ATTACHMENT DD

Technical Support Document on Measures to Mitigate Visibility Impacts of Construction Activities in the MANE-VU Region

Mid-Atlantic/Northeast Visibility Union

MANE-VU

Technical Support Document on Measures to Mitigate the Visibility Impacts of Construction Activities in the MANE-VU Region

Draft: September 1, 2006

1. Introduction

Each state must develop a long-term (10-15 years) strategy for making reasonable progress towards the national goal stated in 40 CFR section 51.300(a), "preventing any future, and remedying any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution." States are required to develop long-term strategies for each mandatory Class I Federal area located within the state and each mandatory Class I Federal area located outside the state that may be affected by sources within the state. According to 40CFR section 51.308(d)(3)(v)(B), states must consider "measures to mitigate the impacts of construction activities" in developing its long-term strategies for regional haze.

The purpose of this technical support document is to assist States in considering measures in the MANE-VU Region to mitigate the impacts of construction activities. This document provides background information on the air quality impacts of construction activities, presents relevant emissions inventory and contribution assessment results, describes potential control measures, and summarizes state regulations currently in place in the MANE-VU Region.

2. Air Quality Impacts of Dust and Diesel Usage from Construction Activities

According to the EPA (www.epa.gov/ttn/chief/ap42/ch13), construction activities may have a significant, albeit temporary, impact on local air quality. Construction activities are sources of fugitive dust and air pollutants from the use of diesel powered equipment.

There are two primary mechanisms of generating fugitive dust, pulverization of surface materials by mechanical equipment and entrainment of dust by wind. Large dust particles typically settle out near the source, creating potential nuisance issues. Particles larger than 100μm generally settle out within six to nine meters from the source while particles between 20 and 100μm typically fall out within a few hundred feet of the source. Smaller particles, especially particles smaller than 10μm (PM_{10}) can persist in the atmosphere, possibly contributing to diminished visibility.

Construction activities that can contribute substantial dust emissions include land clearing, drilling and blasting, ground excavation, hauling dirt, and the construction of roads and buildings. Equipment traffic over temporary roads at construction sites can make up a large

portion of the emissions. The use of diesel fuel in construction equipment causes the emission of Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Nitrogen Oxides (NOx), and Particulate Matter (PM) into the air. These pollutants may contribute to reduced visibility. Construction activities that contribute to the release of the above mentioned pollutants include, idling, the use of high sulfur fuel and diesel, the lack of exhaust controls, and the use older vehicles that are not properly maintained.

In contrast to other fugitive dust sources, such as dust generated from unpaved roads and agricultural tilling practices, construction activities are temporary with a definable beginning and end, and vary significantly over different phases of the construction project. Dust and diesel emissions from construction sites vary daily depending on the level of activity, specific operations, specific machinery used, and meteorological conditions. Other factors that play a role in dust emissions include the silt (particles smaller than 75μm in diameter) content of the soil, soil moisture, the speed and weight of construction equipment. Dust emissions are positively correlated with silt content and the weight of vehicles and negatively correlated with soil moisture content.

3. Relevant Emissions Inventory Results

The Mid-Atlantic Regional Air Management Association (MARAMA), on behalf of MANE-VU, developed a "Fugitive Dust Construction Area Source Category Calculation Methodology Sheet," for use by MANE-VU States. The calculation methodology sheet describes how States may calculate emissions of particulate matter from residential, non-residential, and road construction activities. The calculation methodology sheet, which was most recently updated in December 2004, is available online at http://www.marama.org/visibility/Calculation_Sheets/FugitiveDustConstruction122004.doc.

States submitted $PM_{2.5}$ and PM_{10} data on emissions from construction activities of various types, which were compiled in the MANE-VU 2002 Inventory. Under contract by MARAMA, E.H. Pechan and Associates summed the $PM_{2.5}$ and PM_{10} data for the categories of residential construction, road construction, and industrial/commercial/institutional construction. These category values were added together to determine the Total Construction Emissions for each state, shown in Tables 1 and 2 and Total Off-Highway Diesel Emissions for each state shown in Tables 3 and 4. Each table below shows the Total Emissions of $PM_{2.5}$ and PM_{10} from all sources of pollution, including point source, area, non-road, and on-road in units of tons per year. In the case of non-diesel construction activities, the percentages of construction emissions from area sources and the percentage of construction emissions from all sources were calculated and shown in Tables 1 and 2 for $PM_{2.5}$ and PM_{10} respectively. In the case of diesel emissions the total emissions from all sources are followed by the Total Nonroad Source Emissions, and then the Total Off-Highway Diesel Emissions, the Construction Emissions as a percent of Nonroad Inventory and finally the Construction Emissions as a percent of Total Inventory were calculated and shown in Tables 3 and 4 for $PM_{2.5}$ and PM_{10} respectively.

Table 1: 2002 $PM_{2.5}$ emissions from construction activities (Data Source: 2002 MANE-VU Modeling Inventory, Version 3.0)

State	Total Emissions from all sources of $PM_{2.5}$ (tons/year)	Total Area Source Emissions $PM_{2.5}$ (tons/year)[1]	Total Construction Emissions $PM_{2.5}$ (tons/year)	Construction Emissions as a % of Area Sources Emissions	Construction Emissions as a % of Total Inventory
Connecticut	18365.9	14247.3	932.7	6.5	5.1
Delaware	8210.2	3203.6	268.6	8.4	3.3
District of Columbia	1388.8	804.8	156.9	19.5	11.3
Maine	40824.9	32773.7	373.4	1.1	0.9
Maryland	38929.7	27318.3	2835.1	10.4	7.3
Massachusetts	51864.4	42067.5	2530.8	6.0	4.9
New Hampshire	21996.8	17532.0	352.9	2.0	1.6
New Jersey	31595.3	19349.6	88.3	0.5	0.3
New York	108952.6	87154.2	7039.8	8.1	6.5
Pennsylvania	108811.6	74924.7	7694.7	10.3	7.1
Rhode Island	2901.3	2064.2	301.8	14.6	10.4
Vermont	12300.3	11064.5	264.5	2.4	2.2
MANE-VU	446142.0	332504.5	22839.4	7.5	5.1

[1] SCC 23110xxxx

Table 2: 2002 PM_{10} emissions from construction activities (Data Source: 2002 MANE-VU Modeling Inventory, version 3.0)

State	Total Emissions from all sources of PM_{10} (tons/year)	Total Area Source Emissions PM_{10} (tons/year)[1]	Total Construction Emissions PM_{10} (tons/year)	Construction Emissions as a % of Area Source Emissions	Construction Emissions as a % of Total Inventory
Connecticut	53430.1	48280.7	9327.4	19.3	17.5
Delaware	18857.7	13038.6	2712.1	20.8	14.4
District of Columbia	3962.6	3269.2	784.3	24.0	19.8
Maine	178918.5	168953.4	3733.8	2.2	2.1
Maryland	112193.1	95060.2	28350.7	29.8	25.3
Massachusetts	205629.6	192838.7	25306.1	13.1	12.3
New Hampshire	48531.8	43328.1	3529.2	8.1	7.3
New Jersey	76893.3	61600.9	882.8	1.4	1.1
New York	398048.9	369594.6	70397.9	19.0	17.7
Pennsylvania	449572.9	391896.9	76946.6	19.6	17.1
Rhode Island	9439.7	8294.6	3018.0	36.4	32.0
Vermont	57633.7	56130.6	2645.1	4.7	4.6
MANE-VU	1613112.0	1452286.6	227634.0	16.6	14.3

[1] SCC 23110xxxx

Table 3: 2002 $PM_{2.5}$ emissions from diesel emissions (Data Source: 2002 MANE-VU Modeling Inventory, Version 3.0)

State	Total Emissions from All Sources $PM_{2.5}$ (tons/year)	Total Nonroad Source Emissions $PM_{2.5}$ (tons/year)	Total Off-Highway Diesel Emissions $PM_{2.5}$ (tons/year)[1]	Construction Emissions as a % of Nonroad Source Emissions	Construction Emissions as a % of Total Inventory
Connecticut	18365.9	1793.9	582.5	32.5	3.2
Delaware	8210.2	925.6	215.3	23.3	2.6
District of Columbia	1612.8	298.7	235.9	79.0	14.6
Maine	40824.9	1329.4	261.8	19.7	0.6
Maryland	38929.7	4357.1	1161.6	26.7	3.0
Massachusetts	51864.4	3226.4	1032.0	32.0	2.0
New Hampshire	21996.8	965.4	268.0	27.8	1.2
New Jersey	31595.3	4997.2	1437.4	28.8	4.5
New York	108952.6	8820.9	2556.2	29.0	2.3
Pennsylvania	108811.6	8440.1	1862.7	22.1	1.7
Rhode Island	2901.3	443.1	128.7	29.0	4.4
Vermont	12300.3	485.8	109	22.4	0.9
MANE-VU	446365.9	36083.6	9851.2	27.3	2.2

[1] SCC 2270002xxx

Table 4: 2002 PM_{10} emissions form diesel emissions (Data Source: 2002 MANE-VU Modeling Inventory, Version 3.0)

State	Total Emissions from All Sources PM_{10} (tons/year)	Total Nonroad Source Emissions PM_{10} (tons/year)	Total Off-Highway Diesel Emissions PM_{10} (tons/year)[1]	Construction Emissions as a % of Nonroad Source Emissions	Construction Emissions as a % of Total Inventory
Connecticut	53430.1	1952.1	633.2	32.4	1.2
Delaware	18857.7	1021.4	234.0	22.9	1.2
District of Columbia	6986.7	310.2	243.2	78.4	3.5
Maine	178918.5	1436.8	269.9	18.8	0.2
Maryland	112193.1	4936.0	1262.7	25.6	1.1
Massachusetts	205629.6	3531.2	1121.7	31.8	0.5
New Hampshire	48531.8	1057.8	291.3	27.5	0.6
New Jersey	76893.3	5495.1	1562.3	28.4	2.0
New York	398048.9	9605.3	2778.5	28.9	0.7
Pennsylvania	449572.9	9737.9	2024.7	20.8	0.5
Rhode Island	9439.7	500.2	139.9	28.0	1.5
Vermont	57633.7	529.9	118.5	22.4	0.2
MANE-VU	1616136.2	40113.9	10679.9	26.6	0.7

[1] SCC 2270002xxx

Data on area source emissions and the total emissions for $PM_{2.5}$ and PM_{10} are also shown in Tables 1 and 2. Both tables show that construction dust is a major contributor to total emissions of $PM_{2.5}$ and especially PM_{10} with 5.1% and 14.3% emission contribution respectively. The MANE-VU states with the largest contribution to $PM_{2.5}$ emissions are the District of Columbia, Rhode Island, Maryland, and Pennsylvania. The MANE-VU states with the largest contribution to PM_{10} emissions are the Rhode Island, Maryland, and the District of Columbia.

Data on off-highway and nonroad diesel emissions sources for $PM_{2.5}$ and $_{10}$ are also shown in Tables 3 and 4. These tables show that diesel emissions do not contribute significantly to $PM_{2.5}$ and PM_{10} emissions with 2.2% and 0.7% respectively. However, they do make a contribution to PM emissions. According to Table 3, the District of Columbia, New Jersey, and Pennsylvania contribute the most to $PM_{2.5}$ diesel emissions of all the MANE-VU states. The District of Columbia, New Jersey, and Rhode Island contribute the most to PM_{10} diesel emissions in MANE-VU states as seen in Table 4. Construction emissions are a large percentage of the total PM inventory in urban areas, for example in the District of Columbia has the highest percentage of construction emissions as a percentage of nonroad source emissions and the total inventory.

It should be noted that “a fugitive dust transport fraction” is applied to emissions numbers for construction activities to account for dust settling out of the air close to the sources. This application essentially reduces fugitive dust emissions to approximately one-fourth of the emissions values before they are used in photochemical transport models. As a result of this application, photochemical models produce more consistent results with ambient air quality monitoring data. In addition, the EPA has recently recommended that a new emissions factor be used in determining fugitive dust emissions from construction activities. MANE-VU States have agreed to use the new emissions factor, and, as a result, the values for $PM_{2.5}$ and PM_{10} emissions from construction activities are significantly lower in Version 3.0 of the 2002 MANE-VU Modeling Inventory, compared to Version 2.0 of the 2002 MANE-VU Modeling Inventory.

4. Ambient Air Quality Monitoring Data

The Northeast States for Coordinated Air Use Management (NESCAUM), on behalf of MANE-VU, analyzed ambient air quality data from the Interagency Monitoring of Protected Visual Environments (IMPROVE) network in several areas within and near Class I Areas in the Northeast and Mid-Atlantic Region. Figure 1 shows the relative contributions of sulfate, nitrate, organic carbon, crustal material, elemental carbon, and Rayleigh scattering to visibility impairment on the 20% clearest and 20% haziest days in 1999. Construction activities contribute only a fraction to the crustal material emissions that were measured and diesel emissions from construction sites contribute to elemental carbon, nitrate, and organic carbon.

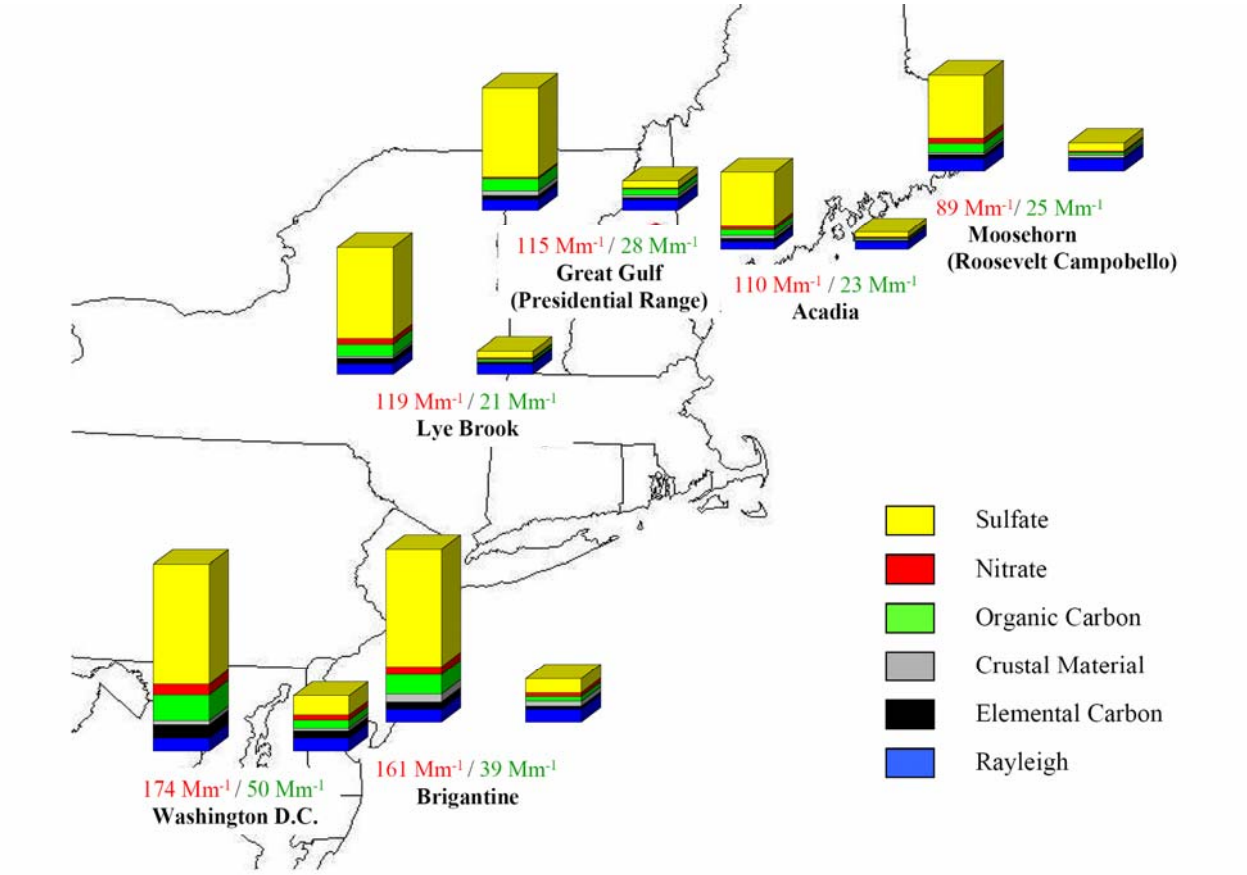

Figure 1: Speciated contribution to total atmospheric light extinction in or near Class I Areas in the Northeast and Mid-Atlantic states on 20 percent of days with the worst (left bar) and best (right bar) visibility conditions during 1999. (Source: Technical Memorandum #1: Updated Statistics for the MANE-VU Region, prepared by the Northeast States for Coordinated Air Use Management, on behalf of MANE-VU in February 2002. The memorandum is available online at http://bronze.nescaum.org/regionalhaze/memoranda/Memo1-VisData.pdf.)

On the 20% haziest days in 1999, sulfate was the greatest contributor to visibility impairment at all of the sites analyzed, and sulfate and Rayleigh scattering were the largest contributors on the 20% clearest days in 1999. Crustal material, including dust from construction activities and other sources of dust, was only a minor contributor to haze on the 20% clearest and haziest days in 1999.

Data from the IMPROVE monitoring network has also been analyzed to estimate the contribution of soil dust to $PM_{2.5}$ concentrations across the nation. Figure 2 shows the results of an analysis on 2001 IMPROVE data.

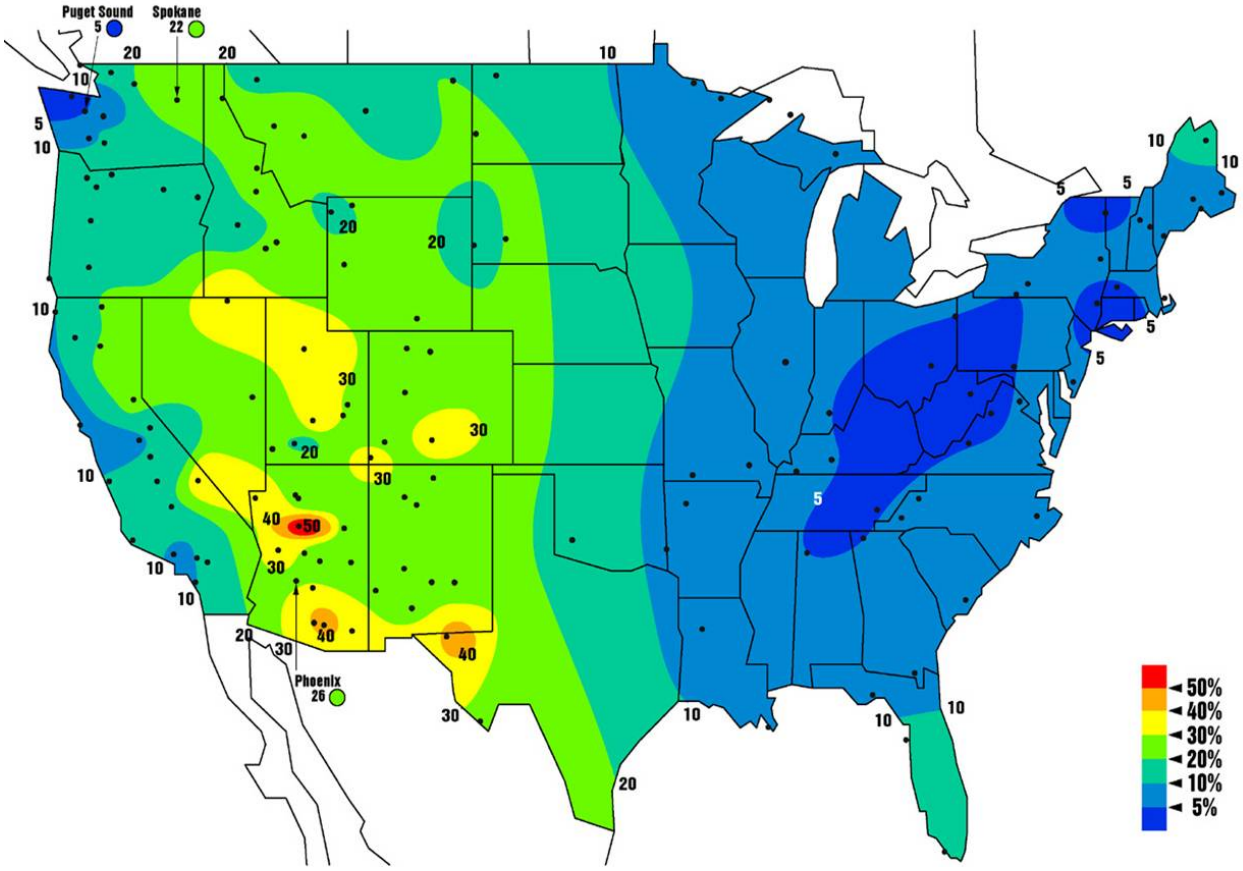

Figure 2: Annual Soil Fraction of Fine Particle Mass (2001). (Source: "Spatial and Seasonal Patterns in Speciated Fine Particle Concentration in the Rural United States," a presentation by Bret Schichtel of the National Park Service and William Malm, Marc Pitchford, Lowell Ashbaugh, Robert Eldred, and Rodger Ames, made available online by IMPROVE at http://vista.cira.colostate.edu/improve/Publications/GrayLit/gray_literature.htm.)

According to IMPROVE results, whereas soil dust contributes more than 50% of the $PM_{2.5}$ mass in parts of the western United States, dust contributes less than 10% in the Mid-Atlantic and Northeast Regions of the United States. Construction activities are not the only sources of construction dust in the Region. Other sources of fugitive dust, such as dust from paved and unpaved roads and agricultural tilling practices, are also significant sources. Since construction dust only partially comprises the total dust component and since soil dust is not a large contributor to ambient $PM_{2.5}$ concentrations, dust from construction activities is unlikely a large component of $PM_{2.5}$ concentrations measured in MANE-VU Class I Areas. These results confirm the NESCAUM findings that dust is not a major contributor to haze in the Region.

5. Potential Available Control Measures

There are several control options for reducing dust and diesel emissions from construction activities. The most common methods for controlling dust emissions include watering surface materials and minimizing surface wind speed using windbreaks or source enclosures. Chemicals can also be used to stabilize surface materials, but these methods can be expensive and/or have adverse ecological effects. Dust minimization techniques used when hauling dirt include covering trucks and rapidly cleaning up spillage. Early paving of permanent roads can also help control dust during certain construction activities. In the case of reducing diesel emissions, four options have been utilized with success. The use of cleaner fuels (e.g., low sulfur, emulsified diesel), the installation of exhaust controls (e.g., diesel oxidation catalysts), placing limitations on the time and location of idling machines, and assuring that heavy duty vehicles comply with state regulations (e.g., smoke standards).

6. Existing Regulations

Most MANE-VU states and the District of Columbia have regulations in place to control dust emissions from construction activities that are relevant to regional haze and certain MANE-VU states have regulations in place to control diesel emissions. MARAMA requested information regarding state control measures, and received responses from every MANE-VU state and the District of Columbia. The following descriptions of state regulations incorporate the information provided by Connecticut (Michael Geigert and Merrily Gere), Delaware (Jack Sipple), the District of Columbia (Rama Tangirala), Maine (Jeff Crawford), Maryland (Brian Hug), Massachusetts (Ken Santlal and Eileen Hiney), New Hampshire (Andy Bodnarik), New Jersey (Ray Papalski), New York (John Kent), Pennsylvania (Nancy Herb), Rhode Island (Ted Burns), and Vermont (Paul Wishinski). The following descriptions are provided as background information and are not intended to incorporate any regulations, policies, programs or projects into the State Implementation Plan.

6.1 Connecticut

Section 22a-174-18 of the Regulations of Connecticut State Agencies, “Control of particulate matter and visible emissions,” addresses the control of airborne particulate matter and fugitive particulate matter in subsections (c) and (d). These regulations, which include dust control measures and visible emissions from diesel powered mobile sources, apply to road building and construction activities. Regulations are available online at http://www.dep.state.ct.us/air2/regs/mainregs.htm.

Two additional emissions control programs related to construction activities are currently underway in Connecticut. First, the Connecticut Clean Air Construction Initiative is a 10-year pilot project designed to reduce idling and operational emissions from construction equipment used to complete the I-95 New Haven Harbor Crossing Improvement Project also called the Q Bridge Project. Retrofits and idling restrictions for this project are required as part of contract specifications with the Connecticut Department of Transportation (CTDOT). Diesel retrofits and idling restrictions for construction vehicles were also written into a special act called the Connecticut Clean Diesel Plan by the Connecticut Department of Environmental Protection (CTDEP). The CTDEP hopes to work with CTDOT to expand this program to all state road construction projects. Currently, 150 diesel powered construction machines have been retrofits with oxidation catalysts and by the projects completion 200 machines will be retrofitted.

Second, a PM_{10} limited maintenance plan for the City of New Haven was approved by EPA. The plan includes some contingency measures that apply to New Haven under a state order. The measures focus on street paving and sweeping.

The Connecticut Department of Transportation has implemented diesel vehicle emission controls that Contractors and Sub-contractors are obligated to follow. Any non-road construction equipment with engine horsepower (HP) rating of 60 HP and above that are assigned to a contract for a period in excess of 30 consecutive calendar days must be retrofitted with Emission Control Devices and/or use Clean Fuels in order to reduce diesel emissions. Contractors must submit a certified list of non-road diesel powered construction equipment what will be retrofitted with emission control devices and/or use Clean Fuel and include the addition or deletion of non-road diesel equipment. The list has three parts and a monthly report must also be submitted by the contractor updating the above stated information. If these rules are not followed the contractor will be issued a Non-Compliance and given 24 hours to bring the equipment into compliance or removed it from the project. If the contractor still does not comply further and more extreme actions will be taken. For further information on this project contact the Connecticut Department of Transportation, regarding the I-95 New Haven Harbor Crossing Corridor Improvement Program.

Connecticut has regulations in place to control fugitive emissions from construction. In Section 22a-174-18(c) of regulations from the Department of Environmental Protection state that, "No person shall cause or allow the emission of visible particulate matter beyond the legal boundary of the property on which such emission occurs that either diminishes the health, safety or enjoyment of people using a building or structure located beyond the property boundary…No person shall emit particulate matter into the ambient air in such a manner as to cause a nuisance." The regulations also place strict controls on the type and amount of visible particulate matter that can be released by the owner or operator of the equipment. These regulations are available online at: http://www.dep.state.ct.us/air2/regs/mainregs/sec18.pdf

6.2 Delaware

Delaware Air Quality Management (AQM) Regulation 6, "Particulate Emissions from Construction and Materials Handling," addresses control measures for particulate emissions from construction and materials handling operations to minimize air pollution. This regulation is available online at http://www.dnrec.state.de.us/air/aqm_page/docs/pdf/reg_6.pdf.

Delaware has no regulations or laws to control emissions from diesel equipment at construction sites.

6.3 District of Columbia

Chapter 6 of the Title 20 D.C. Municipal Regulations (20 DCMR), addresses control measures for particulate matter. Section 605 of 20 DCMR "Control of Fugitive Dust" specifically addresses the fugitive dust control measures that apply to roads, parking lots, vehicles transporting dusty materials, loading & unloading and demolition of buildings activities. Additionally, Section 903 of the Title 20 DCMR addresses odorous or other nuisance air pollutants.

There are no regulations or laws in place to control emissions from diesel at construction sites in Washington D.C. However, there are restriction on the use of heavy duty diesel engines produced for the 2005 and 2006 model years and heavy duty vehicles containing these engines. These vehicles are not allowed to be registered in the District of Columbia without the applicant presenting documentation that the California Air Resources Board has issued an Executive Order for the vehicle or engine certifying that it complies with the applicable exhaust emission standards under the California Code of Regulations. The emission standards for these engines are referenced to CARB Title 13, section 1956.8 which are available online at http://www.calregs.com/linkedslice/default.asp?SP=CCR-1000&Action=Welcome.

6.4 Maine

The Department of Environmental Protection (DEP) Regulations Chapter 101, "Visible Emissions," establishes opacity limitations for emissions from several categories of air contaminant sources, including fugitive emissions. DEP Regs Chapter 101 can be applied to construction activities and is available online at http://www.maine.gov/sos/cec/rules/06/096/096c101.doc

Maine has no regulations or laws to control emissions from diesel equipment at construction sites.

6.5 Maryland

COMAR 26.11.06.03D addresses "Particulate Matter from Materials Handling and Construction." This regulation, available online at http://www.dsd.state.md.us/comar/26/26.11.06.03.htm, states that during construction activities there must be "reasonable precautions to prevent particulate matter from becoming airborne" and lists possible control measures.

Maryland has no regulations or laws to control emissions from diesel equipment at construction sites.

6.6 Massachusetts

Control measures to mitigate the emission of particulate matter from construction activities are included in the Massachusetts Department of Environmental Protection Air Pollution Patrol regulations. According to regulation 310 CMR 7.09, "No person having control of any dust or odor generating operations such as construction work shall permit emissions therefrom which cause or contribute to air pollution," and written notification to the Department is required ten working days prior to the initiation of construction.

According to regulation 310 CMR 7.06, "No person shall cause, suffer, allow, or permit excessive emission of visible air contaminants, other than water, from a diesel engine." In addition regulation 310 CMR 7.11 states that, "All motor vehicles registered in the Commonwealth shall comply with pertinent regulations of the Registry of Motor Vehicles relative to exhaust and sound emissions."

Regulation 310 CMR 7.06, 7.09 and 7.11 are available online at http://www.mass.gov/dep/air/laws/7b.htm#09

6.7 New Hampshire

Fugitive dust control measures for construction activities are included in CHAPTER Env-A 1000, "Prevention, Abatement, and Control of Open Source Air Pollution," PART Env-A 1002, "Fugitive Dust." Subsection Env-A 1002.04, "Precautions to Prevent, Abate, and Control Fugitive Dust," lists potential dust control measures and is available online at http://www.gencourt.state.nh.us/rules/env-a1000.html.

New Hampshire has no regulations or laws to control emissions from diesel equipment at construction sites.

6.8 New Jersey

Fugitive emissions are regulated under the New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 8 (NJAC 7:27-8 et seq.); Permits and Certificates, available on-line at http://www.state.nj.us/dep/aqm/rules.htm. Dust control measures for construction are not specifically mentioned. Any off-site impacts from construction activities are also prevented by NJAC 7-27-5 et seq. - Prohibition of Air Pollution that prevents any activity from being injurious to human health or welfare at any off-site location.

New Jersey has recently passed the Diesel Retrofit Law which is expected to reduce particulate emissions from some equipment that will be used in municipal construction or maintenance projects. The 2005 diesel retrofit law regulates publicly-owned off-road equipment in New Jersey by requiring retrofitting with exhaust particulate emissions control systems. The Department of Environmental Protection is charged with designating Best Available Retrofit Technology and defining specific types of equipment to be retrofitted. The law limits the choices of BART to those verified under the EPA and CARB diesel emissions control strategy verification programs. A constitutionally dedicated portion of the State Corporate Business Tax serves as the funding source to reimburse the retrofit costs.

6.9 New York

The New York State Department of Environmental Conservation Rules and Regulations Part 211, "General Prohibitions" includes a clause that places limits on particulate emissions, 211.3, "Visible emissions limited." The regulation is available online at http://www.dec.state.ny.us/website/regs/part211.html

In addition, the New York State Department of Transportation (NYSDOT) Environmental Procedures Manual Chapter 1.1 Section 15, "Construction Related Air Quality Impacts," addresses air quality issues associated with construction activities and includes possible control measures. This manual is available online at http://www.dot.state.ny.us/eab/epm.html.

New York has no regulations or laws to control emissions from diesel equipment at construction sites.

6.10 Pennsylvania

25 PA Code, Chapter 123, Sections 123.1, "Prohibition of certain fugitive emissions," and 123.2, "Fugitive particulate matter," regulate emissions from construction and other related activities. These regulations were adopted on September 10, 1971 and have been "SIP approved." These regulations are available online at http://www.pacode.com/secure/data/025/chapter123/s123.1.html and http://www.pacode.com/secure/data/025/chapter123/s123.2.html.

Pennsylvania does not have regulations to control emissions from diesel equipment at construction sites. However, permits are required for the operation of diesel and nonroad engines. Section 2 of the both the General Plan Approval And/Or General Operating Permit (BAQ-GPA/GP 9) and the General Plan Approval And/Or General Operating Permit (BAQ-GPA/GP 11), states that nonroad and diesel engines must have the best available technology (BAT) installed and in operation and compliance so that the diesel engine is in compliance with regulated emissions standards. Both General Permits (GPs) require the permittee to maintain accurate records of the amount of time the engine is in operation per month, including the amount of fuel used for each unit. GP 9 is more specific about the emissions limits for diesel engines and these are different depending on when construction commenced and the location of the construction. GP 9 and GP11 are available online at http://www.dep.state.pa.us/dep/deputate/airwaste/aq/permits/gp.htm.

6.11 Rhode Island

The RI Department of Environmental Management Air Pollution Control Regulation No. 5, "Fugitive Dust," regulates fugitive dust generated by numerous operations that include construction activities. The regulation is available online at http://www.dem.ri.gov/pubs/regs/regs/air/air05_96.pdf.

Rhode Island has no regulations or laws to control emissions from diesel equipment at construction sites.

6.12 Vermont

Regulation 5-231 (4) in Vermont's Air Pollution Control Regulations addresses fugitive particulate matter emissions. The regulation states that reasonable precautions must be taken to prevent particulate matter from becoming airborne during the construction of buildings and non-public roads and the handling, transport, and storage of materials. This regulation is available online at http://www.anr.state.vt.us/air/docs/apcregs.pdf.

In addition to this rule, most of Vermont's new source permits include references to fugitive emissions. New source permits typically include language such as, "The Permittee shall take reasonable precautions at all times to control and minimize emissions of fugitive particulate matter from operations at the Facility," and list possible control measures.

Vermont has no regulations or laws to control emissions from diesel equipment at construction sites.

7. Conclusions

The following statements summarize the main points of this technical support document.

- Although a temporary source, fugitive dust and diesel emissions from construction activities can have an affect on local air quality.
- While construction activities are responsible for a relatively large fraction of direct $PM_{2.5}$ and PM_{10} emissions in the Region, the impact on visibility is less because dust settles out of the air relatively close to the sources.
- Ambient air quality data shows that soil dust makes up only a minor fraction of the $PM_{2.5}$ measured in MANE-VU Class I Areas, and impacts of diesel emissions in these rural areas are also a small part of total $PM_{2.5}$.
- The use of measures such as clean fuels, retrofit technology, best available technology, specialized permits, and truck staging areas (to limit the adverse impacts of idling) can help decrease the effects of diesel emissions on local air quality.
- MANE-VU States have rules in place to mitigate potential impacts of construction on visibility in Class I Areas.