

COLORADO ANNUAL MONITORING NETWORK PLAN 2010 - 2011



**Colorado Department
of Public Health
and Environment**

**Prepared by the Air Pollution Control Division
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INTRODUCTION

The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division's (APCD) 2010 Ambient Air Monitoring Network Plan is an examination and evaluation of the Division's network of air pollution monitoring stations. The Network Plan is an annual review of the Division's air monitoring network, as required by Title 40, Code of Federal Regulations, Part 58.10(a) [40 CFR 58.10(a)]. It is also a simple accounting of monitoring site changes expected for that year and the following year. It is due every July 1.

Purpose of Network Plan

The purpose of the Network Plan is to provide an overview of the APCD's current air quality monitoring network and projected plans for the coming year. This plan shows the general reason for monitoring, the location of the monitor, and finally the type and frequency of measurements taken at each location. This is the fourth year that this review has been released to the general public for comment prior to its submittal to the U. S. Environmental Protection Agency (EPA) for approval. This change was initiated because of a change in Federal Regulations implemented in December 2006.

Overview of the Colorado Air Monitoring Network

In 2010 the Colorado Air Pollution Control Division (APCD) plans to operate monitors at 63 locations. In 2009, the APCD operated monitors at 62 separate locations. Particulate monitors, including Total Suspended Particulates (TSP), Particulate Matter 10 microns and smaller (PM_{10}), and Particulate Matter 2.5 microns and smaller ($PM_{2.5}$) are the most abundant and widespread of monitoring types across the state. Currently, there are PM_{10} monitors at 30 separate locations and $PM_{2.5}$ monitors at 19 separate locations. There are 23 meteorological sites in operation. These sites monitor wind speed, wind direction, resultant speed, resultant direction, standard deviation of horizontal wind direction and temperature. Three meteorological sites also monitor for relative humidity. Only six of the 63 locations will monitor for gaseous and particulate pollutants in addition to taking meteorological measurements. Only four of those six locations monitored for more than ten parameters, with each meteorological and particulate parameter monitored being counted individually. All four of these monitoring locations are in the Denver Front Range area.

The APCD currently operates two TSP sites, one with a collocated monitor, and one that was added at the Centennial Airport on 4/3/2010. Both are used for lead analysis. Only three of the 30 PM_{10} monitors are continuous "hourly," while ten of the 29 $PM_{2.5}$ monitors are continuous. This difference reflects the age of the technology, as well as the availability and focus of EPA funding. Increasing the amount of automated versus manual monitoring will require modifications to the particulate network, since in the current network these are primarily manually operated monitors.

Thirty-eight of the 63 current monitoring sites have been in operation for ten or more years, and twenty of these have been in operation for 20 or more years. Ten monitoring sites have been in operation for more than 30 years. These sites are: Denver CAMP (45 years), Greeley-Hospital (43 years), Alamosa ASC (40 years), Arvada (37 years), Welby (36 years), Pagosa Springs (35 years), Lamar Power Plant and Steamboat Springs (34 years), Lamar Municipal (33 years) and Highland Reservoir (32 years). Conversely, 25 of the 63 monitoring sites have begun operation since the start of the year 2000.

Three of the ozone monitoring sites that are located on the western slope and have data included in this report are operated and maintained by a third party contractor, Air Resource Specialists (ARS). These are the Rifle, Palisade and Cortez monitoring sites. They keep the sites in proper working order and perform data retrieval, validating and uploading into the AQS database, while the APCD conducts the independent auditing of the sites for Quality Assurance and Quality Control (QA/QC) purposes.

APCD Monitoring History

The State of Colorado has been monitoring air quality statewide since the mid-1960s when high volume and tape particulate samplers, dustfall buckets, and sulfation candles were the best technology available for defining the magnitude and extent of the very visible air pollution problem. Monitoring for gaseous pollutants (carbon monoxide, sulfur dioxide, oxides of nitrogen and ozone) began in 1965 when the Federal Government established the CAMP station in downtown Denver at the intersection of 21st Street and Broadway Street. This was the area that was thought to represent the best probability for detecting maximum levels of most of the suspected pollutants. Instruments were primitive by comparison with those of today, and frequently were out of service.

Under provisions of the original Federal Clean Air Act of 1970, the Administrator of the U.S. Environmental Protection

Agency (EPA) established National Ambient Air Quality Standards (NAAQS) designed to protect the public's health and welfare. Standards were set for total suspended particulate matter (TSP), carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂). In 1972, the first State Implementation Plan (SIP) was submitted to the EPA. It included an air quality surveillance system in accordance with EPA regulations of August 1971. That plan proposed a monitoring network of 100 monitors (particulate and gaseous) statewide. The system established as a result of that plan and subsequent modifications consisted of 106 monitors.

The 1977 Clean Air Act Amendments required States to submit revised SIP's to the EPA by January 1, 1979. The portion of the Colorado SIP pertaining to air monitoring was submitted separately on December 14, 1979, after a comprehensive review, and upon approval by the Colorado Air Quality Control Commission. The 1979 EPA requirements as set forth in 40CFR58.20 have resulted in considerable modification to the network. These, and subsequent modifications, are made to ensure consistency and compliance with Federal monitoring requirements. Station location, probe siting, sampling methodology, quality assurance practices and data handling procedures are all maintained throughout any changes made to the network.

APCD Monitoring Operations

The APCD attempts to operate all of its monitors for a full calendar year. We attempt to begin operation of new monitors in January and to terminate existing monitors in December. Circumstances both in and out of our control make that desired schedule generally difficult to achieve. The primary reason for this is that the APCD does not own either the land or the buildings where most of the monitors are located, and it is becoming increasingly more difficult to get property owner's permissions for use due to risk management issues.

When modifications to the State and Local Air Monitoring System (SLAMS) network are required, the Division will provide EPA Region VIII with the appropriate modification forms prior its implementation for their approval. All currently operating SLAMS monitors have been approved by EPA and meet the requirements set forth in 40CFR58, Appendices A, C, D and E.

Network Modification Procedures

The APCD develops changes to its monitoring network in several ways. New monitoring locations have been added as a result of community concerns about air quality. An example of this would be the PM₁₀ monitors that were established in Cripple Creek and Hygiene. Other monitors have been established as a result of special studies. Examples of this would be the new ozone monitoring in Aurora, Rifle, Cortez, Aspen Park, Rist Canyon, and Palisade. The Denver Firehouse #6 carbon monoxide monitoring began when models showed that the area around the fire station could have elevated carbon monoxide concentrations.

The most common reasons for monitors being removed from the network are that either the land/building is modified, such that the site no longer meets current EPA siting criteria, or the area surrounding the monitor is being modified in a way that necessitates a change in the monitoring location. The most current example of this is the Pueblo PM₁₀ monitoring site. The site was moved in 2009 because of the construction of a new multi-story building on the adjacent lot. Monitors are also removed from the network after review of the data shows that the levels have dropped to the point where it is no longer necessary to continue monitoring at that location. An example of this is the reduction of TSP lead (TSP-Pb) monitoring around the state from six monitors to one in 2006. However, new TSP-Pb monitors are currently being added due to a lowering of the lead standard in 2008. Another example of this type of change is the termination of carbon monoxide monitoring at the NJH-E location. The carbon monoxide concentrations at that location have dropped to the point that the Division, with EPA's approval, felt that the monitor could be better used elsewhere in the system.

Finally, all monitors are reviewed on a regular basis to determine if they are continuing to meet their monitoring objectives. Has the population, land use or vegetation around the monitor changed significantly since the monitor was established? If it has, is there a "better" location for the monitor?

Table 1 lists the locations and monitoring parameters of each site currently in operation, by county, alphabetically. It lists the AQS identification numbers for each site, the site address and coordinates, the start dates and the site elevations. It further breaks down the monitor type, orientation/scale and the sampling frequency for each site.

Table 1. Monitoring Locations and Parameters Monitored

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
Adams							
08 001 0006	Alsup Elementary School - Commerce City	7101 Birch St.	01/2001		39.826007	-104.937438	1,565
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	01/2001	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM _{2.5}	1	01/2001	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM _{2.5} Collocated	2	01/2001	P.O. Neigh	Partisol 2025	SLAMS	1 in 6
	PM _{2.5}	3	01/2001	P.O. Neigh	TEOM-1400ab	SPM	Continuous
	PM _{2.5} Speciation	5	01/2001	P.O. Neigh	SASS	Trends Spec	1 in 3
	PM _{2.5} Carbon	5	04/2009	P.O. Neigh	URG 3000N	Trends Spec	1 in 3
	WS/WD/Temp	1	06/2003	Other	Met - One	Other	Continuous
08 001 3001	Welby	3174 E. 78 th Ave.	07/1973		39.838119	-104.94984	1,554
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	CO	1	07/1973	P.O. Neigh	Thermo 48C	SLAMS	Continuous
	SO ₂	2	07/1973	P.O. Neigh	API 100E	SLAMS	Continuous
	NO	2	01/1976	P.O. Urban	API 200E	Other	Continuous
	NO ₂	1	01/1976	P.O. Urban	API 200E	SLAMS	Continuous
	O ₃	2	07/1973	P.O. Neigh	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	01/1975	Other	Met - One	Other	Continuous
	PM ₁₀	1	07/1990	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀	3	06/1990	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous
Alamosa							
08 003 0001	Alamosa – Adams State College	208 Edgemont Blvd	01/1970		37.469391	-105.878691	2,302
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	06/1989	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
08 003 0003	Alamosa – Municipal Bldg.	425 4 th St.	04/2002		37.469584	-105.863175	2,301
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	04/2002	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1
Arapahoe							
08 005 0002	Highland Reservoir	8100 S. University Blvd	06/1978		39.567887	-104.957193	1,747
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	O ₃	1	06/1978	P.O. Neigh	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	07/1978	Other	Met - One	Other	Continuous
08 005 0005	Arapaho Community College (ACC)	6190 S. Santa Fe Dr.	12/1998		39.604399	-105.019526	1,636
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	PM _{2.5}	1	03/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
08 005 0006	Aurora - East	36001 E. Quincy Ave.		04/2009		39.63854	-104.56913	1,552
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2009	P.O. Region	API 400A	SPM	Continuous	
	WS/WD/Temp	1	06/2009	Other	Met - One	Other	Continuous	
08 005 0007	Centennial Airport	7800 S. Peoria St.		04/2010		39.572304	-104.84881	1,774
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	TSP	1	4/2010	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	Pb	1	4/2010	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
Archuleta								
08 007 0001	Pagosa Springs School	309 Lewis St.		08/1975		37.26842	-107.009659	2,165
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	3	06/2001	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
Boulder								
08 013 0003	Longmont-Municipal Bldg.	350 Kimbark St.		06/1985		40.164576	-105.100856	1,520
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	2	04/1985	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM _{2.5}	1	01/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM _{2.5}	3	01/1985	P.O. Neigh	TEOM 1400ab	SPM	Continuous	
08 013 0009	Longmont - Main	451 Kimbark St.		11/1989		40.166586	-105.102402	1,519
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	CO	1	11/1989	P.O. Micro	Thermo 48C	SLAMS	Continuous	
08 013 0011	South Boulder Creek	1405 ½ S. Foothills Parkway		06/1994		39.957212	-105.238458	1,669
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	06/1994	H.C. Urban	API 400E	SLAMS	Continuous	
08 013 0012	Boulder Chamber of Commerce of Commerce	2440 Pearl St.		12/1994		40.021097	-105.263382	1,619
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	12/1994	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM _{2.5}	1	01/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
08 013 1001	Boulder – CU – Athens	2102 Athens St.		12/1980		40.012969	-105.264212	1,622
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM _{2.5}	3	11/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
Delta							
08 029 0004	Delta Health Dept	560 Dodge St.	08/1993		38.739213	-108.073118	1,511
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	08/1993	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3
Denver							
08 031 0002	Denver - CAMP	2105 Broadway	01/1965		39.751184	-104.987625	1,593
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	CO	2	01/1971	P.O. Micro	Thermo 48C	SLAMS	Continuous
	SO ₂	1	01/1967	P.O. Neigh	API 100E	SLAMS	Continuous
	NO	1	01/1973	Other	API 200E	Other	Continuous
	NO ₂	1	01/1973	P.O. Neigh	API 200E	SLAMS	Continuous
	WS/WD/Temp	1	01/1965	Other	Met - One	Other	Continuous
	PM ₁₀	1	01/1986	P.O. Micro	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀ Collocated	2	08/1986	P.O. Micro	SA/GMW-1200	SLAMS	1 in 6
	PM ₁₀	3	01/1988	P.O. Micro	TEOM-1400ab	SLAMS	Continuous
	PM _{2.5}	1	01/1999	P.O. Micro	Partisol 2025	SLAMS	1 in 1
	PM _{2.5} Collocated	2	09/2001	P.O. Micro	Partisol 2025	SLAMS	1 in 3
	PM _{2.5}	3	01/1999	P.O. Micro	TEOM FDMS	SPM	Continuous
08 031 0013	Denver - NJH-E	14 th Ave. & Albion St.	01/1983		39.738578	-104.939925	1,620
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM _{2.5}	3	10/2003	P.O. Middle	TEOM FDMS	SPM	Continuous
08 031 0014	Denver - Carriage	2325 Irving St.	06/1982		39.751761	-105.030681	1,621
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	O ₃	2	01/1982	P.O. Neigh	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	01/1983	Other	Met - One	Other	Continuous
08 031 0016	DESCI	1901 E. 13 th Ave.			39.735700	-104.958200	1,623
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	Transmissometer	1	12/1989	Other	Optec LPV-2	SPM	Continuous
	Nephelometer	1	12/2000	Other	Optec NGN-2	SPM	Continuous
	Temp	1	12/1989	Other	Rotronics MP-101A	SPM	Continuous
	Relative Humidity	1	12/1989	Other	Rotronics MP-101A	SPM	Continuous
08 031 0017	Denver Visitor Center	225 W. Colfax	12/1992		39.740342	-104.991037	1,597
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	12/1992	P.O. Middle	SA/GMW-1200	SLAMS	1 in 1
08 031 0019	Denver - Firehouse #6	1300 Blake St.	11/1993		39.748163	-105.002564	1,585

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	CO	1	11/1993	P.O. Micro	Thermo 48C	SLAMS	Continuous	
08 031 0021	Auraria Met Station	12th St. and Auraria Pkwy.		03/1999		39.746955	-105.003604	1,586
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	WS/WD/Temp (U)	1	03/1999	Other	Met - One	Other	Continuous	
	Relative Humidity	1	03/1999	Other	Rotronic	Other	Continuous	
	Temp (L)	2	03/1999	Other	Met - One	Other	Continuous	
08 031 0023	Denver - Swansea Elementary School	4650 Columbine St		07/2002		39.781083	-104.95665	1,583
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM _{2.5}	1	12/2004	P.O. Neigh	Partisol 2025	SPM	1 in 1	
08 031 0025	Denver Municipal Animal Shelter (DMAS)	678 S. Jason St.		07/2005		39.704005	-104.998113	1,594
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	CO (Trace)	1	04/2009	P.O. Neigh	Thermo 48E-TLE	NCore	Continuous	
	SO ₂ (Trace)	1	+	P.O. Neigh	Ecotech 9850T	NCore	Continuous	
	NO _y	1	+	P.O. Neigh	API 200EU	NCore	Continuous	
	O ₃	1	04/2008	Neigh/Urban	API 400E	NCore	Continuous	
	WS/WD/Temp	1	07/2008	P.O. Neigh	Met - One	NCore	Continuous	
	Relative Humidity	1	+		Rotronic	NCore	Continuous	
	Barometric Pressure	1	+			NCore	Continuous	
	Solar Radiation	1	+			NCore	Continuous	
	Precipitation	1	+			NCore	Continuous	
	Temp (L)	2	07/2008	P.O. Neigh	Met - One	NCore	Continuous	
	TSP	1	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	TSP Collocated	2	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	Pb	1	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	Pb Collocated	2	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	PM ₁₀	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀ Collocated	2	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀	3	08/2005	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous	
	PM _{2.5}	1	10/2007	P.O. Neigh	Partisol 2025	NCore	1 in 6	
	PM _{2.5}	3	10/2007	P.O. Neigh	TEOM FDMS	SPM	Continuous	
	PM _{2.5} Speciation	5	11/2002	P.O. Neigh	SASS	Supplemental Speciation	1 in 6	
	PM _{2.5} Carbon	5	04/2009	P.O. Neigh	URG 3000N	Supplemental Speciation	1 in 6	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
Douglas							
08 035 0004	Chatfield State Park	11500 N. Roxborough Pk Rd	04/2004		39.534488	-105.070358	1,676
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	O ₃	1	05/2005	H.C. Urban	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	04/2004	Other	Met - One	Other	Continuous
	PM _{2.5}	1	07/2005	P.O. Neigh	Partisol 2025	SPM	1 in 3
	PM _{2.5}	3	05/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous
Elbert							
08 039 0001	Elbert – Ben Kelly Road	24950 Ben Kelly Rd.	12/1998		39.231384	-104.63477	2,139
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM _{2.5}	1	05/1999	Back Region	Partisol 2025	SLAMS	1 in 6
El Paso							
08 041 0013	U. S. Air Force Academy	USAFA Rd. 640	05/1996		39.958341	-104.817215	1,971
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	O ₃	1	06/1996	P.O. Urban	ML 8810	SLAMS	Continuous
08 041 0015	Colorado Springs Hwy. 24	690 W. Hwy. 24	11/1998		39.830895	-104.839243	1,824
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	CO	1	11/1998	P.O. Micro	Thermo 48C	SLAMS	Continuous
	WS/WD/Temp	+		Other	Met – One	Other	Continuous
08 041 0016	Manitou Springs	101 Banks Pl.	04/2004		38.853097	-104.901289	1,955
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	O ₃	1	04/2004	P.O. Neigh	API 400A	SLAMS	Continuous
08 041 0017	Colorado Springs Colorado College	130 W. Cache La Poudre	12/2007		38.848014	-104.828564	1,832
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	12/2007	P.O. Neigh	Partisol 2000	SLAMS	1 in 6
	PM _{2.5}	1	12/2007	P.O. Neigh	Partisol 2025	SLAMS	1 in 3
	PM _{2.5}	3	01/2008	P.O. Neigh	TEOM FDMS	SLAMS	Continuous
Fremont							
08 043 0003	Cañon City – City Hall	128 Main St.	10/2004		38.43829	-105.24504	1,626
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	PM ₁₀	1	10/2004	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6
Garfield							
08 045 0005	Parachute – High School	100 E. 2nd St.	01/1982		38.453654	-108.053269	1,557

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	05/2000	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	WS/WD/Temp	1	03/2010	Other	RM Young/Viasla	Other	Continuous	
08 045 0007	Rifle – Henry Bldg	144 3rd St.		05/2005		39.531813	-107.782298	1,627
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	05/2005	P.O. Neigh	SA/GMW-1200	SPM	1 in 3	
	PM _{2.5}	3	09/2008	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM ₁₀	3	09/2008	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM _{10-2.5}	3	09/2008	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	WS/WD/Temp	1	09/2008	Other	RM Young/Viasla	Other	Continuous	
08 045 0012	Rifle – Health Dept	195 W. 14th Ave.		06/2008		39.54182	-107.784125	1,629
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	06/2008	P.O. Neigh	API 400E	SPM	Continuous	
Gunnison								
08 051 0004	Crested Butte	603 6th St.		09/1982		38.867595	-106.981436	2,714
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	2	03/1997	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	PM ₁₀ Collocated	3	10/2008	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
08 051 0007	Mt. Crested Butte - Realty	19 Emmons Rd.		07/2005		38.900392	-106.966104	2,866
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
Jefferson								
08 059 0002	Arvada	9101 W. 57th Ave.		01/1973		39.800333	-105.099973	1,640
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	08/1973	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	01/1975	Other	Met - One	Other	Continuous	
08 059 0005	Welch	12400 W. Hwy. 285		08/1991		39.638781	-105.13948	1,742
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	08/1991	P.O. Urban	API 400A	SLAMS	Continuous	
	WS/WD/Temp	1	11/1991	Other	Met - One	Other	Continuous	
08 059 0006	Rocky Flats - N	16600 W. Hwy. 128		06/1992		39.912799	-105.188587	1,802
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	O ₃	1	09/1992	H.C. Urban	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	09/1992	Other	Met - One	Other	Continuous	
08 059 0008	Rocky Flats - SE	9901 Indiana St.		06/1992		39.87639	-105.165611	1,716
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	WS/WD/Temp	1	08/1991	Other	Met - One	Other	Continuous	
08 059 0011	NREL	2054 Quaker St.		06/1994		39.743724	-105.177989	1,832
	Parameter	POC	Started	Scale	Monitor	Type	Sample	
	O ₃	1	06/1994	H.C. Urban	ML 8810	SLAMS	Continuous	
08 059 0013	Aspen Park	26137 Conifer Rd.		04/2009		39.540321	-105.296512	2,467
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2009	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	06/2009	Other	Met - One	Other	Continuous	
La Plata								
08 067 0004	Durango – River City Hall	1235 Camino del Rio		09/1985		37.277798	-107.880928	1,988
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	12/2002	P.O. Neigh	SA/GMW-1200	SLAMS	Continuous	
Larimer								
08 069 0009	Fort Collins – CSU - Edison	251 Edison Dr.		12/1998		40.571288	-105.079693	1,524
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	07/1999	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	PM ₁₀	3	06/2009	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM _{2.5}	1	07/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM _{2.5}	3	06/2009	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM _{10-2.5}	3	06/2009	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
08 069 0011	Fort Collins - West	3416 La Porte Ave.		05/2006		40.592543	-105.141122	1,571
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	05/2006	H.C. Urban	API 400E	SLAMS	Continuous	
08 069 0012	Rist Canyon	11835 Rist Canyon Rd.		04/2009		40.642135	-105.275105	2,058
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2009	P.O. Urban	API 400E	SPM	Continuous	
	WS/WD/Temp	1	04/2009	Other	Met - One	Other	Continuous	
08 069 1004	Fort Collins - Mason	708 S. Mason St.		12/1980		40.57747	-105.07892	1,524

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	CO	1	12/1980	P.O. Neigh	Thermo 48C	SLAMS	Continuous	
	O ₃	1	12/1980	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	01/1981	Other	Met - One	Other	Continuous	
Mesa								
08 077 0017	Grand Junction – Powell Bldg	650 South Ave.		02/2002		39.063798	-108.561173	1,398
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀ & NATTS Toxic Metals	3	01/2005	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM ₁₀ Collocated & NATTS	4	03/2005	P.O. Neigh	Partisol 2000	SLAMS	1 in 6	
	PM _{2.5}	1	11/2002	P.O. Neigh	Partisol 2025	SLAMS	1 in 6	
	PM _{2.5}	3	01/2005	P.O. Neigh	TEOM 1400ab	SPM	Continuous	
08 077 0018	Grand Junction - Pitkin	645 1/4 Pitkin Ave.		01/2004		39.064289	-108.56155	1,398
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	CO	1	01/2004	P.O. Micro	Thermo 48C	SLAMS	Continuous	
	WS/WD/Temp	1	01/2004	Other	Met - One	Other	Continuous	
	Relative Humidity	1	01/2004	Other	Rotronic	Other	Continuous	
08 077 0019	Clifton - Sanitation	Hwy. 141 & D Rd.		10/2006		39.062514	-108.457382	1,413
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	10/2007	P.O. Neigh	SA/GMW -1200	SLAMS	1 in 3	
08 077 0020	Palisade Water Treatment	Rapid Creek Rd.		05/2008		39.130575	-108.313853	1,512
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2008	P.O. Urban	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	04/2008	Other	RM Young	Other	Continuous	
Montezuma								
08 083 0006	Cortez – Health Dept	106 W. North St.		06/2006		37.350054	-108.592337	1,890
	Parameter	POC	Started	Scale	Monitor	Type	Sample	
	O ₃	1	04/2009	P.O. Urban	API 400E	SPM	Continuous	
	PM _{2.5}	1	06/2008	P.O. Region	Partisol 2000	SPM	1 in 6	
Pitkin								
08 097 0006	Aspen - Library	120 Mill St.		05/2002		39.19104	-106.818864	2,408
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	05/2002	P.O. Neigh	SA/GWM 1200	SLAMS	1 in 3	
Prowers								
08 099 0001	Lamar Power Plant	100 N. 2nd St.		08/1975		38.090949	-102.613912	1,107

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
08 099 0002	Lamar Municipal	104 E. Parmenter St.		12/1976		38.084688	-102.618641	1,107
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
08 099 0003	Lamar Port of Entry	7100 US Hwy. 50		03/2005		38.113792	-102.626181	1,108
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	WS/WD/Temp	1	03/2005	Other	Met - One	Other	Continuous	
Pueblo								
08 101 0015	Pueblo – Fountain Magnet School	925 N. Glendale Ave.		06/2009		38.276099	-104.597613	1,433
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	04/2009	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
	PM _{2.5}	1	04/2009	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
Routt								
08 107 0003	Steamboat Springs	136 6th St.		09/1975		40.485201	-106.831625	2,054
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
San Miguel								
08 113 0004	Telluride	333 W. Colorado Ave.		03/1990		37.937872	-107.813061	2,684
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	03/1990	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
Summit								
08 117 0002	Breckenridge	501 N. Park Ave.		04/1992		39.491461	-106.047325	2,904
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	04/1992	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
Weld								
08 123 0006	Greeley-Hospital	1516 Hospital Rd.		04/1967		40.414877	-104.70693	1,441
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	2	03/1987	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 3	
	PM _{2.5}	1	02/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
	PM _{2.5}	3	02/1999	P.O. Neigh	TEOM - 1400ab	SPM	Continuous	
08 123 0008	Platteville Middle School	1004 Main St.		12/1998		40.209387	-104.82405	1,469
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM _{2.5}	1	08/1999	P.O. Region	Partisol 2025	SLAMS	1 in 3	
	PM _{2.5} Speciation	5	08/1999	P.O. Region	SASS	Spec Trends	1 in 6	
	PM _{2.5} Carbon	5	04/2009	P.O. Neigh	URG 3000N	Spec Trends	1 in 6	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>	<i>Ended</i>	<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
08 123 0009	Greeley –County Tower	3101 35th Ave.	06/2002		40.386368	-104.73744	1,484
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	O ₃	1	06/2002	P.O. Neigh	API 400E	SLAMS	Continuous
	WS/WD/Temp	1	+	Other	Met - One	Other	Continuous
08 123 0010	Greeley – West Annex	905 10th Ave.	12/2003		40.423432	-104.69479	1,421
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample
	CO	1	12/2003	P.O. Neigh	Thermo 48C	SLAMS	Continuous

The following abbreviations were used in Table 1, with orientation (Orient) referring to the reason why the monitor was placed in that location, and scale referring to the size of the area that concentrations from the monitor represent.

Orientation

- P.O. - Population oriented
- Back - Background orientation
- SPM - Special Projects Monitor
- H.C. - Highest Concentration
- POC - Parameter Occurrence Code

Scale

- Micro - Micro-scale
- Neigh - Neighborhood Scale
- Middle - Middle Scale
- Urban - Urban Scale
- Regional - Regional Scale

Also included in the above table are listings as “Other” which are meteorological monitors that do not include either orientation or scale. The “+” in the “Start” column indicates that the monitor has not been installed.

Description of Monitoring Areas in Colorado

The state has been divided into five multi-county areas that are generally based on topography. The areas are: (1) the Eastern Plains, (2) the Northern Front Range, (3) the Southern Front Range, (4) the Mountains, and (5) the Western Counties. These divisions are a somewhat arbitrary grouping of monitoring sites that have similar characteristics.

The Eastern Plains consist of those counties east of the urbanized I-25 corridor to the eastern border of Colorado from the northern to the southern border. These counties are generally rolling agricultural plains below the elevation of 6,000 feet.

The Front Range counties are generally those along the I-25 corridor from the northern border to the southern border. They are split into north and south areas with the Palmer Ridge being the dividing area. While the northern counties all have a direct association with I-25, that association is not as well defined in the southern counties. Teller, Fremont, Custer, Alamosa and Costilla counties are included with the Southern Front Range Counties because they have more in common meteorologically with that group than they do with the Mountain counties.

The Mountain counties are generally those counties along the Continental Divide. The Western Counties are those adjacent to the Utah border. Other divisions can and have been made, but these five divisions seemed appropriate for this report. Figure 1 shows the approximate boundaries of these areas.

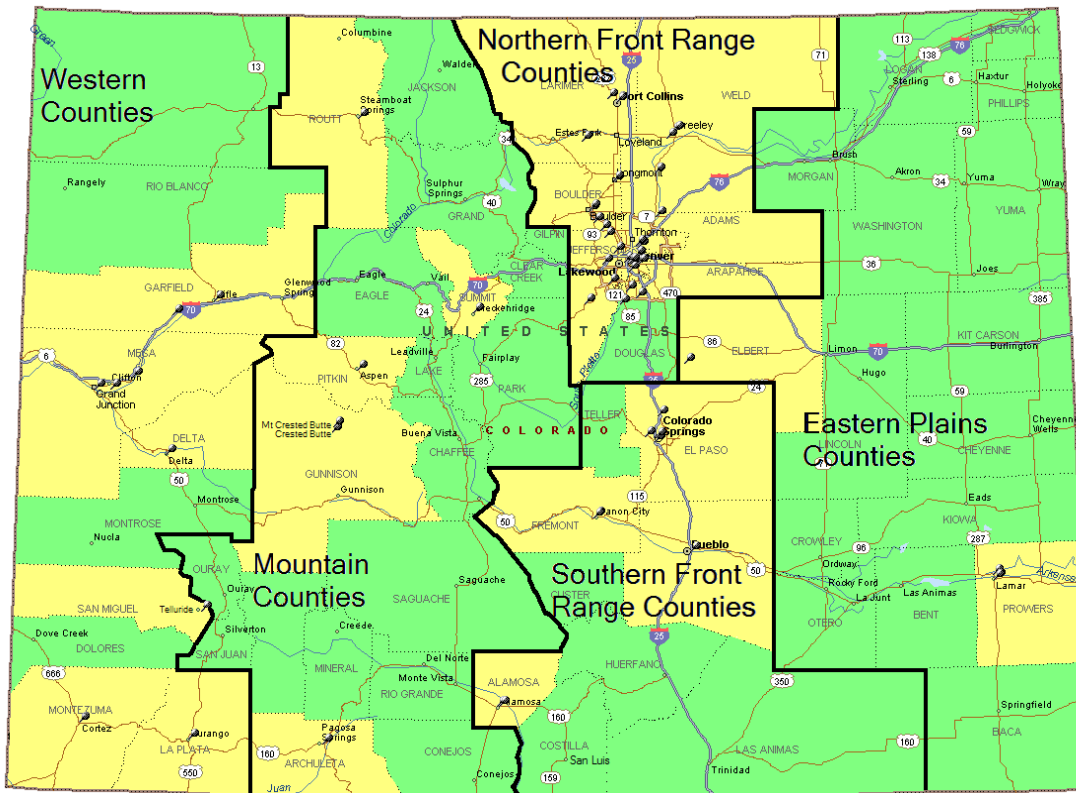


Figure 1. Monitoring Areas in Colorado¹

Eastern Plains Counties

The Eastern Plains Counties are those east of the urbanized I-25 corridor. Historically, there have been a number of communities that were monitored for particulates and meteorology but not for any of the gaseous pollutants. In the northeast along the I-76 corridor, the communities of Sterling, Brush and Fort Morgan have been monitored. Along the I-70 corridor only the community of Limon has been monitored for particulates. Along the US-50/Arkansas River corridor the Division has monitored for particulates in the communities of La Junta, Rocky Ford and Trinidad. These monitors were all discontinued in the late 1970's and early 1990s after a review showed that the concentrations were well below the standard and trending downward.

Currently, there are two PM₁₀ monitoring sites in Lamar, a background PM_{2.5} monitor in Elbert County, and no gaseous pollutant monitors in the area. The Lamar monitors did record 5 separate exceedances of the 24-hour PM₁₀ standard in 2009. These have been associated with high winds and dry conditions that occur anytime of the year, but especially in the springtime. The Elbert County monitor is located on the Palmer Divide and operates as a background PM_{2.5} monitor. This monitor provides baseline PM_{2.5} readings away from urban sources of manmade particulates.

Northern Front Range Counties

The Northern Front Range Counties are those along the urbanized I-25 corridor from the Colorado/Wyoming border to just south of the city of Castle Rock. This area has the majority of the larger cities in the state. The majority of monitors are located in the Denver-metro area and the rest are located in or near Boulder, Fort Collins, Greeley, Longmont and Platteville.

Currently, there are 28 gaseous pollutant monitors and 23 particulate monitors in the Northern Front Range area. There are 7 CO, 16 O₃, 2 NO₂ and 2 SO₂ monitors. There are 9 PM₁₀, 13 PM_{2.5}, and 2 TSP/Pb monitors. There were no NAAQS exceedances of CO, NO₂, SO₂, PM₁₀ or TSP/Pb in 2009. There were two exceedances of the PM_{2.5} NAAQS. One exceedance was at the Boulder – Chamber site (08-013-0012). It occurred on 09/01/2009, and was due to a nearby

¹ Counties with monitors are in yellow and the pin symbols on the map show the approximate location of the monitors within the county.

wildfire. The second exceedance was at the Greeley – Hospital site. There were O₃ NAAQS exceedances at eleven different sites in 2009. These sites were Welby (08-001-3001), Highland (08-005-0002), Aurora East (08-005-0006), South Boulder Creek (08-013-0011), Chatfield State Park (08-035-0004), Arvada (08-059-0002), Welch (08-059-0005), Rocky Flats North (08-059-0006), NREL (08-059-0011), Aspen Park (08-059-0013) and Ft. Collins West (08-069-0011).

Southern Front Range Counties

The Southern Front Range Counties are those along the urbanized I-25 corridor from south of the city of Castle Rock to the southern Colorado border. The cities with monitoring in the area are Colorado Springs, Pueblo, Cañon City and Alamosa. These last two cities are not strictly in the Front Range I-25 corridor but meteorologically fit better with those cities than they do the Mountain Counties. Colorado Springs is the only city in the area that is monitored for carbon monoxide and ozone by the APCD. The other cities are only monitored for particulates. In the past the APCD has conducted particulate monitoring in both Walsenburg and Trinidad but that monitoring was discontinued in 1979 and 1985 respectively, due to low concentrations.

Currently, there are 3 gaseous pollutant monitors and 8 particulate monitors in the Southern Front Range area. There are 1 CO and 2 O₃ monitors in the Colorado Springs area. There are 5 PM₁₀ and 3 PM_{2.5} monitors in the region. There were two exceedances of the PM₁₀ NAAQS in 2009, one at the Alamosa – Municipal site (08 003 0003) and one at the Alamosa – ASC site (08 003 0001). There were no NAAQS exceedances of CO or PM_{2.5} in 2009.

Mountain Counties

The Mountain Counties are generally those that are on or near the Continental Divide. They consist of mostly small towns located in tight mountain valleys. Their primary monitoring concern is with particulate pollution from wood burning and road sanding. These communities range from Steamboat Springs in the north to Breckenridge in the I-70 corridor, as well as Aspen, Crested Butte and Mt. Crested Butte in the central mountains and Pagosa Springs in the south.

Currently, there are no gaseous and 6 particulate monitoring sites operated by the APCD in the Mountain Counties region. The Pagosa Springs monitor (08 007 0001) did record three exceedances of the PM₁₀ NAAQS in 2009.

Western Counties

The Western Counties are generally smaller towns, and are usually located in fairly broad river valleys. Grand Junction is the only large city in the area, and the only location that monitors for carbon monoxide and air toxics on the western slope. They are located in Cortez, Delta, Durango, Palisade, Parachute, Rifle and Telluride.

A special study on ozone conducted in the summer of 2008 looked at ozone concentrations in two areas of the Western Counties. These areas were along the southwestern border with New Mexico in the Four Corners area near Cortez, and along the I-70 corridor from Glenwood Springs to Grand Junction. The result of this study determined that new ozone monitoring sites were needed and subsequently established at Cortez, Palisade and Rifle.

Currently, there are 4 gaseous pollutant monitors and 11 particulate monitors in the Western Counties area. There are 1 CO and 3 O₃ monitoring sites. There are 8 PM₁₀ and 3 PM_{2.5} monitoring sites. There were no NAAQS exceedances for ozone or carbon monoxide in 2009. There were three PM₁₀ NAAQS exceedances in 2009, two at the Durango site (08 067 0004) and one at the Delta site (08 029 0004). There were six PM_{2.5} NAAQS exceedances at the Grand Junction – Powell site (08 077 0017) in 2009.

State-wide Population Statistics

Table 2 is a listing of the projected population statistics by county. The counties have been grouped into Planning and Management Regions (per Colorado Executive Orders of November 1972, 1973 and 1986, and October 1998), Metropolitan Statistical Areas (per the US Office of Management and Budget, June 30, 1993), and Sub-state Regions (i.e., Front Range, Western Slope, Eastern Plains, etc.). The Sub-state Regional grouping typically varies from data user to data user. For the purposes of this assessment, the groupings used were as similar to the State's monitoring regions as possible.

Table 2. Projected Population Statistics and Monitors by County and Metropolitan Statistical Area

REGIONS/COUNTIES	Projected Population			Percent Change		CO	SO ₂	NO _X	NO _Y	O ₃	WS WD T	Rel. Hum	Precip	TSP	Pb	PM ₁₀ Hi- Vol & CrS.	PM ₁₀ Lo- Vol & Cont.	PM _{2.5} FRM & Carb.	PM _{2.5} Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20														
COLORADO	5,171,798	5,632,137	6,186,161	1.7%	2.0%	9	2	2		21	20	3		3	3	31	8	21	15
FRONT RANGE	4,243,767	4,599,832	5,012,326	2.1%	1.8%														
Adams	447,760	497,159	548,709	2.1%	2.3%														
	08 001 0006 Alsup Elementary School - Commerce City										1						1	1 1/C 1/E	1 1/S
	08 001 3001 Welby					1	1	1		1	1					1	1		
Arapahoe	578,444	626,155	677,125	1.6%	1.7%														
	08 005 0002 Highland Reservoir									1	1								
	08 005 0005 Arapahoe Community College																	1	
	08 005 0006 Aurora East									1	1								
	08 005 0007 Centennial Airport													1	1				
Broomfield	58,629	65,359	72,468	2.2%	2.4%														
Denver	631,809	674,642	700,455	1.3%	1.1%														
	08 031 0002 Denver CAMP					1	1	1			1					1 1/C	1	1 1/C	1
	08 031 0013 Denver NJH																		1
	08 031 0014 Denver Carriage									1	1								
	08 031 0017 Denver Visitor Center															1			
	08 031 0019 Denver Firehouse #6					1													
	08 031 0021 Auraria Met										1	1							
	08 031 0023 Denver Swansea Elementary																	1	
	08 031 0025 Denver Animal Shelter					1	+		+	1	1	+	+	1 1/C	1 1/C	1 1/C	1	1 1/E	1 1/S
Douglas	296,072	334,708	388,905	2.5%	3.1%														
	08 035 0004 Chatfield State Park									1	1							1	1
Jefferson	551,938	574,370	608,282	0.8%	1.0%														
	08 059 0002 Arvada									1	1								

REGIONS/Counties	Projected Population			Percent Change		CO	SO ₂	NO _x	NO _y	O ₃	WS WD T	Rel. Hum	Precip	TSP	Pb	PM ₁₀ Hi- Vol & Crst.	PM ₁₀ Lo- Vol & Cont.	PM _{2.5} FRM & Carb.	PM _{2.5} Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20														
	08 059 0005 Welch									1	1								
	08 059 0006 Rocky Flats - N									1	1								
	08 059 0008 Rocky Flats - SE										1								
	08 059 0011 NREL									1									
	08 059 0013 Aspen Park									1	1								
BOULDER PMSA/Co	305,268	324,285	344,098	1.2%	1.3%														
	08 013 0003 Longmont – Municipal Bldg.															1		1	1
	08 013 0009 Longmont – Main					1													
	08 013 0011 South Boulder Creek									1									
	08 013 0012 Boulder Chamber of Commerce															1		1	
	08 013 1001 Boulder CU/Athens																		1
NORTH FRONT RANGE	564,233	629,496	717,050	2.2%	2.7%														
FORT COLLINS MSA	300,804	327,242	362,134	1.7%	2.0%														
	08 069 0009 Fort Collins – CSU - Edison															1 1/R	1	1	1
	08 069 0011 Fort Collins - West									1									
	08 069 0012 Rist Canyon									1	1								
	08 069 1004 Fort Collins - Mason					1				1	1								
GREELEY MSA	263,429	302,254	354,916	2.8%	3.5%														
	08 123 0006 Greeley Hospital															1		1	1
	08 123 0008 Platteville																	1 1/E	1/S
	08 123 0009 Greeley - Tower									1	+								
	08 123 0010 Greeley - West Annex					1													

REGIONS/Counties	Projected Population			Percent Change		CO	SO ₂	NO _x	NO _y	O ₃	WS WD T	Rel. Hum	Precip	TSP	Pb	PM ₁₀ Hi- Vol & Crst.	PM ₁₀ Lo- Vol & Cont.	PM _{2.5} FRM & Carb.	PM _{2.5} Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20														
SOUTH FRONT RANGE	809,614	873,659	955,236	0.79%	1.8%														
COLO. SPRINGS MSA	647,229	698,723	763,736	1.5%	1.8%														
El Paso	624,314	673,324	735,428	1.5%	1.8%														
	08 041 0013 USAFA									1									
	08 041 0015 Colorado Springs - Hwy-24					1					+								
	08 041 0016 Manitou Springs									1									
	08 041 0017 Colorado Springs - Colorado College																1	1	1
Teller	22,915	25,399	28,308	2.1%	2.4%														
PUEBLO MSA	162,385	174,936	191,500	1.5%	1.8%														
	08 101 0015 Pueblo – Fountain Magnet School																1		1
WESTERN SLOPE	577,799	648,602	743,772	2.3%	2.9%														
REGION 9	94,252	105,445	119,230	2.3%	2.7%														
Archuleta	13,284	15,547	18,360	3.2%	3.8%														
	08 007 0001 Pagosa Springs School																1		
Dolores	2,041	2,205	2,410	1.6%	1.8%														
La Plata	52,114	58,479	66,262	2.3%	2.7%														
	08 067 0004 Durango – River City Hall																1		
Montezuma	26,243	28,613	31,562	1.7%	2.0%														
	08 083 0006 Cortez									1								1	
San Juan	570	601	636	1.1%	1.2%														
REGION 10	105,333	119,424	136,120	2.5%	2.9%														
Delta	32,737	37,356	43,227	2.7%	3.2%														
	08 029 0004 Delta Health Dept.																1		
Gunnison	15,366	16,394	17,766	1.3%	1.6%														
	08 051 0004 Crested Butte																1		

REGIONS/Counties	Projected Population			Percent Change		CO	SO ₂	NO _x	NO _y	O ₃	WS WD T	Rel. Hum	Precip	TSP	Pb	PM ₁₀ Hi- Vol & Crst.	PM ₁₀ Lo- Vol & Cont.	PM _{2.5} FRM & Carb.	PM _{2.5} Cont. & SASS	
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20															
	08 051 0007 Mt. Crested Butte Realty																1/C			
	08 113 0004 Telluride																1			
Hinsdale	901	1002	1107	2.1%	2.3%															
Montrose	43,218	49,417	56,638	2.7%	3.1%															
Ouray	4,946	5,748	6,430	3.1%	3.0%															
San Miguel	8,165	9,507	10,952	3.1%	3.4%															
REGION 11	257,686	287,761	333,943	2.2%	3.0%															
Garfield	60,110	70,571	90,151	3.3%	5.0%															
	08 045 0005 Parachute – High School																1			
	08 045 0007 Rifle - Henry Building										1						1 1/R			1
	08 045 0012 Rifle – Health Dept.									1										
Mesa	150,430	165,428	184,592	1.9%	2.3%															
	08 077 0017 Grand Junction - Powell																	1 1/C	1	1
	08 077 0018 Grand Junction - Pitkin					1						1	1							
	08 077 0019 Clifton																1			
	08 077 0020 Palisade Water Treatment									1	1									
Moffat	15,032	15,941	17,965	1.2%	2.0%															
Rio Blanco	7,774	8,407	10,031	1.6%	2.9%															
Routt	24,340	27,394	31,204	2.4%	2.8%															
	08 107 0003 Steamboat Springs																1			
REGION 12	120,528	135,972	154,479	2.4%	2.8%															
Eagle	56,674	64,639	72,824	2.7%	2.8%															
Grand	14,996	16,852	19,763	2.4%	3.2%															
Jackson	1,462	1,535	1,626	1.0%	1.1%															
Pitkin	17,445	19,240	21,478	2.0%	2.3%															
	08 097 0006 Aspen - Library																1			
Summit	29,951	33,706	38,788	2.4%	3.0%															
	08 117 0002 Breckenridge																1			

REGIONS/Counties	Projected Population			Percent Change		CO	SO ₂	NO _x	NO _y	O ₃	WS WD T	Rel. Hum	Precip	TSP	Pb	PM ₁₀ Hi- Vol & Crs.	PM ₁₀ Lo- Vol & Cont.	PM _{2.5} FRM & Carb.	PM _{2.5} Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20														
CENTRAL MTNS.	137,609	154,267	176,047	2.3%	2.8%														
CLR CRK. & GILPIN	14,834	16,234	17,944	1.8%	2.1%														
Clear Creek	9,490	10,390	11,515	1.8%	2.1%														
Gilpin	5,344	5,844	6,429	1.8%	2.0%														
PARK COUNTY	17,704	21,381	27,046	3.8%	5.3%														
REGION 13	79,693	88,822	100,359	2.2%	2.6%														
Chaffee	17,513	19,467	22,625	2.1%	2.9%														
Custer	4,324	5,120	6,027	3.4%	3.9%														
Fremont	48,819	53,099	58,283	1.7%	1.9%														
08 043 0003 Cañon City - City Hall																1			
Lake	9,037	11,136	13,424	4.3%	4.9%														
REGION 14	25,378	27,830	30,698	1.9%	2.1%														
Huerfano	8,296	9,121	10,079	1.9%	2.1%														
Las Animas	17,082	18,709	20,619	1.8%	2.1%														
SAN LUIS VALLEY	49,334	52,900	56,909	1.4%	1.5%														
Alamosa	16,487	18,170	19,984	2.0%	2.1%														
08 003 0001 Alamosa – Adams State College																1			
08 003 0003 Alamosa - Municipal																1			
Conejos	8,472	8,869	9,259	0.9%	0.9%														
Costilla	3,495	3,628	3,772	0.7%	0.8%														
Mineral	1014	107	1,131	1.1%	1.2%														
Rio Grande	12,593	13,245	14,206	1.0%	1.3%														
Saguache	7,273	7,918	8,557	1.7%	1.8%														
EASTERN PLAINS	163,289	176,536	197,107	1.6%	2.1%														
REGION 1	72,813	77,996	85,326	1.4%	1.7%														
Logan	21,924	23,965	26,667	1.8%	2.2%														

REGIONS/Counties	Projected Population			Percent Change		CO	SO ₂	NO _x	NO _y	O ₃	WS WD T	Rel. Hum	Precip	TSP	Pb	PM ₁₀ Hi- Vol & Crs.	PM ₁₀ Lo- Vol & Cont.	PM _{2.5} FRM & Carb.	PM _{2.5} Cont. & SASS
	July, 2010	July, 2015	July, 2020	2010 - 15	2010 -20														
Morgan	28,953	31,477	35,362	1.7%	2.2%														
Phillips	4,583	4,658	4,786	0.3%	0.4%														
Sedgwick	2,572	2,679	2,806	0.8%	0.9%														
Washington	4,755	4,812	4,864	0.2%	0.2%														
Yuma	10,026	10,405	10,841	0.7%	0.8%														
REGION 5	39,819	46,215	57,533	3.0%	4.4%														
Cheyenne	2,015	2,131	2,260	1.1%	1.2%														
Elbert	23,715	29,488	40,051	4.5%	6.9%														
08 039 0001 Elbert County – Ben Kelley Road																		1	
Kit Carson	8,420	8,682	8,954	0.6%	0.6%														
Lincoln	5,669	5,914	6,268	0.8%	1.1%														
REGION 6	50,657	52,325	54,248	0.7%	0.7%														
Baca	4,120	4,122	4,164	0.0%	0.1%														
Bent	6,265	6,481	6,681	0.7%	0.7%														
Crowley	6,344	6,684	7,084	1.0%	1.2%														
Kiowa	1,473	1,511	1,558	0.5%	0.6%														
Otero	19,014	19,716	20,518	0.7%	0.8%														
Prowers	13,441	13,811	14,243	0.5%	0.6%														
08 099 0001 Lamar Power Plant																1			
08 099 0002 Lamar - Municipal																1			
08 099 0003 Lamar Port of Entry											1								

- + - indicates monitors that will be installed in 2010
- C - Collocated monitors
- S - SASS PM_{2.5} monitor
- E – PM_{2.5} carbon monitor
- R – PM_{10-2.5} coarse monitor

CARBON MONOXIDE

In 2010, as in 2009, the APCD will operate nine carbon monoxide monitors. Currently, the NAAQS for carbon monoxide (CO) is a primary standard, with a concentration level not to exceed 9 parts per million (ppm) in an eight hour time period, or 35 ppm in a one hour period. There is no secondary standard for CO. Carbon monoxide levels have declined from a statewide maximum 8-hour value of 48.1 ppm in 1973 to a value of 2.7 ppm in 2009. The level of the standard has not been exceeded since 1999. The carbon monoxide monitors currently operated by the APCD are associated both with State Implementation Plan requirements and CFR requirements.

Larimer and Weld Counties

Larimer and Weld counties have a population of 564,233 (July 2010 population estimates), an increase of 29.2 percent since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a major source of carbon monoxide. However, there are several small industries and manufacturing processes located within the two counties that may contribute to CO levels. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries.

In 2009 the highest 8-hour CO concentration recorded at the Fort Collins-Mason monitor was 1.9 ppm, with a maximum 1-hour concentration of 3.5 ppm. At the Greeley-West Annex site the maximum 8-hour concentration recorded was 2.3 ppm, with a maximum 1-hour concentration of 4.3 ppm. All of the values were well below the Federal NAAQS requirements.

The carbon monoxide monitors in this area are:
08 069 1004 Fort Collins-Mason, 708 S. Mason St.
08 123 0010 Greeley -West Annex, 905 10th Avenue

Metropolitan Denver Counties

The Metropolitan Denver area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area.

The maximum 8-hour and 1-hour concentrations recorded in 2009 for each CO monitoring site are listed in the table below.

Table 3. 2009 Maximum CO Concentrations in Denver Area

Site ID	Site Name	8-Hour Max (ppm)	1-Hour Max (ppm)
08 001 3001	Welby	2.0	2.8
08 013 0009	Longmont - Main	1.9	3.5
08 031 0002	Denver – CAMP	2.5	6.9
08 031 0019	Denver – Firehouse #6	1.8	3.6
08 031 0025	Denver – DMAS	N/A	N/A

It is important to note here that the Denver – DMAS site is not officially up and running, or loading data into AQS yet.

El Paso, Park & Teller Counties

This area has a population of 647,229 according to the July 2010 population estimate. This is an increase of 19.5% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller and Park Counties. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 400,411 according to the July 2008 estimate, the latest year available for municipalities' data. This is an increase of 11% since the 2000 census.

In 2009 the highest 8-hour CO concentration recorded at the Colorado Springs-Hwy 24 monitor was 2.7 ppm, with a maximum 1-hour concentration of 3.8 ppm.

The carbon monoxide monitors in this area are:
 08 041 0015 Colorado Springs – Hwy. 24, 690 W. Highway 24

Western Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 577,799 (July 2010 population estimate). This is an increase of 23.4 percent over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 150,430 people in Mesa County to 570 people in San Juan County, according to the July 2010 estimate. Short-term special purpose monitoring for carbon monoxide has been done in Summit County at Vail and near the oil shale projects of Rio Blanco County. Grand Junction is the largest city on the western slope with a population of 55,189 (July 2008 estimate). This is an increase of 31.4% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

In 2009 the highest 8-hour CO concentration recorded at the Grand Junction monitor was 2.2 ppm, with a maximum 1-hour concentration of 2.3 ppm.

The carbon monoxide monitors in this area are:
 08 077 0018 Grand Junction-Pitkin, 645¼ Pitkin Avenue

Quality Assurance Checks for Carbon Monoxide Monitors

The APCD staff performs two types of gaseous analyzer performance checks: precision checks and accuracy audits. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The following table shows the number of these audits conducted on the carbon monoxide analyzers for 2009.

The APCD Quality Assurance staff conducts accuracy audits on all of the carbon monoxide instruments at least twice per year. The APCD Field staff conducts precision checks nominally once every two weeks, and assessment audits once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

Table 4. Precision Checks for Carbon Monoxide in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08-001-3001	6	8	7	6
08-013-0009	7	7	6	7
08-031-0002	7	7	7	6
08-031-0019	7	7	5	0
08-041-0015	6	6	7	7
08-069-1004	7	7	6	7
08-077-0018	6	7	6	5
08-123-0010	7	7	6	7

Table 5. Accuracy Audits for Carbon Monoxide in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08-001-3001	0	1	0	1
08-013-0009	1	0	1	0
08-031-0002	1	0	1	0
08-031-0019	0	1	0	0
08-041-0015	0	1	0	1
08-069-1004	1	0	1	0
08-077-0018	0	1	0	1
08-123-0010	1	0	1	0

Planned Changes in Carbon Monoxide Monitoring

The trace CO instrument at the DMAS NCore site will become operational in 2010.

OZONE

On March 12, 2008, the U.S. Environmental Protection Agency released a new level of the NAAQS for ozone. The change in the level was from 0.08 ppm as an 8-hour average to 0.075 ppm as an 8-hour average. This made a significant change in the number of ozone monitors that exceed the standard on an annual basis. The following locations exceeded the new level in 2009: Welby, Highland Res., Aurora East, S. Boulder Creek, Chatfield Res., Arvada, Welch, Rocky Flats – N, NREL, Aspen park, and Fort Collins – West.

The EPA is currently set to establish a new primary ozone standard somewhere in the range of 0.060 to 0.070 ppm in August 2010. A new secondary standard in the range of 7 to 15 ppb-hours will also be set at that time as well. Based on the data collected during ozone season in 2009 (March 1 through September 30), should the new primary standard be set at 0.060 ppm, the maximum 8-hour values recorded by every ozone monitor operated by the APCD would exceed it. If set at 0.065 ppm, there would be only two monitors that would not exceed it.

Larimer and Weld Counties

Larimer and Weld counties have a population of 564,233 (July 2010 population estimates), an increase of 29.2 percent since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a major source of ozone precursors. However, there are several small industries and manufacturing processes located within the two counties that contribute to ozone levels. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries.

The maximum 8-hour and 1-hour concentrations recorded in 2009 for each ozone monitoring site are listed in the table below.

Table 6. 2009 Maximum Ozone Concentrations in Larimer and Weld Counties

Site ID	Site Name	8-Hour Max (ppm)
08 069 0011	Fort Collins – West	0.082
08 069 0012	Rist Canyon	0.071
08 069 1004	Fort Collins – Mason	0.074
08 123 0009	Greeley – Tower	0.071

Metropolitan Denver Counties

This area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area. Only Adams, Arapahoe, Boulder, Douglas, Jefferson and Denver Counties have ozone monitors.

The maximum 8-hour and 1-hour concentrations recorded in 2009 for each ozone monitoring site are listed in the table below.

Table 7. 2009 Maximum Ozone Concentrations in the Denver Metro Area

Site ID	Site Name	8-Hour Max (ppm)
08 001 3001	Welby	0.078
08 005 0002	Highland Reservoir	0.079
08 005 0006	Aurora – East	0.079
08 013 0011	South Boulder Creek	0.084
08 031 0014	Denver – Carriage	0.068
08 031 0025	Denver – DMAS	0.070
08 035 0004	Chatfield State Park	0.085
08 059 0002	Arvada	0.078

Site ID	Site Name	8-Hour Max (ppm)
08 059 0005	Welch	0.078
08 059 0006	Rocky Flats – N	0.086
08 059 0011	NREL	0.081
08 059 0013	Aspen Park	0.077

El Paso, Park & Teller Counties

This area has a population of 647,229 according to the July 2010 population estimate. This is an increase of 19.5% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller and Park Counties. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 400,411 according to the July 2008 estimate, the latest year available for municipalities' data. This is an increase of 11% since the 2000 census.

The maximum 8-hour and 1-hour concentrations recorded in 2009 for each O₃ monitoring site are listed in the table below.

Table 8. 2009 Maximum Ozone Concentrations in El Paso, Park and Teller Counties

Site ID	Site Name	8-Hour Max (ppm)
08 041 0013	U.S. Air Force Academy	0.064
08 041 0016	Manitou Springs	0.071

Western Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 577,799 (July 2010 population estimate). This is an increase of 23.4 percent over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 150,430 people in Mesa County to 570 people in San Juan County, according to the July 2010 estimate. Grand Junction is the largest city on the western slope with a population of 55,189 (July 2008 estimate). This is an increase of 31.4% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

The maximum 8-hour and 1-hour concentrations recorded in 2009 for each ozone monitoring site are listed in the table below.

Table 9. 2009 Maximum Ozone Concentrations in the Western Counties

Site ID	Site Name	8-Hour Max (ppm)
08 045 0012	Rifle – Health	0.064
08 077 0020	Palisade Water Treatment	0.066
08 083 0006	Cortez	0.066

Quality Assurance Checks for Ozone Monitors

The APCD staff performs two types of gaseous analyzer performance checks: precision checks and accuracy audits. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The following table shows the number of these audits conducted on the carbon monoxide analyzers for 2009.

The APCD Quality Assurance staff conducts accuracy audits on all of the carbon monoxide instruments at least twice per year. The APCD Field staff conducts precision checks nominally once every two weeks, and assessment audits once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

Table 10. Precision Checks for Ozone in 2009

Site	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
08 001 3001	6	8	7	6
08 005 0002	5	6	7	7
08 005 0006	0	1	7	6
08 013 0011	7	7	6	7
08 031 0014	7	7	6	7
08 031 0025	7	6	7	7
08 035 0004	7	7	6	7
08 041 0013	6	6	7	7
08 041 0016	6	5	7	7
08 045 0012	7	6	7	8
08 059 0002	7	7	6	7
08 059 0005	6	7	6	7
08 059 0006	6	7	5	7
08 059 0011	6	6	6	7
08 059 0013	0	4	6	5
08 069 0011	7	7	6	6
08 069 0012	0	5	6	7
08 069 1004	7	7	6	7
08 077 0020	7	6	7	7
08 083 0006	7	6	7	7
08 123 0009	7	7	6	5

Table 11. Accuracy Audits for Ozone in 2009

Site	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
08 001 3001	0	1	0	1
08 005 0002	0	1	0	1
08 005 0006	0	0	1	0
08 013 0011	1	0	1	0
08 031 0014	0	1	0	1
08 031 0025	0	0	1	0
08 035 0004	0	1	1	0
08 041 0013	0	1	0	1
08 041 0016	0	1	0	1
08 045 0012	0	1	1	1
08 059 0002	0	1	0	1
08 059 0005	1	0	1	0
08 059 0006	1	0	1	0
08 059 0011	0	1	0	1
08 059 0013	0	0	1	0
08 069 0011	1	0	1	0
08 069 0012	0	0	1	0
08 069 1004	1	0	1	0
08 077 0020	0	1	1	1
08 083 0006	0	1	1	1
08 123 0009	1	0	1	0

Planned Changes in Ozone Monitoring

Planned changes for the 2010 /2011 plan year include the review of sites in the Front Range for possible enhancement, and the possible installation of a new site in the Pueblo area to meet the impending new Federal monitoring requirements. Additionally, there are plans for a new ozone site in northwest Colorado by Maybell to support the 3-State Pilot Study.

NITROGEN DIOXIDE

The Air Pollution Control Division has monitored nitrogen dioxide at eight locations in Colorado. All but two of these locations are no longer operating. Only the CAMP monitor has ever approached the annual average standard of 0.053 ppm (53 ppb) yearly average. It recorded a 0.052 ppm yearly average in 1975, 1976 1979 and in 1983. In the past 20 years the levels have been declining and in the past three years the levels have been reduced to less than one-half of the standard. In January 2010, the EPA set a new primary NAAQS that is a supplement to the annual average standard. The new one-hour standard is set at a level of 100 ppb (0.100 ppm), and is based on "...the 3-year average of the 98th percentile of the yearly distribution of the 1-hour daily maximum concentrations..."².

Metropolitan Denver Counties

This area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area.

In 2009, the annual nitrogen dioxide concentration at the Welby site was 0.015 ppm. For 2007 through 2009 the one-hour standard design value is 0.068 ppm (68 ppb), which is well below the 0.100 ppm (100 ppb) NAAQS. There is no average in 2009 for the CAMP site, as 75% of the required data is not available due to quality assurance issues discovered in September of 2009.

The nitrogen dioxide monitors in this area are:

08 001 3001 Welby, 3174 E. 78th Avenue

08 031 0002 Denver-CAMP, 2105 Broadway

Quality Assurance Checks for Oxides of Nitrogen Monitors

The APCD staff performs two types of gaseous analyzer performance checks: precision checks and accuracy audits. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The following table shows the number of these audits conducted on the carbon monoxide analyzers for 2009.

The APCD Quality Assurance staff conducts accuracy audits on all of the carbon monoxide instruments at least twice per year. The APCD Field staff conducts precision checks nominally once every two weeks, and assessment audits once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

Table 12. Precision Checks for Oxides of Nitrogen in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 001 3001	6	7	3	2
08 031 0002	0	0	0	0

Table 13. Accuracy Audits for Oxides of Nitrogen in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 001 3001	0	1	0	1
08 031 0002	0	0	0	0

Planned Changes in Nitrogen Dioxide Monitoring

There are no planned changes in the Nitrogen Dioxide Monitoring Network for 2010. However, there will be the addition of a NO_y analyzer at the Denver Municipal Animal Shelter.

²“Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule,” 75 Federal Register 26 (9 February 2010), pp. 6474 – 6536.

SULFUR DIOXIDE

The Air Pollution Control Division has monitored sulfur dioxide at eight locations in Colorado. All but two of these locations are no longer operating. The primary NAAQS for sulfur dioxide is an annual mean not to exceed 0.03 ppm, and a 24-hour mean not to exceed 0.14 ppm. The secondary NAAQS is a 3-hour average not to exceed 0.5 ppm. Sulfur dioxide has never approached the level of any of the standards. Even in the mid-1970s when the levels were at their highest, they were generally less than one half of the level of the standards. The primary reason for these low levels is that what coal fired industry there is in Colorado uses low sulfur coal for combustion. A new NAAQS is expected to be released by EPA in June 2010. In 2009 a new trace/precursor-level sulfur dioxide monitor was installed as a part of the NCore monitoring at the Denver Animal Shelter. It is anticipated this analyzer will be fully operational some time in 2010.

Metropolitan Denver Counties

This area includes the Front Range counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area that contribute to SO₂ levels.

There is no annual average in 2009 for the CAMP site, as 75% of the data is not available due to quality assurance issues discovered in September of 2009. The value listed for the 24-hour average was calculated using only the data available from the last quarter of 2009.

Table 14. 2009 Maximum SO₂ Concentrations for the Denver Metro Area

Site ID	Site Name	Annual Avg. (ppm)	24-Hour Max (ppm)	3-Hour Max (ppm)
08 001 3001	Welby	0.001	0.01	0.0
08 031 0002	Denver - CAMP	N/A	0.01	0.0

Quality Assurance Checks for Sulfur Dioxide Monitors

The APCD staff performs two types of gaseous analyzer performance checks: precision checks and accuracy audits. These audits challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The following table shows the number of these audits conducted on the carbon monoxide analyzers for 2009.

The APCD Quality Assurance staff conducts accuracy audits on all of the carbon monoxide instruments at least twice per year. The APCD Field staff conducts precision checks nominally once every two weeks, and assessment audits/calibrations once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance). A complete description of the procedures and the results are available from the APCD.

Table 15. Precision Checks for Sulfur Dioxide Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 001 3001	6	5	7	5
08 031 0002	0	0	0	0

Table 16. Accuracy Audits for Sulfur Dioxide Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 001 3001	0	1	0	1
08 031 0002	0	0	0	0

Planned Changes in Sulfur Dioxide Monitoring

In 2010 the only planned change to the SO₂ network is to fully install the trace analyzer at the DMAS site.

PM₁₀

In 2009, the APCD operated 39 PM₁₀ monitors at 30 different locations. Of these monitors, 29 are high volume monitors, 5 are low volume, 3 are continuous and 2 are coarse particulate samplers. There are 3 sites with collocated high volume samplers (Denver CAMP, Denver DMAS and Crested Butte), and one site with collocated low volume samplers (Grand Junction - Powell). The PM₁₀NAAQS is a 24-hour average of 150 µg/m³.

Larimer and Weld Counties

Larimer and Weld counties have a population of 564,233 (July 2010 population estimates), an increase of 29.2 percent since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. Motor vehicle activity is a major source of pollutants. However, there are several small industries and manufacturing processes located within the two counties. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries.

The monitors at the Fort Collins – CSU site had one PM₁₀ exceedance in 2009, while the Greeley monitor had none. The maximum concentrations recorded were 258.6 µg/m³ at Fort Collins, and 63 µg/m³ at Greeley.

The PM₁₀ monitors in this area are:

08 069 0009 Fort Collins-CSU, 251 Edison Drive
08 123 0006 Greeley-Hospital, 1516 Hospital Road

Metropolitan Denver Counties

This area includes the Front Range Counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area.

There were no PM₁₀ exceedances by any of the monitors in the Denver Metro area. The table below lists the maximum concentrations recorded at each of the sites in 2009. Site ID numbers that include an asterisk (*) indicate a low volume sampler, while no star indicates high volume samplers.

Table 17. 2009 Maximum PM₁₀ Concentrations for the Denver Metro Area in 2009

Site ID	Site Name	Max Concentration (µg/m ³)
08 001 0006*	Commerce City	96
08 001 3001	Welby	54
08 013 0003	Longmont-Municipal	40
08 013 0012	Boulder Chamber Building	38
08 031 0002	Denver – CAMP	47
08 031 0017	Denver Visitor Center	53
08 031 0025	Denver – DMAS	48

Eastern Plains Counties

This area includes Elbert and Prowers Counties. The population of the Elbert County area is 23,715 according to the 2010 population estimate. This is a 4.1% increase over the 2000 census data. The July 2010 population estimate of Prowers County is 13,441, which is a decrease of 3.8% from the 2000 census data.

There were three PM₁₀ exceedances at the Lamar Power Plant site, and two exceedances at the Lamar Municipal site in 2009. The highest concentration recorded at the Lamar Power Plant site was 233 µg/m³, while that at the Lamar Municipal site was 176 µg/m³. Both samplers are high volume samplers.

The PM₁₀ monitors in this area are:

08 099 0001 Lamar Power Plant, 100 N. 2nd St.
 08 099 0002 Lamar Municipal, 104 E. Parmenter Street

Southern Front Range Counties

This area has a population of 647,229 according to the July 2010 population estimate. This is an increase of 19.5% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller County. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 400,411 according to the July 2008 estimate, the latest year available for municipalities' data. This is an increase of 11% since the 2000 census.

There were two exceedances in this area in 2009, one at Alamosa – Adams State College, and one at Alamosa Municipal. The table below shows the maximum concentration values recorded at each site in 2009. Sites with a star (*) after the site ID number indicate low volume samplers are in operation. No star indicates a high volume sampler.

Table 18. 2009 Maximum PM₁₀ Concentrations in the Southern Front Range Counties

Site ID	Site Name	Max Concentration (µg/m ³)
08 003 0001	Alamosa – Adams State College	207
08 003 0003	Alamosa – Municipal	157
08 041 0017*	Colorado College	35
08 043 0003	Cañon City – City Hall	38
08 101 0012	Pueblo – Fountain Magnet School	99

Mountain Counties

The mountain counties consist of those counties generally along the Continental Divide. The monitors are located mostly in small towns in tight mountain valleys. These communities range from Steamboat Springs in the north to Breckenridge in the I-70 corridor, as well as Aspen, Crested Butte and Mt. Crested Butte in the central mountains, and Pagosa Springs in the south.

The population of the Pagosa Springs area is 13,284 people (July 2010 population estimate). This is a decrease of 6% from the 2000 census. The Crested Butte and Mt. Crested Butte area population is 15,366 (2010 estimate), which is an increase of 7.7% from the 2000 census. The Aspen area 2010 population estimate is 17,445 people, an increase of 6.2% from the 2000 census. The Steamboat Springs area 2010 population estimate is 24,340, an increase of 11.1% over the 2000 census population. The Breckenridge area 2010 population estimate is 29,951, which is a decrease of 11.5% from the 2000 census numbers.

There were three PM₁₀ exceedances in the mountain counties, all of which were at the Pagosa Springs monitoring location. The table below lists the maximum concentrations recorded at each of the sites in 2009.

Table 19. 2009 Maximum PM₁₀ Concentrations for the Mountain Counties

Site ID	Site Name	Max Concentration (µg/m ³)
08 007 0001	Pagosa Springs	255
08 051 0004	Crested Butte	99
08 051 0007	Mount Crested Butte	93
08 097 0006	Aspen – Library	47
08 107 0003	Steamboat Springs	83
08 117 0002	Breckenridge	101

Western Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 577,799

(July 2010 population estimate). This is an increase of 23.4% over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 150,430 people in Mesa County to 570 people in San Juan County, according to the July 2010 estimate. Grand Junction is the largest city on the western slope with a population of 55,189 (July 2008 estimate). This is an increase of 31.4% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

There were three PM₁₀ exceedances in the western counties in 2009, one at Delta and two at the Durango site. The table below lists the maximum concentrations recorded at the monitoring sites in this area. Site ID numbers that include a star (*) indicate a low volume sampler, while no star indicates high volume samplers.

Table 20. 2009 Maximum PM₁₀ Concentrations in the Western Counties Area

Site ID	Site Name	Max Concentration (µg/m ³)
08 029 0004	Delta	186
08 045 0005	Parachute	88
08 045 0007	Rifle – Henry Building	83
08 067 0004	Durango – River City Hall	203
08 077 0017*	Grand Junction – Powell	65
08 077 0019	Clifton	147
08 113 0004	Telluride	130

Quality Assurance Checks for PM₁₀ Monitors

The audit checks performed on the particulate monitors consist of calibrated flow checks. The precision checks that are made on particulate monitors consist of collocated samplers that operate side-by-side on the same operating schedule. The samples are then compared to ensure that the data are within federal limits.

Table 21. Precision Checks for PM₁₀ Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
PM₁₀ High Volume				
08 031 0002	15	15	15	15
08 031 0025	15	15	15	15
08 051 0004	15	14	15	14
PM₁₀ Low Volume				
08 077 0017	14	12	14	15
PM₁₀ Continuous TEOM				
08 001 3001	13	14	12	12
08 031 0002	14	8	12	10
08 031 0025	12	8	12	12

Table 22. Accuracy Audits for PM₁₀ Monitors in 2009

Site	POC	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
PM₁₀ High Volume					
08 001 3001	2	1	1	2	1
08 003 0001	1	4	4	4	4
08 003 0003	1	4	4	4	4
08 007 0001	3	4	4	4	4
08 013 0003	2	1	1	1	1
08 013 0012	1	1	1	0	1
08 029 0004	1	2	2	2	2
08 031 0002	1	1	1	1	1

08 031 0002	2	1	1	1	1
08 031 0017	1	4	4	4	4
08 031 0025	1	1	1	1	1
08 031 0025	2	1	1	1	1
08 043 0003	1	1	1	1	1
08 045 0005	1	2	0	2	2
08 045 0007	1	2	2	2	2
08 051 0004	2	2	2	2	2
08 051 0004	3	1	1	1	1
08 051 0007	1	4	4	4	4
08 067 0004	1	2	2	2	2
08 069 0009	1	2	2	4	2
08 077 0019	1	2	2	2	2
08 097 0006	1	2	2	2	2
08 099 0001	2	4	4	4	4
08 099 0002	2	4	4	4	4
08 101 0012	1	2	2	0	0
08 101 0015	1	0	0	2	2
08 107 0003	2	4	4	4	4
08 113 0004	1	2	2	2	2
08 117 0002	1	4	4	4	4
08 123 0006	2	2	2	2	2
PM₁₀ Low Volume					
08 001 0006	1	1	1	1	1
08 041 0017	1	1	1	2	1
08 077 0017	3	1	1	1	1
08 077 0017	4	1	1	1	1
PM₁₀ Continuous TEOM					
08 001 3001	3	1	1	0	1
08 031 0002	3	1	1	1	1
08 031 0025	3	1	0	1	1

Planned Changes in PM₁₀ Monitoring

The Lamar Power Plant monitor will be considered for removal and replacement in 2010 due to conversion of the plant to coal burning, and because it is not located in ambient air. The Pueblo site was relocated in 2009 due to the construction of a tall building adjacent to the current site.

PM_{2.5}

PM_{2.5} concentration values are reported in three different groups of readings by the APCD. The first group of readings is reported as the Federal Reference Method (FRM-88101) concentrations, while the second group is reported as Total Atmospheric PM_{2.5} (TEOM with FDMS-88500), and the final group is reported as Raw Data (TEOM without FDMS-88501). In 2009, the APCD operated 36 PM_{2.5} monitors at 19 different locations throughout the state. There are two sites with collocated FRM monitors and eight sites with an FRM monitor plus either a total atmospheric or a raw data monitor. There are three carbon monitors and three SASS monitors, in addition to the twelve continuous and eighteen FRM monitors.

The primary PM_{2.5} NAAQS are 15.0 µg/m³ annually and 35 µg/m³ in a 24-hour period. The 24-hour standard was lowered on September 20, 2006.

Larimer and Weld Counties

Larimer and Weld counties have a population of 564,233 (July 2010 population estimates), an increase of 29.2 percent since the 2000 Census. The two major urban centers are Fort Collins in Larimer County and Greeley in Weld County. Larimer County has irrigated farmland in the eastern half while the western half is mountainous. Weld County is predominantly grassland and irrigated farmland. However, there are several small industries and manufacturing processes located within the two counties. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries. The PM_{2.5} sites listed below with manual method FRM sites in the APCD network as of December 31, 2009, are suitable for comparisons to the annual PM_{2.5} NAAQS.

There was one PM_{2.5} exceedance in 2009 in the Larimer and Weld County area. The exceedance was at the Greeley-Hospital site. The table below lists the maximum PM_{2.5} concentrations recorded at each of the sites in Larimer and Weld Counties. The monitors listed below are all FRM monitors.

Table 23. 2009 Maximum PM_{2.5} Concentrations in Larimer and Weld Counties

Site ID	Site Name	Max Concentration (µg/m ³)
08 069 0009	Fort Collins – CSU	28.7
08 123 0006	Greeley – Hospital	38.1
08 123 0008	Platteville	26.6

Metropolitan Denver Counties

This area includes the Front Range Counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area.

There was one exceedance of the PM_{2.5} standard in the Denver Metro area in 2009. This was at the Boulder – Chamber site, and was due to wild fires in the area. The table below lists the maximum PM_{2.5} concentrations recorded in 2009 for each site in the Denver Metro area. All the monitors listed in the table are FRM monitors.

Table 24. 2009 Maximum PM_{2.5} Concentrations in the Denver Metro Area

Site ID	Site Name	Max Concentration (µg/m ³)
08 001 0006	Commerce City	28.5
08 005 0005	Arapahoe Community College	22.6
08 013 0003	Longmont – Municipal	24.0
08 013 0012	Boulder Chamber Building	39.4
08 031 0002	Denver – CAMP	29.5
08 031 0023	Denver – Swansea	26.6
08 031 0025	Denver – DMAS	25.0
08 035 0004	Chatfield Reservoir	21.7

The following sites are micro-scale sites, but determined to be representative of neighborhood scale with several contiguous micro-scale sites in the area of Denver, and are EPA approved.

- 08 031 0002-1 Denver CAMP, 2105 Broadway
- 08 031 0023-1 Denver Swansea, 4650 Columbine Street
- 08 031 0025-1 Denver Animal Shelter, 678 S. Jason Street
- 08 035 0004-1 Chatfield Reservoir, 11500 N. Roxborough Park Road

El Paso, Park, Pueblo, Elbert & Teller Counties

This area has a population of 647,229 according to the July 2010 population estimate. This is an increase of 19.5% from the 2000 census. It is a very popular tourist area with rapid urban growth. The land usage varies from open prairies in eastern El Paso County to very mountainous in Teller and Park Counties. Only El Paso County has a large urbanized area, Colorado Springs, with a population of 400,411 according to the July 2008 estimate, the latest year available for municipalities' data. This is an increase of 11% since the 2000 census.

There were no exceedances of the PM_{2.5} NAAQS standard in the El Paso, Park, Pueblo, Elbert and Teller County area. The table below lists the maximum recorded PM_{2.5} values recorded in 2009. All monitors listed here are FRM monitors.

Table 25. 2009 Max PM_{2.5} Concentrations in the El Paso, Park, Pueblo, Elbert and Teller Counties

Site ID	Site Name	Max Concentration (µg/m ³)
08 039 0001	Elbert County	10.5
08 041 0017	Colorado College	15.5
08 101 0015	Pueblo – Fountain Magnet School	14.4

Western Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 577,799 (July 2010 population estimate). This is an increase of 23.4 percent over the 2000 census. However, the population is not evenly distributed among the counties and ranges from 150,430 people in Mesa County to 570 people in San Juan County, according to the July 2010 estimate. Grand Junction is the largest city on the western slope with a population of 55,189 (July 2008 estimate). This is an increase of 31.4% from the 2000 census, and is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

There were 6 exceedances recorded in the western counties area. All six occurrences were at the Grand Junction – Powell site, and took place in January (3 times) and December of 2009 (3 times). The table below lists the maximum PM_{2.5} concentrations recorded in 2009 for each site.

Table 26. 2009 Maximum PM_{2.5} Concentrations in the Western Counties

Site ID	Site Name	Max Concentration (µg/m ³)
08 077 0017	Grand Junction – Powell	59.1
08 083 0006	Cortez	19.3

PM_{2.5} Sites not intended for NAAQS Comparison

The following sites are not intended for comparison with the NAAQS.

- 08 001 0006-3 Commerce City, 7101 Birch Street (not FEM or FRM)
- 08 013 0003-3 Longmont-Municipal, 350 Kimbark Street (not FEM or FRM)
- 08 013 1001-3 Boulder CU/Athens, 2440 Pearl Street
- 08 031 0002-3 Denver-CAMP, 2105 Broadway
- 08 031 0013-3 Denver NJH-E, 14th Avenue and Albion Street
- 08 031 0025-3 Denver Municipal Animal Shelter, 678 S. Jason Street
- 08 035 0004-3 Chatfield Reservoir, 11500 N. Roxborough Park Road
- 08 041 0017-3 Colorado College, 130 W. Cache la Poudre

08 045 0007-3 Rifle – Henry Building, 144 3rd Street
 08 069 0009-3 Fort Collins-CSU, 251 Edison Drive
 08 077 0017-3 Grand Junction-Powell, 650 South Avenue (not FEM or FRM)
 08 123 0006-3 Greeley-Hospital, 1516 Hospital Road (not FEM or FRM)

Community Monitoring Zones

Community monitoring zones are an additional method of defining an area for comparison with the PM_{2.5} NAAQS where two or more monitors are averaged together for comparison with the standard. Currently, the APCD does not have any areas where this technique is used.

The definition of community monitoring zone (CMZ) in 40 CFR Part 58.1 is as follows: “Community monitoring zone (CMZ) means an optional averaging area with established, well defined boundaries, such as county or census block, within a Monitoring Planning Area (MPA) that has relatively uniform concentrations of annual PM_{2.5} as defined by appendix N of part 50 of this chapter. Two or more community oriented SLAMS monitors within a CMZ that meet certain requirements as set forth in appendix N of part 50 of this chapter may be averaged for making comparisons to the annual PM_{2.5} NAAQS.” The CMZ is an optional technique that averages the PM_{2.5} 24-hour concentrations from two or more monitors located in the same community.

If the PM_{2.5} monitoring network is changed by the creation/change of a CMZ or changing the location of a violating monitor, then the APCD will ask EPA Region VIII for approval via the current network modification process, and then notify the appropriate governments of affected communities. The APCD will also provide the proposed changes to the affected communities and concerned citizens on our web site. A public comment period will be open for thirty (30) days prior to the APCD selecting a new site. Many times the APCD has no control over a site closure. For example, a site is closed due to the planned demolition of the building that hosts the monitor. In such cases a new site must be found. The PM_{2.5} instruments may be moved to a temporary site and monitoring resumed. However, the final site selection will go through the public vetting process to locate the best possible site.

Quality Assurance Checks for PM_{2.5} Monitors

The audit checks performed on the particulate monitors consist of calibrated flow checks. The precision checks that are made on particulate monitors consist of collocated samplers that operate side-by-side on the same operating schedule. The samples are then compared to ensure that the data are within federal limits.

Table 27. Precision Checks for PM_{2.5} Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
PM_{2.5} FRM				
08 001 0006	14	15	15	14
08 031 0002	15	16	15	14
08 041 0017	1	1	1	1
08 101 0012	1	0	0	0
08 101 0015	0	0	2	0
PM_{2.5} TEOM w/FDMS				
08 013 1001	10	10	12	4
08 031 0002	14	12	12	14
08 031 0013	4	14	14	10
08 031 0025	10	12	8	4
08 035 0004	8	12	8	4
08 041 0017	10	12	12	5
PM_{2.5} TEOM				
08 001 0006	14	13	12	14
08 013 0003	10	8	14	4
08 077 0017	7	5	10	11
08 123 0006	10	14	12	4

Table 28. Accuracy Audits for PM_{2.5} Monitors in 2009

Site	POC	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
PM_{2.5} FRM					
08 001 0006	1	1	1	1	1
08 001 0006	2	1	1	1	1
08 005 0005	1	1	1	1	1
08 013 0003	1	1	1	2	1
08 013 0012	1	1	1	2	1
08 031 0002	1	1	0	1	1
08 031 0002	2	1	0	1	1
08 031 0023	1	1	1	1	1
08 031 0025	1	1	1	1	1
08 035 0004	1	1	1	1	1
08 039 0001	1	1	1	2	1
08 041 0017	1	1	1	2	1
08 069 0009	1	1	1	2	1
08 077 0017	1	1	1	1	1
08 083 0006	1	0	0	1	0
08 101 0012	1	1	1	0	0
08 101 0015	1	0	0	1	1
08 123 0006	1	1	1	1	1
08 123 0008	1	1	1	2	1
PM_{2.5} TEOM w/FDMS					
08 013 1001	3	1	1	1	1
08 031 0002	3	1	1	1	1
08 031 0013	3	1	1	1	1
08 031 0025	3	1	1	1	1
08 035 0004	3	1	1	1	1
08 041 0017	3	1	1	1	1
PM_{2.5} TEOM					
08 001 0006	3	1	1	1	1
08 013 0003	3	1	1	1	1
08 077 0017	3	1	1	1	1
08 123 0006	3	1	1	0	1

Planned Changes in PM_{2.5} Monitoring

Possible relocation of Boulder CU/Athens TEOM site in 2010 due to new construction near the site.

The Pueblo site was relocated in 2009 due to the construction of a tall building next to the current building. Also, the addition of a PM_{10/2.5} TEOM 1405 DF to the Fort Collins Edison St. site occurred in 2009.

A URS carbon sampler for PM_{2.5} chemical speciation was added to the Platteville and Grand Junction-Powell sites in 2009. The URS carbon sampler for PM_{2.5} chemical speciation was removed from the Grand Junction-Powell site in 2009, and was placed at the DMAS NCore site.

TSP/Pb

In December 2006 Total Suspended Particulate (TSP) monitoring by the APCD was reduced from six monitoring sites to a single site at the Denver Municipal Animal Shelter. TSP is monitored only as a first step in ambient lead analysis. In the past three years the maximum quarterly lead concentration has generally been less than a tenth of the standard. In addition, Colorado has not recorded an exceedance of the previous lead standard ($1.5 \mu\text{g}/\text{m}^3$ averaged over a calendar quarter) since the first quarter of 1980. The new lead standard, which is $0.15 \mu\text{g}/\text{m}^3$ averaged over any three rolling consecutive three-month period, has not been exceeded using data from 2006 – 2009. The new lead standard became effective in October 2008.

With the revision of the standard in mind, the APCD reviewed its stationary sources database for all point sources that emit lead in Colorado. There were 32 lead sources identified in a database retrieval conducted in November, 2008. None of the sources emit > 1 ton(s) per year (TPY) of total lead, which includes elemental lead and all lead compounds. Thus, no lead monitors are required at any point source facility in Colorado.

The U.S. EPA calculated emissions for lead at general aviation airports due to piston engine aircraft, which continue to use leaded aviation fuel. According to EPA, Centennial Airport has the second highest lead emissions of any airport in the country at 1.18 TPY using data from the 2005 National Emissions Inventory (NEI). Since this emissions estimate exceeds the threshold for lead, the APCD has located a lead sampling site at the Centennial Airport. This monitoring site was installed in March 2010. Subsequently, EPA has updated the lead emissions inventory for airports using 2008 NEI data. They found that Centennial Airport has dropped to the sixth highest lead emissions of any airport in the country at 1.08 TPY. The decrease in general aviation activity is likely due to the economic recession. Also, the EPA has lowered the lead emissions threshold from 1.0 TPY to 0.5 TPY. Colorado still has no lead point sources greater than 0.5 TPY. However, the APCD may need to monitor lead at three additional airports, including: Pueblo Memorial (0.55 TPY, ranked 47th), Greeley-Weld County (0.54 TPY, ranked 51st), and Rocky Mountain Metropolitan Airport in Jefferson County (0.51 TPY, ranked 59th).

Metropolitan Denver Counties

This area includes the Front Range Counties of Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Douglas, Gilpin, Jefferson and Denver. The population of the area is 2,884,754 (July 2010 population estimates). This is an increase of 18.6% from the 2000 census. There are various industries and manufacturing processes located in the area.

There were no exceedances of the lead NAAQS in 2009. The maximum value recorded by the primary TSP monitor in 2009 was $106 \mu\text{g}/\text{m}^3$, while that recorded by the collocated TSP monitor was $99 \mu\text{g}/\text{m}^3$. The maximum value recorded by the primary lead monitor in 2009 was $0.006 \mu\text{g}/\text{m}^3$, while that recorded by the collocated lead monitor was $0.006 \mu\text{g}/\text{m}^3$.

The TSP/Lead monitoring site in this area is:
08 031 0025 Denver Municipal Animal Shelter, 678 S. Jason Street

Quality Assurance Checks for TSP/Pb Monitors

The audit checks performed on the particulate monitors consist of calibrated flow checks. The precision checks that are made on particulate monitors consist of collocated samplers that operate side-by-side on the same operating schedule. The samples are then compared to ensure that the data are within federal limits.

Table 29. Precision Checks for TSP Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 031 0025	12	15	15	15

Table 30. Precision Checks for Pb Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 031 0025	12	13	15	15

Table 31. Accuracy Audits for TSP Monitors in 2009

Site	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
08 031 0025	2	2	2	2

Planned Changes in TSP and Lead Monitoring

In 2010 the APCD will establish a source-oriented TSP/Lead monitor at Centennial Airport. This site is needed due to the changes in the lead monitoring regulations that require source-oriented monitoring at facilities with emissions of more than one ton per year.

METEOROLOGICAL MEASUREMENTS

Meteorological measurements taken by the APCD consist of Wind Speed, Wind Direction, Temperature and Humidity. The wind speed and direction measurements are made as both scalar and vector averages. A final parameter that is recorded at the meteorological sites is the standard deviation of horizontal wind direction. This is a calculation, not a direct measurement, of the variation of wind direction over time.

The meteorological monitors are:

08 001 0006 Commerce City, 7101 Birch Street
08 001 3001 Welby, 3174 E. 78th Avenue
08 005 0002 Highland Reservoir, 8100 S. University Boulevard
08 005 0006 Aurora-East, 36001 Quincy Avenue
08 031 0002 Denver-CAMP, 2105 Broadway
08 031 0014 Denver-Carriage, 2325 Irving Street
08 031 0021 Auraria Campus Met, 12th and Auraria Parkway
08 031 0025 Denver Municipal Animal Shelter, 678 S. Jason Street
08 035 0004 Chatfield State Park, 11500 N. Roxborough Park Road
08 059 0002 Arvada, 9101 W. 57th Avenue
08 059 0005 Welch, 12400 W. Hwy 285
08 059 0006 Rocky Flats-N, 16600 W. Hwy 128
08 059 0008 Rocky Flats-SE, 9901 Indiana Street
08 059 0013 Aspen Park, 26137 Conifer Road
08 069 0012 Rist Canyon, 11838 Rist Canyon Road
08 069 1004 Fort Collins-Mason, 708 S. Mason Street
08 077 0018 Grand Junction-Pitkin, 645 ¼ Pitkin Avenue
08 077 0020 Palisade Water Treatment, Hwy 141 and D Road
08 099 0003 Lamar Port of Entry, 7100 US Hwy 50

Planned Changes in Meteorological Monitoring for 2010/2011

The Rocky Flats SE site will be eliminated at the end of 2010. New sensors will be installed at the Greeley-Weld County Tower site and the Colorado Springs - Hwy 24 site. Additional sensors may be installed at the Denver Municipal Animal Shelter site. The Auraria Campus site will likely be removed in 2010 due to the planned construction of a multi-story building next to the site.

Appendix A - Monitoring Site Descriptions

This Appendix includes site information for all sites containing continuous gaseous monitors, meteorological monitors, or particulate monitors. The data is presented first in a tabular format, and is then followed by site descriptions. It is in the order of AQS ID number.

Table 32. Monitoring Site Locations and Instruments

<i>AQS #</i>	<i>Site Name</i>	<i>CO</i>	<i>O₃</i>	<i>NO</i>	<i>NO₂</i>	<i>NO_y</i>	<i>SO₂</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>	<i>TSP/Pb</i>	<i>Met</i>
08 001 0006	Alsup Elementary School - Commerce City							X	X		X
08 001 3001	Welby	X	X	X	X		X	X			X
08 003 0001	Alamosa – Adams State Coll.							X			
08 003 0003	Alamosa – Municipal Bldg.							X			
08 005 0002	Highland Reservoir		X								X
08 005 0005	Arapaho Comm. Coll.								X		
08 005 0006	Aurora - East		X								X
08 005 0007	Centennial Airport									X	
08 007 0001	Pagosa Springs School							X			
08 013 0003	Longmont-Municipal Bldg.							X	X		
08 013 0009	Longmont - Main	X									
08 013 0011	South Boulder Creek		X								
08 013 0012	Boulder Chamber of Commerce							X	X		
08 013 1001	Boulder – CU - Athens								X		
08 029 0004	Delta Health Dept							X			
08 031 0002	Denver - CAMP	X		X	X		X	X	X		X
08 031 0013	Denver - NJH-E								X		
08 031 0014	Denver - Carriage		X								X
08 031 0017	Denver Visitor Center							X			
08 031 0019	Denver - Firehouse #6	X									
08 031 0021	Auraria Met Station										X
08 031 0023	Denver – Swansea Elem.								X		
08 031 0025	Denver Municipal Animal Shelter	+	X			+	+	X	X	X	X
08 035 0004	Chatfield State Park		X						X		X
08 039 0001	Elbert – Ben Kelly Road								X		
08 041 0013	U. S. Air Force Academy		X								
08 041 0015	Colorado Springs Hwy. 24	X									X
08 041 0016	Manitou Springs		X								
08 041 0017	Colorado Springs Colorado College							X	X		
08 043 0003	Cañon City – City Hall							X			
08 045 0005	Parachute – High School							X			
08 045 0007	Rifle – Henry Bldg							X	X		X
08 045 0012	Rifle – Health Dept		X								
08 051 0004	Crested Butte							X			
08 051 0007	Mt. Crested Butte - Realty							X			
08 059 0002	Arvada		X								X

<i>AQS #</i>	<i>Site Name</i>	<i>CO</i>	<i>O₃</i>	<i>NO</i>	<i>NO₂</i>	<i>NO_y</i>	<i>SO₂</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>	<i>TSP/Pb</i>	<i>Met</i>
08 059 0005	Welch		X								X
08 059 0006	Rocky Flats - N		X								X
08 059 0008	Rocky Flats - SE										X
08 059 0011	NREL		X								
08 059 0013	Aspen Park		X								X
08 067 0004	Durango-River City Hall							X			
08 069 0009	Fort Collins – CSU - Edison							X	X		
08 069 0011	Fort Collins - West		X								
08 069 0012	Rist Canyon		X								X
08 069 1004	Fort Collins - Mason	X	X								X
08 077 0017	Grand Junction – Powell Bldg							X	X		
08 077 0018	Grand Junction - Pitkin	X									X
08 077 0019	Clifton - Sanitation							X			
08 077 0020	Palisade Water Treatment		X								X
08 083 0006	Cortez – Health Dept		X						X		
08 097 0006	Aspen - Library							X			
08 099 0001	Lamar Power Plant							X			
08 099 0002	Lamar Municipal							X			
08 099 0003	Lamar Port of Entry										X
08 101 0012	Pueblo Public Works							X	X		
08 107 0003	Steamboat Springs							X			
08 113 0004	Telluride							X			
08 117 0002	Breckenridge							X			
08 123 0006	Greeley-Hospital							X	X		
08 123 0008	Platteville Middle School								X		
08 123 0009	Greeley –County Tower		X								X
08 123 0010	Greeley – West Annex	X									

Alsop Elementary School - Commerce City, 7101 Birch Street (08 001 0006):

The Alsop Elementary School - Commerce City site is in a predominantly residential area north of the Denver Central Business District (CBD) near the Platte River Valley, downstream from the Denver urban air mass. There are two schools in addition to the Alsop Elementary School in the immediate vicinity, a middle school to the north and a high school to the southeast. There is a large industrial area to the south and gravel pits to the west and northwest.

PM₁₀ monitoring began in January 2001 and continues today. The maximum PM₁₀ concentration recorded at this site in 2009 was 95.8 µg/m³. There were no exceedances of the PM₁₀NAAQS at this site in 2009.

PM_{2.5} monitoring began in January 2001 and continues today. There are a collocated set of monitors, along with a continuous monitor, a trends speciation monitor, and a PM_{2.5} carbon monitor all in operation. The maximum concentration recorded by the primary monitor was 28.5 µg/m³, while at the secondary monitor it was 15 µg/m³.

Meteorological monitoring began in June of 2003.

Welby, 3174 E. 78th Avenue (08 001 3001):

Located 8 miles north-northeast of the Denver Central Business District (CBD) on the bank of the South Platte River, this site is ideally located to measure nighttime drainage of the air mass from the Denver metropolitan area and the thermally driven, daytime upriver flows. The monitoring shows that high carbon monoxide levels are associated with winds from the south-southwest. While this is the direction of five of the six major sources in the area, it is also the direction of the primary

drainage winds along the South Platte River. This monitor is in the SLAMS network, and is population oriented for a neighborhood scale.

Carbon monoxide monitoring began in 1973 and continued through the spring of 1980. Monitoring was stopped from the spring of 1980 until October 1986 when it began again as a special study. Welby has not recorded an exceedance of either the 1-hour or 8-hour carbon monoxide standard since January 1988. In the last few years, its primary value has been as an indicator of changes in the air quality index (AQI). The 8-hour maximum value recorded in 2009 was 8.0 ppm, while the 1-hour maximum value was 2.8 ppm.

Ozone monitoring began at Welby in July of 1973. The Welby monitor has not recorded an exceedance of the old 1-hour ozone standard since 1998. However, the trend in the 3-year average of the 4th maximum 8-hour average has been increasing since 2002. The maximum 8-hour ozone concentration recorded at this site in 2009 was 0.078 ppm, while the maximum 1-hour concentration was 0.095 ppm. The three year average of the 4th highest 8-hour average value for this site from 2007 through 2009 is 0.072 ppm, which is only slightly less than the standard value of 0.075 ppm. When the standard is lowered in August 2010, this site will exceed it.

The Welby nitrogen dioxide monitor began operation in July 1976. The site's location provides an indication of possible exceedance events before they hit the Denver-Metro area. The site serves as a good drainage location, but it may be a target for deletion or relocation farther down the South Platte River Valley from Denver. The annual average NO₂ concentration for this site was 0.015 ppm in 2009, which is well below the standard of 0.053 ppm.

The Welby sulfur dioxide monitor began operation in July of 1973. The maximum 24-hour concentration recorded here was 0.01 ppm in 2009. The annual average was 0.001 ppm, and the maximum 3-hour average was 0.0 ppm. All values were well below the SO₂ standards of 0.14 ppm (24-hour max), 0.030 ppm (annual avg.), and 0.5 ppm (3-hour max).

PM₁₀ monitoring began at Welby in June and July of 1990. The continuous monitor began operation in June, while the high volume monitor began operation in July. The maximum PM₁₀ concentration recorded in 2009 was 54 µg/m³.

Meteorological monitoring began in January of 1975.

Alamosa – Adams State College, 208 Edgemont Boulevard (08 003 0001):

This Alamosa – Adams State College site is located on the science building of Adams State College in a principally residential area. The only significant traffic is on US 160 through the center of town. The site is along this highway but far enough away to reduce direct impacts on the levels. Meteorological data are not available from the area. The city has a population of 8,458 (July 2007 population estimate). This is an increase of 6.2 percent from the 2000 census. The major particulate source is wind-blown dust. This site began operation in 1973 as a TSP monitor and was changed to a PM₁₀ monitor in June 1990. This is a population oriented neighborhood scale SLAMS monitor that is on a daily sample schedule. The maximum PM₁₀ concentration recorded at this site in 2009 was 207 µg/m³, which was an exceedance of the NAAQS. There was only one exceedance recorded at this site in 2009.

Alamosa - Municipal, 425 4th Street (08 003 0003):

The Alamosa 425 4th Street was started in May 2002. The site was established closer to the center of the city to be more representative of the population exposure in the area. This is a population oriented neighborhood scale SLAMS monitor that is on a daily sample schedule. The maximum PM₁₀ concentration recorded at this site in 2009 was 157 µg/m³, which was an exceedance of the NAAQS. There was only one exceedance recorded at this site in 2009.

Highland Reservoir, 8100 S. University Boulevard (08 005 0002):

The Highlands site began operation in June of 1978. It was intended to be a background location. However, with urban growth and the construction of C-470, it has become a long-term trend site that monitors changes in the air quality of the area. It is currently believed to be near the southern edge of the ozone "cloud," although it may not be in the area of maximum concentrations. This is a population oriented neighborhood scale SLAMS monitor. The maximum 8-hour ozone concentration recorded at this site in 2009 was 0.079 ppm, while the 1-hour maximum was 0.098 ppm. The 3-year average of the 4th maximum ozone concentration from 2007 through 2009 cannot be calculated for this site yet, as there was not enough data available in 2008 due to the site being shut down for reconstruction of other facilities at the location.

Meteorological monitoring began in July of 1978.

Arapahoe Community College (ACC), 6190 S. Santa Fe Drive (08 005 0005):

The ACC site is located in south suburban metropolitan Denver. It is located on the south side of the Arapahoe Community College in a distant parking lot. The site is near the bottom of the Platte River Valley along Santa Fe Drive (Hwy. 85) in the city of Littleton. It is also near the city of Englewood. There is a large residential area located to the east across the railroad and Light Rail tracks. The PM_{2.5} monitor is located on a mobile shelter in the rarely used South parking lot. Located at 6190 S. Santa Fe Drive, this small trailer is close to the Platte River and the monitor has excellent 360° exposure. Based on the topography and meteorology of the area ACC is in an area where PM_{2.5} emissions may collect. This location may capture high concentrations during periods of upslope flow and temperature inversion in the valley. However, since it is further south in a more sparsely populated area than the Broadway-CAMP site, the concentrations are usually not as high as other Denver locations.

Winds are predominately out of the south-southwest and south, with secondary winds out of the north and north-northeast (upslope). Observed distances and traffic estimates easily fall into the neighborhood scale in accordance with federal guidelines found in the 40 CFR, Part 58, Appendix D. The site meets all other neighborhood scale criteria, making the monitor a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

The maximum PM_{2.5} value recorded at this site in 2009 was 22.6 µg/m³, which is not an exceedance of the NAAQS.

Aurora – East, 36001 Quincy Ave (08 005 0006):

The Aurora East site began operation in June 2009. It is intended to act as a regional site and an aid in the determination of the easternmost extent of the ozone “cloud” in the metro area. It is located along the eastern edge of the former Lowry bombing range, on a flat, grassy plains area. This site is currently outside of the rapid urban growth area taking place around Aurora Reservoir. There are currently plans to begin developing the Lowry area in the near future, however, which would shift the focus of this site from being a regional site to a neighborhood scale site. This is a special projects monitor (SPM) for a regional scale. The maximum 8-hour average recorded at this site in 2009 was 0.079 ppm. The 3-year average of the 4th highest ozone concentration for 2007 through 2009 cannot be calculated at this time since the site began operation in 2009.

Pagosa Springs School, 309 Lewis Street (08 007 0001):

The Pagosa Springs School site was located on the roof of the Town Hall from April 24, 2000 through May 2001. When the Town Hall building was planned to be demolished, the PM₁₀ monitor was relocated to the Pagosa Springs Middle School and the first sample was collected on June 7, 2001.

The Pagosa Springs School site is located next to Highway 160 near the center of town. Pagosa Springs is a small town spread over a large area. The San Juan River runs through the south side of town. The town sits in a small bowl like setting with hills all around. A small commercial strip area along Highway 160 and single-family homes surrounds this location. It is representative of residential neighborhood exposure. Pagosa Springs was a PM₁₀ nonattainment area and a SIP was implemented for this area. PM₁₀ concentrations were exceeded a few times in the late 1990s. However, the PM₁₀ pollution was cleaned up through the SIP control measures and the area has only exceeded the PM₁₀ standard three times since 1994. One exceedance was due to a regional blowing dust event in March of 1999, and the other two exceedances occurred in April of 2009. The highest PM₁₀ concentration recorded at this site in 2009 was 225 µg/m³, which is well above the standard of 150 µg/m³.

Winds for this area predominantly blow from the north, with secondary winds from the north-northwest and the south. The predominant wind directions closely follow the valley topography in this rugged terrain. McCabe Creek, which is very near the meteorological station that was on the Town Hall building, runs north south through this area. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

Longmont – Municipal Bldg., 350 Kimbark Street (08 013 0003):

The town of Longmont is a growing, medium sized; Front Range community Longmont is located between the Denver/Boulder Metro-area and Fort Collins. Longmont is both suburban and rural in nature. The town of Longmont is located approximately 30 miles north of Denver along the St. Vrain Creek and is about six miles east of the foothills. Longmont is partly a bedroom community for the Denver-Boulder area. The elevation is 4978 feet. The Front Range peaks rise to an elevation of 14,000 feet just to the west of Longmont. In general, the area experiences low relative humidity, light precipitation and abundant sunshine.

The station began operations in 1985 with the installation of PM₁₀ and PM_{2.5} monitors. In 1999 an additional PM_{2.5} monitor was added to the site. The maximum PM₁₀ concentration recorded at this site in 2009 was 40 µg/m³, while the maximum PM_{2.5} concentration recorded was 24 µg/m³. Both values are well below their respective standards of 150 µg/m³, and 35

$\mu\text{g}/\text{m}^3$ (over 24 hours).

Longmont's predominant wind direction is from the north through the west due to winds draining from the St. Vrain Creek Canyon. The PM_{10} site is near the center of the city near both commercial and residential areas. This location provides the best available monitoring for population exposure to particulate matter. The distance and traffic estimate for the controlling street easily falls into the neighborhood scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 6 day sample schedule.

Longmont, 440 Main Street (08 013 0009):

The town of Longmont is a growing, medium sized, Front Range community located between the Denver/Boulder Metro-area and Fort Collins. Longmont is both suburban and rural in nature. There are no major carbon monoxide sources within 12 miles of the monitor.

In January and February of 1988 and again in the winter of 1988/89 the APCD conducted a study at a site near 11th Avenue and Main Street, a few blocks north of the downtown area. Because two exceedances of the standard were recorded during the study, the Division felt that a permanent carbon monoxide site should be established closer to the downtown area. These exceedances resulted in Longmont being designated as a carbon monoxide nonattainment area and required a SIP for carbon monoxide be developed showing attainment by December 31, 1995. The Air Quality Control Commission accepted the Longmont SIP on June 16, 1995. In 1999, Longmont was redesignated as an attainment area.

Longmont has contended that its carbon monoxide problems are generally the result of transport from the Denver metropolitan area north to the Longmont area. The review of the time series plots for Longmont, Denver CAMP, Greeley and Boulder show that the carbon monoxide maximum at all four locations generally coincide. In addition, these peaks are bimodal at 7 to 9 A.M. and 4 to 6 P.M. at all four locations. This pattern is associated with locally generated emissions from traffic, not transport from another area. The carbon monoxide emissions inventories developed for the SIP show that 78 percent of the carbon monoxide comes from on-road mobile sources. These findings are consistent with the observed distribution of the data.

Carbon monoxide monitoring is expected to continue for the next several years at the current location since the monitoring is a part of the maintenance plan for Longmont. The monitor is in the SLAMS network, and is population oriented for a neighborhood scale. The 8-hour maximum CO concentration recorded at this site in 2009 was 1.9 ppm, while the maximum 1-hour concentration was 3.5 ppm. Both values are well below the NAAQS.

South Boulder Creek, 1405½ S. Foothills Parkway (08 013 0011):

The city of Boulder is located about 30 miles to the northwest of Denver. The Boulder Foothills, South Boulder Creek site was established as a special-purpose ozone monitor as a part of the "summer 1993 Denver Ozone Study." During that summer a 1-hour level of 0.128 ppm was recorded on July 2, 1993. In 1994, the monitor was converted from an SPM to a seasonal SLAMS monitor. In 1995 it was converted to a year-round ozone monitoring site when the instruments were moved into a new shelter. The South Boulder Creek monitor has not recorded an exceedance of the 1-hour NAAQS since the summer of 1993.

Although the Foothills monitor had not exceeded the previous standard of 0.085 ppm as an 8-hour average, it does exceed the current standard of 0.075 ppm as an 8-hour average five of the past six years, and will exceed the new standard (0.060 to 0.070 ppm) due to be released in August 2010. The maximum 8-hour value recorded at this site in 2009 was 0.084 ppm, and the maximum 1-hour concentration was 0.094 ppm. The 3-year average of the 4th maximum ozone concentration is 0.078 ppm for the 2007 through 2009 time period. This is a highest concentration oriented urban scale SLAMS monitor.

Boulder Chamber of Commerce, 2440 Pearl Street (08 013 0012):

The city of Boulder is located on the eastern edge of the Rocky Mountain foothills. Most of the city sits on rolling plains. The Boulder $\text{PM}_{2.5}$ site is approximately 7,000 feet east of the base of the Front Range foothills and about 27.4 feet south of a small branch of Boulder Creek, the major creek that runs through Boulder.

PM_{10} monitoring began at this site in December of 1994, while the $\text{PM}_{2.5}$ monitoring did not begin until January of 1999. The maximum PM_{10} concentration recorded here in 2009 was $38 \mu\text{g}/\text{m}^3$, while the maximum $\text{PM}_{2.5}$ concentration was $39.4 \mu\text{g}/\text{m}^3$. The PM_{10} values were all well below the standard of $150 \mu\text{g}/\text{m}^3$. The $\text{PM}_{2.5}$ concentration was an exceedance of the standard that occurred on September 1, 2009. The exceedance was due to a wildfire that was burning in the area.

The predominant wind direction is from the west with secondary maximum frequencies from the west-northwest and west-

southwest. The distance and traffic estimate for Pearl Street and Folsom Street falls into the neighborhood scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 6 day sample schedule.

Boulder – CU - Athens, 2102 Athens Street (08 013 1001):

The Boulder - CU site is located at the edge of a low usage parking lot to the north and the football practice field to the south. This location provides a good neighborhood representation for particulates. The site began operation in November 2004, and will be removed in 2010 due to construction of a new covered air-filled dome practice field that obstructs air flow. The dome is erected each Fall, and remains inflated until Spring. It is removed during the Summer months. The maximum PM_{2.5} value recorded by the continuous monitor at this site in 2009 was 57.7 µg/m³. This is a population oriented neighborhood scale special project monitor.

Delta, 560 Dodge Street (08 029 0004):

Delta is a small agricultural community midway between Grand Junction and Montrose. The topography in and around Delta is relatively flat as it sits in the broad flat Uncompaghre River Valley. There are high mesas and mountains surrounding this high valley. Delta sits in a large bowl shaped basin that can effectively trap air pollution, especially during persistent temperature inversions.

The Delta County Health Department site was chosen because it is a one story building near the downtown area. The site began operation in August 1993, and is representative of the large basin with the potential for high PM₁₀ due to agricultural burning, automobile traffic and the former Louisiana Pacific wafer board plant. The maximum PM₁₀ value recorded at this site in 2009 was 186 µg/m³, which is an exceedance of the NAAQS. There was only one exceedance of the standard at this location in 2009. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

Denver CAMP, 2105 Broadway (08 031 0002):

The City and County of Denver is located approximately 30 miles east of the foothills of the Rocky Mountains. Denver sits in a basin, and the terrain of the city is characterized as gently rolling hills, with the Platte River running from southwest to northeast, just west of the downtown area. The CAMP site is located in downtown Denver.

Carbon monoxide monitoring began in February 1965 as a part of the Federal Continuous Air Monitoring Program. It was established as a maximum concentration (micro-scale), population-oriented monitor. The CAMP site measures the exposure of the people who work or reside in the central business district (CBD). Its location in a high traffic street canyon causes this site to record most of the high pollution episodes in the metro area. The street canyon effect at CAMP results in variable wind directions for high carbon monoxide levels and as a result wind direction is less relevant to high concentrations than wind speed. Wind speeds less than 1 mph, especially up-valley, combined with temperature inversions trap the pollution in the area. The 8-hour maximum CO value recorded in 2009 at this site was 2.5 ppm, while the 1-hour maximum was 6.9 ppm. Both values are well below the NAAQS.

The nitrogen dioxide monitor began operation in January 1973 at this location. Late in 2009 a sampling manifold issue was discovered at the site, and the data from the first three quarters of 2009, and much of 2008 was invalidated due to the problem. As such, no annual average can be calculated for this site.

The sulfur dioxide monitor began operation in January 1967. As with the NO₂, most of the data from 2008 and 2009 was invalidated due to the sampling manifold issue. The data for the last quarter (from 9/3/2009 through the end of the year) did allow for the calculation of the 3-hour and 24-hour maximums for that time period. The 3-hour maximum value recorded was 0.0 ppm, while the 24-hour maximum was 0.01 ppm. Both values are well below the NAAQS.

The PM₁₀ monitoring began in 1986 with the installation of collocated monitors, and was furthered by the addition of a continuous monitor in 1988. The maximum concentration recorded in 2009 by the primary monitor was 47 µg/m³, and by the secondary monitor was 60 µg/m³. Both values are well below the NAAQS.

The PM_{2.5} monitoring began in 1999 with a continuous and an FEM monitor, and was furthered by the addition of a collocated FEM monitor in 2001. The maximum concentration recorded in 2009 by the primary monitor was 29.5 µg/m³, and by the secondary was 24 µg/m³. Both values are well below the NAAQS.

Meteorological monitoring began at this site in January of 1965.

Denver NJH-E, 14th Avenue & Albion Street (08 031 0013):

This site is located three miles east of the Denver CBD, close to one of the busiest intersections in Denver (Colorado Boulevard and Colfax Avenue). The current site began operations in 1982. Two previous sites were located just west of the current location. The first operated for only a few months before it was moved to a new and “temporary” site in the corner of the laboratory building at the corner of Colorado Boulevard and Colfax Avenue. The maximum PM_{2.5} concentration recorded by the continuous monitor at this site in 2009 was 49.4 µg/m³. The monitor here is a population oriented middle scale special project monitor.

Denver - Carriage, 2325 W. Irving Street (08 031 0014):

Carriage is located 2.5 miles west of the CBD. It began operations in January of 1982. The site represents an ideal neighborhood exposure setting due to its unique location in an old carriage lot in the center of the block surrounded by houses. It represents a good neighborhood site for ozone exposure since it is isolated enough to be unaffected by local traffic. Ozone levels at this site have not exceeded the old 1-hour NAAQS since 1987. The maximum 8-hour ozone concentration recorded at this site in 2009 was 0.068 ppm. The 3-year average of the 4th highest ozone concentration from 2007 through 2009 is 0.070 ppm, which is less than the current standard of 0.075 ppm. However, when the standard is changed in August 2010, the value will either be equal to the standard or above it, as the new standard will be in the range of 0.060 to 0.070 ppm. This is a population oriented neighborhood scale SLAMS monitor.

Denver Visitor Center, 225 W. Colfax Avenue (08 031 0017):

The Denver Visitor Center site is located near the corner of Colfax Avenue and Tremont Street. It began operation on December 28, 1992. In 1993, this site along with the Denver CAMP and Gates monitors recorded the first exceedances of the 24-hour PM₁₀ standard in the Denver metropolitan area since 1987. The Visitor Center recorded a PM₁₀ level of 161 µg/m³ on January 14, 1993. Since then, the maximum value recorded at the site has been 119 µg/m³ in 2001. In 2009 the maximum value recorded was 53 µg/m³, which is well below the NAAQS of 150 µg/m³. In the past ten years, the 24-hour maximum levels have trended downward, while the annual average has been relatively flat by remaining around 25 µg/m³. This is a population oriented middle scale SLAMS monitor on a daily sample schedule.

Denver Firehouse #6, 1300 Blake Street (08 031 0019):

The Denver Firehouse #6 is located on the block between Auraria Parkway and Blake Street where they intersect with Speer Boulevard. This is one of the busiest intersections in downtown Denver, and computer modeling indicated that it would have high levels of carbon monoxide. The monitor is in the SLAMS network and is population oriented for a micro-scale.

In the winter of 1995, the monitor was converted from a special purpose monitor to a SLAMS monitor. In 1999, the Firehouse monitor recorded the last exceedance of the 8-hour CO standard in the Denver Metro area. The levels have continued their decline and in 2009 the maximum 8-hour concentration was 1.8 ppm, which is well below the NAAQS. It should be noted here that the data from this site are from the beginning of the year through 09/02/2009. The instrument was shut down after that while the fire station was being remodeled.

Auraria Met, 12th Street & Auraria Parkway (08 031 0021):

The Auraria meteorological monitor is located at the edge of the athletic fields and next to the parking lot for Metropolitan State College/ CU Denver. The monitor is 230 feet away from the Auraria Parkway and 350 feet from Speer Boulevard. It is one of the few locations in the CBD where wind data will be little affected by the street canyon effect of the buildings. This site will likely be removed in 2010 due to a planned building to be constructed near it.

Denver – Swansea Elementary, 4650 Columbine Street (08 031 0023):

The Denver - Swansea Elementary school site was established as a part of the toxicological study associated with the ASARCO Study conducted by the Colorado Department of Public Health and Environment. The site was established in December of 2004. The highest concentration recorded at this site in 2009 was 26.6 µg/m³, which is below the NAAQS. This population oriented neighborhood scale special project monitor is on a daily sampling schedule.

Denver Municipal Animal Shelter, 678 S. Jason Street (08 031 0025):

The Denver Municipal Animal Shelter (DMAS) site was established as a replacement for the Denver Gates particulate monitor that was located at 1050 S. Broadway, about one half mile south-southeast and on the other side of the South Platte River. The DMAS location represents the core area of the South Platte drainage in Denver. It has a good mixture of light industrial and residential areas, and is strongly affected by the mobile sources along I-25 as well as South Santa Fe Drive. The openness of the area also permits the meteorological data to be representative of the larger core Denver area. Finally, the site is on city owned property and will presumably be available for long-term trend analysis. When fully developed, the site will be established as the NCore site for the Denver Metropolitan area and will include a trace/precursor-level carbon

monoxide analyzer and a NO_y analyzer, in addition to the trace level sulfur dioxide, ozone, meteorology and particulate monitors. The site is intended as a population oriented neighborhood scale monitoring area.

The maximum 8-hour ozone concentration recorded at this site in 2009 was 0.070 ppm, while the maximum 1-hour value was 0.082 ppm. The 3-year average of the 4th maximum ozone concentration for this site from 2007 through 2009 cannot be calculated since the monitor did not start up until April of 2008.

The meteorological monitoring began in July of 2008. During the course of 2010 ^{additional} sensors will be added to the met monitoring network. These sensors will monitor relative humidity, barometric pressure, solar radiation and precipitation.

PM₁₀ monitoring began in July 2005. Currently, there is a pair of collocated high volume samplers in addition to a continuous monitor on site. The maximum value recorded by the primary monitor was 48 µg/m³, while that recorded by the secondary monitor was 50 µg/m³. Both values are well below the NAAQS.

PM_{2.5} monitoring began in 2002 with the installation of a supplemental speciation monitor, and was furthered by the addition of an FEM monitor and a continuous monitor in 2007, and a carbon speciation monitor in 2009. The maximum value recorded by the FEM monitor in 2009 was 25 µg/m³, which is below the NAAQS.

TSP/lead monitoring began in July of 2005. The largest value of the 3-month rolling average recorded by the primary and collocated lead instruments was 0.01 µg/m³, which is well below the level of the standard at 0.15 µg/m³.

Chatfield State Park, 11500 N. Roxborough Park Road (08 035 0004):

The Chatfield State Park location was established as the result of the 1993 Summer Ozone Study. The site is located on the south side of Chatfield State Park at the park offices. This location was selected over the Corps of Engineers Visitor Center across the reservoir because it was more removed from the influence of traffic along C-470. Located in the South Platte River drainage, this location is well suited for monitoring southwesterly ozone formation in the Denver metro area.

The Chatfield monitor has exceeded the ozone standard each of the past five years and the trend of the 3-year averages is increasing. The 8-hour maximum concentration recorded at this site in 2009 was 0.085 ppm, while the 1-hour maximum was 0.109 ppm. The 3-year average of the 4th maximum ozone concentration for 2007 through 2009 is 0.077 ppm, which exceeds the current standard, and will exceed the new lowered standard to be announced in August 2010. The new standard is expected to be in the 0.060 to 0.070 ppm range. This is a highest concentration oriented urban scale SLAMS monitor.

PM_{2.5} monitoring began at this site in 2004 with the installation of a continuous monitor, and was furthered by the addition of an FEM monitor in 2005. The maximum concentration recorded at this site in 2009 was 21.7 µg/m³, which is below the NAAQS.

Meteorological monitoring began in April of 2004.

Elbert County, 24950 Ben Kelly Road (08 039 0001):

The Elbert County site is believed to be a good location to measure urban background concentrations of PM_{2.5}. Winter winds at Elbert are from the southwest to southeast at 4-5 m/s during the morning hours. During the afternoon hours, brisk winds are generally from the south-southwest to the southeast. This shows that the Denver Metropolitan Area does not influence the winds moving across the monitoring site. A July 1981 analyses of surface streamline was done to study summer wind patterns in this same area. The study shows that in the later morning hours (0800), winds predominately blow from the north and northeast, placing the Denver Metro-Area upwind of the site. Although, during the early morning hours, wind flows off the Cheyenne Ridge and Palmer Lake Divide into the river basins to the north and south, away from the Elbert County monitoring site. By early afternoon (1100) and continuing through later afternoon (1400), up slope flow occurs over nearly the entire region, bringing clean air from the east and northeast to the site. By the evening hours, winds again predominately flow from the mountain region, with these westerly winds again flowing off the Palmer Lake Divide, away from the monitoring site. This would suggest that the Elbert County site is a very clean location for winter months and for early morning, afternoon and evening hours during the summer months. The low PM_{2.5} measured concentrations since 2001 also indicate that this is a clean background site. The annual average for 2009 was 3.9 µg/m³, and the 98th percentile concentration was 9.7 µg/m³.

The location of this Elbert County site classifies it as an urban background site, in accordance with federal guidelines found in 40 CFR, Part 58, Appendix D. The site meets all guidelines for the urban background site. This monitor is a background oriented regional scale SLAMS monitor on a 1 in 6 day sampling schedule. The maximum PM_{2.5} concentration recorded at

this site in 2009 was $10.5 \mu\text{g}/\text{m}^3$, which is well below the NAAQS.

Colorado Springs, USAFA Road 640 (08 041 0013):

The United States Air Force Academy site was installed as a replacement maximum concentration ozone monitor for the Chestnut Street (08 041 0012) site. Modeling in the Colorado Springs area indicates that high ozone concentrations should generally be found along either the Monument Creek drainage to the north of the Colorado Springs central business district (CBD), or to a lesser extent along the Fountain Creek drainage to the west of the CBD. The decision was made to locate this site near the Monument Creek drainage, approximately 9 miles north of the CBD. This location is near the south entrance of the Academy but away from any roads. This is a population oriented urban scale SLAMS monitor.

The Academy monitor did record an exceedance of the old 1-hour standard in 2003 but it would not have recorded any exceedances of the current 8-hour standard. However the trend in values over the past ten years is increasing. The maximum 8-hour ozone concentration recorded at this site in 2009 was 0.064 ppm, with a 1-hour max of 0.076 ppm. The 3-year average of the 4th maximum ozone concentration for 2007 through 2009 is 0.067 ppm, which is below the current NAAQS, but will likely be above the new ozone standard set to be released in August 2010. The new standard value is expected to lie between 0.060 and 0.070 ppm.

Colorado Springs Hwy-24, 690 W. Highway 24 (08 041 0015):

The 690 W. Highway 24 site is located just to the west of I-25 and just to the east of the intersection of U.S. Highway 24 and 8th Street, approximately 0.8 miles to the west of the Colorado Springs CBD. Commencing operation in November 1998, this site is a replacement for the Tejon Street (08 041 0004) carbon monoxide monitor. The site is located in the Fountain Creek drainage and is in one of the busiest traffic areas of Colorado Springs. Additionally, traffic is prone to back-up along Highway 24 due to a traffic light at 8th Street. Thus, this site is well suited for the SLAMS network to monitor maximum concentrations of carbon monoxide in the area both from automotive sources and also from nearby industry, which includes a power plant. It also provides a micro-scale setting for the Colorado Springs area, which has not been possible in the past.

The 8-hour maximum CO value recorded at this site in 2009 was 2.7 ppm, and the 1-hour max was 3.8 ppm, which are both well below their respective NAAQS.

In 2010 the APCD expects to install meteorological monitors at this site.

Manitou Springs, 101 Banks Place (08 041 0016):

Manitou Springs is a located 4 miles west of Colorado Springs. It was established because of concern that the “ozone cloud” was traveling farther up the canyon and the current monitoring network was not adequate. The Manitou Springs monitor began operations in April 2004. It is located in the foothills above Colorado Springs in the back of the maintenance area at the site. In its four seasons of operation it has not recorded any levels greater than the current standard. The trend in 8-hour concentrations is increasing, however.

The 8-hour maximum ozone value recorded at this site in 2009 was 0.071 ppm, which is below the current NAAQS. The 3-year average of the 4th maximum ozone value for 2007 through 2009 is 0.069. This value will likely exceed the new standard (0.060 to 0.070 ppm) due to be released in August 2010. This is a population oriented neighborhood scale SLAMS monitor.

Colorado Springs - Colorado College, 130 W. Cache la Poudre Street (08 041 0017):

The Colorado Springs - Colorado College monitoring site was established in 2007 after the revised particulate regulations required that Colorado Springs needed a continuous PM_{2.5} monitor. The Department elected to collocate the new PM_{2.5} monitor with the corresponding filter based monitors from the RBD site at the Colorado College location, which included a FEM PM_{2.5} monitor and a low volume PM₁₀ monitor. The continuous monitor began operation in January of 2008.

The nearest representative meteorological site is located at the Colorado Springs Airport. Wind flows at the Colorado College site are affected by its proximity to Fountain Creek, so light drainage winds will follow the creek in a north/south direction. The three monitors here are population oriented neighborhood scale monitors, two on the SLAMS network (PM₁₀ and PM_{2.5}) and one that is a special projects monitor (PM_{2.5} continuous).

The maximum value recorded by the PM₁₀ monitor at this site in 2009 was $35 \mu\text{g}/\text{m}^3$, which is well under the NAAQS. The maximum value recorded by the PM_{2.5} monitor at this site in 2009 was $15.5 \mu\text{g}/\text{m}^3$; again this value is well under the NAAQS.

Cañon City - City Hall, 128 Main Street (08 043 0003):

Cañon City is located 39 miles west of Pueblo. Particulate monitoring began on January 2, 1969 with the operation of a TSP monitor located on the roof of the courthouse building at 7th Avenue and Macon Street. The Macon Street site was relocated to the City Hall in October of 2004.

The Cañon City PM₁₀ site began operation in December 1987. On May 6, 1988, the Macon Street monitor recorded a PM₁₀ concentration of 172 µg/m³. This is the only exceedance of either the 24-hour or annual NAAQS since PM₁₀ monitoring was established at Cañon City. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 6 day sample schedule.

The maximum PM₁₀ concentration recorded at this site in 2009 was 38 µg/m³, which is well below the NAAQS.

Parachute – High School, 100 E. 2nd Street (08 045 0005):

The parachute site began operation in May 2000 with the installation of a PM₁₀ monitor at the high school. The annual average has been trending upward, but is still just over one half of the former annual standard for PM₁₀ which was 50µg/m³. The maximum value recorded at this site in 2009 was 88 µg/m³, which is below the NAAQS. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

Rifle - Henry Building, 144 3rd Street (08 045 0007):

The first Rifle site began operation in June 1985 and ended operation in May 1986. The next site began operation in December 1987 and continued until 2001. The levels at that site, with the exception of the March 31, 1999 high wind event, were always less than one half of both the annual and the 24-hour standards. The current location on the Henry Building began operation in May of 2005 with the installation of a PM₁₀ monitor as a part of the Garfield County study. There are now two population oriented neighborhood scale special project PM₁₀ monitors: one on a 1 in 3 day sample schedule, and one that is continuous. There is also a continuous PM_{2.5} monitor, a continuous PM Course monitor, and meteorological monitors. The maximum PM₁₀ value recorded at this site in 2009 was 83 µg/m³, which is below the NAAQS.

Rifle – Health Dept., 195 14th Ave (08 045 0012):

The Rifle Health site is located at the Garfield County Health Department building. The site is 1 km to the north of the downtown area and next to the Garfield County fairgrounds. The site is uphill from the downtown area. A small residential area is to the north and a commercial area to the east. This site was established to measure ozone in Rifle, which is the largest population center in the oil and gas impacted area of the Grand Valley. Monitoring commenced in June 2008. This is a special projects monitor with a neighborhood scale. The 8-hour maximum ozone concentration recorded at this site in 2009 was 0.064 ppm, which is below the current standard. This may change, however, when the new standard is introduced in August 2010. It is expected to be in the range of 0.060 to 0.070 ppm. A 3-year 4th maximum ozone concentration for 2007 through 2009 cannot be calculated for this site yet, as operations only began in 2008.

Crested Butte, 603 6th Street (08 051 0004):

The Crested Butte PM₁₀ site began operation in June 1985. Crested Butte is a high mountain ski town. The monitor is at the east end of town near the highway and in the central business district. Any wood burning from the residential area to the west directly affects this location. The physical setting of the town, near the end of a steep mountain valley, makes wood burning, street sanding and wintertime inversions a major concern. The town is attempting to regulate the number of wood burning appliances, since this is a major source of wintertime PM₁₀.

There are two population oriented neighborhood scale monitors here, one in the SLAMS network (1 in 3 day sample schedule) and one that is a quality assurance collocated monitor (1 in 6 day sample schedule). Crested Butte has not recorded an exceedance of the NAAQS since it began monitoring. The maximum PM₁₀ value recorded at this site by the primary monitor in 2009 was 99 µg/m³, while the value recorded by the collocated secondary monitor was 103 µg/m³. Both values are below the standard of 150 µg/m³.

Mt. Crested Butte Realty, 19 Emmons Road (08 051 0007):

Mount Crested Butte is located at an elevation of 8,940 feet (2,725 m) at the base of the Crested Butte Mountain Resort ski area. Mount Crested Butte is a unique location for high particulate matter concentrations because it is located on the side of a mountain (Crested Butte 12,162 ft. or 3,707 m), not in a bowl, valley, or other topographic feature that would normally trap air pollutants. There is not a representative meteorological station in or near Mt. Crested Butte.

The location for the Mt. Crested Butte site was selected because it had an existing PM₁₀ site that had several high PM₁₀ concentrations including five exceedances of the 24-hour standard in 1997 and one in 1998. Mt. Crested Butte also exceeded

the PM₁₀ annual average standard in 1997. A CMB source apportionment from 10 PM₁₀ filters identified crustal material as the mostly likely source (91 percent) of PM₁₀. Carbon, which is most likely from residential wood smoke, made up 8 percent of the statistically composite sample and secondary species made up the remaining 1 percent. The Mt. Crested Butte site was also selected because it is an area representative of the residential impact of PM_{2.5}. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The maximum PM₁₀ value recorded at this site in 2009 was 83 µg/m³, which is less than the NAAQS of 150 µg/m³.

Arvada, 9101 57th Avenue (08 059 0002):

The city of Arvada is located 15 miles west-northwest of the Denver central business district (CBD). The Arvada site began operation before 1973. It is located to the northwest of the Denver CBD near the western end of the diurnal midday wind flow of the ozone “cloud.” As a result, when conditions are proper for daylong ozone production, this site has received some of the highest levels in the city. In the early and mid 1990s, these wind patterns caused Arvada to have the most exceedances in the metro area.

The Arvada monitor has exceeded the ozone standard six of the past ten years, and the years that it would not have exceeded the standard it was just below the level of the standard. The 8-hour maximum ozone value recorded at this site in 2009 was 0.078 ppm. The 3 year average of the 4th maximum ozone concentration for 2007 through 2009 is 0.074 ppm, which is just below the level of the current standard (0.075 ppm). When the new standard comes out in August 2010, this site will not be in compliance with it, as it is expected to be in the 0.060 to 0.070 ppm range. This is a population oriented neighborhood scale SLAMS monitor.

Meteorological monitoring began in 1975.

Welch, 12400 W. Highway 285 (08 059 0005):

The Division conducted a short-term ozone study on the grounds of Chatfield High School from June 14, 1989 until September 28, 1989. The Chatfield High School location was chosen because it sits on a ridge southwest of the Denver CBD. Wind pattern studies showed a potential for elevated ozone levels in the area on mid to late afternoon summer days. There were no exceedances of the NAAQS recorded at the Chatfield High School site, but the levels were frequently higher than those recorded at the other monitoring sites south of the metro area.

One finding of the study was the need for a new, permanent site further north of the Chatfield High School location. As with most Denver locations, the predominant wind pattern is north/south. The southern flow occurs during the upslope, daytime warming period. The northern flow occurs during late afternoon and nighttime when drainage is caused by cooling and settling. The major drainages of Bear Creek and Turkey Creek were selected as target downwind transport corridors. These are the first major topographical features north of the Chatfield High School site. A point midway between the valley floor (Englewood site) and the foothill’s hogback ridge was modeled to be the best estimate of the maximum downwind daytime transport area. These criteria were used to evaluate available locations. The Welch site best met these conditions. This site is located off State Highway 285 between Kipling Street and C-470.

The Welch monitor has not exceeded the new standard in the past ten years. However, since 2002 the trend in values is increasing, and in 2008 the 3-year average was above the level of the standard. In 2009 the maximum 8-hour ozone value recorded at this site was 0.078 ppm. The 3-year average of the 4th maximum ozone concentration is 0.074 ppm for 2007 through 2009, which is just below the level of the current standard of 0.075 ppm. Once the standard is revised in August 2010, this site will be in exceedance of the new standard, which is expected to be in the range of 0.060 and 0.070 ppm. This is a population oriented urban scale SLAMS monitor.

Rocky Flats - N, 16600 W. Highway 128 (08 059 0006):

The Rocky Flats - N site is located north-north east of the plant on the south side of Colorado Highway 128, approximately 1¼ miles to the west of Indiana Street. The site began operation in June 1992 with the installation of an ozone monitor and meteorological monitors as a part of the first phase of the APCD’s monitoring effort around the Rocky Flats Environmental Technology Site.

Ozone monitoring began as a part of the “Summer 1993 Ozone Study.” The monitor recorded some of the highest ozone levels of any of the sites during that study. Therefore, it was included as a regular part of the APCD ozone-monitoring network. The Rocky Flats – N monitor has exceeded the current standard each of the last eleven years and fourteen out of the last sixteen years. The 8-hour maximum ozone concentration recorded at this site in 2009 was 0.086 ppm. The 3-year average of the 4th maximum ozone concentration for 2007 through 2009 is 0.082 ppm, which exceeds the level of the current

standard, and will exceed the level of the proposed new standard (0.060 to 0.070 ppm). This is a highest concentration oriented urban scale SLAMS monitor.

Rocky Flats - SE, 9901 Indiana Street (08 059 0008):

This site is located along Indiana Street southeast of Rocky Flats. The winds at this location are appreciably different from either the Rocky Flats North site or the Arvada site. The site began operation in August of 1991. The site is scheduled for shut-down and removal in 2010.

NREL Solar Radiation Research Laboratory, 2054 Quaker Street (08 059 0011):

The National Renewable Energy Laboratory (NREL) site is located on the south rim of South Table Mountain, near Golden, and was part of the "1993 Summer Ozone Study." Based on the elevated concentrations found at this location, it was made a permanent monitoring site in 1994. This site typically records some of the higher 8-hour ozone concentrations in the Denver area. It has exceeded the current standard each of the past 14 years it has been in operation. The 8-hour maximum concentration recorded at this site in 2009 was 0.081 ppm. The 3-year average of the 4th maximum ozone concentration for 2007 through 2009 is 0.077 ppm, which is above the level of the current standard, and will be above the level of the proposed new standard (0.060 to 0.070 ppm). This is a highest concentration oriented urban scale SLAMS monitor.

Aspen Park, 26137 Conifer Road (08 059 0013):

The Aspen Park site began operation in May 2009. It is intended to verify/refute model predictions of above normal ozone levels. In addition, passive ozone monitors used in the area in a 2007 study indicated the possibility of higher ozone levels. The monitor is located in an urban setting at a Park N Ride facility off of Highway 285, at an elevation of just over 8,100 feet. Because the site is nearly 3,000 feet higher than the average metro area elevation, it should see ozone levels that are larger than those seen in the metro area, as ozone concentrations increase with increasing elevation. Whether or not the increased concentrations will be a health concern will be determined with the data gathered from this monitor. This is a special purpose neighborhood scale monitor.

The 8-hour maximum ozone concentration recorded at this site in 2009 was 0.077 ppm. A 3-year average of the 4th maximum ozone concentration cannot be calculated for this site from 2007 through 2009 as it began operation in 2009.

Durango - River City Hall, 1235 Camino del Rio (08 067 0004):

Durango is the second largest city on the western slope. The town is situated in the Animas River Valley in southwestern Colorado. Its elevation is approximately 6,500 feet (1981 meters) above mean sea level. The Animas valley through Durango is steep and narrow. Even though little meteorological information is available for the area, the microclimate of Colorado mountain communities is characterized by cold air subsidence, or drainage flows during the evening and early morning hours and up valley flows during afternoon and early evening hours when solar heating is highest. Temperature inversions that trap air pollutants near the surface are common during night and early morning hours. This is a population oriented neighborhood scale SLAMS monitor that samples continuously.

The maximum PM₁₀ concentration recorded at this site in 2009 was 203 µg/m³, which is an exceedance of the NAAQS. This site also exceeded the NAAQS one other time with a value of 198 µg/m³.

Fort Collins – CSU – Edison, 251 Edison Street (08 069 0009):

Fort Collins does not have the population to require a particulate monitor under Federal regulations. However, it is one of the largest cities along the Front Range. There are two population oriented neighborhood scale SLAMS monitors, a PM₁₀ and a PM_{2.5}, that sample on a 1 in 3 day sample schedule. There are also two continuous monitors, one PM₁₀ and one PM_{2.5}.

The maximum PM₁₀ concentration recorded at this site in 2009 was 61 µg/m³. The maximum PM_{2.5} concentration recorded was 28.7 µg/m³. Both values are below their respective NAAQS.

Fort Collins - West, 3416 W. La Porte Avenue (08 069 0011):

The Fort Collins-West monitor began operation in May of 2006. The location was established based on modeling and to satisfy permit conditions for a major source in Fort Collins area. The levels recorded for the first season of operation showed consistently higher concentrations than the 708 S. Mason Street monitor. For 2009 the 3-year average of the 4th maximum 8-hour average value was 0.078 ppm. The same average at the Mason Street monitor was 0.065 ppm for the same period. This site exceeds the current standard of 0.075 ppm, and will exceed the proposed new standard of 0.060 to 0.070 ppm when it is introduced in August 2010. The highest 8-hour average recorded here in 2009 was 0.082 ppm. This is a highest concentration oriented urban scale SLAMS monitor.

Rist Canyon, 11838 Rist Canyon Road, (08 069 0012):

The Rist Canyon site began operation in May 2009. The monitor is located within the Rist Canyon Volunteer Fire Department Station Number 1, in the foothills west of Fort Collins. The monitor is at an elevation of 6,750 feet, which is roughly 1,600 feet above the Fort Collins – West monitor. Model predictions have indicated possible elevated ozone levels in this area. The site is intended to verify/refute the model prediction. This is an urban scale special purpose monitor.

In 2009 the largest 8-hour average ozone concentration recorded at this site was 0.071 ppm. A 3-year average of the 4th maximum ozone concentration for 2007 through 2009 cannot yet be calculated for this site as it just began operation in 2009.

Fort Collins- Mason, 708 S. Mason Street (08 069 1004):

The 708 S. Mason Street site began operation in December 1980 and is located one block west of College Avenue in the Central Business District. The 1-hour carbon monoxide standard of 35 ppm as a 1-hour average has only been exceeded on December 1, 1983, at 4:00 P.M. and again at 5:00 P.M. The values reported were 43.9 ppm and 43.2 ppm respectively. The 8-hour standard of 9 ppm was exceeded one or more times a year from 1980 through 1989. The last exceedances were in 1991 on January 31 and December 6 when values of 9.8 ppm and 10.0 ppm respectively were recorded.

Fort Collins does not have the population to require a carbon monoxide monitor under Federal regulation. However, it is one of the largest cities along the Front Range and was declared in nonattainment for carbon monoxide in the mid-1970s after exceeding the 8-hour standard in both 1974 and 1975. The current level of monitoring is in part a function of the resulting carbon monoxide SIP for the area. It is a population oriented neighborhood scale SLAMS monitor. The 8-hour maximum concentration recorded at this site in 2009 was 1.9 ppm. The 1-hour max recorded was 3.5 ppm. Both values are well below the NAAQS for CO.

Ozone monitoring began in 1980, and continues today. The 8-hour average ozone maximum value recorded here in 2009 was 0.074 ppm, which is just below the level of the current standard. The 3-year average of the 4th maximum ozone concentrations for 2007 through 2009 is 0.065 ppm, which is below the level of the current standard, but could be above the level of the proposed new standard depending on where it is set (0.060 to 0.070 ppm).

Grand Junction - Powell, 650 South Avenue (08 077 0017):

Grand Junction is the largest city on the western slope in the broad valley of the Colorado River. The monitors are on county owned buildings in the south side of the city. The site is on the southern end of the central business district and close to the industrial area along the train tracks. It is about a half a mile north of the river and about a quarter mile east of the railroad yard. This site monitors for 24-hour and hourly PM₁₀ as well as for 24-hour and hourly PM_{2.5}.

The maximum PM₁₀ concentration recorded at this site in 2009 was 68.4 µg/m³, which is below the level of the standard. The maximum PM_{2.5} concentration recorded here in 2009 was 59.1 µg/m³. This is an exceedance of the standard. The PM_{2.5} monitor recorded a total of 6 exceedances throughout 2009.

Grand Junction - Pitkin, 645¼ Pitkin Avenue (08 077 0018):

The Grand Junction-Pitkin CO monitor began operation in January 2004. This monitor replaced the site at the Stocker Stadium. The Stocker Stadium location had become less than ideal with the growth of the trees surrounding the park and the Division felt that a location nearer to the central business district (CBD) would provide a better representation of carbon monoxide concentration values for the city. The carbon monoxide concentrations at the Stocker Stadium site had been declining from an 8-hour maximum in 1991 of 7.8 ppm to a 3.3 ppm in 2003. The Pitkin monitor has shown a continuing decline in the 8-hour average values to 2.2 ppm in 2009, which is well below the standard. It is a population oriented, micro-scale SLAMS monitor.

Meteorological monitors were installed in 2004, and include wind speed, wind direction, temperature and relative humidity sensors.

Clifton, Hwy 141 & D Road (08 077 0019):

The Clifton PM₁₀ monitor is located in the town of Clifton which is a southeastern suburb of Grand Junction, Colorado. The monitor is in a low usage parking lot operated by the sanitation district. It is one half mile north of the Colorado River. The site was established at the request of the Mesa County Health Department to address concerns of oil and gas related industries in the area.

The population oriented neighborhood scale SLAMS monitor began operations in October 2007, and operates on an every third day schedule. The maximum PM₁₀ concentration recorded at this site in 2009 was 147 µg/m³, which is very near the

level of the standard.

Palisade Water Treatment, Rapid Creek Rd (08 077 0020):

The Palisade site is located at the Palisade Water Treatment Plant. The site is 4 km to the east-northeast of downtown Palisade, just into the De Beque Canyon area. The site is remote from any significant population and was established to measure maximum concentrations of ozone that may result from summertime up-flow conditions into a topographical trap. Monitoring commenced in May 2008. This is an urban scale special purpose monitor. The maximum 8-hour average ozone concentration recorded at this site in 2009 was 0.067 ppm, which is below the level of the current standard. This could change, however, when the proposed new ozone standard is announced in August 2010. It is expected to be in the range of 0.060 to 0.070 ppm. A 3-year average of the 4th maximum 8-hour ozone values cannot be calculated for this site for 2007 through 2009 as it only began operating in 2008.

Cortez, 106 W. North St (08 083 0006):

The Cortez site is located in downtown Cortez at the Montezuma County Health Department building. Cortez is the largest population center in Montezuma County in the southwest corner of Colorado. Currently, there are ozone and PM_{2.5} monitors in operation at this site.

The ozone site was established to address community concerns of possible high ozone from oil and gas and power plant emissions in the area. Many of these sources are in New Mexico. Monitoring commenced in May 2008. This is an urban scale special purpose monitor. The maximum 8-hour average value recorded here in 2009 was 0.066 ppm, which is below the level of the current standard. This could change, however, when the proposed new ozone standard is announced in August 2010. It is expected to be in the range of 0.060 to 0.070 ppm. A 3-year average of the 4th maximum 8-hour ozone values cannot be calculated for this site for 2007 through 2009 as it only began operating in 2008.

Aspen - Library, 120 Mill Street (08 097 0006):

Aspen is at the upper end of a steep mountain valley. Aspen does not have an interstate running through it. Aspen was classified as nonattainment for PM₁₀, but it is now under an attainment/maintenance plan. The valley is more restricted at the lower end, and thus forms a tighter trap for pollutants. The transient population due to winter skiing and summer mountain activities greatly increases the population and traffic during these seasons. There is also a large down valley population that commutes to work each day from as far away as the Glenwood Springs area, which is 41 miles to the northeast.

There have been several particulate monitors in the Aspen area. Only three have not been short-term special studies. The first PM₁₀ monitor began operation in June 1985. The next, the Sport Stalker, was chosen after an intense effort involving EPA, State and local agency personnel. The need was to find an acceptable middle scale location. The population oriented neighborhood scale SLAMS monitor is on a 1 in 3 sample schedule. The largest PM₁₀ concentration recorded at this site in 2009 was 47 µg/m³, which is below the level of the standard.

Lamar Power Plant, 100 2nd Street (08 099 0001):

Lamar is one of the largest cities on the eastern plains. Particulate monitoring in Lamar began in August 1975 with the installation of a TSP site at the Lamar power plant at 100 2nd Street. It operated as a TSP site until August of 1986. The first Lamar PM₁₀ site began operation in June 1985 at the power plant. In August 1986, the monitoring site was moved to the Municipal Complex (08 099 0002).

On March 19, 1976, the Lamar power plant monitor recorded a TSP concentration of 1,033 µg/m³. This is the fourth highest particulate concentration ever reported in Colorado. Lamar has regularly recorded its highest TSP and PM₁₀ levels in March. Between 1975 and 1986 the power plant monitor reported 25 concentrations greater than the 24-hour TSP NAAQS of 260 µg/m³, twelve of these occurred in March, no other month had more than three. Three of the seven exceedances of the 24-hour PM₁₀ NAAQS have also occurred in March. The primary reason for this relationship is due to the combination of low humidity and high winds that are common during the month of March. Lamar is the only Colorado city east of Denver to have been designated as a PM₁₀ nonattainment area, and is now under an attainment/maintenance plan. In 1992, the Division reinstated the power plant location as well. This was done after a review showed that levels at the power plant were generally higher than those at the City Complex. As a part of the SIP for Lamar, a meteorological site was established in 1992 at the city complex location. Analysis of these data was included as a part of the SIP process. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The highest PM₁₀ concentration recorded at this site in 2009 was 233 µg/m³, which exceeds the level of the standard. There were also two other exceedances of the standard at this site in 2009 with values of 174 and 171 µg/m³.

This site will likely be relocated in 2010 due to conversion of the power plant to coal-fired.

Lamar - Municipal Building, 104 Parmenter Street (08 099 0002):

The Lamar Municipal site was established in January of 1996 as a more population oriented location than the Power Plant. The Power Plant site is located on the northern edge of town while the Municipal site is near the center of the town. Both sites have recorded exceedances of the 24-hour standard of $150 \mu\text{g}/\text{m}^3$, and both sites regularly record values above $100 \mu\text{g}/\text{m}^3$ as a 24-hour average. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The highest PM_{10} concentration recorded at this site in 2009 was $176 \mu\text{g}/\text{m}^3$, which exceeds the level of the standard. There was also one other exceedance of the standard at this site in 2009 with a value of $173 \mu\text{g}/\text{m}^3$.

Lamar Port of Entry, 7100 US Highway 50, (08 099 0003):

The particulate monitors in Lamar have recorded some of the highest readings in the state. These readings are primarily associated with east winds in excess of 20 mph. The Division first established a meteorological monitor in Lamar at the Municipal Building but this location was too protected and the monitor was moved to the Port of Entry location in March of 2005.

Pueblo – Fountain Magnet School, 925 N. Glendale Ave (08 101 0015):

Pueblo is the third largest city in the state, not counting communities that are part of Metropolitan Denver. Pueblo is principally characterized by rolling plains and moderate slopes with elevations ranging from 4,474 ft to 4,814 ft (1,364 to 1,467 m). The Rocky Mountain Front Range is about 25 miles (40 km) west and the sight of Pikes Peak is easily visible on a clear day.

Meteorologically, Pueblo can be described as having mild weather with an average of about 300 days of sunshine per year. Generally, wind blows up valley from the southeast during the day and down valley from the west at night. Pueblo experiences average wind speed ranges from 7 miles per hour in the fall and early winter to 11 miles per hour in the spring.

This site was formerly located on the roof of the Public Works Building at 211 E. D St., in a relatively flat area found two blocks northeast of the Arkansas River. At the end of June in 2009 the Public Works site was shut down and moved to the Magnet School site as the construction of a new multi-story building caused a major change in the flow dynamics of the site. The new site began operations in 2009. The distance and traffic estimate for the surrounding streets easily falls into the middle scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D.

The largest PM_{10} concentration recorded at this site in the last quarter of 2009 was $30 \mu\text{g}/\text{m}^3$, which is lower than the level of the standard. The largest $\text{PM}_{2.5}$ concentration here in the last quarter of 2009 was $14.4 \mu\text{g}/\text{m}^3$, which is lower than the level of the standard.

Steamboat Springs, 136 6th Street (08 107 0003):

Like other ski towns, Steamboat Springs has problems with wintertime inversions, high traffic density, wood smoke and street sand. These problems are exacerbated by temperature inversions that trap the pollution in the valleys.

The first site began operation in Steamboat Springs in June 1985 at 929 Lincoln Avenue. It was moved to the current location in October 1986. The 136 6th Street location not only provides a good indication of population exposure, since it is more centrally located, but it has better accessibility than the previous location. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The largest PM_{10} concentration recorded at this site in 2009 was $83 \mu\text{g}/\text{m}^3$, which is below the level of the standard.

Telluride, 333 W. Colorado Avenue (08 117 0002):

Telluride is a high mountain ski town in a narrow box end valley. The San Miguel River runs through the south end of town and the town is only about $\frac{1}{2}$ mile wide from north to south. The topography of this mountain valley regime creates temperature inversions that can last for several days during the winter. Temperature inversions can trap air pollution close to the ground. Telluride sits in a valley that trends mainly east to west, which can trap air pollutants more effectively since the prevailing winds in this latitude are the westerly and the San Miguel River Valley is closed off on the east end. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

The largest PM_{10} concentration recorded at this site in 2009 was $130 \mu\text{g}/\text{m}^3$, which is below the level of the standard.

Breckenridge - 501 N. Park Avenue (08 119 0002):

The City of Breckenridge is located in the valley of the Blue River. It is a tourist center with skiing in the winter and numerous summertime festivals and activities. The resulting wood smoke and traffic caused sufficient concern that the city of Breckenridge requested that the APCD establish PM₁₀ monitoring in the area. The Breckenridge site began operation in April 1992 and it recorded exceedances of the level of the 24-hour standard in both 2000 and in 2005. The site is currently operating on an every third day sampling schedule. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

The largest PM₁₀ concentration recorded at this site in 2009 was 101 µg/m³, which is below the level of the standard.

Greeley - Hospital, 1516 Hospital Road (08 123 0006):

The Greeley PM₁₀ monitor is on the roof of a hospital office building at 1516 Hospital Road. Greeley Central High School is located immediately to the east of the monitoring site. Overall, this is in an area of mixed residential and commercial development that makes it a good population exposure, neighborhood scale monitor. The distance and traffic estimate for the most controlling street easily falls into the neighborhood scale in accordance with federal guidelines found in 40 CFR, Part 58. This is a population oriented neighborhood scale SLAMS monitor on a 1 in 3 day sample schedule.

Winds in this area are primarily out of the northwest, with dominant wind speeds less than 3.1 m/s. Secondary winds are from the north, north-northwest and east-southeast, with the most frequent wind speeds also being less than 3.1 m/s. The most recent available wind data for this station is for the period December 1986 to November 1987. Predominant residential growth patterns are to the west and north with large industrial growth expected to the west. There are two feedlots located about 11 miles east of the town. There was a closer feedlot on the east edge of town, but it was shut down in early 1999, after the town of Greeley purchased the land in 1997.

The largest PM₁₀ concentration recorded at this site in 2009 was 63 µg/m³, which is below the level of the standard. The largest PM_{2.5} concentration recorded at this site in 2009 was 38.1 µg/m³, which exceeds the level of the standard. This was the only PM_{2.5} exceedance at this site in 2009.

Platteville, 1004 Main Street (08 123 0008):

Platteville is located immediately west of Highway 85 along the Platte River valley bottom approximately five miles east of I-25, at an elevation of 4,825 feet. The area is characterized by relatively flat terrain and is located about one mile east of the South Platte. The National Oceanic and Atmospheric Administration operated the PROFS (Prototype Regional Observational Forecasting System) Mesonet network of meteorological monitors from the early 1990s through the mid 1990s in the northern Colorado Front Range area. Based on this data, the area around Platteville is one of the last places in the wintertime that the cold pool of air that is formed by temperature inversions burns off. This is due to solar heating. The upslope/down slope Platte River Valley drainage and wind flows between Denver and Greeley make Platteville a good place to monitor PM_{2.5}. These characteristics also make it an ideal location for chemical speciation sampling, which began at the end of 2001.

The Platteville site is located at 1004 Main Street at the South Valley Middle School, located on the south side of town on Main Street. The school is a one-story building and it has a roof hatch from a locked interior room providing easy access to its large flat roof. There is a 2-story gym attached to the building approximately 28 meters to the Northwest of the monitor. The location of the Platteville monitor easily falls into the regional transport scale in accordance with federal guidelines found in 40 CFR, Part 58, and Appendix D. There are three monitors here. Two are population oriented regional scale monitors, one of which is on the SLAMS network and the other is for supplemental speciation. The SLAMS monitor is on a 1 in 3 day sample schedule, while the speciation monitor is on a 1 in 6 day schedule. The remaining monitor is a population oriented neighborhood scale supplemental speciation monitor on a 1 in 6 day sample schedule.

The largest PM_{2.5} concentration recorded at this site in 2009 was 26.6 µg/m³, which is below the level of the standard.

Greeley - Weld County Tower, 3101 35th Avenue (08 123 0009):

The Weld County Tower ozone monitor began operation in June 2002. The site was established after the 811 15th Street building was sold and was scheduled for conversion to other uses. The Weld County Tower site has generally recorded levels greater than the old site and would have exceeded the new standard each year since it began operation in 2002. This is a population oriented neighborhood scale SLAMS monitor.

The maximum 8-hour average ozone concentration recorded at this site in 2009 was 0.071 ppm, which is below the level of the current standard (0.075 ppm). The 3-year average of the 4th maximum ozone concentrations from 2007 through 2009 is

0.071 ppm, which is just below the level of the current standard. This will change, however, when the new ozone standard is introduced in August 2010. The new standard will be in the range of 0.060 to 0.070 ppm, which would put this monitor as exceeding the standard.

Greeley West Annex Bldg, 905 10th Avenue (08 123 0010):

Greeley does not have the population to require a carbon monoxide monitor under Federal regulation. However, it is one of the larger cities along the Front Range and was declared in nonattainment for carbon monoxide in the late-1970s after exceeding the 8-hour standard in 1976 and 1977. The first Greeley monitor operated from December 1976 to December 1980. It was located at 15th Street and 16th Avenue and exceeded the 8-hour standard numerous times from 1976 through 1980. The monitor is a population oriented neighborhood scale SLAMS monitor.

The 811 15th Street location began operation in November 1981 and was discontinued in 2002. The current monitor is located in the Weld County West Annex building, and began operations in December 2003. This location is in the Greeley central business district (CBD). The levels recorded at this site are comparable but slightly lower than those at the former 811 15th Street site, about a quarter of the 8-hour standard.

The maximum 8-hour average CO concentration recorded at this site in 2009 was 2.3 ppm, which is below the level of the current standard (9 ppm). The 1-hour maximum CO concentration recorded at this site was 4.3 ppm, which is also well below the level of the standard (35 ppm).

Appendix B - National Core (NCore) Monitoring Station Description

The Colorado Department of Public Health and Environment, Air Pollution Control Division's NCore monitoring station is located on the Denver Municipal Animal Shelter (DMAS) lot at 678 S. Jason Street in Denver, Colorado. This location is in the Denver-Boulder Region with its projected population for 2010 of 2.870 million people. This is a projected increase of 1.8 percent from the 2000 census. The site is located approximately 4 miles directly south of the Denver CBD along the South Platte River. This location was established as the NCore site in conjunction with EPA Region VIII and the City and County of Denver. APCD received EPA approval for NCore designation on 8/6/2009.

The DMAS site was also chosen because it represented a good neighborhood scale for carbon monoxide, ozone and particulate matter. The site also had enough space available for the number of samplers required for an NCore monitoring site. Its location along the South Platte River provides maximum exposure to the up and down-valley pollution carried by the diurnal winds. This last point is supported by the wind rose. The wind rose has data only for seven months but the trend is evident.

Area of Representativeness

40 CFR Part 58 Appendix D provides design criteria for ambient air quality monitoring. The monitoring objective for the NCore site is to produce data that represents a fairly large area and therefore the spatial scale of the site is important. The special scale defines the physical dimensions of the air parcel nearest to the monitoring site throughout which actual pollutant concentrations are similar. It is determined by the characteristics of the area surrounding the air monitoring site and the site's distance from nearby air pollution sources such as roadways, factories, etc. In the case of urban NCore the special scales to be used are neighborhood and urban. The following table shows the area of representativeness for each pollutant for the DMAS site.

Table 33. Parameters and Scale for the Denver Municipal Animal Shelter

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>	<i>Ended</i>	<i>Lat. (dec. deg.)</i>	<i>Long. (dec. deg.)</i>	<i>Elevation (m)</i>
08 031 0025	Denver Municipal Animal Shelter	678 S. Jason St.		07/2005		39.704005	-104.998113	1,594
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	CO (Trace)	1	04/2009	P.O. Neigh	Thermo 48i	NCore	Continuous	
	SO ₂ (Trace)	1	06/2009	P.O. Neigh	Ecotech 9850T	NCore	Continuous	
	NO _y		+					
	O ₃	1	04/2008	Neigh/Urban	API 400E	NCore	Continuous	
	WS/WD/Temp (U)	1	07/2008	P.O. Neigh	Met - One	NCore	Continuous	
	Relative Humidity	1	+		Rotronic	NCore	Continuous	
	Barometric Pressure	1	+			NCore	Continuous	
	Solar Radiation	1	+			NCore	Continuous	
	Precipitation	1	+			NCore	Continuous	
	Temp (L)	1	07/2008	P.O. Neigh	Met - One	NCore	Continuous	
	TSP	1	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	TSP	2	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	Pb	1	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	Pb	2	07/2005	P.O. Neigh	TSP-SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀	1	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀	2	07/2005	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀	3	08/2005	P.O. Neigh	TEOM-1400ab	SLAMS	Continuous	
	PM _{2.5}	1	10/2007	P.O. Neigh	Partisol 2025	NCore	1 in 6	
	PM _{2.5}	3	10/2007	P.O. Neigh	TEOM FDMS	SPM	Continuous	

The neighborhood scale is set to represent an area up to 4 km in diameter from the site. This represents an area from the state capitol on the north almost to Colfax Boulevard and Alameda Avenue on the east. The southern end of the neighborhood scale area is Yale Avenue and Santa Fe Drive. The western boundary is almost to Alameda Avenue and Sheridan Boulevard. This area is a mix of residential, commercial and light industry and contains 28 schools, two hospitals and three clinics. The Xcel Energy’s Zuni Power Plant is located 4 km north-northwest of the DMAS site along the South Platte River and the Arapahoe Power Plant is 3.7 km to the south.

The urban scale of up to 50 km encompasses all of the Denver Metro Area and stretches from Longmont on the north to below Castle Rock on the south and from Bennett on the east to Idaho Springs on the west. The western scale boundary is more reasonably restricted to the edge of the foothills near Golden.

Traffic in the immediate area around the site is limited as shown in the following table.

Table 34. Traffic Information for the Denver Municipal Shelter

Distance to nearest roadway	Direction	Daily Traffic Estimates	Year of Traffic Estimates	Type of Roadway	Comments
58 meters	North/East	<2000	2008	6-local	Estimates only
	East				
	South				
91 meters	West	<2000	2008	6-local	Estimates only

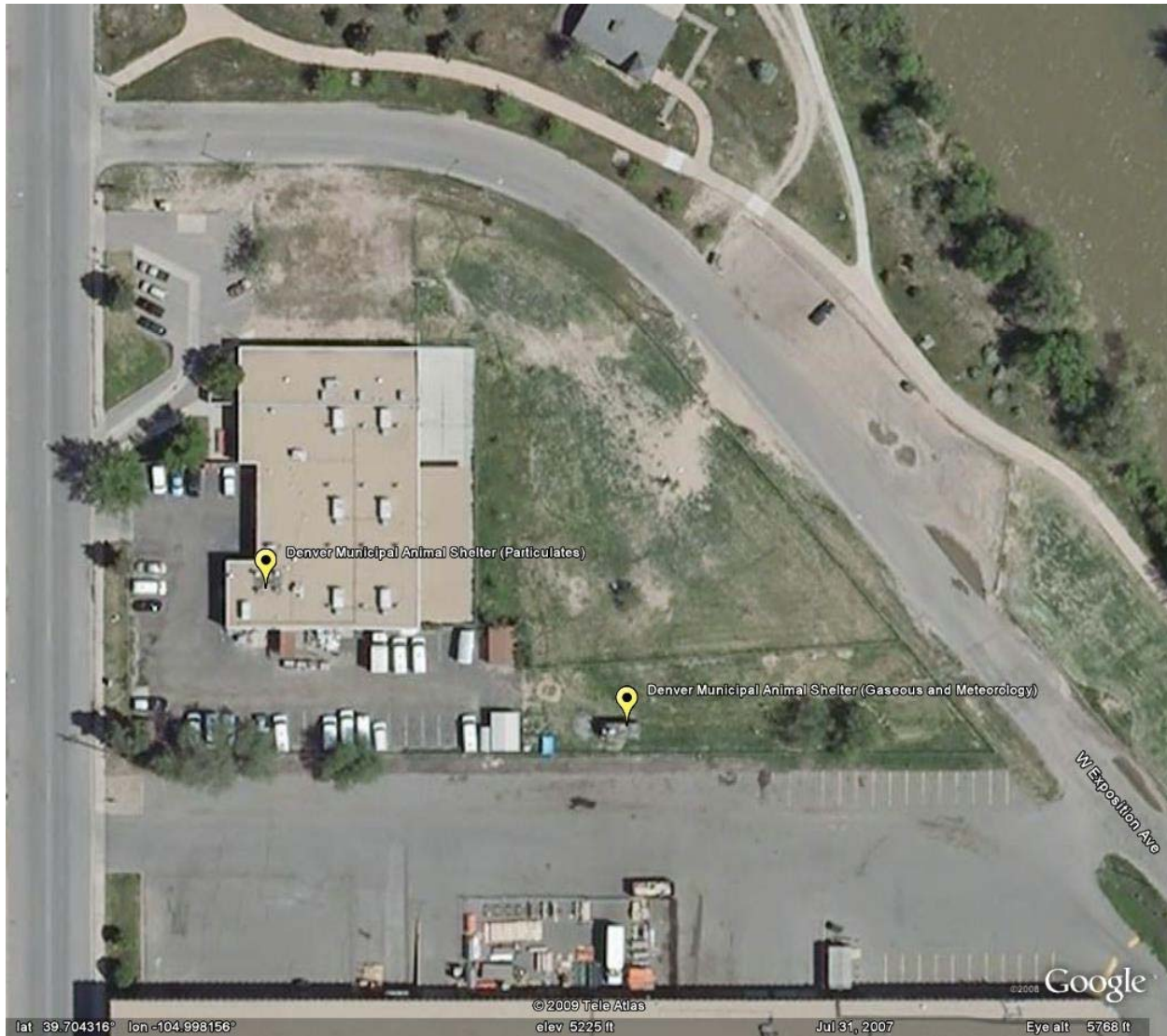


Figure 2. Denver Municipal Animal Shelter Site Photos

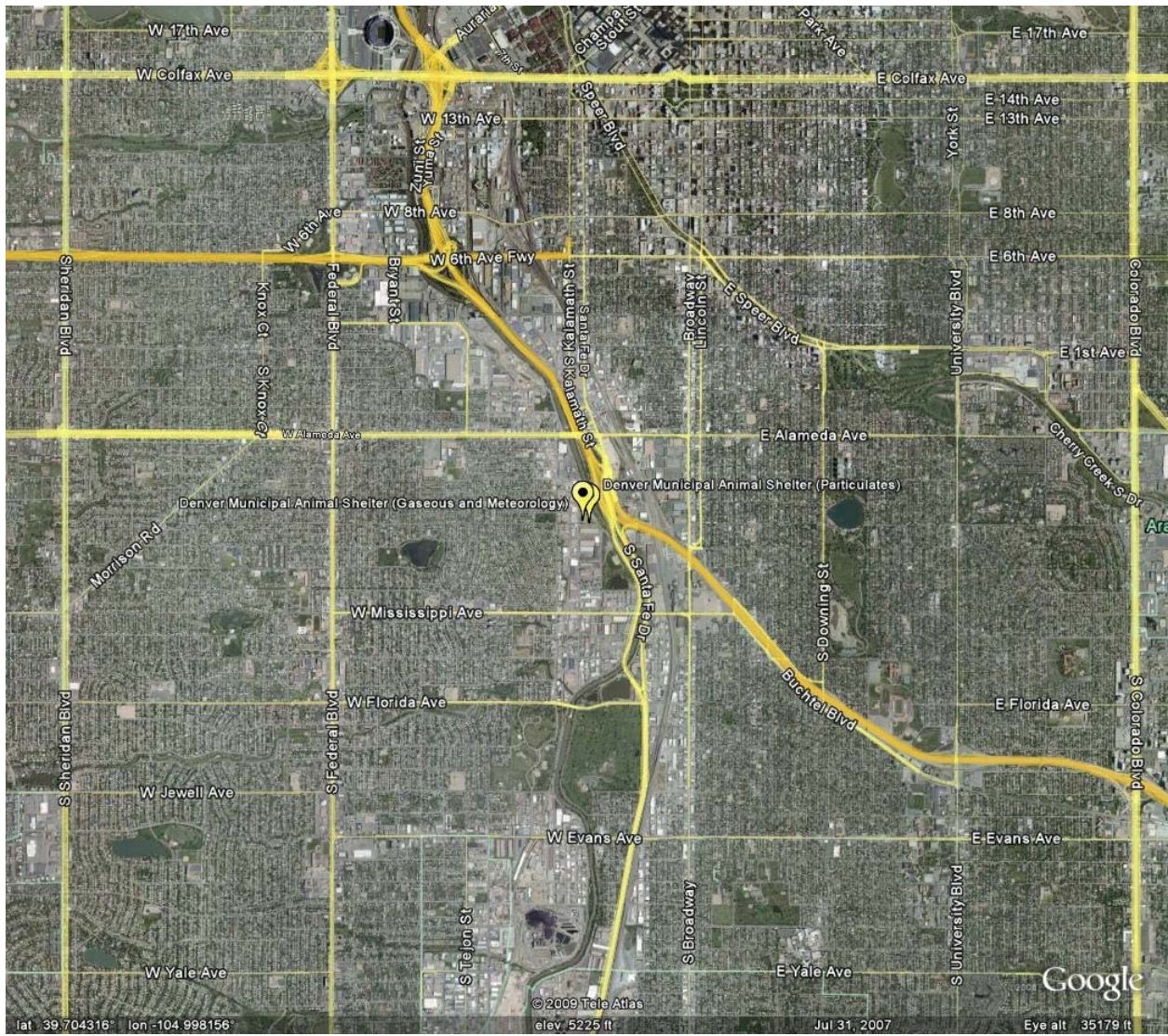


Figure 3. Denver Municipal Animal Shelter (4 Km Radius)

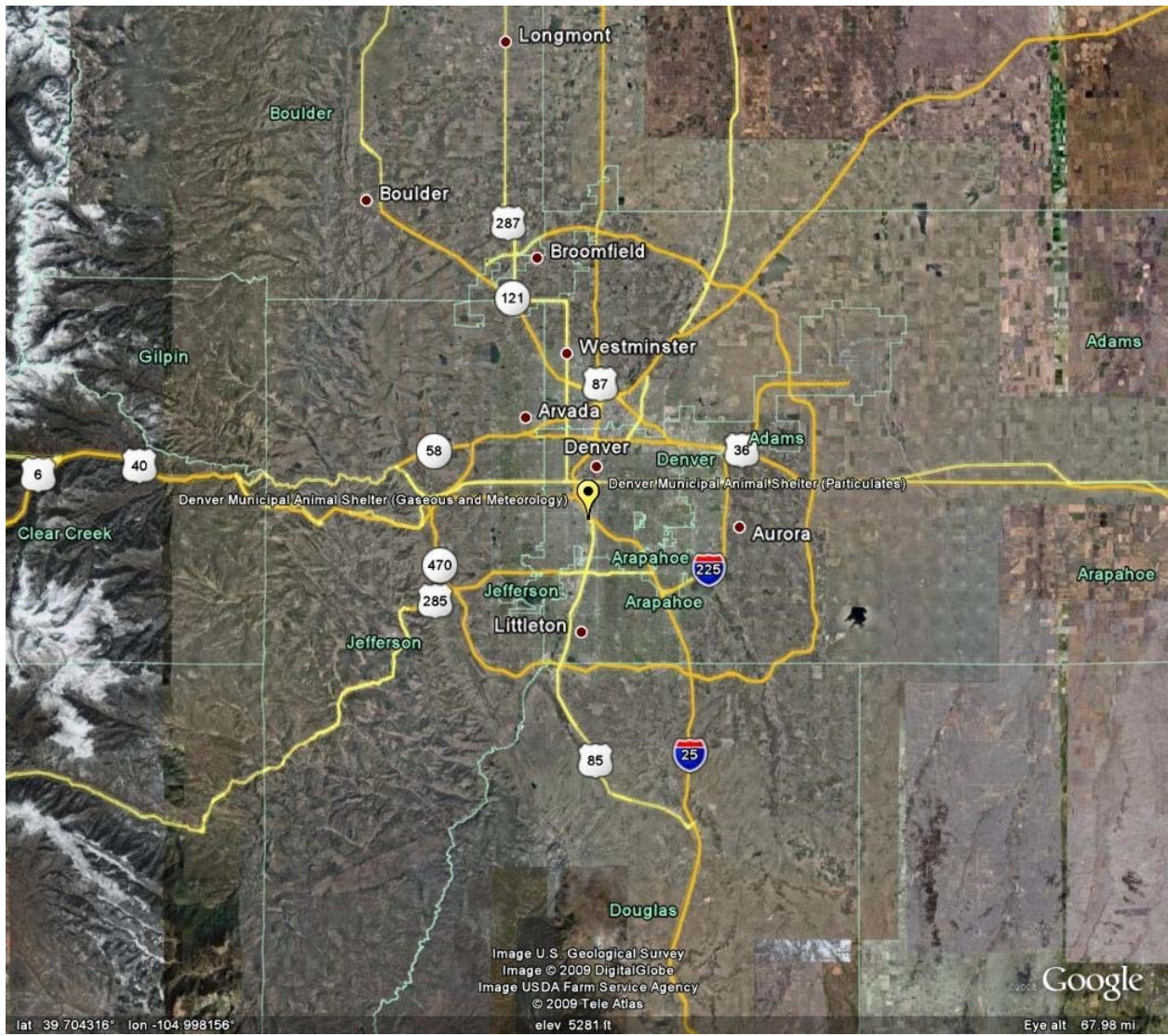


Figure 4. Denver Municipal Animal Shelter (50 Km Radius)

Wind Speed and direction measurements at the DMAS site began in July 2008. The rest of the suite of meteorological measurements are scheduled to begin operation in 2010. The following wind roses show the data for January 1, 2009 through December 31, 2009.

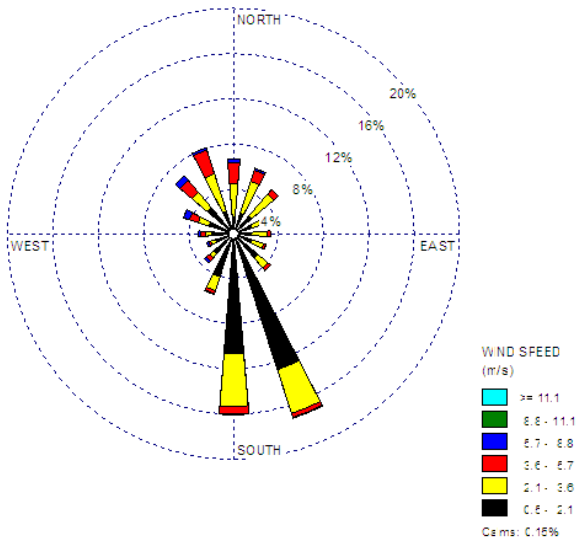


Figure 5. NCore Wind Rose January 1, 2009 - December 31, 2009 - All Hours

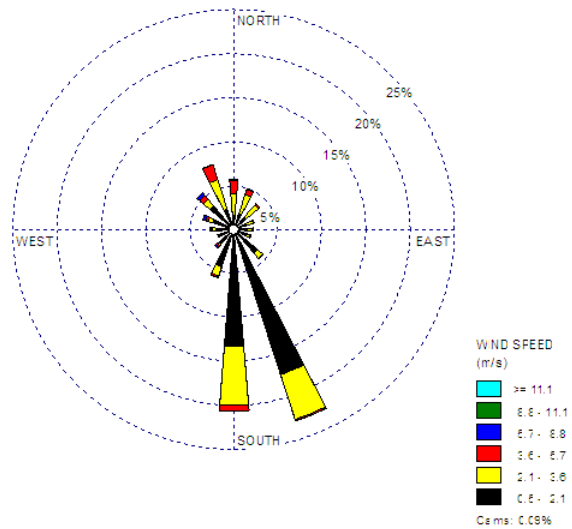


Figure 6. NCore Wind Rose 2009 AM Hours

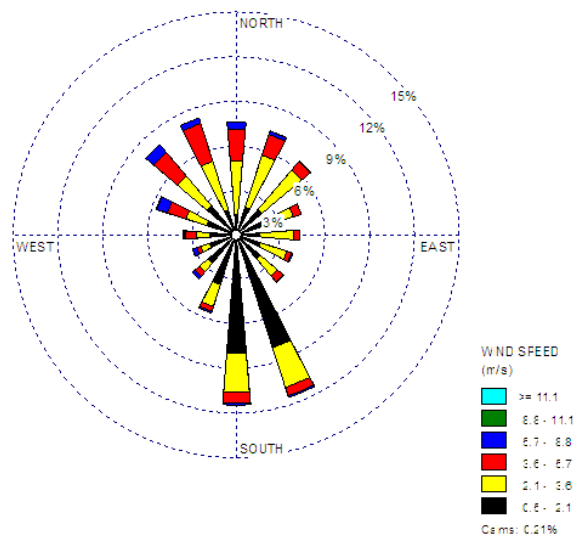


Figure 7. NCore Wind Rose 2009 PM Hours

Denver Municipal Animal Shelter
678 S. Jason Street
08-031-0025

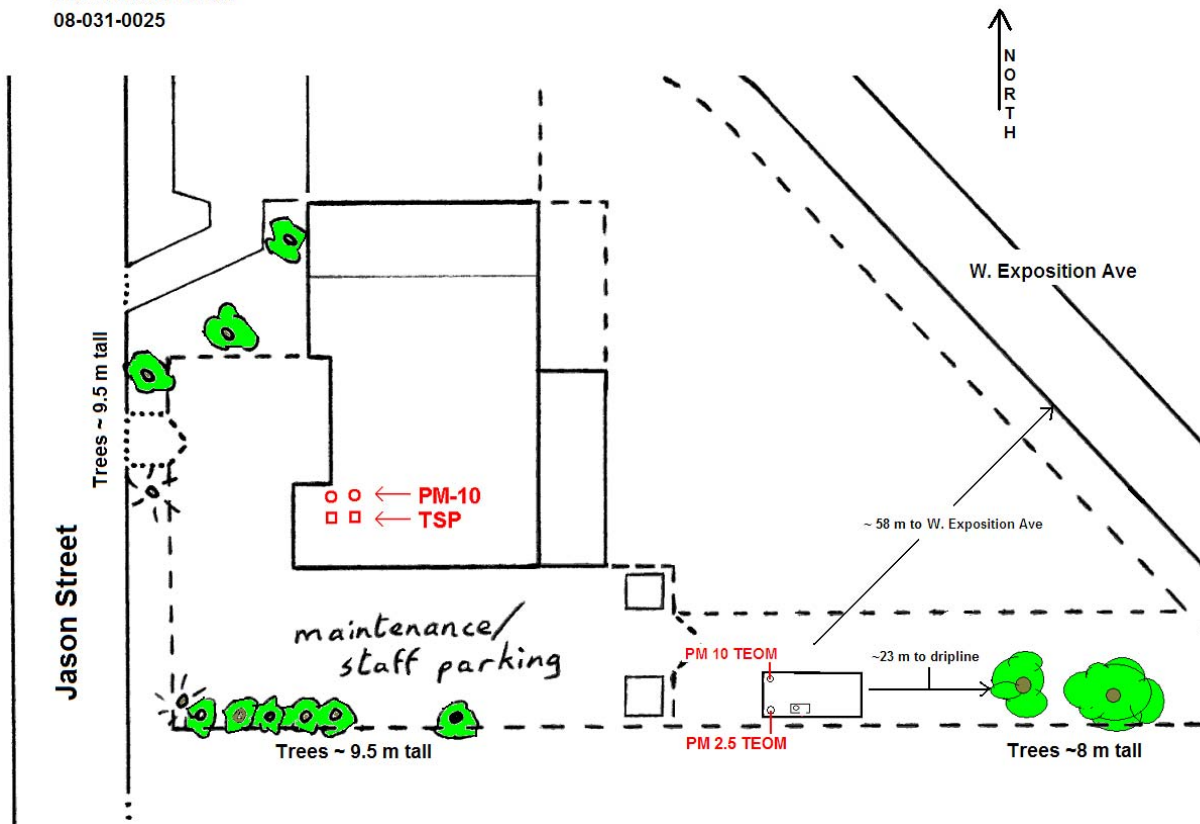


Figure 8. Drawings of Denver Municipal Animal Shelter Site Layout

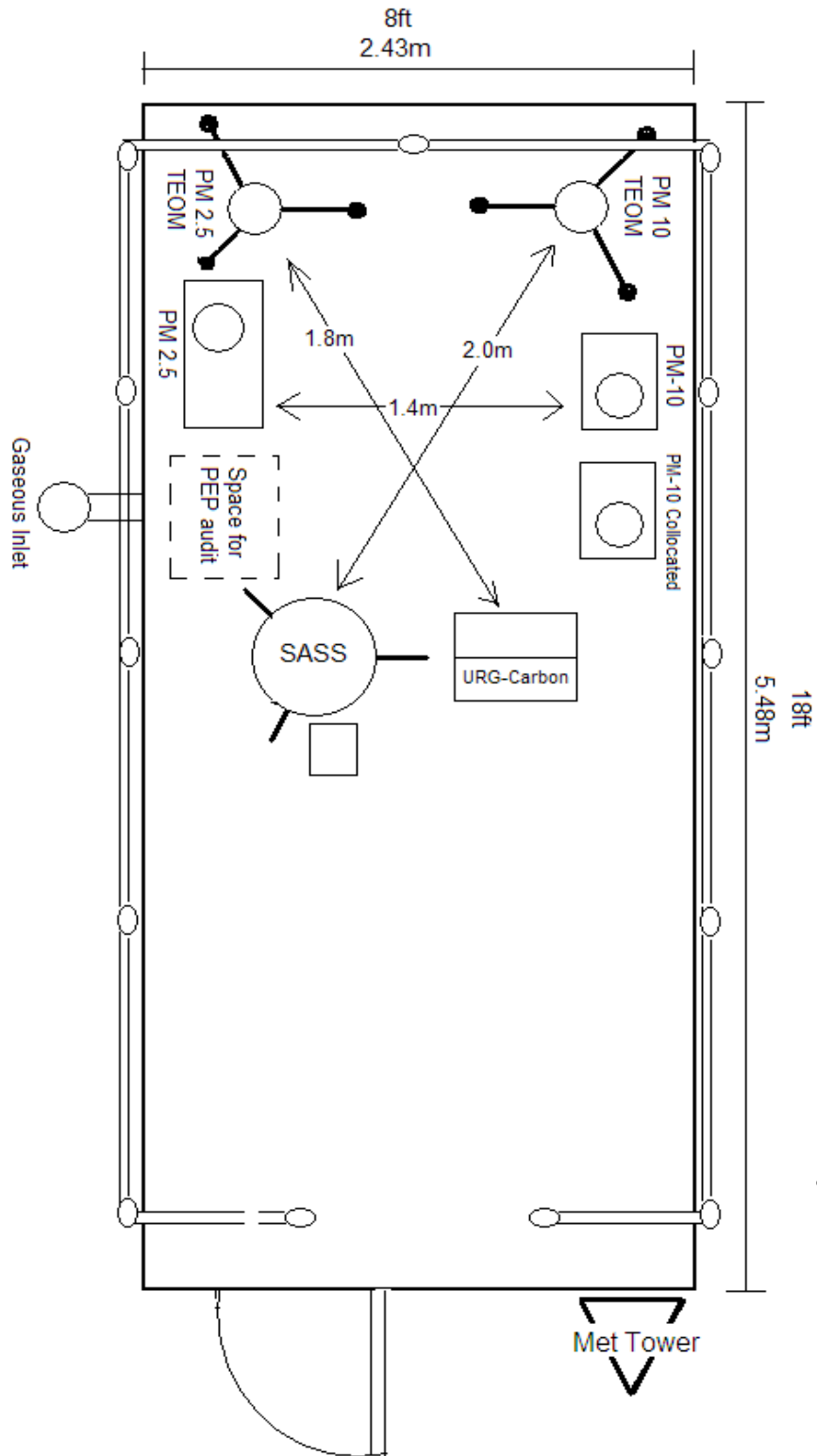


Figure 9. NCore Rooftop Sampler Layout