VT Responses to U.S. Federal Land Management Agency and U.S. Environmental Protection Agency Comments on 12/18/08 and 1/15/09 Draft Revisions to Vermont's Regional Haze State Implementation Plan (SIP)

On December 22, 2008, Vermont submitted a 12/18/08 draft of its State Implementation Plan (SIP) Revision for Regional Haze for 60-day review by the Federal Land Management Agencies, including the Forest Service of the U.S. Department of Agriculture and the National Park Service and U.S. Fish and Wildlife Service of the U.S. Department of the Interior (DOI). On January 15, 2009, Vermont submitted a slightly revised 1/15/09 draft of its Regional Haze SIP Revision for 30-day review by the U.S. Environmental Protection Agency (EPA).

Vermont received comments back from the Forest Service and the DOI on February 19, 2009, and from EPA on February 24, 2009, and has subsequently made revisions which are incorporated into the June 2009 version of the VT Regional Haze SIP. The following is a summary of the comments received and Vermont's responses to them.

1. VT Responses to 2/19/09 USDA Forest Service Comments on 12/18/09 VT Draft Regional Haze SIP

Forest Service Comment:
A correction has been addressed regarding the NY Kodak Park Division SO2 emissions (p. 90), via an email with Ms. Heidi Hales.

Vermont Response:
Misplaced commas were corrected in Table 10.3 on page 90 of the Draft SIP.

Forest Service Comment:
In Section 5.3, Lye Brook Wilderness Monitoring Strategy, we feel that a haze camera would be a beneficial addition to the monitoring site. A haze camera has the benefit of providing a picture every 15 minutes, accessed through a public web site, of the conditions on site, which are instantly understood by the lay person, as well as the scientist. Understanding the limitations of budgetary constraints, a future consideration might include one haze camera which is shared by multiple Class I areas. The camera could be located at Lye Brook for a one or two year period. The camera could then go to another Class I area, and at a future time return to Lye Brook.

Vermont Response:
Vermont agrees that an automated haze camera with Internet Link would be a desirable addition to the Lye Brook monitoring site. The following was added to Section 5.3:

Vermont currently lacks the funding and personnel resources to support enhancements to existing IMPROVE visibility monitoring at Lye Brook, but would be interested in discussing future options, including possibilities for sharing a haze camera with multiple Class I areas, with the Forest Service, other states and/or other Federal Land Management agencies.

2. VT Responses to 2/19/09 DOI National Park Service and U.S. Fish and Wildlife Service Comments on 12/18/09 VT Draft Regional Haze SIP

DOI Comment:
As noted in your discussion, most of the impairment from such sources comes from outside of your State. We request that the final SIP clarify whether the inclusion of these impact thresholds under the Long-Term Strategy for Regional Haze protection, if approved by EPA, are intended to apply to sources in other States.

Vermont Response:
This is the intent of the revised impact thresholds. The following sentences have been added to the end of the first paragraph on page 136:

It is Vermont's intention to use these revised "levels of significant impact" to determine whether newly proposed (or existing) sources, located within Vermont (or in upwind states), are significantly contributing to exceedances of Vermont's sulfate standard, and therefore significantly contributing to Lye Brook visibility impairment. When this SIP has been approved by EPA, Vermont assumes that sources exceeding this significance level will be considered by EPA to be interfering with Vermont's ability to assure reasonable progress toward the Clean Air Act §169 national visibility goal.

DOI Comment:
Page 56: Recommend changing title of Table 6.4 to "Updated Scenario" from "Most Recent Inventory" to reflect narrative of emission scenarios on page 50.

Vermont Response:
Table 6.4 caption was revised by adding ("Updated Scenario").

DOI Comment:
Also, we would like the State to explain why there is only a minimal difference in Vermont's inventories for 2018 OTB/OTW and 2018 BOTW (25 tons decline in VOCs and 1 ton increase in $PM_{2.5}$, respectively). The assumption could be the small difference is due to the minimal efforts the State has to do in regards to ozone regulations. Nonetheless, the draft SIP could better explain these data.

Vermont Response:
This assumption is correct. The following sentences have been added at top of page 56:

It may be noted that there is virtually no change in Vermont's estimated emissions from the 2018 OTB/OTW scenario to the 2018 BOTW (beyond on the way) scenario. This is because Vermont is currently in attainment of old (and new) NAAQS for both ozone and $PM_{2.5}$ (nor is VT a CAIR state for ozone or $PM_{2.5}$). Thus no additional emissions reductions are anticipated for those specific programs.

DOI Comment:
We wanted to note that earlier in the draft SIP, Vermont identifies Wisconsin as a contributor to visibility impairment and invites Wisconsin to consult in the regional haze process. However, in terms of the Contribution Assessment, Wisconsin is never identified as a top contributor based o n the three ranking criteria adopted by MANE-VU. Under the reasonable progress goal (RPG) discussion, the draft SIP does mention that there is only one source identified in Wisconsin (as part of the "167 Stacks" strategy). We would like to encourage the State to include language that clarifies Wisconsin was identified to consult with not through the Contribution Assessment but through the development of the "167 Stack" strategy.

Vermont Response:
There had previously been an explanation in the first paragraph on page 30 indicating that:

Independent of the other MANE-VU states with Class I areas, Vermont separately identified Wisconsin as having the potential to impact the Lye Brook Wilderness Area based on CALPUFF regional modeling using the VTDEC modeling platform which predicts Wisconsin impacts on sulfate there as equivalent to those from Illinois, ie 4% {see page D-54 of the NESCAUM report, "Contributions to Regional Haze in the Northeast and Mid-Atlantic United States", August 2006 (Attachment A).

In addition to that, a new footnote was added on page 22 indicating:

Vermont independently determined based on CALPUFF modeling, which was not considered in developing Table 2.2, that Wisconsin has the potential to contribute to visibility impairment in Lye Brook. Therefore, Vermont asked Wisconsin to consult. See Section 3.2.1 and Table 3.4.

"Wisconsin" was also added to the list of states targeted for coordinated actions on page 85 along with a modified footnote on that page indicating that:

Independently from other MANE-VU modeling and assessments, Vermont CALPUFF modeling identified Wisconsin as a significant contributor to visibility impairment at the Lye Brook Wilderness Class I Area (See Section 3.2.1).

DOI Comment:
Page 109, Section 10.4: This section is somewhat misleading and we suggest clarifying more explicitly the terms of the "2018 glideslope" and "2018 projected progress." It is important to make clear that the 2018 Projected Progress bars are based on inclusion of the MANE-VU/Vermont Ask in the May 2008 modeling results, strategies that are not necessarily adopted by all states (which the draft SIP does acknowledge throughout, but no so clear here). Better clarification within the text could help interpret the tables or another option would be to change the title of yellow bars to "2018 Additional Progress" or "2018 Ask Progress." Also, referencing Section 11.8 may help, because there is a better description of projected visibility for 2018 under this section entitled "Estimated Effects on visibility from LTS."

Vermont Response:
The following sentences have been added at the bottom of page 109:

While the MANE-VU states agree that these modeled 2018 visibility changes result from required and reasonable control measures, it should be noted that source-specific VISTAS and MRPO RPOs projected 2018 emissions are similar to but different from those requested in the MANE-VU ask, and consequently the future impacts on Lye Brook visibility may be different from what been projected here. See sections 3.2, and 10.2 for additional detail.

DOI Comment:
No information is given within the regional haze portion of the SIP on current State regulations dealing with agricultural or wild land prescribed burns. The SIP should indicate that the State will continue to review the impacts from agricultural use of fire and prescribed fire for forest or ecosystem management. If those impacts become important for maintaining reasonable progress in the future, revisions to the regional haze SIP should contain a smoke management plan. We did not see any commitment for further work or coordination in terms of prescribed fire regulations in the current draft. Vermont does have regulations on the books for outdoor wood smoke, which is a larger contributor to haze at this time.

Vermont Response:
The following sentences were added to the end of Section 11.7 on page 129:

Vermont will continue to review the impacts from agricultural use of fire and prescribed fire for forest or ecosystem management. If those impacts become important for maintaining reasonable progress in the future, revisions to the regional haze SIP will include a smoke management plan. Vermont will continue to consult with the US Forest Service regarding potential impacts of prescribed fire on visibility in the Lye Brook Wilderness.

DOI Comment:
We would like to see a commitment to work with Federal agencies as a team if economic challenges are faced by the monitoring program.

Vermont Response:
The following sentences were added to section 5.3 on page 46:

Vermont routinely participates in the IMPROVE monitoring program by serving as the NESCAUM regional representative to the IMPROVE Steering Committee. Vermont is committed to working with other state, regional and federal IMPROVE partners to assure that adequate resources are available to provide continued monitoring representative of visibility conditions and trends in Lye Brook and other Class 1 areas.

DOI Comment:
Page 31-32: The text includes follow-up MRPO coordination but does not include how the consultation with VISTAS was resolved.

Vermont Response:
This is an accurate observation, as some issues between MANE-VU and VISTAS were not fully resolved during the regional haze consultations. The following sentences have been added at the bottom of page 36:

Vermont and other MANE-VU states are committed to continuing consultation with states in the MRPO and VISTAS regions, through participation in the State Collaborative Process, in which new regional control strategies are discussed to reduce future emissions of multiple pollutants of common regional concern.

In Addition, the following sentences have been added at the bottom of page 109:

While the MANE-VU states agree that these modeled 2018 visibility changes result from required and reasonable control measures, it should be noted that source-specific VISTAS and MRPO RPOs projected 2018 emissions are similar to but different from those requested in the MANE-VU ask, and consequently the future impacts on Lye Brook visibility may be different from what been projected here. See sections 3.2, and 10.2 for additional detail.

DOI Comment:
Page 33: Vermont indicates that it will be meeting the terms of the MANE-VU Ask by adopting the low Sulfur fuel strategy. There is not mention that the State also has other control programs on the books, e.g., new standards for outdoor wood boilers. We therefore recommend the State include a reference to Section 11.2, which outlines the State's regulations regarding outdoor wood boilers. We also recommend that the State commit to investigating sources of cleaner energy, which is also highlighted in the Ask.

Vermont Response:
MANE-VU's strategies for reasonable progress goals at all class I areas in MANE-VU have focused on control of the most significant contributing air pollutant implicated in haze at these areas. The focus of these strategies for 2018 is to reduce "sulfate" formed from sulfur emissions. Vermont's OWB regulations are more likely to gain reductions in carbonaceous particulate matter and VOCs. Emissions reductions from these sources were not included in the MANE-VU "Ask" or in modeling of Reasonable Progress Goals, and would not produce significant improvements in visibility at Lye Brook or other class I areas until the sulfate-dominated visibility impairment has been reduced and overall visibility brought closer to natural conditions. Therefore, Vermont is not including references its OWB regulations in its visibility SIP at this time, but will continue to evaluate the need to include these and other control measures in future visibility SIP submissions.

In addition, the following sentences have been added in Section 3.2.2.2 on page 32:

Vermont intends to adopt a rule specifying the low sulfur fuel limits for "outer zone" MANE-VU states in the near future. After this rule is adopted, Vermont will submit the

rule to EPA for approval into the Vermont SIP. Vermont will also continue investigating sources of cleaner energy.

DOI Comment:
Page 3, last paragraph, first sentence: “must include” not “must including”

Vermont Response:
Page 3 text was revised accordingly.

DOI Comment:
Page 27, Table 3.1: “MANE-VU Members” not “MANE-VIEW Members”

Vermont Response:
Table 3.1 text was revised accordingly.

DOI Comment:
Page 59, first paragraph, last sentence: “(Attachment F).”

Vermont Response:
Page 59 text was revised accordingly.

DOI Comment:
Page 64, Section 8.2, second paragraph¨ “Table 8.1 displays the result of **one** just one of the methods used…”

Vermont Response:
Page 64 text was revised accordingly.

DOI Comment:
Page 78, first sentence: “While there are occasionally large Canadian fire impacts at Lye Brook, these infrequent natural sources **and** not subject to regulatory controls.”

Vermont Response:
Page 78 text was revised accordingly.

DOI Comment:
Page 109, last sentence: Suggest including national parks in addition to wilderness areas to achieve natural conditions by 2064.

Vermont Response:
Page 110 text was revised accordingly.

3. VT Responses to 2/24/09 U.S. EPA Comments on 1/15/09 VT Draft Regional Haze SIP

EPA comment:
1.5 The Basics of Haze
1) When discussing the visibility on the 20 percent cleanest days and 20 percent haziest days at Lye Brook, it would be helpful to include the visibility range (in kilometers) for each to give the reader a better context.

VT Response:
Second sentence on page 9 revised to: At Lye Brook Wilderness over the 5 year period from 2000 through 2004, reconstructed extinction averaged 6.4 dv (visual range of 222 kilometers) on the 20 percent cleanest days and 24.5 dv (visual range of 38 kilometers) on the 20 percent haziest days.

EPA comment:
1.6 Anatomy of Regional Haze
2) We suggest the first full paragraph on page 11 as follows:

About half of the worst visibility days in Lye Brook occur in the summer when meteorological conditions are more conducive to the formation of sulfate from SO_2 and to the oxidation of organic aerosols. ~~In addition, winter and summer transport patterns are different, possibly leading to different contributions from upwind pollutant source regions. As a result,~~ The remaining worst visibility days are divided nearly equally among spring, winter, and fall. In addition, winter and summer transport patterns are different, possibly leading to different contributions from upwind pollutant source regions.

VT Response:
This paragraph on page 11 was revised as recommended.

EPA comment:
2.1 States Contributing to Visibility Impairment at Lve Brook
3) It is not clear why Wisconsin is absent from Table 2.2, "States that Contribute to Visibility Impairment in the MANE- VU Class I Areas of Acadia, Moosehorn, Great Gulf, Lye Brook, and Brigantine," when it is included in Table 3.4, "States (Listed by Regional Planning Organization) and Provinces Contributing to Visibility Impairment at Vermont's Lye Brook Wilderness Areas".

VT Response:
A footnote was added at end of second paragraph in section 2.1 on page 22 indicating that "Vermont independently determined based on CALPUFF modeling, which was not considered in developing Table 2.2, that Wisconsin has the potential to contribute to visibility impairment in Lye Brook. Therefore, Vermont asked Wisconsin to consult. See Section 3.2.1 and Table 3.4"

"Wisconsin" was also added to the list of states identified in the list of states in the first paragraph of section 10.2, and the footnote at the bottom of page 85 was revised to: "Independently from other MANE-VU modeling and assessments, Vermont CALPUFF modeling identified Wisconsin as a significant contributor to visibility impairment at the Lye Brook Wilderness Class I Area (See Section 3.2.1)."

EPA comment:
3.2.2.2 Meeting the "Ask" - Vermont
4) This section states, "Vermont contains no BART-eligible sources, but intends to meet the terms of the MANE-VU agreement by pursuing the low-sulfur fuel oil strategy. Vermont should include more detail on the mechanism by which this will become an enforceable part of the Vermont SIP (e.g, does Vermont plan to adopt a rule and submit it to EPA for approval into the SIP?)

VT Response:
Vermont does intend to adopt a rule enforcing the low sulfur fuel requirements specified in the MANE-VU Ask. The following sentences have been added to Section 3.2.2.2 on p. 32:

Vermont intends to adopt a rule specifying the low sulfur fuel limits for "outer zone" MANE-VU states in the near future. After this rule is adopted, Vermont will submit the rule to EPA for approval into the Vermont SIP. Vermont will also continue investigating sources of cleaner energy.

EPA comment:
3.2.4 Consultation Issues
5) Vermont should include more detail regarding its consultation with contributing states in particular expanding upon the statement that , "A few non-MANE-VU states did not respond to Vermont's consultation requests or responded by downplaying the magnitude of their states' contributions to visibility impairment at the Lye Brook Wilderness area."

VT Response:
This sentence in Section 3.2.4 on page 34 has been revised to:

Some states in the MRPO and VISTAS regions had interpretations of the requirements for BART and for establishing Reasonable Progress Goals which differed from those in the MANE-VU states.

More detail on RPO differences on future emissions inventory assumptions is added in Section 10.4, and the following sentence was added to the end of Section 3.2.4:

Vermont and other MANE-VU states are committed to continuing consultation with states in the MRPO and VISTAS regions, through participation in the State Collaborative Process, in which new regional control strategies are discussed to reduce future emissions of multiple pollutants of common regional concern.

EPA comment:

9. Best Available Retrofit Technology (BART)
6) The last full paragraph on page 82 should be revised as follows:
"... there are ~~currently~~ **no** BART -eligible sources in Vermont."

VT Response:
This sentence on page 83 was revised as recommended.

EPA comment:
9.1 Bart-Eligible EGUs and the Role of CAIR
7) In the third bullet on page 83, Vermont should delete Massachusetts from the list of non-CAIR states.

VT Response:
The third bullet on page 84 has been revised to:

- *Non-CAIR states*: EGUs in states not eligible to participate in the CAIR annual or seasonal programs (Maine, New Hampshire, Rhode Island, and Vermont).

EPA comment:
10.2.4 Targeted EGU Strategy for S02 Reduction
8) Vermont should include a description of visibility improvement expected from controlling the 167 stacks in addition to the discussion of expected improvement in PM levels.

VT Response:
The discussion at the bottom page 95 and Figure 10.3 on page 97 provide an illustration of reductions in annual average $PM_{2.5}$ mass concentrations estimated to result if 90% emission reductions were applied to the 167 EGU sources identified as the largest contributors to sulfate at MANE-VU Class 1 areas. This illustration, as well as similar average $PM_{2.5}$ mass model results for other individual elements of the MANE-VU strategy (such as BART, low sulfur oil S-1 and S-2, can be found in the NESCAUM Report "MANE-VU Modeling for Reasonable Progress Goals" (Attachment U). It might be conceptually feasible to provide similar calculations for the visibility impacts of these individual strategy elements, as well as the OTB/OTW element including CAIR, and other adjustments to the modeled emission inventory discussed in Attachment U and further modified as described in Attachment O ("2018 Visibility Projections") following further inter-RPO consultations. However, the calculations would be extremely complex, since the worst 20% days will differ for the different locations on the map, and different f(RH) adjustments would be needed for each day and location. In addition, the EGU emissions reductions that would result from CAIR, other OTB/OTW mechanisms and the 167 source strategies are combined in complex ways in the final MANE-VY 2018 modeling inventory (see Attachment O). Furthermore, the "partial strategy" visibility results would not be especially meaningful since the final model results reflect the combination of all control elements taken together, but a change in (nonlinear) deciviews resulting from any individual control element is dependent on the order in which the individual elements were executed – with the largest deciview benefits generally attributed to whatever control element is imposed first. The estimated visibility improvements resulting from all

elements of the MANE-VU strategy to determine the reasonable progress goals for Lye Brook are presented in Table 10.8 on page 108. The modeled improvements in Lye Brook visibility on best and worst 20% days are presented graphically in Figure 11.1 on page 131, and the modeled reductions in the individual aerosol species components on best and worst days are shown in Figure 11.2 on page 132.

EPA comment:
11.9 Vermont' s Share of Emission Reductions
9) Vermont states that it expects a nearly 85% reduction of Vermont's S02 emissions from ICI boilers and residential heating units via MANE-VU's low sulfur fuel oil strategy. Vermont also cites the implementation of the Low Emissions Vehicle regulations and Vermont's regulation controlling Outdoor wood-fire boilers. Vermont will need to submit all regulations that the State is taking credit for in its Regional Haze SIP to EPA for approval into the SIP.

VT Response:
Vermont intends to meet the terms of the MANE-VU Ask by pursuing the low-sulfur fuel oil strategy and by continued evaluation of other control measures. As discussed above, Section 3.2.2.2 has been revised to indicate that Vermont plans to adopt a rule establishing low sulfur fuel limits and then submit the rule to EPA for approval into the Vermont SIP.

Emission reduction strategies such as Vermont's Low Emission Vehicle (LEV) regulations and outdoor wood-fired boiler (OWB) regulations will help reduce future emissions, but are not elements of the MANE-VU Ask (see Section 3.2.2.1). Further, given Vermont's low sulfur emission contributions and commitment to adopt a rule establishing low sulfur fuel limits, these strategies are not required to obtain Vermont's share of emission reductions needed to meet the reasonable progress goals in this first 10-year planning cycle. MANE-VU's strategies for reasonable progress goals at all class I areas in MANE-VU have focused on control of the most significant contributing air pollutant implicated in haze at these areas. The focus of these strategies for 2018 is to reduce "sulfate" formed from sulfur emissions. LEV and OWB control programs are strategies more likely to gain reductions in carbonaceous particulate matter and VOCs, and would not produce significant improvements in visibility at Lye Brook until the sulfate-dominated visibility impairment has been reduced and overall visibility brought closer to natural conditions.

Therefore, Section 11.9 has been revised to delete cites to Vermont's LEV and OWB regulations. Moreover, including the LEV regulations in Vermont's SIP would be particularly onerous because of the frequent changes to California's LEV program and could stifle Vermont's adoption of future LEV amendments. In addition, Vermont's OWB regulations are currently undergoing major revisions. Vermont will, however, continue to evaluate the need to include these and other control measures in future visibility SIP submissions.