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July 6, 2011

Mr. Curt Spalding
Regional Administrator
U.S. Environmental Protection Agency, Region I
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Re: Designation of Attainment Area Status under the Revised Sulfur Dioxide Standard

Dear Mr. Spalding:

As required by the Clean Air Act and the Transportation Equity Act for the 21st Century and consistent with Section 107(d)(1)(A) of the Clean Air Act ("CAA") and based on the advice of the New Hampshire Department of Environmental Services, I hereby recommend that most of New Hampshire be designated as "unclassifiable" for the one-hour National Ambient Air Quality Standard (NAAQS) for ground-level sulfur dioxide (SO₂). While all SO₂ monitors in New Hampshire, except for one, are currently meeting the new one-hour SO₂ NAAQS, designations of attainment cannot be made until source dispersion modeling is completed and demonstrates compliance with the new standard. When this new data becomes available, the Department of Environmental Services will provide updated information to EPA in order to finalize SO₂ designations.

On March 24, 2011, the U.S. Environmental Protection Agency (EPA) issued guidance summarizing their expectations for the new 1-hour SO₂ NAAQS. According to the guidance, EPA anticipates that any area currently violating the 1-hour SO₂ standard with the existing monitoring network will be designated as nonattainment. All other areas are required to be designated as unclassifiable until comprehensive source modeling has been completed. Once completed, the modeling will serve to support either the determination of an attainment designation or to more precisely define the boundaries that should be designated as nonattainment.

As specified by EPA guidance, these SO₂ designation recommendations are based on the most recent three-year period of quality assured data, 2008 through 2010. Based on this data, one portion of New Hampshire adjacent to the Pembroke monitoring station is not currently meeting the new one-hour SO₂ NAAQS. The "presumptive norm" for nonattainment designations in such instances is the boundary of the county where the monitor resides. However, after consultation with EPA, it was agreed that the western edge of the affected county was unlikely to experience SO₂ levels in excess of the new NAAQS and that portions of other nearby counties may be at greater risk than prescribed by the presumptive norm. Therefore, New Hampshire

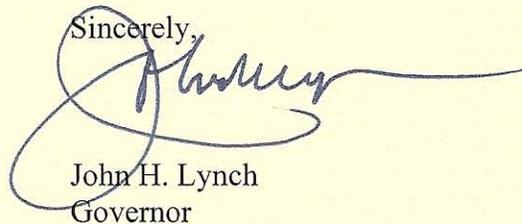
exercised the flexibility allowed in the EPA guidance to refine nonattainment boundaries contained in this recommendation. As a result, I believe that this letter's recommended nonattainment boundaries more realistically match the region that could experience SO₂ concentrations in excess of the new SO₂ NAAQS (see Figure 1 for map and Attachment A for technical background). Of course, once required source modeling is completed, final nonattainment area boundaries may need to be refined.

While these recommendations follow EPA procedures for areas with monitors currently exceeding the level of the new SO₂ NAAQS, it is probable that the scrubber that is under construction at Merrimack Station will remedy the situation and may be operational before the nonattainment area is finalized. If this proves to be the case, the process of formalizing the nonattainment area followed by submittals of an attainment SIP and then a redesignation request would be burdensome with little or no net benefit. I ask that EPA consider the administrative resources that will be demanded for addressing nonattainment designation in New Hampshire and compare that to the expected benefit when the prospective nonattainment area involved is already nearing remedy without the need for a formal attainment SIP.

After careful review of EPA's designation guidance for SO₂, these recommendations are fully compliant with Section 107(d)(1)(A) of the Clean Air Act ("CAA"), which defines a nonattainment area as any area that (1) does not meet the SO₂ NAAQS, or (2) contributes to ambient SO₂ violations in a nearby area. It is also my understanding that by designating a portion of the state as nonattainment, there will be certain requirements and obligations that include the preparation of a State Implementation Plan that brings all portions of the state into compliance with the new 1-hour SO₂ NAAQS by 2017.

Thank you for your consideration of my recommendations. If you have any questions regarding this determination, please contact Thomas Burack, Commissioner of the Department of Environmental Services at (603) 271-3449.

Sincerely,

A handwritten signature in blue ink, appearing to read "John H. Lynch", with a long, sweeping horizontal stroke extending to the right.

John H. Lynch
Governor

cc: Thomas S. Burack, Commissioner DES
Robert R. Scott, Air Resources Director DES
Jeffrey T. Underhill, DES
David Conroy, USEPA Region 1
Ian Cohen, USEPA Region 1

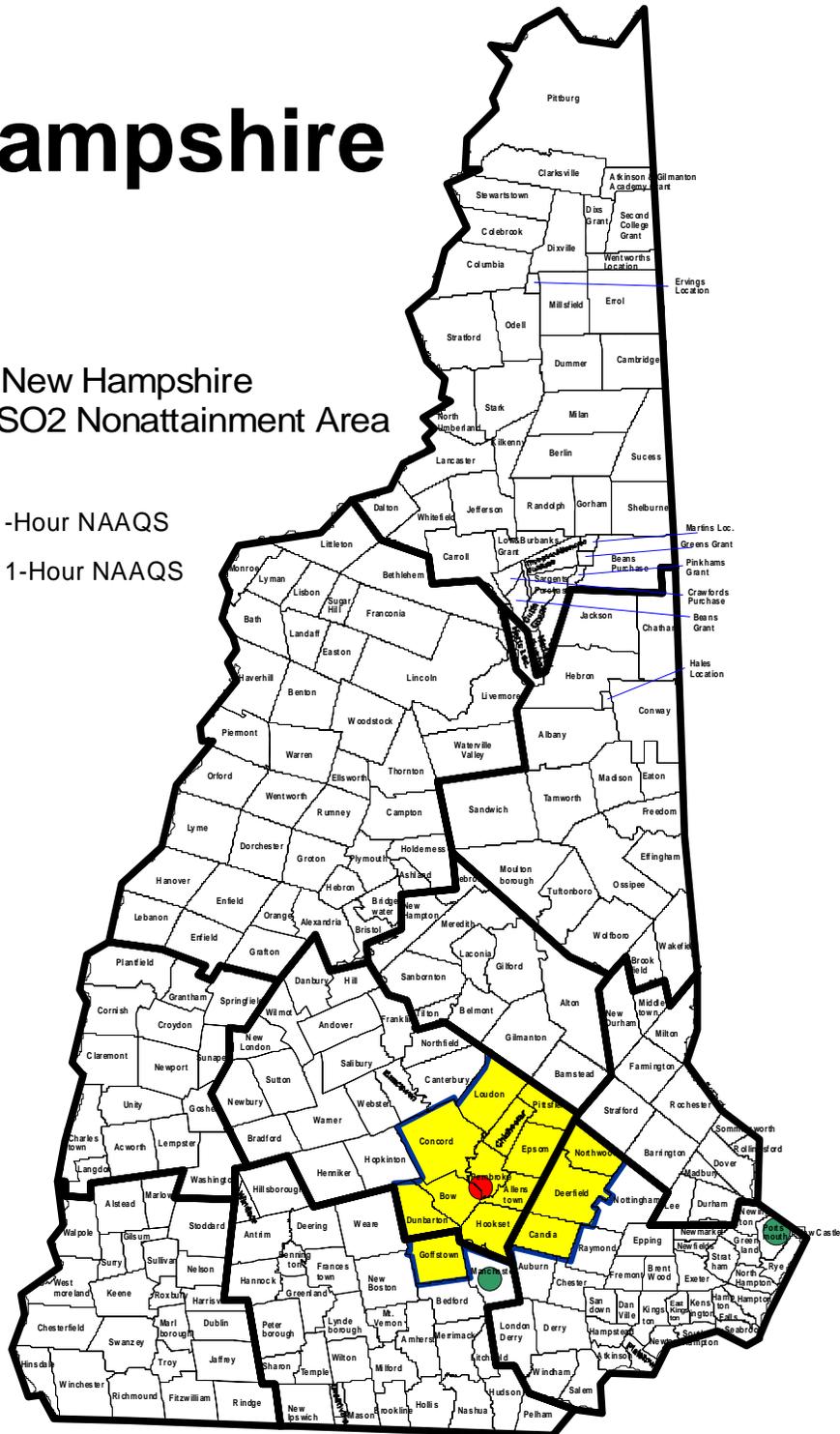
FIGURE 1. Proposed Central New Hampshire 1-Hour Sulfur Dioxide Nonattainment Area

New Hampshire



Central New Hampshire
1-Hour SO₂ Nonattainment Area

- SO₂ Monitor Exceeding 1-Hour NAAQS
- SO₂ Monitor Meeting the 1-Hour NAAQS



ATTACHMENT A

TECHNICAL ATTACHMENT Rationale for New Hampshire's 1-Hour Sulfur Dioxide Nonattainment Area Boundaries

Rationale for New Hampshire’s 1-Hour Sulfur Dioxide Nonattainment Area Boundaries

The recommendations contained in this letter are fully compliant with Section 107(d)(1)(A) of the Clean Air Act (“CAA”) which defines a nonattainment area as any area that (1) does not meet a National Ambient Air Quality Standard (“NAAQS”), or (2) contributes to ambient NAAQS violations in a nearby area. The New Hampshire recommended nonattainment area boundaries fulfill these requirements and exercises the flexibility allowed in the guidance, including consideration of: existing air quality, emission patterns, prevailing meteorology, topography and terrain, and jurisdictional boundaries. To a limited degree, airflow trajectories were also considered.

The starting point of attainment area boundary designations is the examination of existing monitoring data. Table A1 contains the most recent 4 years of quality assured monitoring data for 1-hour average SO₂ in New Hampshire. The locations of these monitors are marked in Figure 1 (above) and Figure A1 (below).

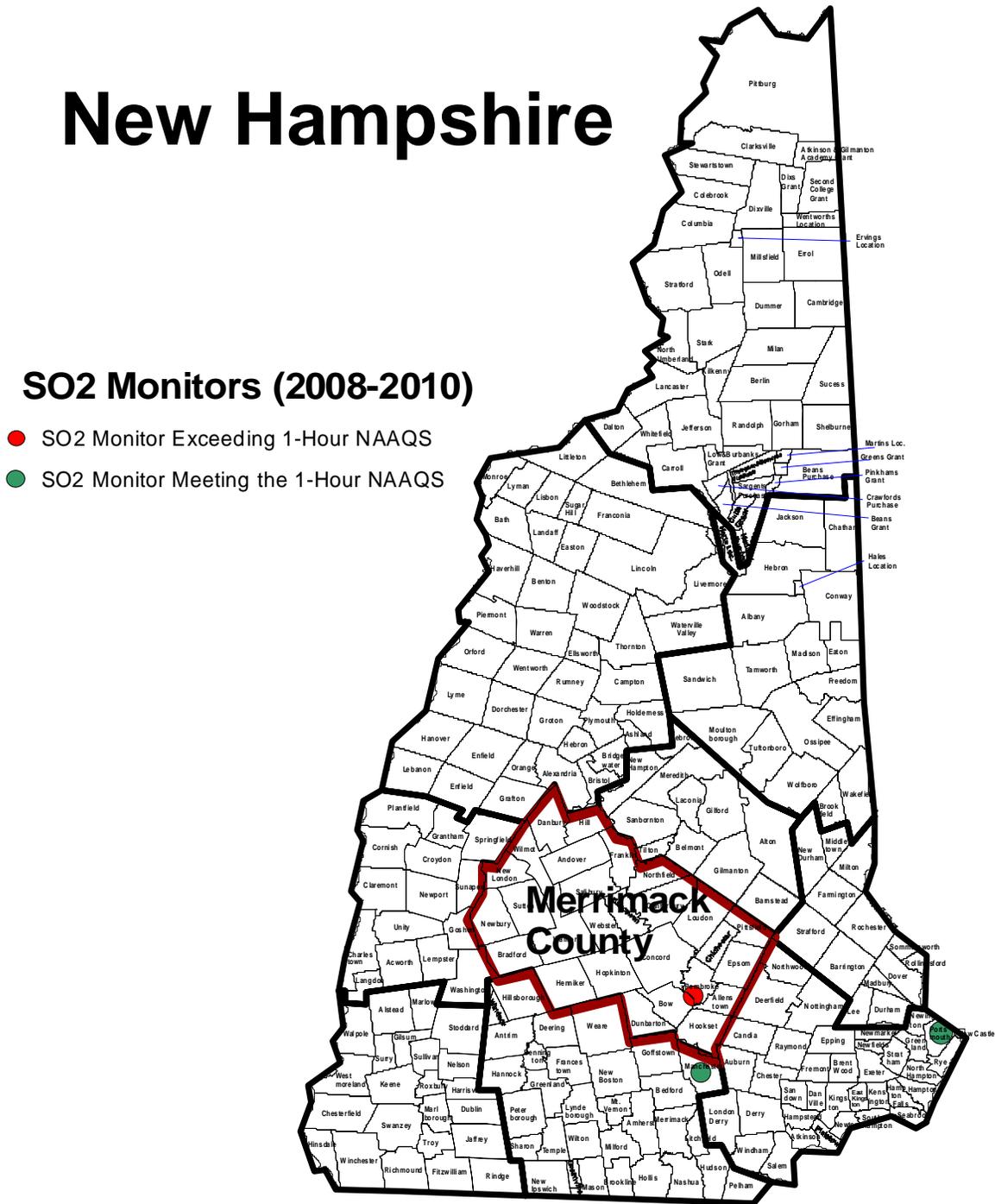
TABLE A1. Estimated 2007 – 2010 1-Hour SO₂ Design Values by Monitor, in parts per billion (ppb)

Location	Monitor ID	2007 98 th Percentile	2008 98 th Percentile	2009 98 th Percentile	2010 98 th Percentile	2007-2009 Design Value	2008-2010 Design Value	SO ₂ NAAQS (ppb)
Concord	33-013-1007	--	--	--	46	--	46	75
Manchester	33-011-0020	58	48	50	57	52.0	51.7	75
Pembroke	33-013-1006	165	141	222	217	176.0	193.3	75
Portsmouth	33-015-0014	59	62	42	45	54.3	49.7	75
State Maximum	--	165	141	222	217	176.0	193.3	75

All but one of the New Hampshire SO₂ monitors indicate attainment of the new SO₂ NAAQS. Monitors located in Manchester and Portsmouth have recent 3-year design values of about two-thirds the level of the new NAAQS. A monitor located in Concord does not have 3 years’ worth of data, or even a full single year of data, but the 98th percentile of the data that does exist suggests that the monitor is likely to also meet the level of the new NAAQS. Only the Pembroke monitor fails to meet the level of the new SO₂ NAAQS. This monitor is located about 0.4 miles to the southeast of a coal-fired power plant and is strategically located to capture the power plant’s worst-case air pollution impacts.

The power plant, Merrimack Station, is subject to a state air pollution law that requires the installation of a scrubber system for the reduction of mercury emissions and SO₂ emissions (as part of a Best Available Retrofit Technology (BART) requirement in the New Hampshire Regional Haze SIP). This scrubber system is under construction and is reportedly ahead of its construction schedule. Since the existing stacks for the station are relatively short, there is relatively poor dispersion of air pollutants. Part of the pollution control project includes

FIGURE A1. Presumptive Norm – Merrimack County Boundary



construction of a new Good Engineering Practice (GEP) stack for optimal dispersion. Stacks shorter than GEP allow for pollutant downwash, which brings air pollution down to the ground near the stack. The elimination of downwash combined with the benefits of SO₂ emission reductions from the scrubber system should greatly diminish power plant SO₂ impacts in the vicinity of the Pembroke monitor as soon as the new control system is operational. Once operation of this new system is required and a modeling demonstration shows compliance, the existing monitoring data for the Pembroke monitor showing nonattainment will be out of date and no longer representative of conditions in the vicinity of the power plant. EPA guidance suggests that if either monitoring data or dispersion modeling exceeds the NAAQS, the area should be defined as nonattainment. NHDES suggests that once the operation of the scrubber system becomes enforceable, the value of the modeling data should supersede the monitoring data.

Evaluation of the Degree of Nonattainment in New Hampshire

During pre-designation discussions between NHDES and EPA, EPA expressed concern that if New Hampshire followed the presumptive norm (county boundaries), portions of nearby counties may be excluded from the nonattainment area when there is likelihood that these areas could exceed the new SO₂ NAAQS. Conversely, the presumptive norm boundaries would include the remote western portion of Merrimack County, which has a low likelihood of exceeding the SO₂ standard. NHDES agrees that the presumptive norm boundary would present a nonattainment boundary that is off-centered and probably not a realistic estimate of estimated areas of concern. Through the flexibility allowed under the designation guidance, NHDES is providing the following information in order to improve on the presumptive norm boundaries and provide a more realistic estimate of SO₂ nonattainment area boundaries. The discussion that follows is consistent with the five factors specified in Section 107(d)(1)(A) provisions of the Clean Air Act, and considers benefits likely to be achieved for the requirements.

Five Factors for Evaluating Designation Boundaries

1. Air Quality data
2. Emissions-related data
3. Geography and topography
4. Meteorology and transport patterns
5. Jurisdictional boundaries (counties, existing nonattainment area boundaries, MPOs, etc.)

Central New Hampshire Nonattainment Area Discussion

1. Air Quality Data

New Hampshire's analyses starts with the identification of the EPA presumptive norm area for the county containing the Pembroke monitor (see Figure A1 above). The Pembroke monitor is indicated as a red dot while the Manchester and Portsmouth monitors, which are both meeting the new NAAQS are identified as green dots.

2. Emissions Related Data

Sulfur Dioxide emissions generally come from burning fossil fuels containing sulfur. Sulfur-rich fuels generally produce higher SO₂ emissions. Fuels rich in sulfur include coal and oil compounds, but in each case the sulfur content varies depending on source and fuel processing or refining. In New Hampshire, the use of truly high sulfur coal or oil is rare. The sulfur content of fuel oils is on the decline and likely to continue decreasing in the future in order to continue progress towards air pollution and regional haze goals. For the most part, the sulfur content of fuel oil is not important to a unit that burns it. There is generally a higher cost for the fuel oil which can be off-set by lower cleaning to maintenance costs for maintaining optimal performance.

On the other hand, the sulfur content of coal can matter to the unit combusting it, so simply requiring the use of low-sulfur coal to produce SO₂ emission reductions may not be a viable control strategy. The point here is that a quick fuel switch may not always be a workable strategy. In the case of the power plant near the Pembroke monitor, coal switching to lower sulfur coals is unlikely to be a viable quick solution since many coals don't burn efficiently in the boilers. Instead, the power plant is constructing a scrubber system to control its emissions, and that work is nearing completion. Since the plant currently burns a mix of low- and mid-sulfur coal, emissions of SO₂ are lower than they could be, but the power plant is still a significant source of SO₂. While there are other sources of SO₂ in the area, they are consistent with emission levels throughout most of the remainder of the state, including areas near the Manchester and Portsmouth monitors which are both measuring levels well below the new SO₂ NAAQS. There is no reason to believe that the Pembroke monitor would exceed the new SO₂ NAAQS without the nearby proximity of Merrimack Station.

3. Geography and Topography

The SO₂ monitor located in Pembroke is located near the Merrimack River, which roughly runs from the north-northwest to the south-southeast in the area. The prevailing winds in the Pembroke area tend to flow in either direction up or down stream, following the river valley (Figure A2). For the most part, the land is rolling and hills reaching 1000 feet above sea level rise in almost every direction from the monitor.

4. Meteorology and Transport Patterns

Following the logic that SO₂ emissions from Merrimack Station play a major role in the SO₂ monitoring values in Pembroke, then the dispersion patterns of those emissions can be estimated in order to form boundaries that reasonably capture areas likely to exceed the level of the new SO₂ NAAQS. Ultimately, modeling will be performed to more precisely define these boundaries, but until this work is complete, estimated boundaries are being provided to extrapolate monitoring data values with dispersion assumptions. To start this work, prevailing wind patterns and terrain features were examined. In specific, terrain features with elevations near and above stable plume heights for Merrimack Station in each direction from the plant were identified. Stable plume heights of 783 to 1019 feet above seal level for the two boilers provide a target for terrain of similar elevation. In many cases, such terrain could be found within 10

miles of the power plant, and the goal was to include these locations in the current nonattainment designation recommendation.

For lower level areas, a fairly simple measure was applied. The monitoring station in Concord is about 6 miles to the north of Merrimack Station and the Manchester monitor is located 10 miles to the south. Since both monitors currently show SO₂ levels at about two-thirds the level of the NAAQS, this 10 mile distance was applied as a conservative ruler and all towns within about 10 miles of Merrimack Station were included in the New Hampshire nonattainment boundary recommendations. The City of Manchester is the lone exception to this 10 mile rule, and it was excluded because it has 3-years of monitoring data showing compliance with the NAAQS.

According to the presumptive norm presented by EPA designation guidance, the Central New Hampshire nonattainment area would extend westward into remote and upwind portions of Merrimack County. This western portion of the county would require east and southeast winds to carry power plant emissions up and over mountainous terrain before reaching the area. Wind roses for central New Hampshire (Figures A3 and A4) indicate that prevailing winds rarely blow in such a direction, five percent or less of the time per year. The most common wind directions are from the northwest or north-northwest (about 35% of the year) or from the south or south-southeast (about 20% of the year). Such wind patterns suggest that there is a greater likelihood of elevated SO₂ values to the southeast and the north of the Pembroke monitor, rather than the western portion of Merrimack County. Further, it should be noted that a band of terrain near 1000 feet above sea level separate eastern Merrimack County from the western portion, forming a physical barrier protecting lower elevations beyond these mountains from SO₂ emissions from Merrimack Station. The end result of this technical approach is that the recommended nonattainment area is better centered on Merrimack station than the presumptive norm boundaries would suggest and more consistent with prevailing wind patterns in the area (Figure A5).

5. Jurisdictional Boundaries

The use of county boundaries appears to provide for an awkward nonattainment area boundary. While several physical boundary options are available, NHDES finds the traditional use of Town jurisdictional boundaries makes for effective boundaries for nonattainment areas in New Hampshire. Where physical or topographical features may be more scientific, NHDES will use those physical features and translate them to Town boundaries for designation recommendations.

In summary, New Hampshire recommends that based on monitoring data and the application of dispersion science, a single nonattainment area should be designated in the south-central portion of the state near a large coal-fired power plant. NHDES recommends that this nonattainment area be named the Central New Hampshire SO₂ Nonattainment Area. The remainder of the state should be designated as unclassifiable until the requisite dispersion modeling can be completed as according to EPA guidance, as requested in EPA's guidance (and consistent with how designations are identified in Part 81 of the Code of Federal Regulations), attainment/nonattainment information is provided in Table A2. This information, along with digitized longitude and latitude coordinates for mapping purposes, and electronic versions of this data and associated maps will be provided.

Figure A2: Map of Bow Meteorology Station Demonstrating how Prevailing Wind Patterns Follow Direction of the River

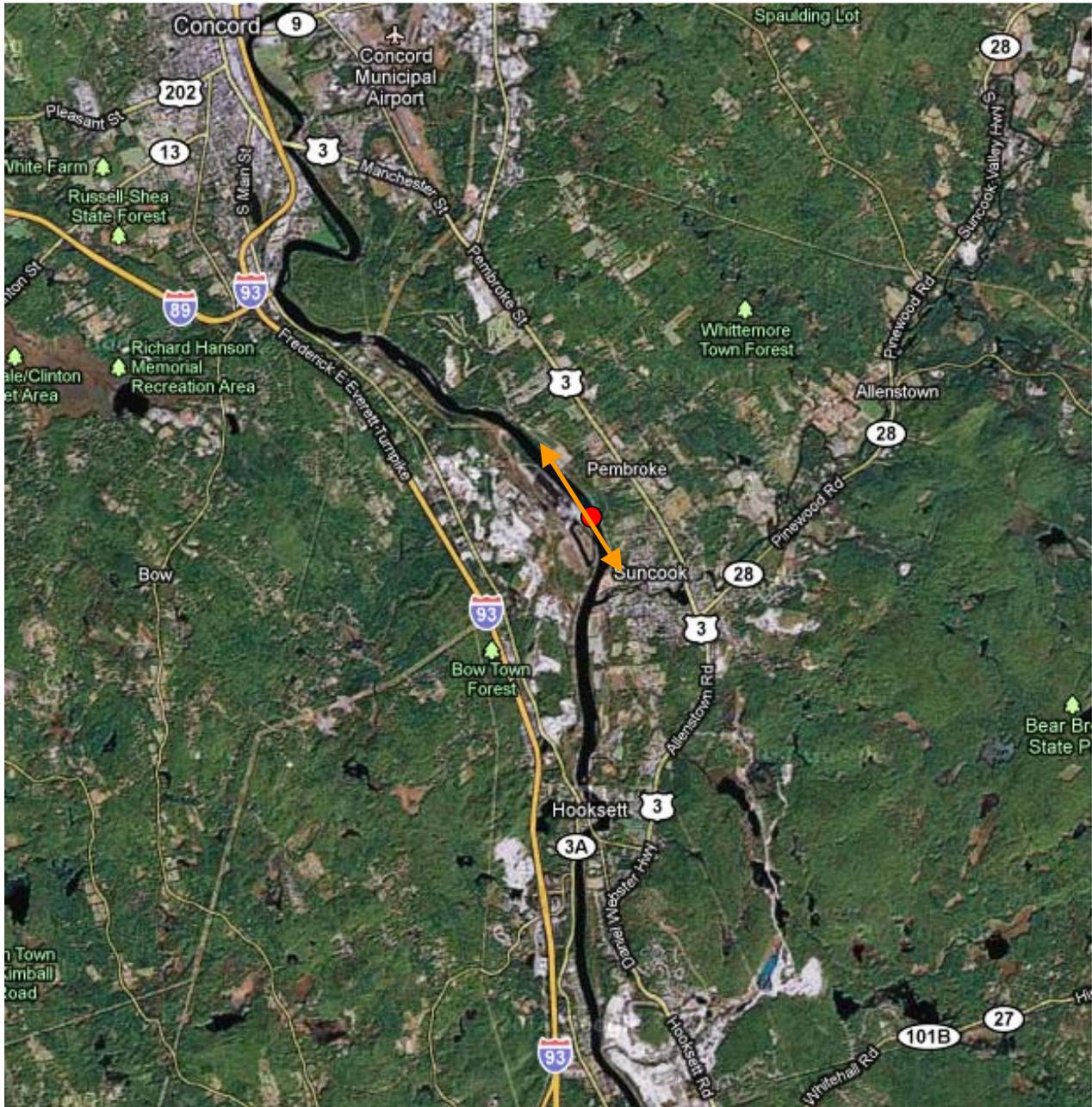
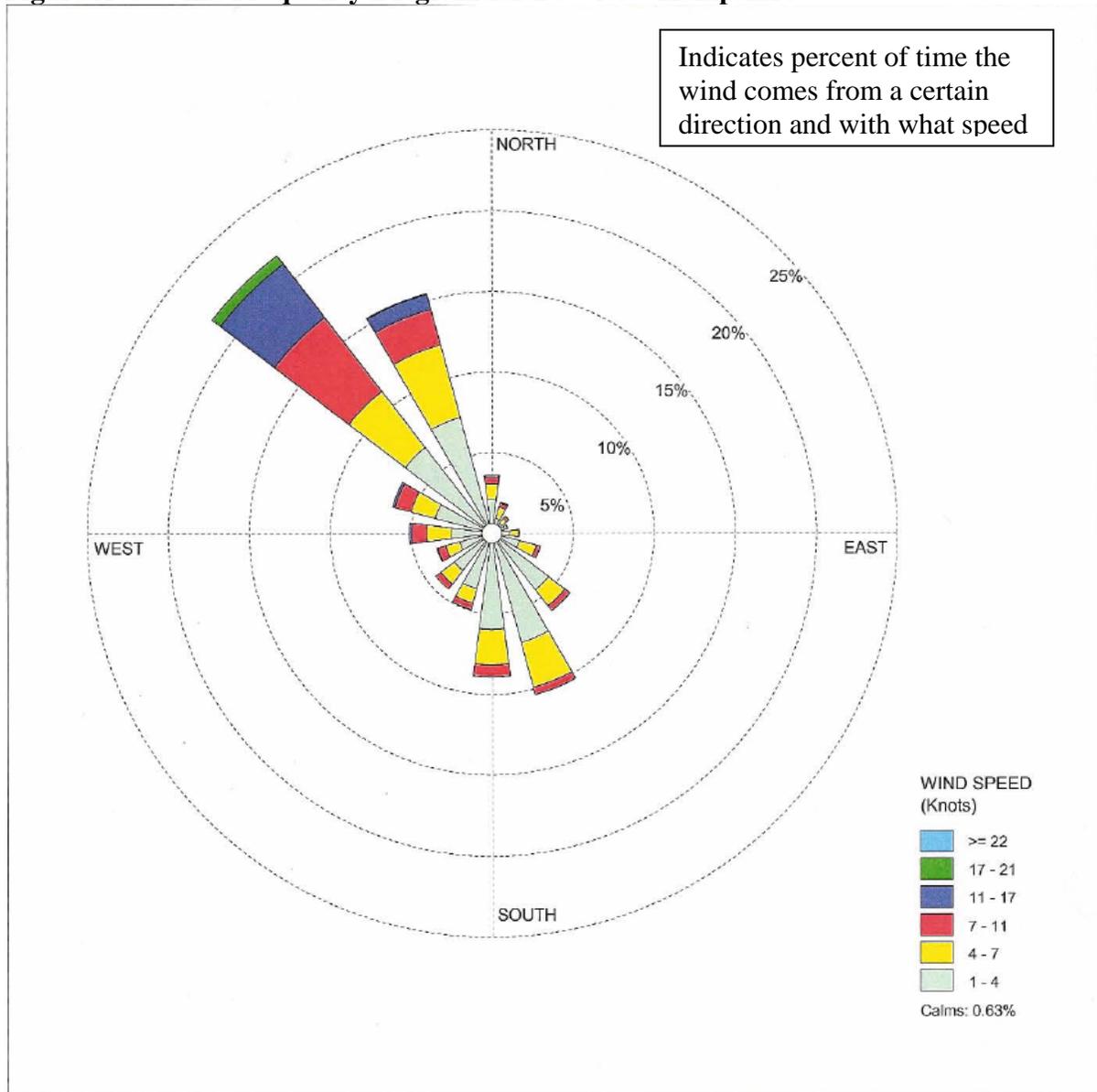


Figure A3: Wind Frequency Diagram for Bow New Hampshire



COMMENTS: 1994 on-site met data	DATA PERIOD: 1994 Jan 1 - Dec 31 00:00 - 23:00	COMPANY NAME:	
	CALM WINDS: 0.63%	MODELER:	
	AVG. WIND SPEED: 4.83 Knots	TOTAL COUNT: 8760 hrs.	DATE: 5/19/2011

Figure A4: Wind Frequency Diagram for Bow New Hampshire

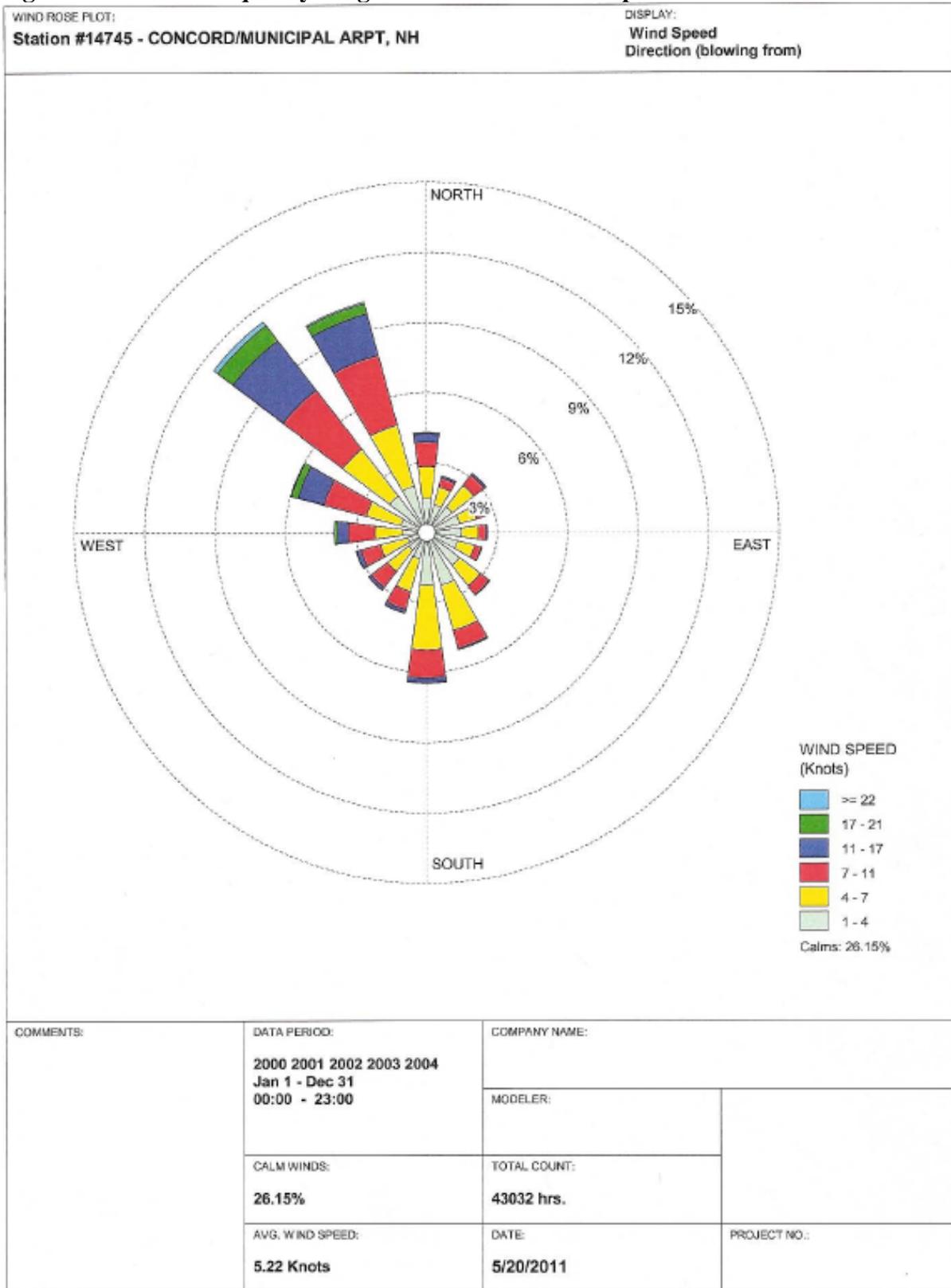


TABLE A2. Proposed Designation of Areas for 1-Hour Sulfur Dioxide
 NAAQS Nonattainment in New Hampshire

NEW HAMPSHIRE – SO ₂ (1-HOUR STANDARD)		
Designated Area	Designation	Classification
	Type	Type
New Hampshire:		
Hillsborough County		
Goffstown	Nonattainment	--
All remaining towns	Unclassifiable	--
Merrimack County		
Allenstown	Nonattainment	--
Bow	Nonattainment	--
Chichester	Nonattainment	--
Concord	Nonattainment	--
Dunbarton	Nonattainment	--
Epsom	Nonattainment	--
Hooksett	Nonattainment	--
Loudon	Nonattainment	--
Pembroke	Nonattainment	--
Pittsfield	Nonattainment	--
All remaining towns	Unclassifiable	--
Rockingham County		
Candia	Nonattainment	--
Deerfield	Nonattainment	--
Northwood	Nonattainment	--
All remaining towns	Unclassifiable	--
All remaining counties	Unclassifiable	--

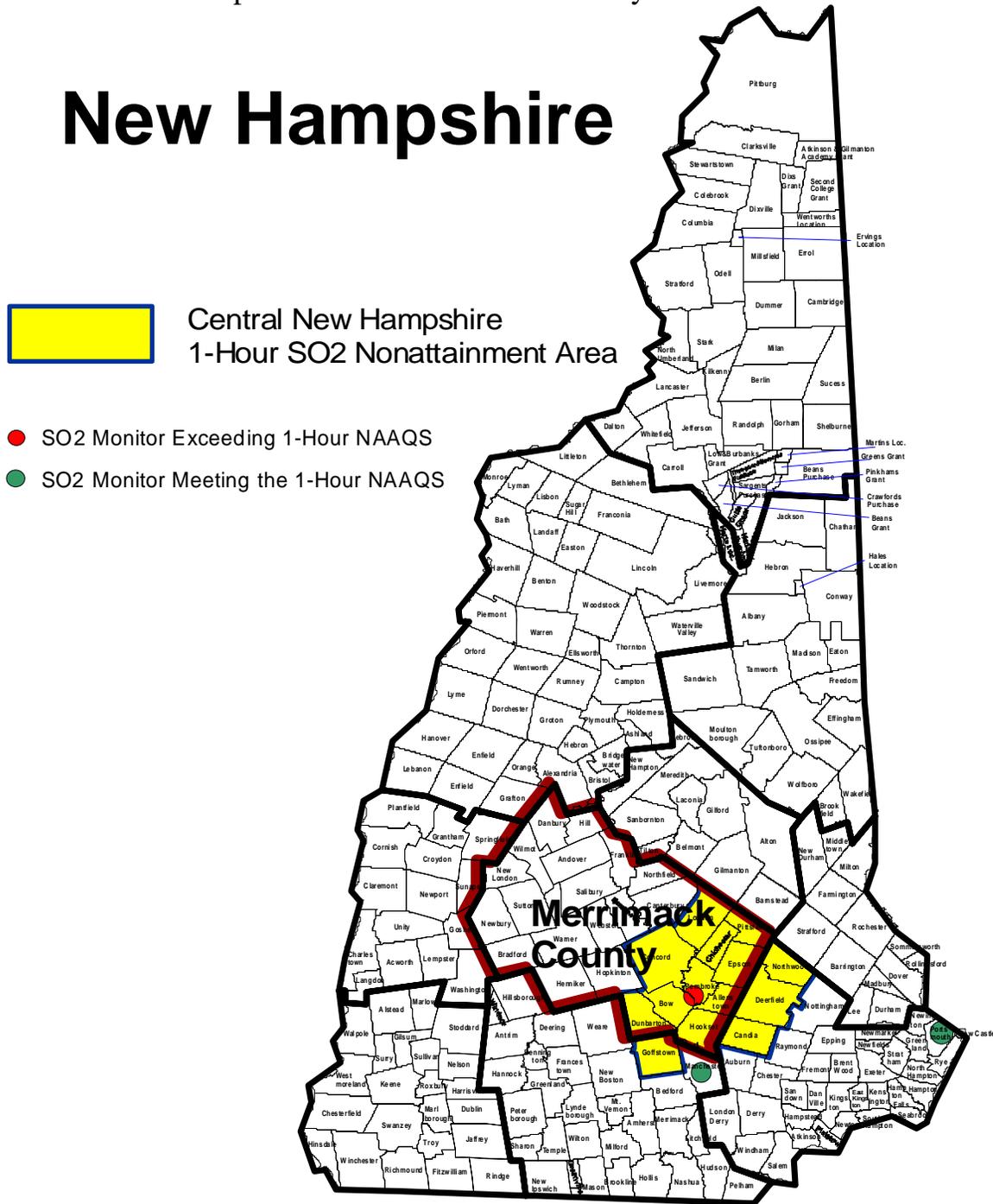
TABLE A3. Towns in Presumptive Norm Boundaries of Merrimack County that are Not Included in the Recommended Nonattainment Area

<i>County Town</i>	<i>Notes**</i>
State Totals	--
Merrimack County	EPA Presumptive Norm for 1-Hour SO₂ Nonattainment Boundaries
Andover	More than 10 miles and beyond terrain of plume height elevation
Boscawen	More than 10 miles and beyond terrain of plume height elevation
Bradford	More than 10 miles and beyond terrain of plume height elevation
Canterbury	More than 10 miles and beyond terrain of plume height elevation
Danbury	More than 10 miles and beyond terrain of plume height elevation
Franklin	More than 10 miles and beyond terrain of plume height elevation
Henniker	More than 10 miles and beyond terrain of plume height elevation
Hopkinton	More than 10 miles and beyond terrain of plume height elevation
New London	More than 10 miles and beyond terrain of plume height elevation
Newbury	More than 10 miles and beyond terrain of plume height elevation
Northfield	More than 10 miles and beyond terrain of plume height elevation
Salisbury	More than 10 miles and beyond terrain of plume height elevation
Sutton	More than 10 miles and beyond terrain of plume height elevation
Warner	More than 10 miles and beyond terrain of plume height elevation
Webster	More than 10 miles and beyond terrain of plume height elevation
Wilmot	More than 10 miles and beyond terrain of plume height elevation

TABLE A4. Towns Outside the Presumptive Norm Boundaries of Merrimack County that Are Included in the Recommended Nonattainment Area

<i>County Town</i>	<i>Notes**</i>
State Totals	--
Hillsborough County	
Goffstown	First occurrence of plume height terrain within 10 miles - Uncanoonuc Mountains
Rockingham County	
Candia	Plume height terrain near areas that previous modeling indicated possible impact from Merrimack Station
Deerfield	Plume height terrain near areas that previous modeling indicated possible impact from Merrimack Station
Northwood	Plume height terrain near areas that previous modeling indicated possible impact from Merrimack Station

FIGURE A5. Comparison of Presumptive Norm Boundary with the New Hampshire Recommended Boundary



Areas of Influence

In accordance with EPA guidance, New Hampshire has investigated the influence of New Hampshire emissions on 1-hour SO₂ attainment/nonattainment within and beyond the state's borders. Based on data currently available, there is no indication of a New Hampshire SO₂ source causing or contributing to monitored nonattainment outside of the Central New Hampshire area. All monitors in northern New England are meeting the new SO₂ NAAQS during the three most recent available monitoring years (2008-2010); however, this in itself does not ensure attainment until dispersion modeling is completed. Contributions of New Hampshire sources will be reassessed with modeling as required by EPA guidance. Until this new work is complete, New Hampshire recommends designation of unclassifiable for such cases.