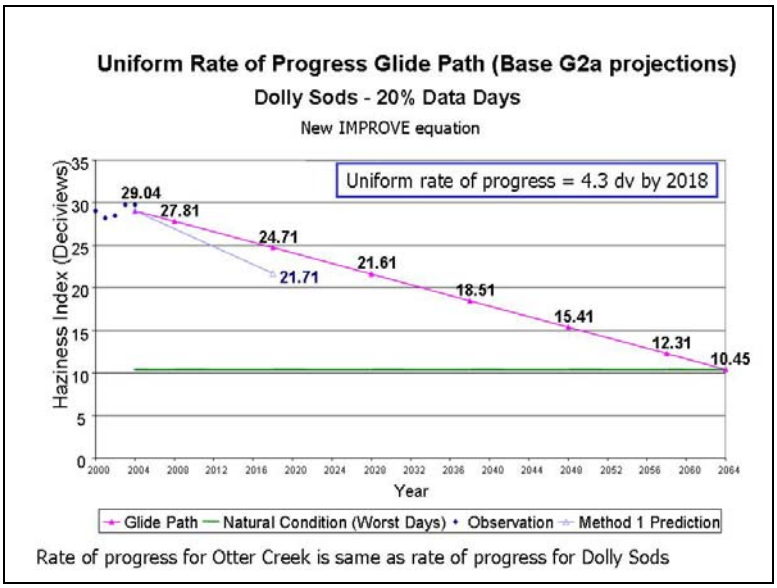




The results of the long term strategy developed by the states and VISTAS provide anticipated visibility improvements below the glidepath.







Rate of progress for Otter Creek is same as rate of progress for Dolly Sods

This series of charts and plots show that impacts from Indiana sources are minimal. Neither Virginia nor West Virginia contacted IDEM to participate in consultations for these areas. The four-factor analyses performed by the VISTAS states and resulting long term strategies that indicate controls closer to the Class 1 areas provide the most effective reductions at this time. Additionally, the long term strategies provide anticipated visibility improvements below the glidepaths. Indiana concurs with these conclusions.

App. 3 - 6. Caney Creek Wilderness Area and Upper Buffalo Wilderness Area, AR; Hercules-Glades Wilderness Area and Mingo Wilderness Area, MO

These areas were identified in early MRPO modeling and other analyses as being impacted by Indiana sources. Indiana was invited to participate in the consultation process for these areas, and attended the conference phone calls. Arkansas and Missouri notified IDEM that they

consider the consultation process finished. They have developed long term strategies that meet rate of progress goals by 2018. At this time, they have indicated that no reductions are necessary from Indiana. Indiana concurs with this finding.

The letter providing this information is below in this section.

Following the letter from Arkansas and Missouri are charts showing glidepaths resulting from the long term strategies developed by the states. All the Class 1 areas are projected to meet their reasonable progress goals in 2018. These charts are from the "12 Sep 2007 Appendices" found on the CENRAP website, http://www.cenrap.org/projects.asp. They are based upon the information and strategies found in the Draft Technical Support Document, of the same date and from the same location.

An additional analysis is included with information obtained from VISTAS and is similar to that contained in the previous sections. The focus of this work was to determine the impact of VISTAS states upon the CENRAP areas, but includes useful information regarding midwestern sources as well. This was done prior to the CENRAP work, but is consistent with materials presented for the other areas.

Letter from Arkansas and Missouri regarding conclusion of consultation process.

ADEQ
ARKANSAS
Department of Environmental Quality

July 23, 2007

To: Participants in the Central Class I Areas Consultation Process

Re: Central Class I Areas Consultation Conclusion

On Feb. 26, 2007, an invitation letter was sent to 12 states and tribes from the states of Missouri and Arkansas. The invitation included a consultation plan, which detailed the procedures and timelines for identifying possible contributors to regional haze in Arkansas and Missouri Class I Areas (Caney Creek, Upper Buffalo, Hercules Glade and Mingo). This process was initiated because the federal Regional Haze Rule requires states to consult with other states and tribes that may be causing or contributing to visibility impairments in federal Class I areas.

These consultations have been accomplished through a series of conference calls. The calls were held on April 3, May 11 and June 7, 2007. Participants included states and tribes, Environmental Protection Agency personnel, regional office staff, Federal Land Managers, and other Regional Planning Organizations. A summary of these conference calls can be found on the CENRAP Web site.

A Uniform Rate of Progress was developed for each of the Class I Areas in Arkansas and Missouri. Regional modeling and other findings indicate that these Class I Areas will meet the established Rate of Progress goals by 2018 based on the existing and proposed controls through both state and federal requirements. Therefore, it is the intent of Arkansas and Missouri to proceed with the development and submittal of a Regional Haze Plan.

Both Missouri and Arkansas believe that the consultations conducted to date have satisfied the consultation process requirements described in the rule. These consultations were completed so that the each state's plan can be submitted for separate review with the Federal Land Managers and Environmental Protection Agency. If necessary, future consultations will be conducted to address any issues that are identified in the review of those draft plans or if changes occur in the contributions associated with regional haze transport.

Arkansas and Missouri are committed to continue on-going assessments of progress in meeting visibility improvement goals. However, the ability to conduct

AIR DIVISION
8001 NATIONAL DRIVE / POST OFFICE BOX 8913 / LITTLE ROCK, ARKANSAS 72219-8913 / TELEPHONE 501-682-0739 / FAX 501-682-0753
www.adeq.state.ar.us

any substantive future planning activities of this nature are made difficult by the lack of federal funding for these efforts. The next review is scheduled for completion in 2013, as dictated by Long Term Strategy Planning on a five-year cycle.

Furthermore, to document that these initial consultations have been made, we are asking that recipients of this letter respond to provide a record that these consultations have taken place to the satisfaction of your state or tribe. Since federal recipients of this letter have a separate administrative process for review, we are not asking for your reply at this time.

Thank you for your participation and contributions in this consultation process. Your time and efforts are appreciated. If you require additional information regarding this matter, please contact Mr. Calvin Ku, Missouri Department of Natural Resources at (573) 751-8406 or, Mr. Mark McCorkle, Arkansas Department of Environmental Quality at (501) 682-0736.

Sincerely,

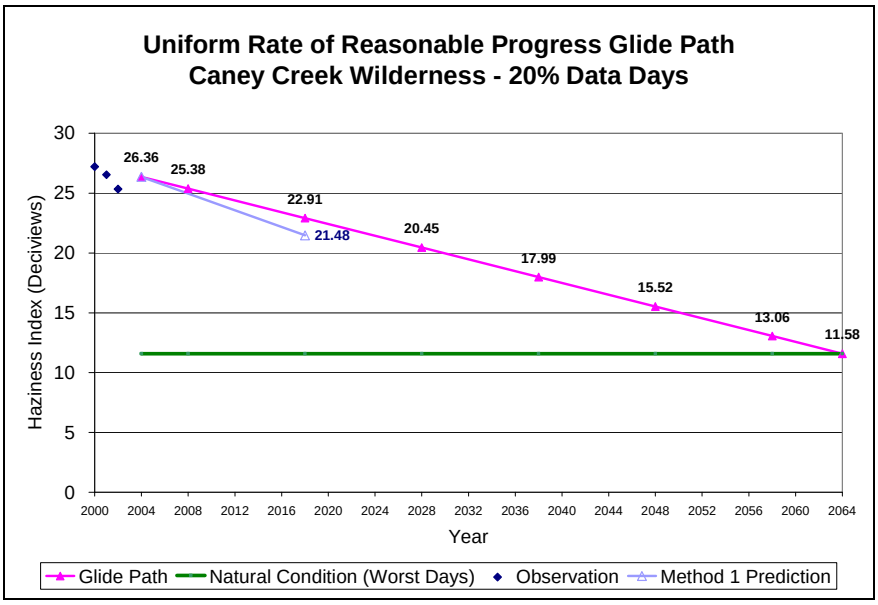
ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

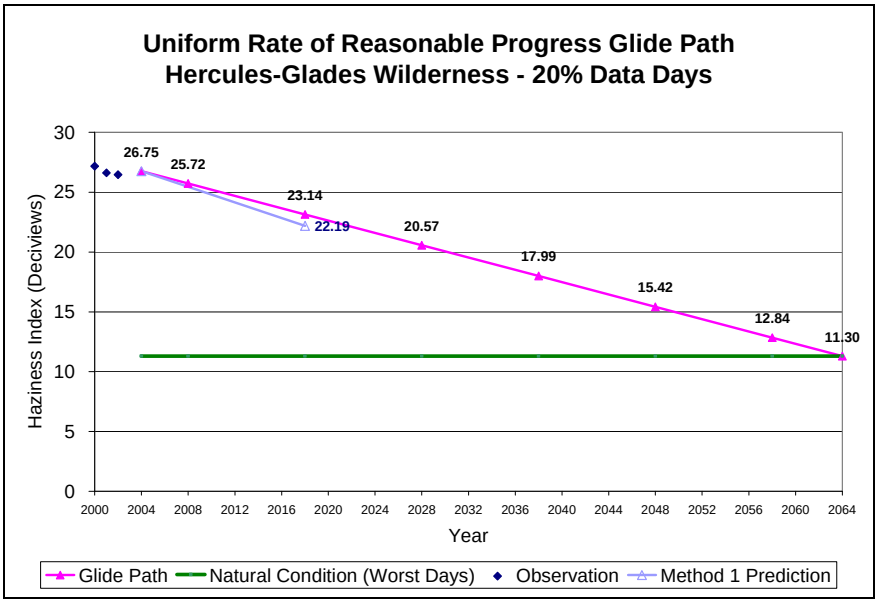
Mike Bates, Chief
Air Division
Arkansas Department of Environmental Quality

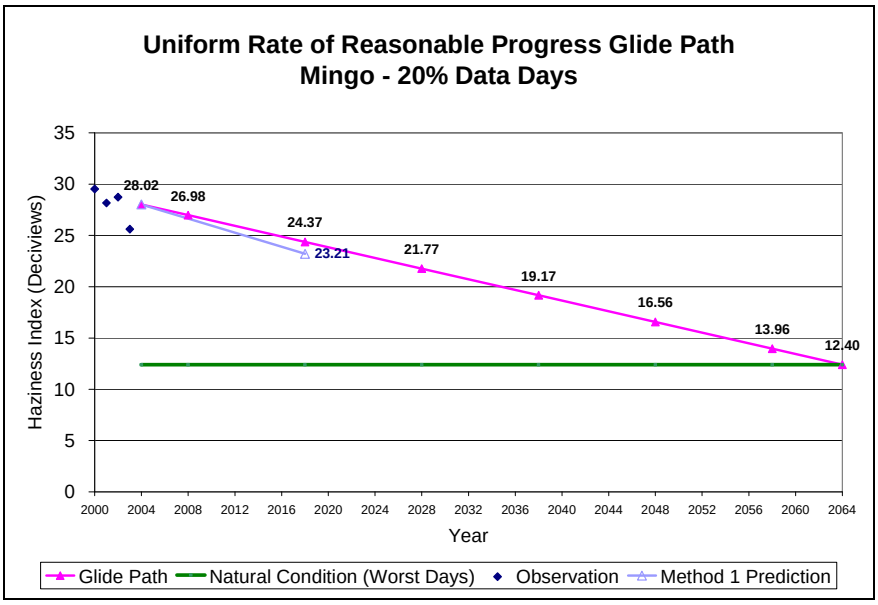
MISSOURI DEPARTMENT OF NATURAL RESOURCES

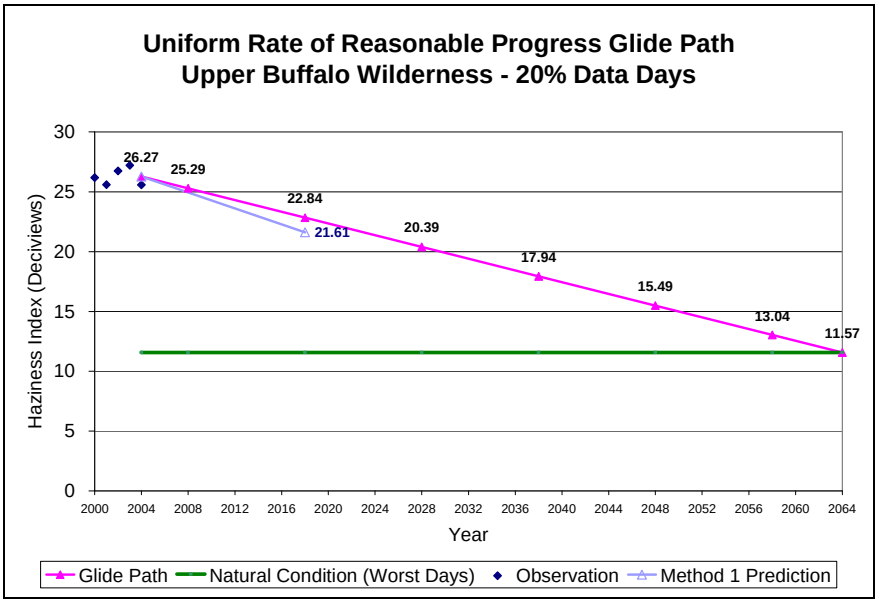
James L. Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources

Glidepaths generated by CENRAP showing that the long term strategy developed by the states meets reasonable progress goals for 2018.





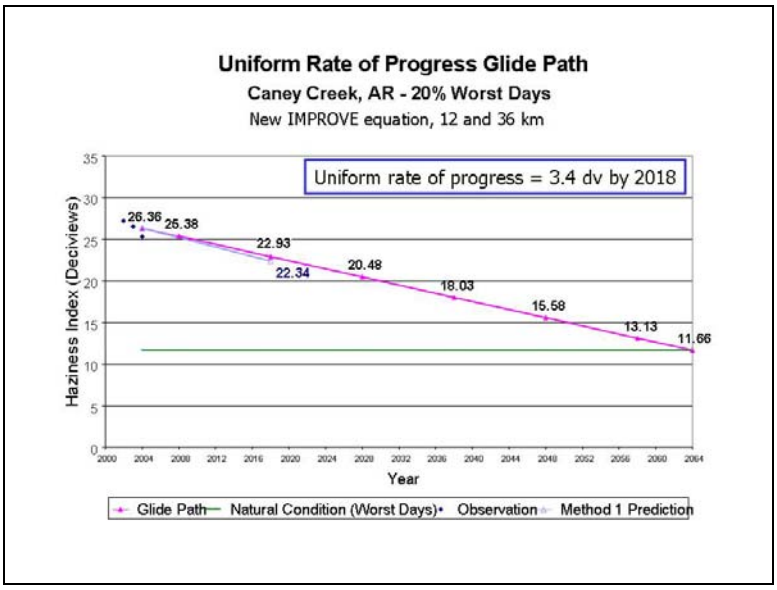


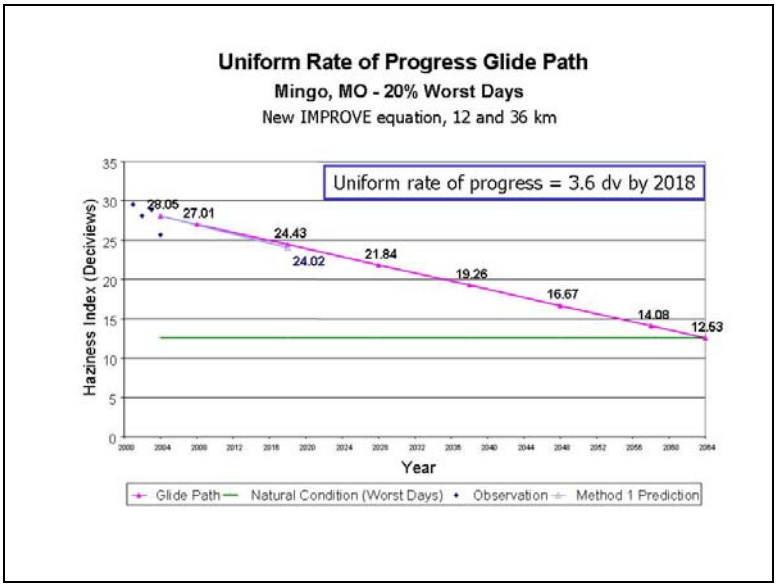


VISTAS Analysis

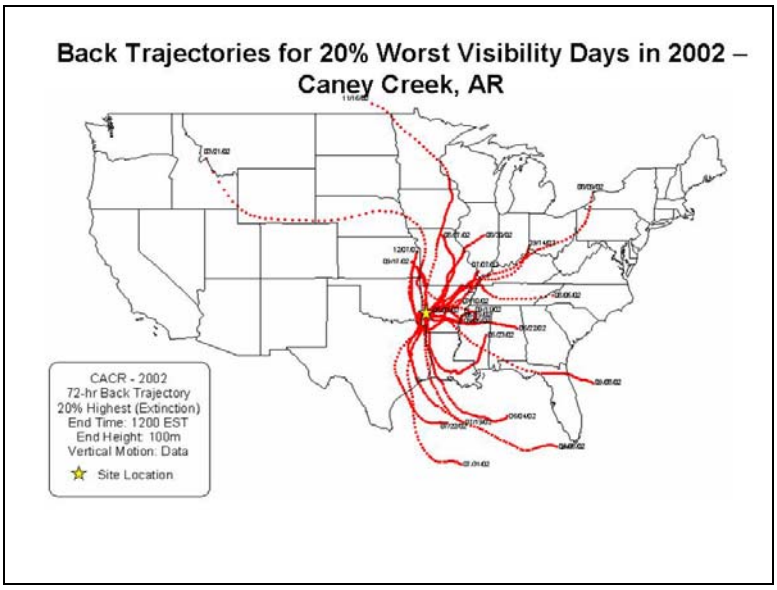
In developing information to support long term strategies for its member states, VISTAS examined their impacts upon the Missouri and Arkansas Class 1 areas. Impacts from midwestern states were also included in these analyses. Again in this case, the focus of reduction strategies is for SO_2.

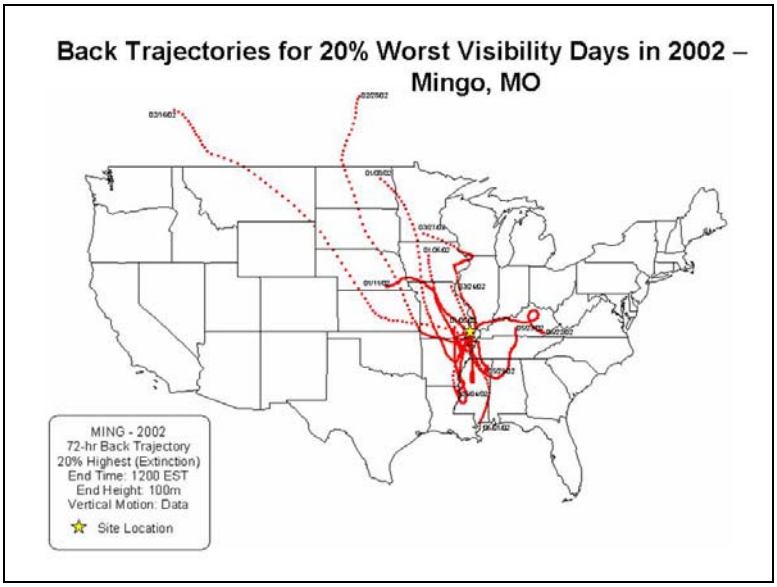
Results from these strategies produced results similar to CENRAP. Below are the glidepaths generated for two of the Class 1 areas, for comparison to those above.



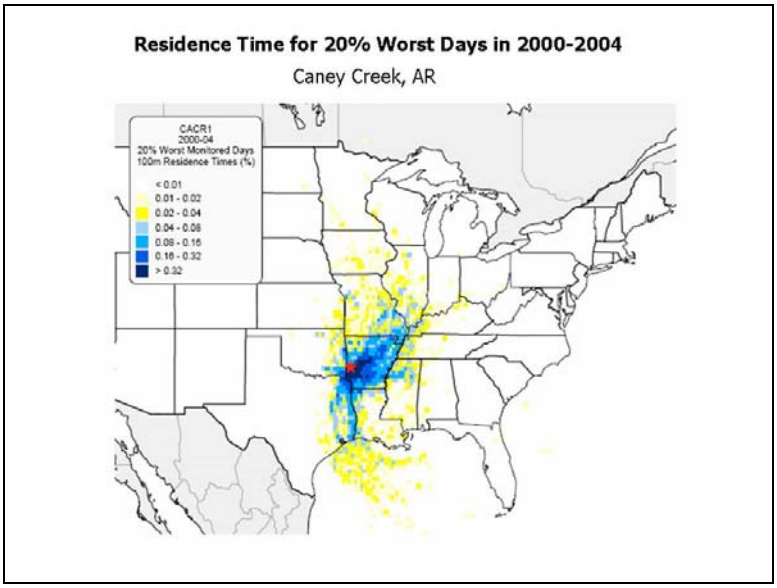


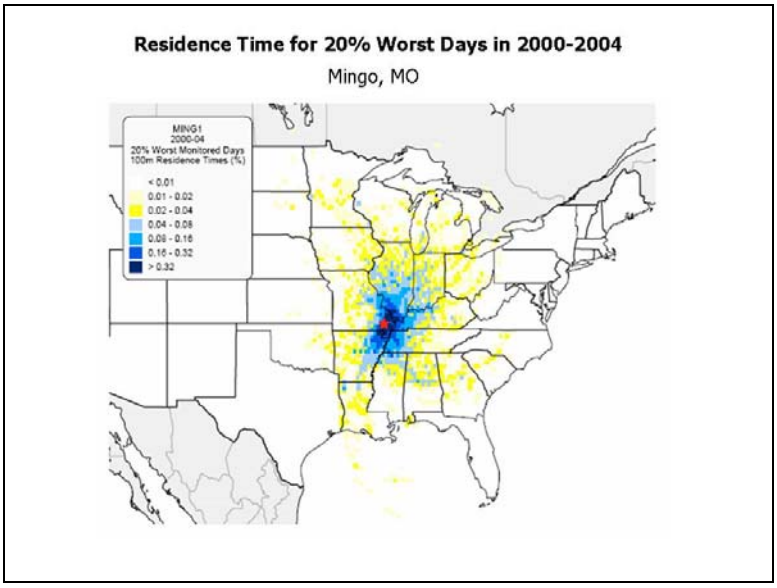
The following plots show the back trajectories for 20% worst days for 2002 for two sites. Neither appear to be heavily impacted by Indiana sources in these plots.



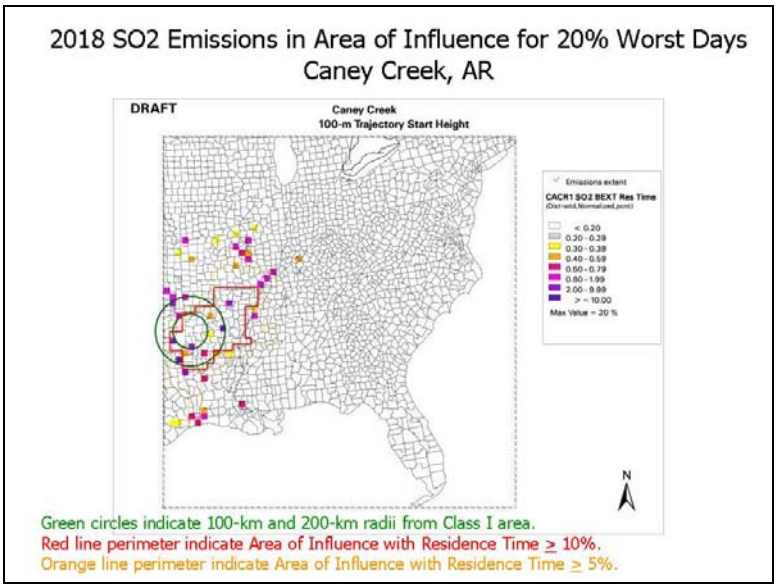


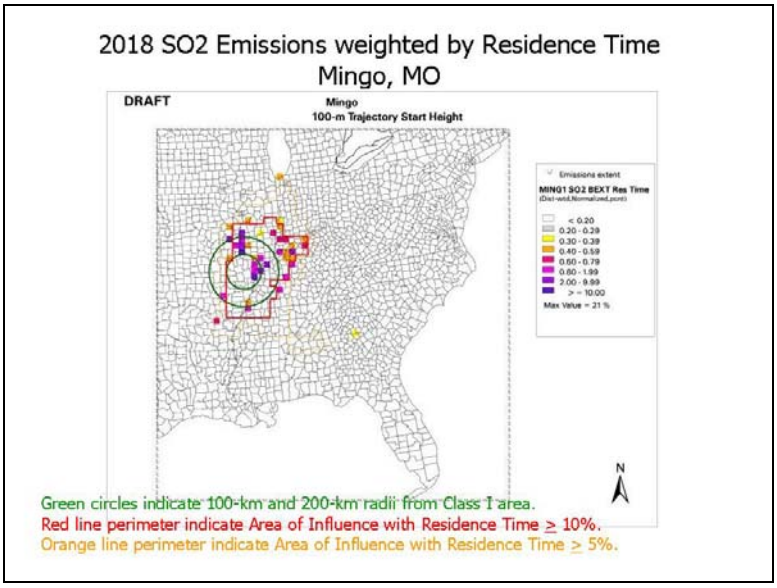
The next two plots show residence time for the 20% worst days from 2000-2004. The plot for Mingo Cave shows a greater impact from Indiana sources, although the greatest impacts are from sources closer to the Class 1 area.



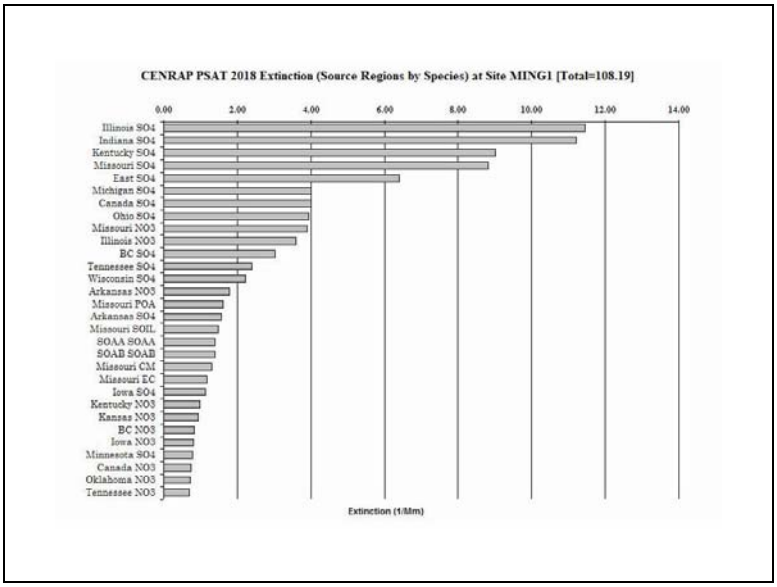


The last two plots show SO_2 emissions weighted by residence time for 2018 for the two Class 1 areas. Indiana is on the edge of the Area of Influence for Mingo Cave.





The bar graph below further illustrates the projected impact of Indiana sources of SO_2 on Mingo Cave in 2018. Because of this impact, a further examination of the SO_2 control devices on EGUs in southwestern Indiana was performed.



The EGUs in this area of the state are listed by unit in the following table. Many of these units did not have controls in the 2002 baseyear inventory. The IPM projections used for future years may also not have reflected current or future control projects.

Plant	Unit	Emissions in 2002	SO_2 control in 2002	SO_2 controls planned
A.B. Brown	1	6004	FGD existing	
A.B. Brown	2	1868	FGD existing	
Cayuga	1	29,379		FGD 2008
Cayuga	2	26,237		FGD 2008
Edwardsport	8	2742		current plans to
Edwardsport	7*1	2688		replace facility with
Edwardsport	7*2	2742		IGCC prior to 2018
F.B. Culley	1	2993		
F.B. Culley	2	730	FGD existing	
F.B. Culley	3	3396	FGD existing	
Frank E. Ratts	1SG1	7907		
Frank E. Ratts	2SG1	10,148		
Gibson	1	34,698		FGD 2007
Gibson	2	37,162		FGD 2007
Gibson	3	28,477		FGD 2007
Gibson	4	9196	FGD existing	
Gibson	5	17969	FGD existing	
Merom	1SG1	5835	FGD existing	
Merom	2SG1	7011	FGD existing	
Petersburg	1	2093	FGD existing	
Petersburg	2	3535	FGD existing	

Plant	Unit	Emissions in 2002	Existing SO_2 control	SO_2 controls planned
Petersburg	3	20,936	FGD existing	
Petersburg	4	20,614	FGD existing	
Rockport	MB1	25,943		FGD planned 2017
Rockport	MB2	25,602		FGD planned 2019
Wabash	2	7912		
Wabash	3	6999		
Wabash	4	7131		
Wabash	5	9380		
Wabash	6	25,602		FGD planned
ALCOA-Warrick	1	18,459		FGD in 2008
ALCOA-Warrick	2	19,258		FGD in 2008
ALCOA-Warrick	3	16,012		FGD in 2008
SIGECO-Warrick	4	40,476		FGD in 2008

While Indiana was not included in any requests for controls from this Class 1 area, it can be seen that the vast majority of SO_2 emitting units will have scrubbers installed by 2018, which should help further improve the visibility in those areas.

App. 3 - 7. Isle Royale National Park and Seney Wilderness Area, MI

Indiana sources have shown an impact on these Class 1 areas through modeling studies. Indiana and the other midwestern states participated extensively in the MRPO modeling and data analysis efforts for fine particulates, ozone, and haze in these areas. Michigan determined that existing and on-the-books controls, combined with reductions necessary to meet the new 24-hour fine particulates standard and the new ozone standard will be sufficient to meet their reasonable progress goals.

The letter from the Michigan Department of Environmental Quality, below, contains their conclusions. Indiana concurs that this is the best approach for addressing visibility impairment at Isle Royale National Park and Seney Wilderness Area Class 1 areas at this time. Therefore, no further analysis for this SIP is necessary. Indiana will continue to work with Michigan and the other MRPO states through LADCO to evaluate the progress and the Class 1 areas.

Letter from Michigan regarding conclusion of consultation process.

Ken

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

October 26, 2007

TO: Northern Class I Area Consultation Participants Listed on Attachment

We are writing this letter to those parties that have participated in the Regional Haze consultation process with the Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD), over the last several months. This letter explains the AQD's response to the Regional Haze Rule.

As you know, the federal rule requires states with Class I areas to consult with other states that may be contributing to visibility impairment within the Class I areas. Michigan's two haze Class I areas are Isle Royale National Park and the Seney Wilderness Area. The dialog over the last few months with you and the other participants (see attached list) has helped the AQD decide on the best approach for complying with the reasonable progress requirements of the rule.

The AQD is relying primarily on the study by EC/R, Inc. to evaluate the costs and impacts on visibility through additional controls in the region. A key finding of the report is that "beyond CAIR" reductions from EGUs in a three-state (Michigan, Wisconsin and Minnesota) or nine-state (Michigan, Wisconsin, Minnesota, Indiana, Illinois, Missouri, Iowa, North Dakota and South Dakota) region would provide the most significant visibility improvement in Michigan's Class I areas. While the AQD would likely support a federal "beyond CAIR" program, we do not intend to promulgate a state rule for the purpose of improving visibility.

Additional measures were analyzed in the EC/R report focusing on ICI boilers, reciprocating engines and turbines, agricultural sources and mobile sources. While controls for ICI boilers and reciprocating engines may be cost-effective, they appear to have little effect on visibility. Agricultural (ammonia) sources appear to have a larger impact and may be cost-effective, but the ammonia inventory is still inaccurate. Mobile source controls are generally expensive and have very little impact on visibility. Due to the small effects on visibility from these sources, the AQD does not intend to pursue such category-specific controls for regional haze.

The AQD is completing its Best Available Retrofit Technology (BART) analysis of the six facilities that have been shown to impact one or more of Michigan's Class I areas and will develop consent orders or rules to implement BART controls on these facilities. The AQD is also developing a state implementation plan for PM2.5 and expects there will be additional areas of nonattainment resulting from the new PM2.5 24-hour standard and possibly for the revised National Ambient Air Quality Standard for ozone.

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Additional controls will probably be needed in order to meet these standards, and such controls are likely to contribute to a reduction in regional haze in the 2018 time frame.

Since the AQD is not planning new controls at this time, specifically for the regional haze program, we are not asking other states to reduce emissions for the regional haze rule. However, we do support Minnesota's plan to reduce emissions to improve visibility at their two Class I areas and their request to impacting states to do likewise. Any such emission reductions will have some beneficial impacts on Michigan's Class I areas.

We would like to thank you for your participation in the consultation process. It was an opportunity for a fruitful discussion and sharing of data relative to Michigan's regional haze areas. If you have any questions regarding this letter or the consultation process, please contact Ms. Cindy Hodges, AQD, at 517-335-1059, or you may contact me.

Sincerely,

ACTING

G. Vinson Hellwig, Chief
Air Quality Division
517-373-7069

Attachment
cc: Mr. Jim Sygo, Deputy Director, MDEQ
Mr. Robert Irvine, MDEQ
Ms. Cindy Hodges, MDEQ

Participants in the Northern Class I Consultation

States and Provinces
Illinois Environmental Protection Agency
Indiana Department of Environmental Management
Iowa Department of Natural Resources
Michigan Department of Environmental Quality
Minnesota Pollution Control Agency
Missouri Department of Natural Resources
North Dakota Department of Health
Wisconsin Department of Natural Resources
Ontario Ministry of the Environment

Tribes
Leech Lake Band of Ojibwe
Fond du Lac Band of Lake Superior Chippewa
Mille Lacs Band of Ojibwe
Upper and Lower Sioux Community
Red Lake Band of Chippewa
Grand Portage Band of Chippewa
Nottawaseppi Huron Band of Potawatomi

Regional Planning Organizations
Midwest Regional Planning Organization
Central Regional Air Planning Association

Federal Government
USDA Forest Service
U.S. Fish and Wildlife Service
National Park Service
USDA Forest Service
Environmental Protection Agency, Region 5

App. 3 - 8. Acadia National Park, ME; Moosehorn Wilderness Area, ME; Great Gulf Wilderness Area, NH; Brigantine Wilderness Area, NJ; and Lye Brook Wilderness, VT (MANE-VU)

Indiana sources have shown an impact on these Class 1 areas through LADCO and MANE-VU modeling projects. Indiana, along with the other MRPO states, has participated in consultations with MANE-VU.

MANE-VU released "Assessment of Reasonable Progress for Regional Haze in MANE-VU Class 1 Areas - Methodology for Source Selection, Evaluation of Control Options, and Four Factor Analysis, July 2007" which supported requests of states outside that area to examine controls for specific types of sources. This assessment is a large document and is not included in this submittal. It is available online at the MANE-VU website, http://www.manevu.org, under "Consultations - Projects and Work Products." The resulting request is referred to as the "MANE-VU Ask."

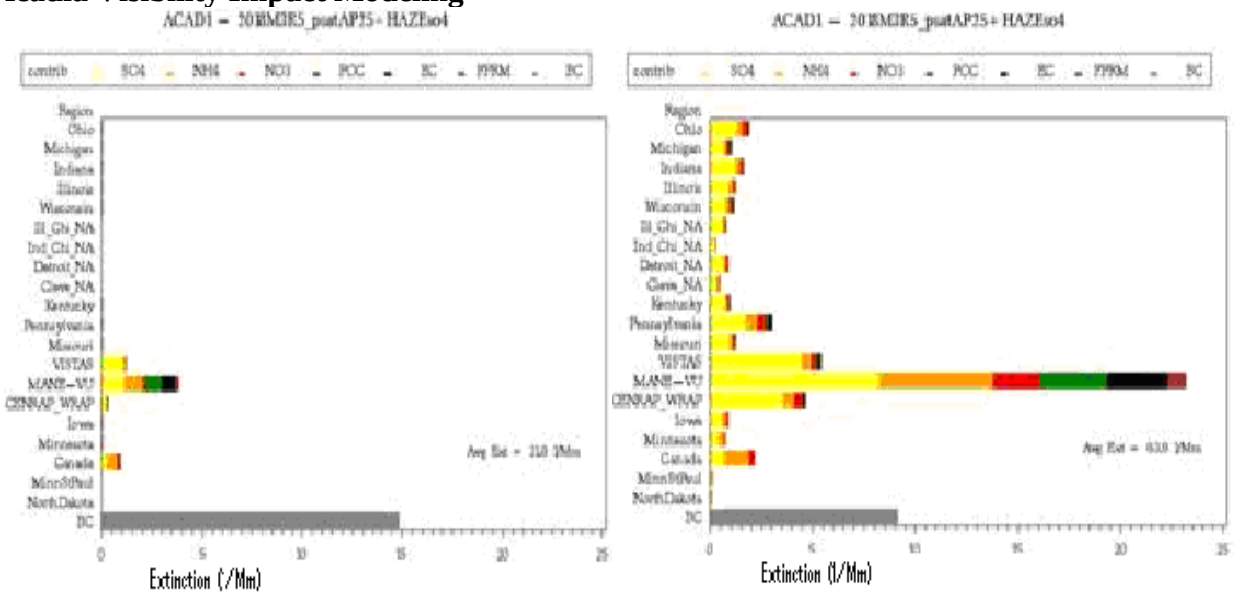
MANE-VU Ask: In its "Statement of the Mid-Atlantic/Northeast Visibility Union (MANE-VU) Concerning a Request for a Course of Action by States Outside of MANE-VU Toward Assuring Reasonable Progress" (June 20, 2007), pages 63 and 64 of this appendix, MANE-VU suggested that several control strategies should be pursued for adoption and implementation, including:

- Application of Best Available Retrofit Technology
- 90% (or greater) reduction in SO_2 emissions from each of the EGU stacks on MANE-VU's list of 167 stacks (located in 19 states), which reflect those stacks determined to be reasonably anticipated to cause or contribute to visibility impairment in the MANE-VU Class 1 areas
- 28% reduction in non-EGU (point, area, on-road, and off-road) SO_2 emissions relative to on-the-books, on-the-way 2018 projections
- Continued evaluation of other measures, including measures to reduce SO_2 and NOx emissions from coal-burning facilities and promulgation of new source performance standards for wood combustion
- Further reduction in power plant SO_2 (and NOx) emissions beyond the current Clean Air Interstate Rule program

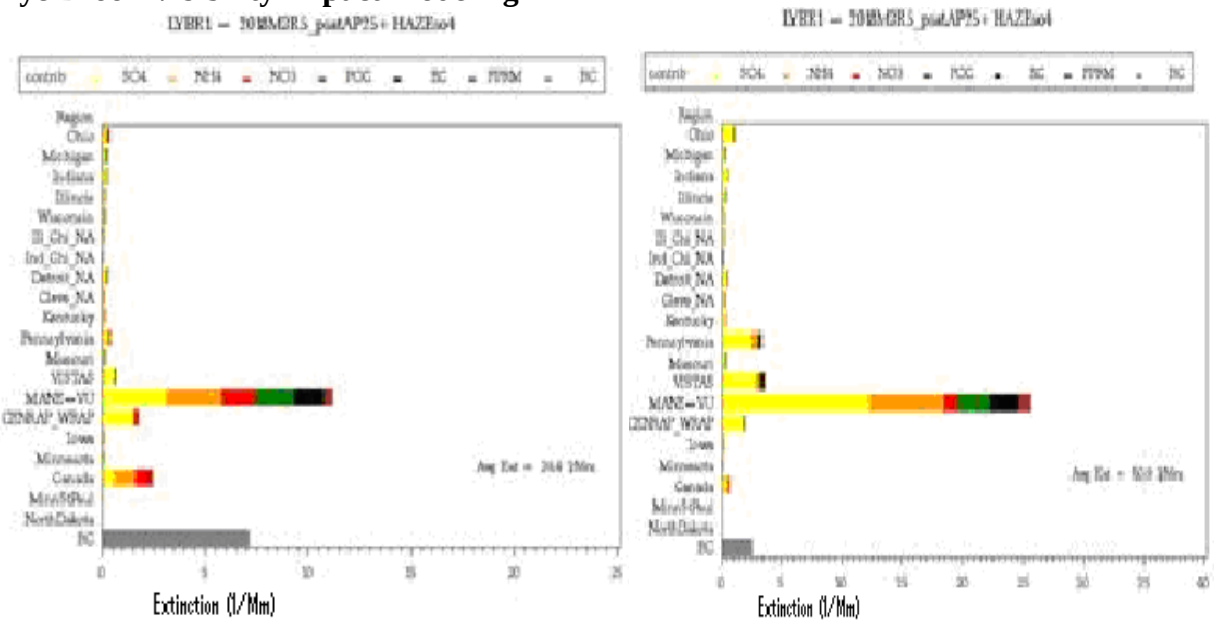
Of the 167 stacks, 15 are from 9 sources in Indiana, page 62 of this section. Most of these stacks have or will have post-combustion emission controls (i.e., scrubbers), see the table at the end of this section.

The two sets of charts from MRPO "Round 5" modeling show the culpability of geographic areas to visibility conditions in two Class 1 areas in the northeast. The left charts are the best days, the right charts are the worst days.

Acadia Visibility Impact Modeling



Lye Brook Visibility Impact Modeling



The following tables further detail the impact Indiana sources have on the northeastern Class 1 areas. Impacts are calculated in terms of light extinction.

MANE-VU (worst days)			
Site ID	**Lye Brook**	**Acadia**	**Brigantine**
Total - Light Extinction (1/Mm)	41.27821	52.91908	71.23547
Indiana Contribution (1/Mm)	0.65769	1.62771	1.28582
Indiana/Chicago Non-Attainment Area (1/Mm)	0.10376	0.28095	0.1648
Indiana Contribution (%)	1.6%	3.1%	1.8%
Indiana/Chicago Non-Attainment Area (%)	0.3%	0.5%	0.2%
Total Indiana/Chicago Non-Attainment Area (%)	1.8%	3.6%	2.0%

MANE-VU (best days)			
Site ID	**Lye Brook**	**Acadia**	**Brigantine**
Total - Light Extinction (1/Mm)	18.9041	6.69923	19.35866
Indiana Contribution (1/Mm)	0.28827	0.0313	0.15311
Indiana/Chicago Non-Attainment Area (1/Mm)	0.03538	0.00681	0.03268
Indiana Contribution (%)	1.5%	0.5%	0.8%
Indiana/Chicago Non-Attainment Area (%)	0.2%	0.1%	0.2%
Total Indiana/Chicago Non-Attainment Area (%)	1.7%	0.6%	1.0%

It can be seen that Indiana sources have insignificant impacts on these areas.

The MRPO has conducted modeling to evaluate the various levels of controls in place or planned between 2008 and 2018. From this "Round 5" modeling the following table was produced for MANE-VU Class 1 areas.

MRPO Round 5 Modeling Results (dV)

Best 20%	**Baseline**	**2018**	**2009**	**2009**	**2012**	**2018**	**2018**
Site	**2000-2004**	**URP Value**	**Base**	**Will Do**	**Base**	**Base**	**Will Do**
Brigantine	14.33	14.33	14.15	14.16	14.08	13.92	13.92
Lye Brook	6.37	6.37	6.25	6.28	6.23	6.14	6.15
Acadia	8.78	8.78	8.86	8.88	8.86	**8.82**	**8.82**
Worst 20%	**Baseline**	**2018**	**2009**	**2009**	**2012**	**2018**	**2018**
Site	**2000-2004**	**URP Value**	**Base**	**Will Do**	**Base**	**Base**	**Will Do**
Brigantine	29.01	25.05	25.79	25.83	25.72	**25.21**	**25.22**
Lye Brook	24.45	21.48	22.04	22.08	21.86	21.14	21.14
Acadia	22.89	20.45	21.72	21.75	21.72	**21.49**	**21.49**

These results show that for the northeastern Class 1 areas, controls already implemented and on-the-books controls may or may not result in achievement of reasonable progress goals. However, Indiana, along with the other MRPO states has committed to continue consultation with MANE-VU. Specifically, Indiana has agreed to support additional work and discussion to accomplish the following:

- Establish a clear understanding of the MANE-VU “Ask” by agreeing on base emissions inventories and control assumptions;
- Draft language on a national "Ask" based on the multi-pollutant needs of the states, including potential controls for EGUs and Industrial, Commercial, and Institutional boilers; and
- Reconvene the MANE-VU/MRPO Industrial, Commercial, and Institutional boiler workgroup (with participation by the Southeastern States and U.S. EPA) to re-examine the workgroup’s January 2007 straw proposal, and receive a workgroup recommendation by the end of the year.

MANE-VU has performed their own modeling. A recent status update, "Recent MANE-VU Projections of Visibility for 2018", MANE-VU Stakeholder Briefing, April 4, 2008, states, "The Uniform Rate is achieved and exceeded at all MANE-VU Class I sites." This presentation is available on the MANE-VU website, http://www.manevu.org.

Therefore, Indiana does not believe at this time that it can commit to any particular course of action until it is determined, through the above work and further discussions, what actions may be appropriate to meet reasonable progress goals given Indiana's marginal impact on those areas.

Sources listed in MANE-VU "Ask". Not all units within a source were listed in the Ask, but this is a complete listing of SO_2 emitting units from those sources to provide a more complete view of control projects at these locations.

Plant	Unit	Emissions in 2002	SO_2 control in 2002	SO_2 controls planned
Cayuga	1	29,379		FGD 2008
Cayuga	2	26,237		FGD 2008
Cayuga	1	29,379		FGD 2008
Cayuga	2	26,237		FGD 2008
Clifty Creek	1	6642		FGD Scheduled 2010
Clifty Creek	2	6712		FGD Scheduled 2010
Clifty Creek	3	6662		FGD Scheduled 2010
Clifty Creek	4	5846		FGD Scheduled 2010
Clifty Creek	5	5433		FGD Scheduled 2010
Clifty Creek	6	6902		FGD Scheduled 2010
Harding Street Station (Stout)	50	7895		
Harding Street Station (Stout)	60	7919		
Harding Street Station (Stout)	70	29,907		FGD 2007
Gibson	1	34,698		FGD 2007
Gibson	2	37,162		FGD 2007
Gibson	3	28,477		FGD 2007
Gibson	4	9196	FGD existing	
Gibson	5	17969	FGD existing	
R. Gallagher	1	11,743		
R. Gallagher	2	12,252		
R. Gallagher	3	23,773		
R. Gallagher	4	11,161		
Rockport	MB1	25,943		FGD planned 2017
Rockport	MB2	25,602		FGD planned 2019
Tanners Creek	1	4941		
Tanners Creek	2	4779		
Tanners Creek	3	6269		
Tanners Creek	4	48,450		
Wabash	2	7912		
Wabash	3	6999		
Wabash	4	7131		
Wabash	5	9380		
Wabash	6	25,602		FGD planned
ALCOA-Warrick	1	18,459		FGD in 2008
ALCOA-Warrick	2	19,258		FGD in 2008
ALCOA-Warrick	3	16,012		FGD in 2008
SIGECO-Warrick	4	40,476		FGD in 2008

STATEMENT OF THE MID-ATLANTIC/NORTHEAST VISIBILITY UNION (MANE-VU) CONCERNING A COURSE OF ACTION WITHIN MANE-VU TOWARD ASSURING REASONABLE PROGRESS

The federal Clean Air Act and Regional Haze rule require States that are reasonably anticipated to cause or contribute to impairment of visibility in mandatory Class I Federal areas to implement reasonable measures to reduce visibility impairment within the national parks and wilderness areas designated as mandatory Class I Federal areas. Most pollutants that affect visibility also cause unhealthy concentrations of ozone and fine particles. In order to assure protection of public health and the environment, any additional air pollutant emission reduction measures necessary to meet the 2018 reasonable progress goal for regional haze should be implemented as soon as practicable .

To address the impact on mandatory Class I Federal areas within the MANE-VU region, the Mid-Atlantic and Northeast States will pursue a coordinated course of action designed to assure reasonable progress toward preventing any future, and remedying any existing impairment of visibility in mandatory Class I Federal areas and to leverage the multi-pollutant benefits that such measures may provide for the protection of public health and the environment. This course of action includes pursuing the adoption and implementation of the following "emission management" strategies, as appropriate and necessary:

- timely implementation of BART requirements; and
- a low sulfur fuel oil strategy in the inner zone States (New Jersey, New York, Delaware and Pennsylvania, or portions thereof) to reduce the sulfur content of: distillate oil to 0.05% sulfur by weight (500 ppm) by no later than 2012, of #4 residual oil to 0.25% sulfur by weight by no later than 2012, of #6 residual oil to 0.3 – 0.5% sulfur by weight by no later than 2012, and to further reduce the sulfur content of distillate oil to 15 ppm by 2016; and
- a low sulfur fuel oil strategy in the outer zone States (the remainder of the MANE-VU region) to reduce the sulfur content of distillate oil to 0.05% sulfur by weight (500 ppm) by no later than 2014, of #4 residual oil to 0.25 – 0.5% sulfur by weight by no later than 2018, and of #6 residual oil to no greater than 0.5 % sulfur by weight by no later than

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2018, and to further reduce the sulfur content of distillate oil to 15 ppm by 2018, depending on supply availability; and

- A 90% or greater reduction in sulfur dioxide (SO_2) emissions from each of the electric generating unit (EGU) stacks identified by MANE-VU (Attachment 1- comprising a total of 167 stacks – dated June 20, 2007) as reasonably anticipated to cause or contribute to impairment of visibility in each mandatory Class I Federal area in the MANE-VU region. If it is infeasible to achieve that level of reduction from a unit, alternative measures will be pursued in such State; and

- continued evaluation of other control measures including energy efficiency, alternative clean fuels, and other measures to reduce SO_2 and nitrogen oxide (NOx) emissions from all coal-burning facilities by 2018 and new source performance standards for wood combustion. These measures and other measures identified will be evaluated during the consultation process to determine if they are reasonable and cost-effective.

This long-term strategy to reduce and prevent regional haze will allow each state up to 10 years to pursue adoption and implementation of reasonable and cost-effective NOx and SO_2 control measures.

Adopted by the MANE-VU States and Tribes on 20 June 2007

David Littell, Commissioner – Maine Dept. of Environmental Protection
Chair

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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November 15, 2007

Anna Garcia
Acting Executive Director
Ozone Transport Commission
Hall of the States
444 North Capitol Street, Suite 638
Washington, DC 20001

Dear Ms. Garcia:

The purpose of this letter is to respond to your letter dated July 30, 2007 and the MANE-VU States' initial request for a course of action by states outside of the MANE-VU region toward assuming reasonable progress at the Class I areas within your region (i.e., the MANE-VU "ask").

I would like to first express my appreciation to the MANE-VU States and their representatives for traveling to Chicago on August 6 for the initial consultation meeting. This was a productive meeting and sets the stage for further constructive dialogue.

At the August 6 meeting, the following action items were identified:

1. Define next steps for multi-pollutant approach to reduce regional haze, PM 2.5, and ozone.
2. Discuss crafting a national ask among interested MANE-VU and MRPO states regarding national action on Electric Generating Units (EGUs), including potential multi-pollutant control levels for CAIR Phase III with emission rates and output-based options.
3. Pursue discussions on options for reducing SO_2 (and NO_x) emissions from ICI boilers, including:
   - Reconvening the MANE-VU/MRPO ICI boiler workgroup to re-examine the workgroup's January 2007 straw proposal;
   - Developing a process for sharing information on SO_2 RACT for ICI boilers, and examining potential SO_2 control measures;
   - Contacting NACAA regarding expansion of the Boiler MACT model rule work to address SO_2 and NO_x; and
   - Discuss crafting a revised national ask among interested MANE-VU and MRPO states regarding needs for national action on ICI boilers.

4. Discuss crafting a national ask regarding low sulfur fuel for all off-road sources, and share information on biodiesel.
5. Gather information on pending federal controls for locomotives and commercial marine vessels.
6. Continue to share emissions data and modeling analyses, and continue dialogue between MANE-VU and MRPO states regarding SIP submittals. (Note, clarification of the MANE-VU "ask" is still needed.)
7. Develop list of controls for units that will be scrubbed, not just MANE-VU's list of 167 stacks.

I support this additional work and discussion. Within the next few months, I would, especially, like to accomplish the following:

- Establish a clear understanding of the MANE-VU "ask" by agreeing on base emissions inventories and control assumptions;
- Draft language on a national ask based on the multi-pollutant needs of the states, including potential controls for EGUs and ICI boilers; and
- Reconvene the MANE-VU/MRPO ICI boiler workgroup (with participation by the Southeastern States and USEPA) to re-examine the workgroup's January 2007 straw proposal, and receive a workgroup recommendation by the end of the year.

It appears that, based on our review of the Round 5 Midwest RPO modeling for 2018 and U.S. EPA modeling for 2015, reasonable further progress is essentially meeting or exceeding reasonable further progress interim goals in each of the MANE-VU Class I areas. It is apparent that significant regional emission reduction programs are achieving health and interim visibility goals across the majority of the eastern United States. With the current goals achieved, the focus should be on the development of the next tier of cost-effective controls, looking at the need for reductions to achieve the revised ambient air quality standards and considering a future regional haze interim milestone date. CAIR Phase 3, ICI controls and regional programs for fuels, etc. should be the focus for making continued progress towards the 2064 ultimate regional haze goals.

Finally, I believe it is premature to respond to the MANE-VU "ask" for additional reductions in SO_2 emissions from EGU and non-EGU sources. The work and discussion noted above are needed before we can determine what actions are appropriate. While I am unable to commit to any particular course of action at this time, I am looking forward to further discussions which consider our mutual air quality interests.

Sincerely,

Thomas W. Easterly
Commissioner

KNR
Cc: Daniel Murray