3.1 Meteorology/Air Quality

EXISTING CONDITIONS

Air Quality

The proposed project would be located in Modoc County within the Northeast Plateau Air Basin (NPAB). The NPAB extends from the Nevada border on the east to the Siskiyou Mountains on the west; from the Oregon border in the north to the southern border of Lassen County; and includes all of Lassen, Siskiyou, and Modoc Counties (Figure 3.1-1). The NPAB encompasses a total area of 14,920 square miles, and is the fourth largest air basin in California (BLM et al. 1998). The NPAB is designated as "attainment[1]" for the California Ambient Air Quality Standards (CAAQS) for Ozone (O_3), oxides of Nitrogen (NO_x), sulfates, and lead (Pb) but is "unclassified[2]" with regard to sulfur dioxide (SO_2), carbon monoxide (CO), visibility reducing particles, vinyl chloride (chloroethane), and hydrogen sulfide (H_2S). As is the case with most of California, the NPAB is classified as "nonattainment[3]" for particulate matter less than 10 microns (PM_{10}) (CARB 1997b). Table 3.1-1 presents estimated annual emissions for both the County and the NPAB.

Table 3.1-1: Modoc County 2001 Emissions Estimate by Pollutant Type in Tons/Day

Emissions (tons/day)	**TOG**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**PM_{10}**
Modoc County	5.02	3.90	33.79	4.78	0.31	35.69	21.99
Northeast Plateau Air Basin	51.60	38.86	406.79	24.56	1.68	130.10	85.92

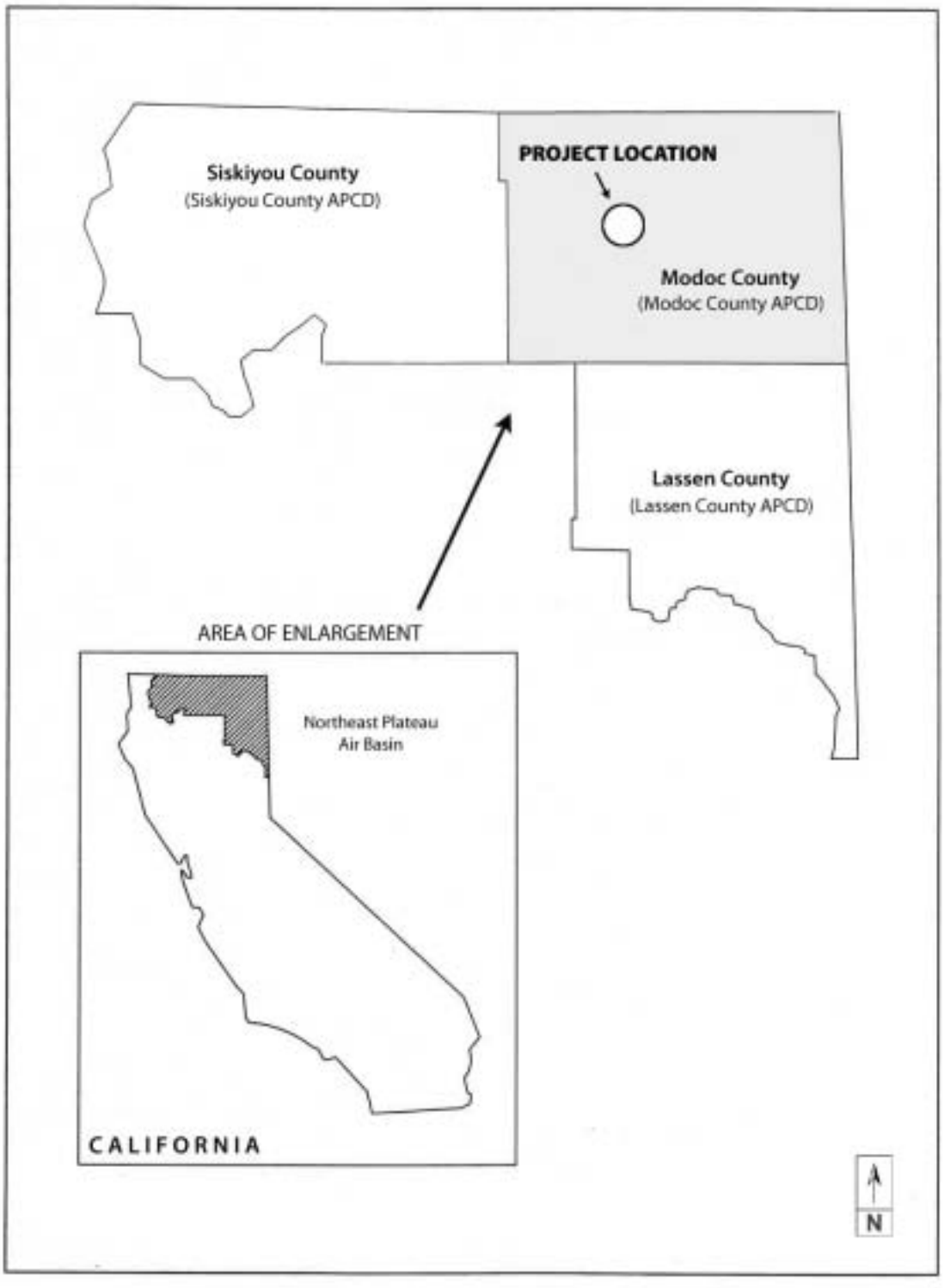
SOURCE: California Air Resources Board 2002

The NPAB is classified "nonattainment[4]" for particulate matter less than 10 microns (PM_{10}). The major contributors to PM_{10} emissions in the County include:

- Natural sources (i.e., wildfires) (2.70 tons/day)
- Unpaved roads dust (15.14 tons/day)
- Farming operations (4.5 tons/day)

[1] Attainment-Pollutant concentration does not exceed air quality standards.
[2] Unclassified-No federal standards exist for the pollutant.
[3] Nonattainment-Pollutant concentration exceeds air quality standards.
[4] Nonattainment-Pollutant concentration exceeds air quality standards.

Figure 3.1-1: Northeast Plateau Air Basin Location and APCD Jurisdictions



SOURCE: California Air Resources Board 1997 & MHA

Climate and Meteorology

Regional. Weather in northern California is dominated by the position of the Eastern Pacific high-pressure cell normally located off the coast of North America (BLM et. al 1998). Due to the positioning of this cell, an almost unbroken chain of winter storms occurs within the study area and a bulk of the precipitation within the study area occurs during this winter storm period. Weather systems in the region usually result in strong winds and unstable air masses, providing for good dispersion conditions. During fair weather periods, stable air conditions prevail throughout the region.

During the spring, the movement of the Pacific High pressure cell results in a decline of precipitation in vicinity of the proposed action. Spring conditions are rarely warm and dry, due to unstable conditions that result in rain and snow (BLM et al 1998).

Dry, warm conditions are characteristic of the summer months, although thunderstorms are not uncommon. The transitional period between the summer and winter/spring is generally characterized by cool, clear days and evening temperatures, which drop below freezing.

Local. Canby 3 SW was established as a weather station on July 1, 1948. It is located at Canby and is at an elevation of 4,310 feet. Table 3.1-2 presents meteorological data for Canby accumulated at this weather station from 1971 to 2000. The annual average high temperature for that period was 62°F and the annual average low temperature was 31.5°F. Average annual precipitation for that period was 16.45 inches.

Table 3.1-2: Canby Meteorological Data from 1971 to 2000

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	YEAR
Average High	40.7	45.9	51.1	57.8	67.1	76.4	85.6	85.1	77.2	66.2	49.4	41.5	62.0
Average Low	20.2	22.4	27.0	30.4	36.1	42.4	46.6	44.4	37.1	29.2	23.1	18.7	31.5
Monthly Precip.	1.85	1.95	2.19	1.46	1.48	.84	.26	.40	.77	1.08	2.11	2.06	16.45
Heating Degree Days	1071	864	805	628	417	193	63	76	245	537	861	1082	6842
Cooling Degree Days	0	0	0	0	1	24	96	68	10	0	0	0	199

SOURCE: Canby 3 SW, Weather Station of the U.S. Weather Service 2002

REGULATORY FRAMEWORK

Federal, state, and local requirements provide for the regulation of air quality in the project vicinity. A discussion of these requirements is provided below.

Federal

Ambient Air Quality Standards (AAQS). National AAQS (NAAQS) were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended to 1987 for NAAQS, and has now been further extended in air quality problem areas like Southern California until the year 2010.

EPA developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "$PM_{2.5}$"). New national AAQS were adopted on July 17, 1997. Those national standards currently in effect are shown in Table 3.1-3. There are no NAAQS for volatile organic compounds (VOCs).

An area that is found to be in violation of NAAQS is called a "nonattainment area." Pollution sources contributing to nonattainment areas are subject to tighter restrictions.

State and Local

Ambient Air Quality Standards (AAQS). The complete list of state standards currently in effect in California is shown in Table 3.1-3. California standards for PM_{10}, which includes $PM_{2.5}$, are more stringent than the federal $PM_{2.5}$ standard. There are no California AAQS for VOCs.

On June 20, 2002, the California Air Resources Board passed new, stricter standards for particulate matter (PM). The newly adopted standards include:

- A PM_{10} annual-average standard of 20 micrograms per cubic meter ($\mu g/m^3$), not to be exceeded;
- A new $PM_{2.5}$ annual-average standard of 12 $\mu g/m^3$, not to be exceeded;
- Retention of the 24-hour PM_{10} standard of 50 $\mu g/m^3$, not to be exceeded; and
- Retention of the sulfates 24-hour average standard of 25 $\mu g/m^3$.

Modoc County Air Pollution Control District. The Modoc County Air Pollution Control District (MCAPCD) is responsible for regulating stationary sources of air pollution. Businesses that may be impacted by air pollution regulations includes those involved with fuel burning, incineration, fueling systems, internal combustion engines, painting/coating processes, dry cleaning, degreasing, and many others.

The MCAPCD Rule Book contains all regulations on air emissions and can be viewed at http://www.arb.ca.gov/drdb/mod/cur.htm. The MCAPCD adheres to State Ambient Air Quality Standards. Applicants proposing new sources of air pollutants are required to obtain an Authority to Construct (ATC) and/or a Permit to Operate (PTO) from the MCAPCD. Rules for new sources are identified in Regulation VI of the District's Rules and Regulations.

In order to regulate new air emission sources that would emit or have the potential to emit criteria air pollutants, MCAPCD has adopted New Source Review (NSR) requirements. Two key provisions of NSR requirements are the use of best available control technology (BACT) and the identification of the need for emission offsets. BACT is required for sources emitting more than 250 pounds per day (lb/day) of any pollutant for which there is a national ambient air quality standard, or any precursor of such a pollutant. Emission offsets (or mitigation) may be required for net emission increases (i.e., increases after the application of BACT). The offset of net emission increases would not be required if it is demonstrated through modeling that emissions from a new source would not cause a new violation of any ambient air quality standard.

Table 3.1-3: Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [5,8]	Secondary [5,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	0.12 ppm (235 µg/m³)[8]	Same as Primary Standard	Ethylene Chemiluminescence
	8 Hour	—		0.08 ppm (157 µg/m³)		
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	30 µg/m³	Size Selective Inlet Sampler ARB Method P (8/22/85)	—	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	24 Hour	50 µg/m³		150 µg/m³		
	Annual Arithmetic Mean	—		50 µg/m³		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		65 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean			15 µg/m³		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m³)	Non-dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	None	Non-dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		—		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m³)		—		
Lead	30 days average	1.5 µg/m³	AIHL Method 54 (12/74) Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m³	Same as Primary Standard	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Fluorescence	0.030 ppm (80 µg/m³)	—	Pararosaniline
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (365 µg/m³)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m³)	
	1 Hour	0.25 ppm (655 µg/m³)		—	—	

Table 3.1-3: Federal and California Ambient Air Quality Standards (continued)

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [5,8]	Secondary [6,8]	Method [7]
Visibility Reducing Particles	8 Hour (10 am to 6 pm, PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer—visibility of ten miles or more (0.07—30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent. Method: ARB Method V (8/18/89).		No Federal Standards		
Sulfates	24 Hour	25 µg/m³	Turbidimetric Barium Sulfate-AIHL Method 61 (2/76)			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Cadmium Hydroxide STRactan			

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), Nitrogen dioxide, suspended particulate matter—PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. In addition, Section 70200.5 lists vinyl chloride (chloroethene) under "Ambient Air Quality Standards for Hazardous Substances." In 1978, the California Air Resources Board (ARB) adopted the vinyl chloride standard of 0.010 ppm (26 mg/m^3) averaged over a 24-hour period and measured by gas chromatography.

The standard notes that vinyl chloride is a "known human and animal carcinogen" and that "low-level effects are undefined, but are potentially serious. Level is not a threshold level and does not necessarily protect against harm. Level specified is lowest level at which violation can be reliably detected by the method specified. Ambient concentrations at or above the standard constitute an endangerment to the health of the public."

In 1990, the ARB identified vinyl chloride as a Toxic Air Contaminant and determined that there was not sufficient available scientific evidence to support the identification of a threshold exposure level. This action allows the implementation of health-protective control measures at levels below the 0.010-ppm ambient concentration specified in the 1978 standard.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure, which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard, may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. New federal 8-hour ozone and fine particulate matter standards were promulgated by the U.S. EPA on July 18, 1997. The federal 1-hour ozone standard continues to apply in areas that violated the standard. Contact U.S. EPA for further clarification and current federal policies.

SOURCE: California Air Resources Board 1999