# Town of Truckee

# 2006 Annual Report
# Particulate Matter Air Quality

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March 31, 2006

# *Preface*

Within two years of the adoption of this plan and every year thereafter, the Planning Division will submit to the Town Council a report that analyzes air quality monitoring data for particulate matter including emission levels and concentrations and compliance with National and State ambient air quality standards. The Town Council will review the report to determine the success of the plan's control strategies in achieving the attainment goal of the plan, and if necessary take the appropriate steps to ensure consistency with the plan's goal and objectives.

For a plan to be effective, its strategies must be implemented and achieve their purposes as planned. It is critical to gauge the effectiveness of the control strategies to ensure the goal and objectives of the plan are being met. The Town must continue to monitor particulate matter air quality and associate any changes to particulate matter emission levels and concentrations to the control strategies and to factors that are beyond the Town's control. If emissions and concentrations increase, remain as they are, or do not decrease to the levels anticipated, this may signal that the control strategies are not succeeding and a change in the Town's efforts may be needed. This objective provides the mechanism for the Town Council to review the effectiveness of the control strategies on an annual basis and determine if they are succeeding. It is presumed that if the control strategies are not succeeding that the Town Council will take appropriate action based on the findings of the report.

***Objective 9, Truckee Particulate Matter Air Quality Management Plan***

# 2006 Annual Report for Particulate Matter Air Quality

## INTRODUCTION

This report is the sixth annual report on particulate matter air quality in the Truckee air basin. It analyzes the quality of our air for particulate matter pollution in 2005, identifies compliance with National and State air quality standards, and summarizes the status of our monitoring network and the implementation of control strategies. The report also discusses the changes proposed to the particulate matter standards by the Environmental Protection Agency.

## PARTICULATE MATTER MONITORS

There were no changes to our particulate matter monitoring network. The California Air Resources Board and the Northern Sierra Air Quality Management District operate and maintain the following particulate matter monitors in Truckee:

- A Hi-Vol $PM_{2.5}$ monitor located at the Downtown fire station. This monitor samples $PM_{2.5}$ air quality for a 24-hour period once every three days. (Data from this monitor is used to determine compliance with NAAQS.)
- A MetaOne Beta Attenuation Monitor (BAM) located at the Downtown fire station. This monitor samples $PM_{10}$ air quality for a 24-hour period on a continuous basis. The monitor was not in operation in early January and late September.
- A Hi-Vol $PM_{10}$ monitor located at the Downtown fire station. This monitor samples $PM_{10}$ air quality for a 24-hour period once every six days. This monitor was not in operation in January and February. (Data from this monitor is used to determine compliance with NAAQS.)

These monitors recorded the following readings for particulate matter air quality in the Truckee region in 2005:

| | Sampling Days | Annual Concentration | Highest 24-Hour Concentration |
|---|---|---|---|
| **$PM_{10}$ BAM** | 310 | 30.5 ug/$m^3$ | 127.3 ug/$m^3$ |
| **$PM_{10}$ Hi-Vol** | 47 | 23.2 ug/$m^3$ | 69.1 ug/$m^3$ |
| **$PM_{2.5}$ Hi-Vol** | 112 | 6.8 ug/$m^3$ | 35.0 ug/$m^3$ |
| **$PM_{2.5-10}$** | 95 | 21.9 ug/$m^3$ | 57.8 ug/$m^3$ |

Note: $PM_{2.5-10}$ data is an estimate derived from subtracting $PM_{2.5}$ Hi-Vol readings from $PM_{10}$ BAM readings on common days. Annual concentrations of $PM_{2.5-10}$ and $PM_{2.5}$ do not equal $PM_{10}$ concentrations because of the limited data utilizing only common days.

By analyzing this monitoring data, more detailed information on particulate matter air quality during the winter months (January to March) was analyzed. The average daily concentrations from January to March 2005 were:

| | |
|---|---|
| PM 10 | 47.8 ug/$m^3$ |
| PM 2.5 | 9.2 ug/$m^3$ |
| PM 2.5-10 | 32.1 ug/$m^3$ (estimate) |

Average daily concentrations for both fine and inhalable coarse particulate matter are over 50% higher in January to March than the rest of the year.

Also, the monitoring data reveals that fine particulate matter (< 2.5 microns) comprised approximately ¼ of $PM_{10}$ concentrations in 2005. The proportion of fine particulate matter to inhalable coarse particulate matter did not vary substantially between the winter months and the summer months.

## NATIONAL AND STATE AIR QUALITY STANDARDS

Both the United States Environmental Protection Agency and the California Air Resources Board have adopted ambient air quality standards for $PM_{10}$ and $PM_{2.5}$. The State standards are more stringent than the National standards. However, failure to meet the National standards results in harsher consequences. (Non-compliance with State standards does not result in any legal or regulatory ramifications.) The monitoring data was reviewed to determine our compliance with both National and State standards.

| | | |
|---|---|---|
| ☑ | National Standard: | $PM_{10}$ Annual Concentration, 50 ug/$m^3$ (Average for 3 years) |
| | Compliance: | Truckee is in compliance (Average for 2004 to 2005 [2003 N/A] – 31.6 ug/$m^3$) |
| ☑ | National Standard: | $PM_{10}$ 24-Hour Concentration, 150 ug/$m^3$ (Not to be exceeded more than once per year over 3 years) |
| | Compliance: | Truckee is in compliance (Highest concentration in 2004 and 2005 [2003 N/A] – 127 ug/$m^3$; this standard has not been exceeded since 1999) |
| ☑ | National Standard: | $PM_{2.5}$ Annual Concentration, 15 ug/$m^3$ (Average for 3 years) |
| | Compliance: | Truckee is in compliance (Average for 2003 to 2005 – 6.8 ug/$m^3$) |
| ☑ | National Standard: | $PM_{2.5}$ 24-Hour Concentration, 65 ug/$m^3$ ($98^{th}$ percentile, average for 3 years) |
| | Compliance: | Truckee is in compliance (Average $98^{th}$ percentile for 2003 to 2005 – 17 ug/$m^3$) |
| ☒ | State Standard: | $PM_{10}$ Annual Concentration, 20 ug/$m^3$ |
| | Compliance: | Truckee is <u>not</u> in compliance (30.5 ug/$m^3$ in 2004) |
| ☒ | State Standard: | $PM_{10}$ 24-Hour Concentration, 50 ug/$m^3$ |
| | Compliance: | Truckee is <u>not</u> in compliance (The State standard was exceeded 36 times in 2005) |
| ☑ | State Standard: | $PM_{2.5}$ Annual Concentration, 12 ug/$m^3$ |
| | Compliance: | Truckee is in compliance (6.8 ug/$m^3$ in 2005) |

Truckee comfortably complies with National standards for both $PM_{10}$ and $PM_{2.5}$. We have made substantial progress in reducing our particulate matter concentrations so that we no longer exceed the 24-Hour $PM_{10}$ standard, and do not threaten to exceed the $PM_{2.5}$ standards. We still

exceed State standards for $PM_{10}$, however, progress continues to be made in reducing our non-compliance with those standards. We comfortably comply with the State standard for $PM_{2.5}$.

## PROPOSED NATIONAL AIR QUALITY STANDARDS

In late 2005 the United States Environmental Protection Agency proposed several changes to the National Ambient Air Quality Standards for particulate matter. The proposed changes and how they may apply to the Truckee area are summarized in Table 1. If adopted, which could occur as early as October 2006, the proposed changes would strengthen the 24-hour concentration standard for fine particulate matter less than 2.5 microns in size, eliminate the 24-hour and annual concentration standards for $PM_{10}$ except in a few areas, and establish a new 24-hour concentration standard for inhalable coarse particulate matter between 2.5 and 10 microns in size.

Because of the community's efforts to remove old woodstoves and fireplace inserts and greater utilization of natural gas for heating, the Truckee region will be able to comfortably comply with the changes to the $PM_{2.5}$ standards. Although the 24-hour concentration standard is proposed to be reduced from 65 ug/$m^3$ to 35 ug/$m^3$, Truckee complies with this proposed standard with a 24-hour standard of 17 ug/$m^3$ for the last three years. In fact, the Truckee region has exceeded the 24-hour standard only three times in the last six years (one of those exceedances caused by the Martis Fire).

The other proposed changes may be more problematic. By eliminating the $PM_{10}$ standard and establishing a 24-hour $PM_{2.5-10}$ standard, the EPA is placing greater emphasis on reducing inhalable coarse particulate matter, especially for episodic periods of poor air quality. Truckee's past efforts have successfully focused on fine particulate matter with inhalable coarse particulate matter, specifically re-entrained road dust, to be tackled in the near future. Inhalable coarse particulate matter concentrations have increased over the last 15 years, mainly a result of higher emissions from increased roads and traffic.

It cannot be determined with any confidence at this time whether Truckee air quality for the next five to ten years will be able to meet the $PM_{2.5-10}$ standard. Indicators from our air quality monitoring data foretell that the Truckee region may exceed the 24-hour $PM_{2.5-10}$ standard several times each winter unless steps are taken to reduce emissions of coarse particulate matter on winter days. In fact, Truckee probably exceeded this standard on several days in February 2006. However, it appears that Truckee will not be included in the EPA/CARB monitoring network for $PM_{2.5-10}$, and a $PM_{2.5-10}$ will not be located in the Truckee region. Lacking any monitoring, the Truckee region will most likely be an unclassified area and will not be reviewed for designation as an attainment or non-attainment area, at least in the near future.

## CONTROL STRATEGIES

The Town's air quality efforts in 2005 focused on our rebate program and the removal of non-certified woodstoves and fireplace inserts prior to sale or transfer of a home. The Town continues to offer rebates of $300 to $500 to homeowners to encourage the removal of these non-Town approved appliances. Rebates in the amount of $68,200 were issued in 2005 for the removal of 172 non-certified woodstoves and fireplace inserts (83 stoves and inserts were replaced by gas service stoves). Since the program's inception in 1999, the Town has expended nearly $275,000 associated with the removal of 850 non-Town approved woodstoves and inserts.

The program requiring the removal of non-certified woodstoves and inserts prior to sale ended in September. From January to September 2005, over 225 inspections were conducted by Town-licensed inspectors verifying that the homes did not have any non-Town approved appliances. Between 2002 and the end of the program in September 2005, over 1500 homes built prior to 1994 were inspected. Although there is no data on the number of non-Town approved appliances removed as a result of this program, staff believes that over 300 old woodstoves and inserts, and possibly more, no longer emit particulate matter into Truckee's air basin.

## CONCLUSIONS

As discussed in previous annual reports, our particulate matter air quality has improved dramatically since the "dark days" of 1992 and 1993. Although we have more traffic, more homes and residents, our $PM_{2.5}$ and $PM_{10}$ concentrations are less today than in 1993 with $PM_{2.5}$ concentrations less than half than what they were in 1993. This is a result of a substantial reduction in fine particulate matter emissions from woodburning appliances. However, coarse particulate matter emissions, primarily from re-entrained road dust, have increased and have partially offset the reductions in fine particulate matter. Today, coarse particulate matter comprises a higher proportion of our $PM_{10}$ concentrations (60% in 1993, 82% in 2005). The monitoring data for 2005 does not refute these suppositions that fine particulate matter emissions are continuing to decline while coarse particulate emissions increase. Our particulate matter monitors recently raised a red flag in regards to coarse particulate matter; in February 2006 Truckee exceeded the Federal 24-Hour standard for $PM_{10}$ for the first time since 1999. The high $PM_{10}$ concentrations were primarily caused by significant emissions from re-entrained road dust, including CalTrans sweeping of Interstate 80, in conjunction with a strong and low inversion layer sitting atop the Truckee air basin.

The Town's efforts to remove old woodstoves and fireplace inserts, along with the extension of natural gas to Truckee, have been very successful and should continue to be pursued to further reduce fine particulate matter emissions. However, the Town in the near future will need to shift its efforts to coarse particulate matter. Once all of the old woodstoves and fireplace inserts are removed, reductions in fine particulate matter will be slowed considerably and will no longer be able to offset increases in coarse particulate matter. We will have to reduce coarse particulate matter emissions to ensure that $PM_{10}$ concentrations do not rise and our air quality does not worsen. **We do not want to return to the "dark days" of 1992 and 1993.**

**TABLE 1 – Proposed EPA Particulate Matter National Ambient Air Quality Standards and Monitoring Requirements**

| | Proposed NAAQS Standard | Proposed Form | Proposed Monitoring | Applicability to Truckee |
|---|---|---|---|---|
| | | | | |
| **$PM_{2.5}$ (Fine)** | Strengthen 24-hour standard from current level of 65 ug/$m^3$ to 35 ug/$m^3$.<br><br>Retain annual standard at current level of 15 ug/$m^3$. | Retain current form for 24-hour standard.<br><br>Retain current form for annual standard. | Retain current monitoring network and requirements except that some monitors could be removed. | The strengthened 24-hour standard will apply to Truckee.<br><br>No changes to our monitoring network for $PM_{2.5}$. |
| **$PM_{2.5-10}$ (Inhalable Coarse)** | Establish new 24-hour standard of 70 ug/$m^3$.<br><br>No annual standard. | Establish new form: Complies with 24-hour standard if the 98$^{th}$ percentile of concentrations in a year, averaged over three years, is less than or equal to the level of the standard. | Establish monitoring network with monitors in Metropolitan Statistical Areas (MSA) with a population of at least 50,000 persons that contain all or part of an urbanized area with a population of at least 100,000 or more. | Truckee does not meet EPA rules for locating a PM 2.5-10 monitor, and a monitor will not be located in Truckee.<br><br>With no monitoring network, the new $PM_{2.5-10}$ standard would not apply to Truckee. |
| **$PM_{10}$** | Change definition of standard so that it only covers particles between 10 and 2.5 micrometers in diameter.<br><br>Revoke current 24-hour standard except in areas that have violating monitors and a population of 100,000 or more.<br><br>Revoke annual standard | | Except in urban areas that are exceeding $PM_{10}$ standards, revoke monitoring requirements and allow State and local agencies to discontinue $PM_{10}$ monitors without prior EPA approval.<br><br>Monitoring organizations would have the option of funding and operating $PM_{10}$ monitors as needed to monitor compliance with non-Federal air quality standards. | The 24-hour and annual standard would no longer apply in Truckee.<br><br>The NSAQMD and CARB may discontinue and remove EPA-required $PM_{10}$ monitor without prior EPA approval. The NSAQMD and CARB may remove the $PM_0$ Hi-Vol monitor, but could retain the $PM_{10}$ BAM monitor. |