SECTION 1

INTRODUCTION

1.0 INTRODUCTION

1.1 The Federal Clean Air Act and the SIP

The Air Quality Management Plan for the Town of Mammoth Lakes has been developed in response to a Federal Clean Air Act requirement to develop and implement a PM-10 State Implementation Plan (SIP). All areas that violate the National Ambient Air Quality Standard (Standard) for PM-10 are required to develop a SIP that demonstrates how the area will attain the PM-10 Standard.

In August 1987, the U.S. Environmental Protection Agency (EPA) grouped areas into high, medium and low probabilities of violating the PM-10 Standard (Federal Register, August 7, 1987). The Mammoth Lakes area was classified as Group I. Group I areas have a greater than 95% probability of exceeding the PM-10 Standard or have measured violations, which is the case with the Mammoth Lakes area. As a result of the Group I classification, a PM-10 SIP for the Mammoth Lakes area is required under the Federal Clean Air Act. The Air Quality Management Plan for the Town of Mammoth Lakes is intended to satisfy this requirement for a PM-10 SIP.

Under Section 110 of the Clean Air Act, the SIP was due for submission to the U.S. EPA within nine months of promulgation of the PM-10 Standard, which occured on July 1, 1987. The Town of Mammoth Lakes received an extension from EPA to allow time to collect data necessary to determine source impacts and control strategies. A definite deadline is unknown at this time, but due to a pending National lawsuit concerning the failure of EPA to approve a number of PM-10 SIP's, including Mammoth Lakes, action should be taken by June 1990 to avoid Federal intervention.

1.2 PM-10 Standard and Health Effects

PM-10 stands for particulate matter less that 10 microns in diameter. For comparison a human hair is about 100 microns in diameter. The National Ambient Air Quality Standard (Standard) for PM-10 was set July 1, 1987 at 150 micrograms per cubic meter ($\mu g/m^3$) for the 24-Hour standard and 50 $\mu g/m^3$ for the annual average standard. The levels for the PM-10 Standard were selected to protect the health of people who may be sensitive to exposure to fine particles (OAQPS Staff Paper, 1982 and Addendum, 1986).

Fine particles less than 10 microns are easily inhaled and retained in the deepest parts of the lungs. Children, the elderly, those with cardiovascular and respiratory problems, and those with influenza are especially susceptible to increased respiratory problems and illnesses due to exposure to high levels of PM-10. In addition, some PM-10 sources emit particles which contain toxic and carcinogenic compounds.

Wood smoke, which is a major contributor to the high PM-10 levels in Mammoth Lakes, includes several air pollutants aside from PM-10 that contribute to the health effects problem. These are carbon monoxide, hydrocarbons and polycyclic aromatic hydrocarbons (PAH's). Wood burning is a major source of PAH's which has been identified as a class of compounds containing carcinogens (Davis and Read, Guidance Document for Residential Wood Combustion Emission Control Measures, 1989).

1.3 Area Description and Population

The Town of Mammoth Lakes is located in a valley on the eastern slopes of the Sierra Nevada mountains at an elevation of 7,861 feet (2,396 meters). Figure 1.1 shows the relative location of Mammoth Lakes. The town, which was incorporated in 1984, has grown from a permanent population of 390 in 1960 to about 5,000 in 1987. Included in the Town boundaries is the Mammoth Mountain Ski Area, which attracts about one million skiers each winter. During major winter weekends, there are about 29,000 people in Mammoth Lakes. The Town anticipates that this figure will grow to about 48,000 people within twenty years (Town of Mammoth Lakes General Plan, 1987)

Most homes and rental units in the Town of Mammoth Lakes contain wood stoves or fireplaces. Temperature inversions during the winter season cause a buildup of wood smoke in the stagnant valley air. In addition to wood smoke emissions, particulate emissions from resuspended road dust and cinders adds significantly to the problem during periods when the roads are dry. The combination of major particulate sources and meteorological stagnations, especially during peak periods of the ski season, has caused violations of the PM-10 Standard.

1.4 Boundaries of the PM-10 Planning Area

The U.S. Environmental Protection Agency identified the boudaries in Figure 1.2 as the inital designation for the Group I area or planning area. Through the course of the development of this document it was determined that the boundaries for the Town of Mammoth Lakes are more appropriate for the PM-10 planning area. This is justified by the lack of significant sources outside the

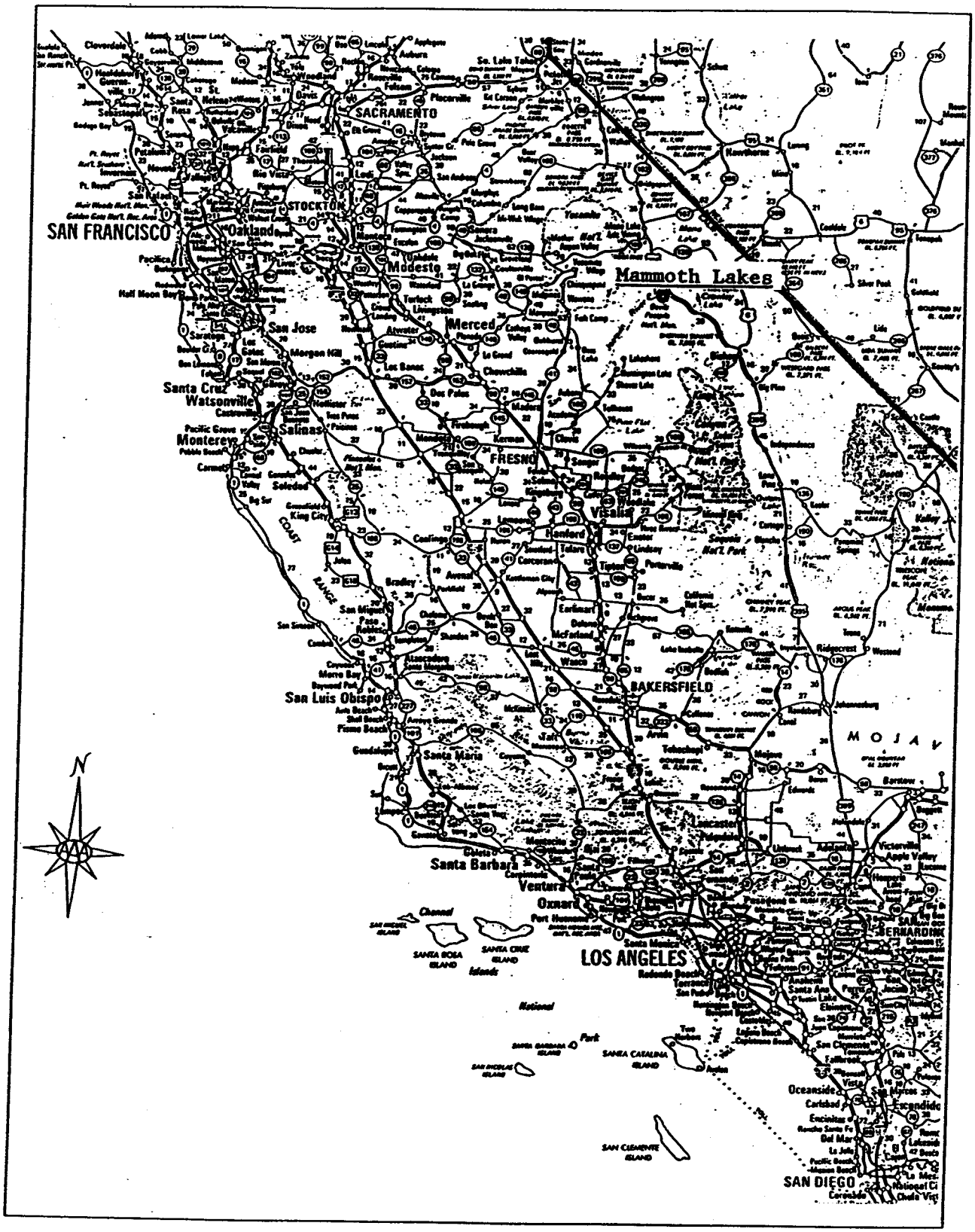
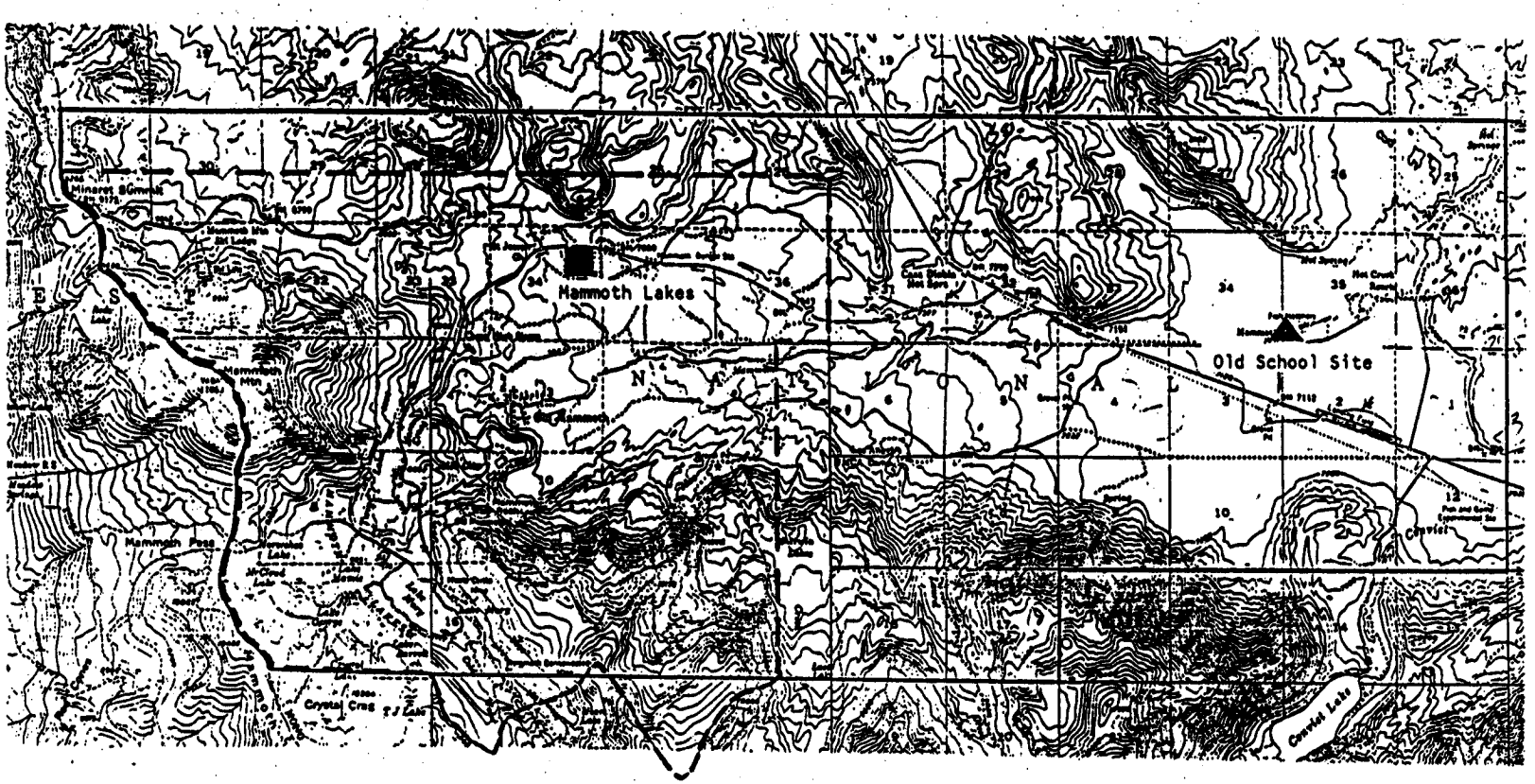


FIGURE 1.1

RELATIVE LOCATION OF MAMMOTH LAKES

FIGURE 1.2

BOUNDARIES OF THE GROUP I AREA AND THE TOWN OF MAMMOTH LAKES



Town boundaries and the extremely low monitored particulate matter levels that have been measured outside the Town boundaries at the Old School site (see Figure 1.2). The shrinking of the planning area boundaries is not expected to have any significant effects on the adequacy of the SIP, since all the sources affected by the controls discussed in the SIP are inside the Town boundaries.

1.5 Elements of the SIP

The SIP includes detailed analyses of the sources of PM-10, their contributions and impacts, the effects of population growth on future PM-10 levels and the effectiveness of controls to attain and maintain the PM-10 Federal Standard.

The PM-10 air quality data that was used for the analyses is discussed in Section 2.0. The data summary includes analyses of pollution episodes, trends and meteorological conditions.

The PM-10 emissions inventory is included in Section 3. This section includes a discussion of the methods and asumptions used to calculate the emissions for wood stoves, fireplaces, vehicle exhaust, resuspended road dust and cinders, as well as industrial point sources.

A Chemical Mass Balance (CMB) Model was run to estimate the contributions from from different PM-10 source types to the ambient PM-10 concentrations on peak days. Section 4 includes the analyses of the contributions from wood burning, road dust and cinders, and vehicle exhaust to the ambient PM-10 concentrations.

The effects of population growth on the air quality is discussed in Section 5. This section considers the effects of increased numbers of visitors, residents and vehicle traffic on the PM-10 concentrations over the next 15 years.

The particulate matter regulations that were adopted by the Town of Mammoth Lakes are included in Section 6. The final control strategy and the demonstation of the attainment with the PM-10 Standard is summarized in this section. A detailed analysis of the numerical calculations is included in Appendix I.