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2005 Annual Report on Air Quality State of Vermont

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Ozone

Vermont operated two ozone (O_3) monitoring sites in 2004; one at the Proctor Maple Research Facility in Underhill and the other in Bennington. The 8-hour average ozone National Ambient Air Quality Standard (NAAQS) is 0.08 parts per million (ppm) and is assessed relative to the running 3-year average of the annual 4th maximum daily maximum 8-hour average. Based on this criteria, both Underhill and Bennington are 100% of the NAAQS (0.08 ppm) for 2004; this is in compliance with the standard, which must not be exceeded. The highest 8-hour concentration of ozone in 2004, 0.091 ppm, was recorded at the Bennington site. The highest recorded 8-hour concentration of ozone at the Proctor Maple Research site was 0.079 ppm. The highest 1-hour concentration of ozone in 2004, 0.106 ppm, was recorded at the Bennington site while the highest recorded 1-hour concentration of ozone at the Proctor Maple Research Facility was 0.093 ppm.

$PM_{2.5}$

Vermont maintained six monitoring sites that sampled for particulate matter with aerodynamic diameter < 2.5 microns ($PM_{2.5}$). $PM_{2.5}$ sampling in 2004 was conducted at Rutland, Bennington Airport Road, Burlington Zampieri Building, Burlington Main Street, Shoreham Lapham Bay and Shoreham Smith Street. Although $PM_{2.5}$ sampling was discontinued in 2003 at the Proctor Maple Research Facility in Underhill, $PM_{2.5}$ sampling continues in Underhill through the IMPROVE program. Vermont began $PM_{2.5}$ sampling in 1999. The annual average $PM_{2.5}$ standard is assessed relative to the three-year average of the respective annual averages. The $PM_{2.5}$ annual average NAAQS is 15 micrograms per cubic meter ($\mu g/m^3$). Compliance was

assessed at only the Burlington Zampieri site as it was the only site with the last three consecutive years of annual averages. The three-year average as the Burlington Zampieri site was 9.5 µg/m^3 (63% of NAAQS). The $PM_{2.5}$ 24-hour average standard is assessed relative to the three-year average of the annual 98th percentile sample concentration. Given Vermont's 1-in-3 day sampling schedule, the annual 98th percentile concentration is the annual third 24-hour maximum concentration. The $PM_{2.5}$ 24-hour standard is 65 µg/m^3. Compliance was assessed at the Burlington Zampieri site and the three-year 98^{th} percentile average was 32µg/m^3 (49% of NAAQS).

PM_{10}

In 2004, Vermont maintained six monitoring site that sampled for particulate matter with aerodynamic diameter < 10 microns (PM_{10}) for the entire year at Burlingon Main Street. PM_{10} sampling in 2004 was conducted at Rutland, Underhill, Brattleboro, Burlington Main Street, Shoreham Lapham Bay Road and Shoreham Smith Street. The highest 24-hour concentration in 2004 of 45 µg/m^3 was recorded in Rutland. The highest annual PM_{10} average concentration observed was in Brattleboro at 19 µg/m^3. These concentrations are well below the former PM_{10} annual maximum 24-hour average NAAQS of 150 µg/m^3 and the PM_{10} annual average NAAQS of 50 µg/m^3. Yearly variability in the data is common, in part determined by meteorology, transport of particulate matter from distant sources, and changes in the emission strength of local sources.

Carbon Monoxide

During 2004, Vermont operated two Carbon Monoxide (CO) sites in Rutland and Burlington Main Street. No exceedance of the NAAQS for CO was recorded. The highest 1st and 2nd maximum 8-hour concentrations of CO recorded at Rutland were 2.1 ppm and 1.8 ppm. The highest 1st and 2nd maximum 8-hour concentrations of CO recorded at Burlington were 2.2 ppm and 1.9 ppm. The five-year trend line shows in Rutland shows a slight downward trend with the second highs at levels between 20% and 28% of the 8-hour NAAQS of 9 ppm. The Burlington CO site was not in operation in 2002; however was put back in operation for 2003 where it continues to

operate. CO measured in Burlington from 1995 through 1999 resulted in second 8-hour maximums ranging between 24% and 37% of the standard. The second 8-hour maximum in Burlington of 1.9 ppm in 2004 was 21% of the standard. In 2004, the maximum one-hour concentration of CO recorded at Burlington and Rutland was 3.2 ppm and 3.6 ppm, respectively.

Nitrogen Dioxide

Vermont operated two nitrogen dioxide (NO_2) monitoring sites in Rutland and Burlington Main Street in 2004. No exceedance of the NAAQS for NO_2 was recorded. In 2004, the annual average for NO_2 at Burlington and Rutland was 0.014 ppm and 0.012 ppm, respectively. Historical data for the most recent five years (2000-2004) indicate that the annual average concentrations of NO_2 have remained relatively stable. During this time period, the annual averages for the Rutland site ranged from 0.011 ppm to 0.013 ppm NO_2. The Burlington NO_2 site was not in operation in 2002; however was put back in operation for 2003 where it continues to operate. During the period of 1996 to 2000, the annual average NO_2 concentrations ranged from 0.017 ppm to 0.018 ppm in Burlington. The five-year annual NO_2 average trend in Burlington and Rutland ranged between 21% to 34% of the NAAQS. In 2004, the maximum one-hour concentration of NO_2 recorded at Burlington and Rutland was 0.067 ppm and 0.059 ppm, respectively.

Sulfur Dioxide

In 2004, Vermont maintained two sulfur dioxide (SO_2) monitoring sites in Burlington and Rutland. No exceedance or violation of the NAAQS for sulfur dioxide was recorded. The Burlington NO_2 site was not in operation in 2003; however was put back in operation for 2004. The highest 24-hour average concentrations of SO_2 in Burlington and Rutland in 2004 were 0.013 and 0.044 ppm, respectively. The highest 1-hour average SO_2 concentrations at Burlington and Rutland were 0.016 and 0.076 ppm, respectively. The annual average of 0.005 ppm in Rutland for 2004 is 17% of the NAAQS. For compliance purposes, the annual second maximum 24-hour average of 0.030 ppm is 21% of the NAAQS for Rutland. The annual second maximum 3-hour average of 0.063 ppm is 13% of the NAAQS for Rutland. Five years (2000-

2004) of historical SO_2 data indicate little variability in SO_2 concentrations in Rutland.

Lead

Vermont is not required to measure the concentration of lead in ambient air. No measurement data are available. [Note: The Vermont Air Pollution Control Division discontinued monitoring lead concentrations in Vermont in 1989.]

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