

COLORADO ANNUAL MONITORING NETWORK PLAN 2012



**Colorado Department
of Public Health
and Environment**

**Prepared by the Air Pollution Control Division
Technical Services Program
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I. INTRODUCTION

The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division's (APCD) 2012 Ambient Air Monitoring Network Plan is an examination and evaluation of the APCD'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)].¹ It is also a simple accounting of monitoring site changes expected for that year and the following year. It is due on or before July 1 each year.

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 fifth 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 2012, the Colorado Air Pollution Control Division currently operates monitors at 60 locations. In 2011, five monitoring sites were removed: Auraria and Rocky Flats - SE (meteorology), Arvada (ozone), Longmont and Denver – Firehouse #6 (carbon monoxide). Four new sites will be or have been added since the last Network Plan. Additions to the network for 2012 that have occurred or are planned include a replacement PM_{2.5} background site at Castlewood Canyon State Park, a near roadway NO₂ monitor, an O₃ monitor at Lay Peak, and a temporary air toxics monitoring site located in the Erie area. Two additional temporary air toxics monitors were placed at sites that are already established—CAMP and Platteville. In addition, several other sites were shut down, and their equipment reallocated for use at other sites. These changes are discussed in more detail later in this document. Particulate monitors, including Total Suspended Particulates (TSP), Particulate Matter 10 microns and smaller (PM₁₀), Particulate Matter 2.5 microns and smaller (PM_{2.5}), and ozone monitors are the most abundant and widespread of monitoring types across the state. Currently, there are PM₁₀ monitors at 29 separate locations, PM_{2.5} monitors at 18 separate locations and ozone monitors at 22 locations. There are 22 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 and the visibility site also monitor for relative humidity. Only five of the 60 locations monitoring are looking at both gaseous and particulate pollutants in addition to taking meteorological measurements. Only three of those five locations are monitoring for more than ten parameters, with each meteorological and particulate parameter monitored being counted individually. All three 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 4/3/2011. Both are used for lead analysis. Only six of the 29

¹ "Annual Monitoring Network Plan and Periodic Network Assessment," 40 Federal Regulations 58.10 (1 July 2011), p. 248.

PM₁₀ monitoring site are continuous “hourly,” while twelve of the 18 PM_{2.5} monitoring sites also have continuous monitors. Only three continuous PM_{2.5} sites (Boulder Athens, NJH, and Rifle) are not collocated with PM_{2.5} FRM monitors. 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.

38 of the 60 currently monitoring sites have been in operation for ten or more years, and 20 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 (47 years), Greeley-Hospital (45 years), Alamosa ASC (42 years), Arvada (39 years), Welby (38 years), Pagosa Springs (37 years), Lamar Power Plant and Steamboat Springs (36 years), Lamar Municipal (35 years) and Highland Reservoir (34 years). Conversely, 25 of the 62 operating sites have begun operation since the start of the year 2000.

Four of the ozone (O₃) 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, Lay Peak and Cortez monitoring sites. ARS keeps the sites in proper working order and performs calibrations, data retrievals, and data validation, while the APCD uploads data to the AQS database and conducts independent audits of the sites for Quality Assurance (QA) 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 40 CFR 58.20 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, beginning operation of new monitors in January and terminating existing monitors in December. Circumstances both in and out of the Division's control make that desired schedule generally difficult to completely 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 to its implementation for their approval. All currently operating SLAMS monitors have been approved by EPA and meet the requirements set forth in 40 CFR 58, 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 in 1998. Other monitors have been established as a result of special studies. Examples of this would be the O₃ monitoring in Aurora, Rifle, Cortez, Aspen Park, Rist Canyon, Palisade and Lay Peak. The Denver Firehouse #6 CO monitoring began in 1993 when models showed that the area around the fire station could have elevated CO concentrations, and was decommissioned on 1/1/2012 due to declining CO levels and network redundancy.

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, the property ownership changes, or the area surrounding the monitor is being modified in a way that necessitates a change in the monitoring location. The most current examples of this are the Auraria meteorological monitoring station and the relocation of the Denver – DMAS site. The Auraria station was removed due to the construction of a tall building in the immediate vicinity of the monitor that obstructed airflow around the monitoring site. The DMAS site is being relocated due to a change in use of the former animal shelter building, and land use changes at the site that will create an environment that will no longer be suitable for ambient air quality monitoring. 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 CO monitoring sites at the end of last year.

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 more suitable location for the monitor? An example of this is the O₃ monitor previously located at the Arvada monitoring site. It was shut down on 1/1/2012, and relocated to the Denver – CAMP location beginning 3/1/2012.

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. The parameter date is the date when valid data were first collected. Due to equipment problems this date can be significantly different than the site installation date, which is the “Started” date.

Table 1. Monitoring Locations and Parameters Monitored

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</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	06/2003	P.O. Neigh	TEOM-1400ab	SPM	Continuous
	PM _{2.5} Speciation	5	02/2001	P.O. Neigh	SASS	Trends Spec	1 in 3
	PM _{2.5} Carbon	5	02/2007	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	02/1992	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	07/1989	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	05/2002	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

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	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	
	PM _{2.5}	1	03/1999	P.O. Neigh	Partisol 2025	SLAMS	1 in 3	
08 005 0006	Aurora - East	36001 E. Quincy Ave.		04/2011		39.63854	-104.56913	1,552
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2011	P.O. Region	API 400E	SPM	Continuous	
	WS/WD/Temp	1	06/2011	Other	Met - One	Other	Continuous	
08 005 0007	Centennial Airport	7800 S. Peoria St.		04/2011		39.572304	-104.84881	1,774
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	TSP	1	4/2011	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	Pb	1	4/2011	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	09/1990	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	09/1985	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	11/2005	P.O. Neigh	TEOM 1400ab	SPM	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	2440 Pearl St.		12/1994		40.021097	-105.263382	1,619
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	10/1994	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 6	
	PM _{2.5}	1	01/1999	P.O. Middle ²	Partisol 2025	SLAMS	1 in 3	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
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	02/2004	P.O. Neigh	TEOM FDMS	SPM	Continuous	
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	05/1993	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	
	O ₃	6	03/2012	P.O. Neigh	API 400E	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	08/1986	P.O. Micro ²	SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀ Collocated	2	12/1987	P.O. Micro ²	SA/GMW-1200	SLAMS	1 in 6	
	PM ₁₀	3	01/1988	P.O. Micro ²	TEOM-1400ab	SLAMS	Continuous	
	PM _{2.5}	1	01/1999	P.O. Micro ²	Partisol 2025	SLAMS	1 in 1	
	PM _{2.5} Collocated	2	09/2001	P.O. Micro ²	Partisol 2025	SLAMS	1 in 3	
	PM _{2.5}	3	10/2001	P.O. Micro ²	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. Neigh	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

² It should be noted here that the CAMP PM_{2.5} site is technically a micro-scale site, but the Division demonstrated to EPA in 2001 that the CAMP site is representative of a much larger area of similar land use, meteorology, and emissions around downtown Denver, and has therefore been justified to meet the Neighborhood scale criteria for PM_{2.5} concentrations. The same is true for the Boulder Chamber Center PM_{2.5} site, which is technically a middle scale site, but was shown to be representative of a Neighborhood scale site.

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	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 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	04/2011	P.O. Neigh	Thermo 48i-TLE	NCORE	Continuous	
	SO ₂ (Trace)	1	01/2011	P.O. Neigh	API 100EU	NCORE	Continuous	
	NO _y	1	01/2011	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	01/2011	P.O. Neigh	Rotronic	NCORE	Continuous	
	Barometric Pressure	1	+			NCORE	Continuous	
	Solar Radiation	1	+			NCORE	Continuous	
	Precipitation	1	+			NCORE	Continuous	
	Temp (Lower)	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/TSP	1	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	Pb/TSP Collocated	2	07/2005	P.O. Neigh	TSP-GMW	SLAMS	1 in 6	
	PM ₁₀	1	07/2005	P.O. Neigh	Partisol 2025	SLAMS	1 in 6	
	PM ₁₀ Collocated	2	07/2005	P.O. Neigh	Partisol 2025	SLAMS	1 in 6	
	PM ₁₀	3	07/2005	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	07/2007	P.O. Neigh	TEOM FDMS	SPM	Continuous	
PM _{2.5} Speciation	5	11/2002	P.O. Neigh	SASS	Supplem. Speciation	1 in 6		

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	PM _{2.5} Carbon	5	01/2011	P.O. Neigh	URG 3000N	Supplem. Speciation	1 in 6	
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	
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	API 400E	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	
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 400E	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 – Elem. School	100 E. 2nd St.		01/1982		38.453654	-108.053269	1,557
	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	03/2011	Other	RM Young	Other	Continuous	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
					/Vaisala			
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 /Vaisala	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	
	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 400E	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	
	O ₃	1	09/1992	H.C. Urban	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	09/1992	Other	Met - One	Other	Continuous	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
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	API 400E	SLAMS	Continuous	
08 059 0013	Aspen Park	26137 Conifer Rd.		04/2011		39.540321	-105.296512	2,467
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2011	P.O. Neigh	API 400E	SLAMS	Continuous	
	WS/WD/Temp	1	06/2011	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	06/2011	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	06/2011	P.O. Neigh	Thermo 1405 DF	SPM	Continuous	
	PM _{10-2.5}	3	06/2011	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.		04/2011		40.642135	-105.275105	2,058
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	O ₃	1	04/2011	P.O. Urban	API 400E	SPM	Continuous	
	WS/WD/Temp	1	04/2011	Other	Met - One	Other	Continuous	
08 069 1004	Fort Collins - Mason	708 S. Mason St.		12/1980		40.57747	-105.07892	1,524
	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	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
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 ₁₀	3	07/2011	P.O. Neigh	Thermo 1405 DF	SPM	Continuous
	PM _{2.5}	3	01/2005	P.O. Neigh	Thermo 1405 DF	SPM	Continuous
	PM _{10-2.5}	3	07/2011	P.O. Neigh	Thermo 1405 DF	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
Moffat							
08 081 0002	Lay Peak	Moffat CR 17	08/20/2011		40.506890	-107.891000	
	Parameter	POC	Started	Scale	Monitor	Type	Sample
	O ₃	1	08/2011	P.O. Region	API 400E	SPM	Continuous
	WS/WD/Temp	1	08/2011	P.O Region	Met – One	Other	Continuous
	Relative Humidity	1	08/2011	P.O Region	Met - One	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

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>		<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
	O ₃	1	04/2011	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
	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 School	925 N. Glendale Ave.		06/2011		38.276099	-104.597613	1,433
	Parameter	POC	Started	Orient/Scale	Monitor	Type	Sample	
	PM ₁₀	1	04/2011	P.O. Neigh	SA/GMW-1200	SLAMS	1 in 1	
	PM _{2.5}	1	04/2011	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	

<i>AQS #</i>	<i>Site Name</i>	<i>Address</i>	<i>Started</i>		<i>Latitude (dec. deg.)</i>	<i>Longitude (dec. deg.)</i>	<i>Elevation (m)</i>
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	04/2011	P.O. Neigh	URG 3000N	Spec Trends	1 in 6
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 (Area Represented)³

- Micro - Micro-scale (several m – 100 m)
- Middle - Middle Scale (100 – 500 m)
- Neigh - Neighborhood Scale (0.5 – 4 km)
- Urban - Urban Scale (4 – 50 km)
- Region - Regional Scale (50 – hundreds of km)

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

³ “Appendix D to Part 58 – Network Design Criteria for Ambient Air Quality Monitoring,” 40 Federal Register 58 (1 July 2011), pp. 290-292.

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 Slope. 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.

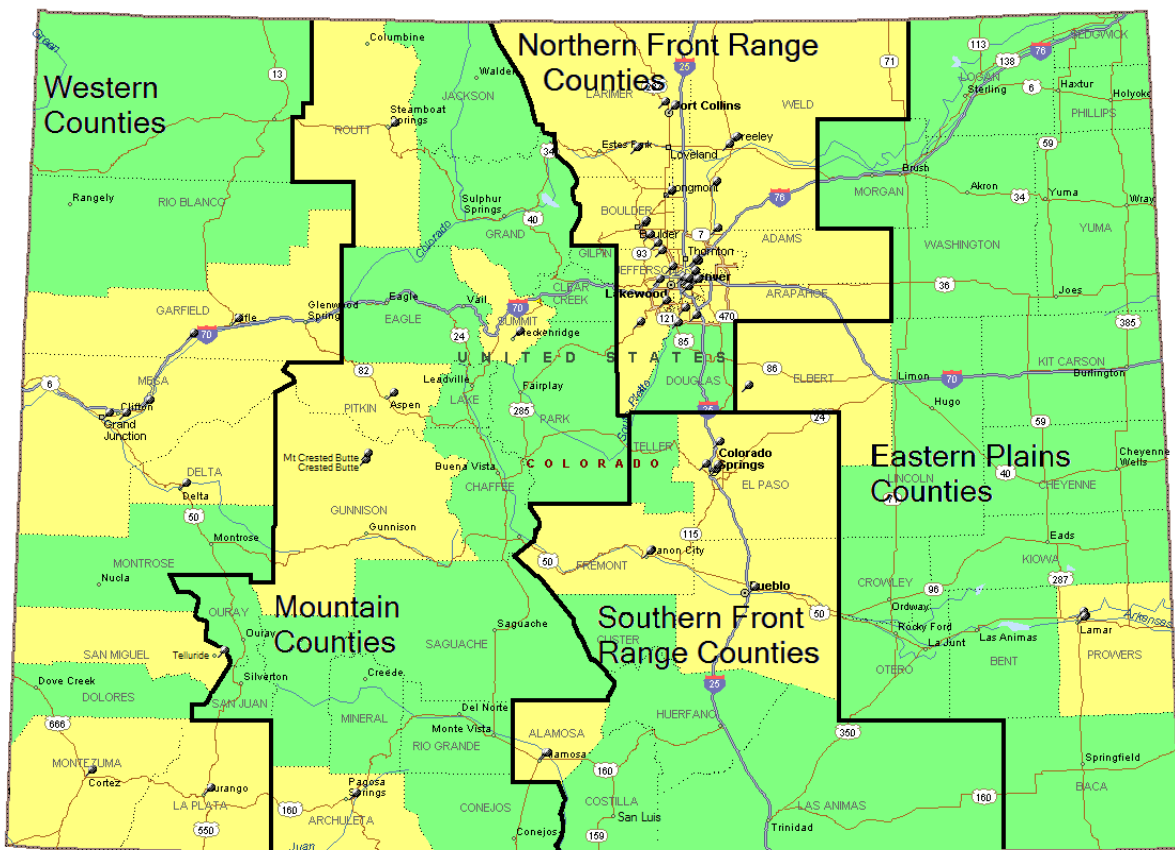


Figure 1. Monitoring Areas in Colorado⁴

⁴ Counties with monitors are in yellow and the pin symbols on the map show the approximate location of the monitors within the county.

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 monitoring sites were all discontinued in the late 1970s and early 1990s after a review showed that the concentrations were well below the standard and trending downward.

For the Eastern Plains Counties there are currently two PM₁₀ monitoring sites in Lamar and no gaseous pollutant monitoring sites in the area. Quite often, exceedances of the standard are associated with natural events from regional high winds/blowing dust and dry soils that can occur anytime of the year, but with a slightly higher frequency in the springtime. These regional dust storms are natural events that are uncontrollable and are being investigated and documented by the Division as exceptional events.

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 the monitoring sites 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 monitoring sites and 23 particulate monitoring sites in the Northern Front Range area. There are five CO, 16 O₃, two NO₂, one NO_y, and three SO₂ monitoring sites. There are nine PM₁₀, 14 PM_{2.5}, and two TSP/Pb monitoring sites. There are two air toxics monitoring sites, one located at CAMP, and one at Platteville.

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 CO and O₃ 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 three gaseous pollutant monitoring sites and five particulate monitoring sites in the Southern Front Range area. There are one CO and two O₃ monitoring sites in the Colorado Springs area. There are five PM₁₀ and two PM_{2.5} monitoring sites in the

region. A replacement site for the Elbert background site may be installed in Elbert County, which is in the Southern Front Range region or in Douglas County, which is in the Northern Front Range region.

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. Although, all recent PM₁₀ exceedances have been caused by dust storms due to regional blowing dust/high wind events. These regional dust storms are natural events that are uncontrollable and are being investigated and documented by the Division as exceptional events. 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 six particulate monitoring sites operated by the APCD in the Mountain Counties region.

Western Slope Counties

The Western Slope 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 CO and air toxics on the western slope. The particulate and O₃ monitoring sites are located in Clifton, Cortez, Delta, Durango, Grand Junction, Lay Peak, Palisade, Parachute, Rifle and Telluride.

Currently, there are five gaseous pollutant monitoring sites and 8 particulate monitoring sites in the Western Counties area. There are one CO and four O₃ monitoring sites. There are seven PM₁₀ and three PM_{2.5} monitoring sites. The Western Slope counties are often subjected to exceedances of the PM₁₀ standard have been caused by dust storms from regional blowing dust/high wind events. These regional dust storms are natural events that are uncontrollable and are being investigated and documented by the Division as exceptional events.

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. Population Statistics and Monitors by County and Metropolitan Statistical Area

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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	5,029,196	5,474,968	5,999,989	1.8%	1.9%	7	3	2	1	22	21	4	0	3	3	29	11	20	15
FRONT RANGE	4,141,359	4,488,360	4,892,326	1.7%	1.8%														
DNVR-BLDR Region	2,784,228	3,004,415	3,252,481	1.6%	1.7%														
DENVER PMSA	2,489,661	2,691,747	2,920,374	1.6%	1.7%														
Adams	441,603	491,263	544,258	2.2%	2.3%													1 1/C	1 1/S
	08 001 0006 Alsup Elementary - Commerce City										1						1	1 1/E	
	08 001 3001 Welby					1	1	1		1	1					1	1		
Arapahoe	572,003	619,762	673,230	1.7%	1.8%														
	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	55,889	63,926	71,211	2.9%	2.7%														
Denver	600,158	645,364	686,613	1.5%	1.4%														
	08 031 0002 Denver CAMP					1	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 0016 DESCJ											1							
	08 031 0023 Denver Swansea Elementary																	1	
	08 031 0025 Denver Animal Shelter					1	1		1	1	1	1	+	1 1/C	1 1/C		1 1/C	1 1/E	1 1/S

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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															
Douglas	285,465	322,985	373,308	2.6%	3.1%															
	08 035 0004 Chatfield State Park									1	1								1	1
Jefferson	534,543	548,447	571,753	0.5%	0.7%															
	08 059 0002 Arvada										1									
	08 059 0005 Welch									1	1									
	08 059 0006 Rocky Flats - N									1	1									
	08 059 0011 NREL									1										
	08 059 0013 Aspen Park									1	1									
BOULDER PMSA/Co	294,567	312,668	332,107	1.2%	1.3%															
	08 013 0003 Longmont – Municipal Bldg.															1			1	1
	08 013 0011 South Boulder Creek									1										
	08 013 0012 Boulder Chamber of Commerce															1			1	
	08 013 1001 Boulder CU/Athens																			1
N. FRONT RANGE	552,455	610,993	691,615	2.1%	2.5%															
FORT COLLINS MSA	299,630	325,776	360,274	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	252,825	285,216	331,341	2.6%	3.1%															
	08 123 0006 Greeley Hospital															1			1	1
	08 123 0008 Platteville																		1 1/E	1 1/S

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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															
	08 123 0009 Greeley – Tower									1	1									
	08 123 0010 Greeley - West Annex					1														
S. FRONT RANGE	804,676	872,952	948,230	1.7%	1.8%															
COLO. SPRINGS MSA	645,613	702,925	763,003	1.8%	1.8%															
El Paso	622,263	677,353	734,862	1.8%	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	23,350	25,572	28,142	1.9%	2.1%															
PUEBLO MSA	159,063	170,027	185,227	1.4%	1.6%															
Pueblo	08 101 0015 Pueblo – Fountain School															1		1		
WESTERN SLOPE	552,564	622,228	704,243	2.5%	2.7%															
REGION 9	91,716	103,916	118,231	2.7%	2.9%															
Archuleta	12,084	14,348	17,127	3.7%	4.2%															
	08 007 0001 Pagosa Springs School															1				
Dolores	2,064	2,247	2,436	1.8%	1.8%															
La Plata	51,334	58,404	66,714	2.8%	3.0%															
	08 067 0004 Durango – River City Hall															1				
Montezuma	25,535	28,160	31,171	2.1%	2.2%															
	08 083 0006 Cortez									1									1	
San Juan	699	758	784	1.7%	1.2%															

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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														
REGION 10	105,333	114,699	131,150	1.8%	2.5%														
Delta	30,952	35,724	41,311	3.1%	3.3%											1			
	08 029 0004 Delta Health Dept.																		
Gunnison	15,324	16,457	17,895	1.5%	1.7%											1			
	08 051 0004 Crested Butte															1			
	08 051 0007 Mt. Crested Butte Realty															1			
Hinsdale	843	928	1,027	2.0%	2.2%														
Montrose	41,276	47,541	54,718	3.0%	3.3%														
Ouray	4,436	5,220	5,832	3.5%	3.1%														
San Miguel	7,359	8,829	10,367	4.0%	4.1%											1			
	08 113 0004 Telluride																		
REGION 11	247,082	271,207	301,602	2.0%	2.2%														
Garfield	56,389	65,124	76,939	3.1%	3.6%						1					1			
	08 045 0005 Parachute – Elem. School															1			
	08 045 0007 Rifle - Henry Building										1					1	1		1
	08 045 0012 Rifle – Health Dept.									1									
Mesa	146,723	157,878	171,581	1.5%	1.7%											1/R	1	1	1
	08 077 0017 Grand Junction – Powell																1		
	08 077 0018 Grand Junction – Pitkin					1					1	1							
	08 077 0019 Clifton															1			
	08 077 0020 Palisade Water Treatment									1	1								
Moffat	13,795	14,672	15,464	1.3%	1.2%														
	08 081 0002 Lay Peak									1	1	1							
Rio Blanco	6,666	7,827	9,056	3.5%	3.6%														
Routt	23,509	25,706	28,563	1.9%	2.1%														
	08 107 0003 Steamboat Springs															1			

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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															
REGION 12	113,576	132,406	153,260	3.3%	3.5%															
Eagle	52,197	61,846	71,076	3.7%	3.6%															
Grand	14,843	16,989	20,090	2.9%	3.5%															
Jackson	1,394	1,507	1,598	1.6%	1.5%															
Pitkin	17,148	19,394	21,929	2.6%	2.8%															
08 097 0006 Aspen – Library																1				
Summit	27,994	32,670	38,568	3.3%	3.8%															
08 117 0002 Breckenridge																1				
CENTRAL MTNS.	129,151	143,418	160,566	2.2%	2.4%															
CLR CRK. & GILPIN	14,529	15,729	17,228	1.7%	1.9%															
Clear Creek	9,088	9,757	10,710	1.5%	1.8%															
Gilpin	5,441	5,972	6,519	2.0%	2.0%															
PARK COUNTY	16,206	19,614	23,816	4.2%	4.7%															
REGION 13	76,198	83,733	92,777	2.0%	2.2%															
Chaffee	17,809	19,862	23,052	2.3%	2.9%															
Custer	4,255	4,991	5,866	3.5%	3.8%															
Fremont	46,824	50,456	54,217	1.6%	1.6%															
08 043 0003 Cañon City - City Hall																1				
Lake	7,310	8,424	9,642	3.0%	3.2%															
REGION 14	22,218	24,343	26,744	1.9%	2.0%															
Huerfano	6,711	6,996	7,527	0.8%	1.2%															
Las Animas	15,507	19,346	19,217	5.0%	2.4%															
SAN LUIS VALLEY	46,027	49,107	52,843	1.3%	1.5%															
Alamosa	15,445	16,505	17,860	1.4%	1.6%															

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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															
	08 003 0001 Alamosa – Adams State College																			
	08 003 0003 Alamosa – Municipal																			
Conejos	8,256	8,773	9,253	1.3%	1.2%															
Costilla	3,524	3,726	3,871	1.1%	1.0%															
Mineral	712	804	870	2.6%	2.2%															
Rio Grande	11,982	12,812	13,887	1.4%	1.6%															
Saguache	6,108	6,487	7,101	1.2%	1.6%															
EASTERN PLAINS	160,095	171,854	190,011	1.5%	1.9%															
REGION 1	72,546	76,169	81,358	1.0%	1.2%															
Logan	22,709	23,873	25,734	1.0%	1.3%															
Morgan	28,159	29,772	32,209	1.1%	1.4%															
Phillips	4,442	4,540	4,670	0.4%	0.5%															
Sedgwick	2,379	2,542	2,689	1.4%	1.3%															
Washington	4,814	4,948	5,054	0.6%	0.5%															
Yuma	10,043	10,494	11,001	0.9%	1.0%															
REGION 5	38,659	44,636	55,341	3.1%	4.3%															
Cheyenne	1,836	1,940	2,082	1.1%	1.3%															
Elbert	23,086	28,266	38,173	4.5%	6.5%															
Kit Carson	8,270	8,643	8,893	0.9%	0.8%															
Lincoln	5,467	5,787	6,193	1.2%	1.3%															
REGION 6	48,890	51,049	53,312	0.9%	0.9%															
Baca	3,788	3,822	3,893	0.2%	0.3%															
Bent	6,499	6,657	6,832	0.5%	0.5%															
Crowley	5,823	6,234	6,643	1.4%	1.4%															
Kiowa	1,398	1,458	1,509	0.9%	0.8%															

REGIONS/Counties	Actual Population	Projected Population		Avg. Annual % 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															
Otero	18,831	19,813	20,802	1.0%	1.0%															
Prowers	12,551	13,065	13,633	0.8%	0.9%															
	08 099 0001 Lamar Power Plant																1			
	08 099 0002 Lamar – Municipal																1			
	08 099 0003 Lamar Port of Entry										1									

+ - indicates monitors that to be installed in 2012

- C - Collocated monitors
- S - SASS PM_{2.5} monitor
- E – PM_{2.5} carbon monitor
- R – PM_{10-2.5} coarse monitor
- WS – Wind Speed
- WD – Wind Direction
- T – Temperature
- Rel. Hum. – Relative Humidity
- Precip – Precipitation
- Hi-Vol – High Volume
- Lo-Vol – Low Volume
- Crs. – Coarse
- Cont. – Continuous
- FRM – Federal Reference Method
- Carb. – Carbon
- SASS – Speciation Air Sampling System

II. Carbon Monoxide (CO)

In 2012 the APCD will operate seven CO monitors. Currently, the NAAQS for 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. CO levels have declined from a statewide maximum eight-hour value of 48.1 ppm in 1973 to a value of 2.6 ppm in 2011. The level of the standard has not been exceeded since 1999. The CO monitors currently operated by the APCD are associated both with State Maintenance Plan requirements and CFR requirements. However, the EPA has revised the minimum requirements for CO monitoring by requiring CO monitors to be sited near roads in certain urban areas. They are requiring one CO monitor to be collocated with the near-roadway NO₂ monitoring requirements. EPA is also specifying that monitors required in CBSAs of 2.5 million or more persons are to be operational by January 1, 2015, and that monitors required in CBSAs of one million or more persons are required to be operational by January 1, 2017. A monitor will be located at the near roadway NO₂ site to satisfy these requirements.

Northern Front Range Counties

The Northern Front Range counties of Larimer and Weld have a population of 552,455 (April 2010 census data). 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 CO. However, there are several small industries and manufacturing processes located within the two counties that may contribute to CO levels. These industries include breweries, power plants, cement plants, mining, electronics and film manufacturing facilities, and rock quarries. Weld County is also an area of significant oil and gas development.

In 2011, the highest eight-hour CO concentration recorded at the Fort Collins-Mason monitor was 1.5 ppm, with a maximum one-hour concentration of 2.8 ppm. At the Greeley-West Annex site the maximum eight-hour concentration recorded was 2.0 ppm, with a maximum one-hour concentration of 2.7 ppm. All of the values were well below the Federal NAAQS requirements.

The CO 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 2,784,228 (April 2010 census data). There are various industries and manufacturing processes located in the area.

The maximum eight-hour and one-hour concentrations recorded in 2011 for each CO monitoring site are listed in the table below.

Table 3. 2011 Maximum CO Concentrations in Denver Area

Site ID	Site Name	2011 Eight-Hour Max (ppm)	2011 One-Hour Max (ppm)
08 001 3001	Welby	2.0	2.4
08 013 0009	Longmont - Main	2.6	8.6
08 031 0002	Denver – CAMP	1.9	3.5
08 031 0019	Denver – Firehouse #6	1.6	2.6
08 031 0025	Denver – DMAS	1.5	2.450

The monitor in operation at the Denver – DMAS site is a trace-level monitor, while the others are not. It is important to note here that the Longmont – Main, and Denver – Firehouse #6 sites recorded their last valid samples on 12/31/2011 at 23:00, and 12/14/2011 at 12:00, respectively. The Denver – Firehouse #6 monitor was removed on 12/14/2011. A network modification form was posted for public comment on 12/09/2011 through 01/09/2011. The Longmont monitor was removed on March 14, 2012, with a network modification form sent to EPA on May 30, 2012. The Denver site was determined to be redundant in the CDPHE’s 5-Year Network Assessment Plan. The Longmont site was removed due to construction in the area, but was also determined to be unnecessary due to declining CO levels. As the Longmont site is in a SIP maintenance area, the SIP plan will be modified so that the Denver – CAMP monitor will be a surrogate. The network modification form can be seen in Appendix C.

Southern Front Range Counties

This area has a population of 820,882 according to the April 2010 census data. 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 645,613 people.

In 2011, the highest eight-hour CO concentration recorded at the Colorado Springs-Hwy 24 monitor was 1.7 ppm.

The CO monitor in this area is:

08 041 0015 Colorado Springs – Hwy. 24, 690 W. Highway 24

Western Slope Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to the April 2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

In 2011, the highest eight-hour CO concentration recorded at the Grand Junction – Pitkin monitor was 1.1 ppm.

The CO monitor in this area is:

08 077 0018 Grand Junction - Pitkin, 645 ¼ Pitkin Ave.

Planned Changes in CO Monitoring

In 2012 both the Denver – Firehouse #6, and the Longmont – Main monitoring sites were decommissioned. The NCore site will be moved from the current location of 678 S. Jason St., to 4587 Navajo St. in Denver. In addition, there are plans to install a new trace-level CO monitor in conjunction with the new Near Roadway NO₂ monitoring site.

III. Ozone (O₃)

On March 12, 2008, the U.S. Environmental Protection Agency released a new level of the NAAQS for O₃. The change in the level was from 0.08 ppm as an eight-hour average to 0.075 ppm as an eight-hour average. This made a significant change in the number of O₃ monitors that exceed the standard on an annual basis. Seventeen of the twenty-two sites operated by CDPHE recorded maximum eight-hour average concentrations that were greater than the level of the standard.

The EPA is currently set to propose a new primary O₃ standard in 2013, to be final in 2014. The APCD operates three sites that have three year design values (2009 – 2011) in excess of the current eight-hour O₃ NAAQS standard of 0.075 ppm—Chatfield State Park (0.077 ppm), Rocky Flats – North (0.078 ppm), and Fort Collins – West (0.076 ppm). This is an increase from the number that exceeded the standard last year.

EPA’s monitoring requirements for O₃ include placing certain numbers of monitors in areas with high populations. For example, in Metropolitan Statistical Areas (MSAs) with a population greater than ten million people, EPA recommends the placement of at least four monitors in areas with design value concentrations that are greater than or equal to 85% of the O₃ standard. The largest MSA in Colorado is the Denver Primary Metropolitan Statistical Area (PMSA). This PMSA includes the counties of Adams, Arapahoe, Broomfield, Denver, Douglas, and Jefferson. There are seven different MSAs in Colorado. The table below lists EPA’s O₃ monitoring requirements. Each MSA is discussed further in the following subsections.

Table 4. EPAs Minimum Ozone Monitoring Requirements

MSA population^{1,2}	Most recent 3-year design value concentrations \geq 85% of any O₃ NAAQS³	Most recent 3-year design value concentrations $<$ 85% of any O₃ NAAQS^{3,4}
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000 ⁵	1	0

¹Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

²Population based on latest available census figures.

³The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

⁴These minimum monitoring requirements apply in the absence of a design value.

⁵Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

In addition to the above mentioned O₃ monitoring requirements, EPA rules also state that there must be at least one monitoring site per MSA that monitors for the highest concentrations.

Northern Front Range

The Northern Front Range counties of Larimer and Weld have a population of 552,455 (April 2010 census data). 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 precursor source of O₃. However, there are several small industries and manufacturing processes located within the two counties that may contribute to those levels as well. These industries include a brewery, power plants, cement plants, mining, electronics and film manufacturing facilities, and rock quarries. Weld County is also an area of significant oil and gas development.

The first and fourth maximum eight-hour concentrations recorded in 2011 for each O₃ monitoring site in Larimer and Weld Counties are listed in the table below. Also listed are the three year design values (2009-2011) for each site with enough data available to calculate them. The design value for the Fort Collins – West site is bolded and italicized because it exceeds the level of the current O₃ standard.

There are two MSAs located in Larimer and Weld counties. These are the Fort Collins-Loveland MSA, and the Greeley PMSA. According to the 2010 Census data their populations are 299,630, and 252,825, respectively. Per EPA monitoring requirements, these MSAs fall in the 50,000 to 350,000 population range, and each area requires at least one O₃ monitor. These requirements are satisfied by the monitors listed below. The monitor located at the Fort Collins – West site is a highest concentration monitor for the Fort Collins-Loveland MSA.

Table 5. 2011 Maximum O₃ Concentrations in Northern Front Range Counties

Site ID	Site Name	2011 1 st eight-hour Max (ppm)	2011 4 th eight-hour Max (ppm)	2009-2011 Design Value (ppm)
08 069 0011	Fort Collins – West	0.086	0.080	<i>0.076</i>
08 069 0012	Rist Canyon	0.080	0.073	0.071
08 069 1004	Fort Collins – Mason	0.071	0.068	0.065
08 123 0009	Greeley – Tower	0.081	0.077	0.072

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 2,784,228 (April 2010 census data). There are various industries and manufacturing processes located in the area. Only Adams, Arapahoe, Boulder, Douglas, Jefferson, and Denver Counties have O₃ monitors. There are twelve monitors currently in operation in this area.

The first and fourth maximum eight-hour concentrations recorded in 2011 for each O₃

monitoring site in the metropolitan Denver area are listed in the table below. Also listed are the three year design values (2009-2011) for each site with enough data available to calculate them.

There are two MSAs located in the Metropolitan Denver area. These are the Boulder-Longmont PMSA, and the Denver PMSA. According to the 2010 Census data their populations are 294,567, and 2,489,661, respectively. Per EPA monitoring requirements, the Boulder-Longmont PMSA falls in the 50,000 to 350,000 population range, and the Denver PMSA falls in the 350,000 to 4,000,000 range. The Boulder-Longmont PMSA therefore requires at least one monitor, which is satisfied by the monitor at South Boulder Creek. By EPA rules, the Denver PMSA requires at least two monitors. This requirement is satisfied by the remaining eleven monitors that are placed throughout the Denver PMSA. The monitor at South Boulder Creek is a highest concentration monitor for the Boulder-Longmont PMSA. The monitors located at Chatfield, Rocky Flats – North, and NREL are all highest concentration monitors for the Denver PMSA.

Table 6. 2011 Maximum O₃ Concentrations in the Denver Metro Area

Site ID	Site Name	2011 1 st Eight- hour Max (ppm)	2011 4 th Eight- hour Max (ppm)	2009-2011 Design Value (ppm)
08 001 3001	Welby	0.089	0.075	0.070
08 005 0002	Highland Reservoir	0.087	0.078	0.074
08 005 0006	Aurora – East	0.089	0.077	0.071
08 013 0011	South Boulder Creek	0.082	0.076	0.073
08 031 0014	Denver – Carriage	0.090	0.075	0.069
08 031 0025	Denver – DMAS	0.075	0.070	0.065
08 035 0004	Chatfield State Park	0.099	0.082	0.077
08 059 0002	Arvada	0.100	0.079	0.074
08 059 0005	Welch	0.087	0.077	0.073
08 059 0006	Rocky Flats – N	0.104	0.081	0.078
08 059 0011	NREL	0.096	0.083	0.075
08 059 0013	Aspen Park	0.078	0.072	0.070

Two of the twelve monitors are in excess of the 8-hour NAAQS standard for ozone. Their values are bolded and italicized to highlight them. The NREL site is equal to the standard at 0.075 ppm. Several other sites are within 0.005 ppm of reaching the standard limit. The Arvada site was removed from the ozone network on 12/31/2011. It was determined to be a redundant site in the CDPHE’s 5-Year Network Assessment Plan. That monitor was placed at the CAMP site, located in downtown Denver, on February 2, 2012. The Network Assessment Plan also recommended that ozone monitoring be reinstated at CAMP for weight of evidence determinations and model validation. The CDPHE also plans to close the Denver – Carriage site at the end of 2012. It was also determined to be a redundant monitor in the Plan.

Southern Front Range Counties

This area has a population of 804,676 according to the April 2010 census data. 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.

The first and fourth maximum eight-hour concentrations recorded in 2011 for each O₃ monitoring site in the Southern Front Range are listed in the table below. Also listed are the three year design values (2009-2011) for each site with enough data available to calculate them. Neither one of the sites exceeds the 8-hour ozone standard.

There are two MSAs located in the Southern Front Range area. These are the Colorado Springs MSA, and the Pueblo MSA. There are currently no state funded monitors in the Pueblo MSA, but as it falls in the same Southern Front Range area as the Colorado Springs monitors it is mentioned here. According to the 2010 Census data their populations are 645,613, and 159,063, respectively. Per EPA monitoring requirements, the Pueblo MSA falls in the 50,000 to 350,000 population range, and the Colorado Springs MSA falls in the 350,000 to 4,000,000 range. The Colorado Springs MSA therefore requires at least two monitors. This is satisfied by the monitors at the Air Force Academy and Manitou Springs. Based on O₃ values calculated via permit required monitoring in the area, the design value for the Pueblo MSA falls under the 85% NAAQS limit listed in Table 4. This indicates that no monitor is currently required for the Pueblo MSA.

Table 7. 2011 Maximum O₃ Concentrations in Southern Front Range Counties

Site ID	Site Name	2011 1 st Eight- hour Max (ppm)	2011 4 th Eight- hour Max (ppm)	2009-2011 Design Value (ppm)
08 041 0013	U.S. Air Force Academy	0.083	0.074	0.067
08 041 0016	Manitou Springs	0.080	0.075	0.070

Western Slope Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to the April 2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

The first and fourth maximum eight-hour concentrations recorded in 2011 for each O₃ monitoring site in the Western Slope Counties are listed in the table below. Also listed are the three year design values (2009-2011) for each site with enough data available to calculate them. None of these sites recorded ozone concentrations that exceeded the 8-hour ozone standard. The Lay Peak site was established in August of 2011, so there is insufficient data to report at this time.

There is one MSA located on the Western Slope. It is the Grand Junction MSA, which includes all of Mesa County. Per EPA monitoring requirements, this MSA falls in the 50,000 to 350,000 population range, and requires one O₃ monitor. The monitor at the Palisade Water Treatment Plant satisfies this requirement, as well as the highest concentration monitor requirement.

Table 8. 2011 Maximum O₃ Concentrations in the Western Slope Counties

Site ID	Site Name	2011 1st Eight- hour Max (ppm)	2011 4th Eight- hour Max (ppm)	2009-2011 Design Value (ppm)
08 045 0012	Rifle – Health	0.068	0.066	0.064
08 077 0020	Palisade Water Treatment	0.068	0.066	0.066
08 081 0002	Lay Peak	Insuf. Data	Insuf. Data	Insuf. Data
08 083 0006	Cortez	0.073	0.069	0.065

Planned Changes in O₃ Monitoring

Planned changes for the 2012-2013 plan year include the review of sites in the Front Range for possible enhancement, the relocation of the NCore site, the decommissioning of the Carriage site, and the possible installation of a new site in the Pueblo area, pending reviews of industry monitoring data. The monitor from the Arvada site was removed and subsequently installed at the CAMP site. Additionally, the Lay Peak O₃ site in northwest Colorado, near Maybell, was established on 08/20/2011 in support of the 3-State Pilot Study.

IV. Nitrogen Dioxide/Reactive Oxides of Nitrogen (NO₂/NO_y)

The APCD has monitored NO₂ at eight locations in Colorado in the past. All but two of these locations, Welby and CAMP, are no longer operating. Only the CAMP monitor has ever approached the annual average standard of 53 ppb. It recorded a 52 ppb 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 in addition to the annual average standard. The new one-hour standard is set at a level of 100 ppb, and is based on "...the 3-year average of the 98th percentile of the yearly distribution of the one-hour daily maximum concentrations..."⁵. The secondary standard is the same as the primary standard for this pollutant.

The APCD began monitoring for NO_y at the NCore DMAS site in January 2011. NO_y monitoring is a requirement for an NCore station, but as of yet there are no standards for NO_y. The EPA has established requirements for an NO₂ monitoring network that will include monitors at locations where maximum NO₂ concentrations are expected to occur, including within 50 meters of major roadways, as well as monitors sited to measure the area-wide NO₂ concentrations that occur more broadly across communities. Per the requirements, at least one monitor must be located near a major road in any urban area with a population greater than or equal to 500,000 people. A second monitor is required near another major road in areas with either: (1) population greater than or equal to 2.5 million people, or (2) one or more road segments with an annual average daily traffic count greater than or equal to 250,000 vehicles. In addition to the near roadway monitoring, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO₂

⁵ "Primary National Ambient Air Quality Standards for Nitrogen Dioxide; Final Rule," 75 Federal Register 26 (9 February 2010), pp. 6474 – 6536.

concentrations representing the neighborhood or larger spatial scales. The Denver – CAMP and Welby sites satisfy this requirement.

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 2,784,228 (April 2010 census data). There are various industries and manufacturing processes located in the area.

In 2011, the annual NO₂ concentration at the Welby site was 18.14 ppb. For 2009 through 2011 the one-hour standard design value is 64 ppb, which is well below the 100 ppb NAAQS. The same value for the CAMP site is 89 ppb. The 2011 annual average at CAMP was 24.49 ppb, which is also well below the standard. There are currently no reportable NO₂ values available for the DMAS site.

The NO₂/NO_y monitors in this area are:

08 001 3001 Welby, 3174 E. 78th Avenue
08 031 0002 Denver-CAMP, 2105 Broadway
08 031 0025 Denver-DMAS, 678 S, Jason Street

Planned Changes in NO₂/NO_y Monitoring

The first change will be the relocation of the Denver – DMAS site. A change in land use has occurred around the site, and as such it is being moved to a new location at 4587 N. Navajo Street in Denver. This location is in the same airshed as the previous site. The second change planned is the addition of a near roadway monitoring site by January 1, 2013. Per Appendix C of the EPAs draft version of the *Fiscal Year 2013 Program and Grant Guidance* (February 23, 2012),

“On January 22, 2010, EPA strengthened the nitrogen dioxide (NO₂) NAAQS with the addition of a one-hour standard to capture peaks associated with short-term exposures to this pollutant. Due to current economic difficulties facing the States, EPA, in coordination with NACAA has developed a phased approach for funding the near-road network. This plan provides a phased framework for funding an initial subset of the required NO₂ near-road monitors referenced in the NO₂ NAAQS final rule. The plan supports the funding of approximately 52 NO₂ monitors in urban areas having approximately 1 million or more persons over a two year period (phase one and phase two). The primary objective of the plan is to establish a base of monitors to characterize NO₂ concentrations in near-road environments across the country so that ambient concentrations relative to the revised 1-hour NAAQS can be assessed. A secondary objective is to establish a near-road monitoring network that can support future multi-pollutant monitoring efforts, as needed. Phase one of the funding was provided in FY 2011 for the establishment of certain sites and Phase two funding for the establishment of the additional sites is expected in FY 2012. EPA expects the phase one sites to be operational approximately by January 1, 2013, and the phase two sites by January 1, 2014. EPA will work closely with States not covered by the initial phases to plan for later funding of the remainder of the required sites, based on the FY13 budget and/or alternative sources such as local funds. States will be required to operate CO monitors at these near-road sites, following a staggered deployment schedule with deadlines of January 1, 2015 for those areas of population 2.5M or greater, and by January 1, 2017 for areas with population between 1M and 2.5M. Continued

operations and maintenance of these near-road sites is to be funded from the section 105 state and local air quality management grants.”

V. Sulfur Dioxide (SO₂)

The Air Pollution Control Division has monitored SO₂ at eight locations in Colorado in the past. Currently, there are only three monitoring locations in operation. A new one-hour primary standard was finalized in June 2011. To attain that standard, the three year average of the 99th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 75 ppb. The secondary NAAQS is a three-hour average not to exceed 500 ppb more than once per year. SO₂ 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.

SO₂ monitoring requirements include the need for calculating a Population Weighted Emissions Index (PWEI). This figure is calculated for each MSA by multiplying the population of the MSA by the SO₂ emissions for that MSA and dividing by 1,000,000. This PWEI value is then used to determine areas in need of SO₂ monitoring. A sum of the most recent emissions data by county (2008) give a total for SO₂ emissions of 15,235 tons per year for the Denver PMSA. The calculated PWEI for this region is 37,930 million persons-tons per year. This indicates the need for one SO₂ monitor in the Denver MSA according to the EPA's monitoring rules for SO₂. This need is met by the monitors listed below.

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 2,784,228 (April 2010 census data). There are various industries and manufacturing processes located in the area.

The mean calculated by the one-hour standard design value for the DMAS site does not satisfy summary criteria, as monitoring began in early 2011. The concentration values are listed in ppb in accordance with the EPA's data reporting rules for this pollutant. It should be noted here that the values listed for the Denver – DMAS site are only shown for comparative purposes, and are not of sufficient validity for a comparison to the standard, as the data do not span the entirety of 2011.

Table 9. 2011 Maximum SO₂ Concentrations for the Denver Metro Area

Site ID	Site Name	2011 Annual Avg. (ppb)	2011 24-Hour Max (ppb)	2011 One-Hour Max (ppb) ⁶
08 001 3001	Welby	1.36	5.0	30.0
08 031 0002	Denver - CAMP	2.07	9.7	34.0
08 031 0025	Denver – DMAS	2.22	6.9	29.9

⁶The one-hour SO₂ design value is calculated by taking the three year average of the 99th percentile of the daily maximum one-hour averages.

Planned Changes in SO₂ Monitoring

In 2012, one planned change to the SO₂ monitoring network is the relocation of the Denver – DMAS site due to a change in the surrounding land use. The second planned change will be the addition of a monitor in the Colorado Springs area by 12/31/2012 to meet the new monitoring requirements.

VI. PM₁₀

In 2011, the APCD operated 38 PM₁₀ monitors at 29 different locations. Twenty-five of these sites use high volume instruments, four sites use low volume instruments, three sites have continuous monitors collocated with FRM monitors, and three sites have continuous dichotomous particulate monitors, which also monitor PM_{2.5} and PM₁₀. There are three sites with collocated high volume samplers (Denver CAMP, Denver DMAS and Crested Butte), and two sites with collocated low volume samplers (Denver DMAS and Grand Junction - Powell). The PM₁₀ NAAQS is a 24-hour average of 150 µg/m³ not to be exceeded more than an average of 1.0 times in a three year period. This average is also based on the monitoring frequency and the percent of valid data collected at a site.⁷

Northern Front Range Counties

The Northern Front Range counties of Larimer and Weld have a population of 552,455 (April 2010 census data). 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 source of particulate matter. Several industries and manufacturing processes located within the two counties also contribute to particulate levels. These industries include breweries, power plants, cement plants, mining, electronics, film manufacturing facilities, and rock quarries. There are also a variety of agricultural sources of PM₁₀ including feed lots, grazing, tilling, and other agricultural activities. Weld County is also an area of significant oil and gas development.

Neither the monitor at the Fort Collins – CSU site nor the Greeley monitor had any PM₁₀ exceedances in 2011. The maximum concentrations recorded were, 53 µg/m³ at Fort Collins, and 46 µg/m³ at Greeley.

The PM₁₀ monitoring sites in this area are:

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

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 2,784,228 (April 2010 census data). There are various industries and manufacturing processes located in the area.

⁷“Appendix K to Part 50 – Interpretation of the National Ambient Air Quality Standards for Particulate Matter,” 40 Federal Regulations 50 (1 July 2011), pp. 80-83.

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 2011. Site ID numbers that include an asterisk (*) indicate a low volume sampler, while no asterisk indicates high volume samplers.

Table 10. 2011 Maximum PM₁₀ Concentrations for the Denver Metro Area

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)
08 001 0006*	Commerce City	82
08 001 3001	Welby	67
08 013 0003	Longmont-Municipal	36
08 013 0012	Boulder Chamber Bldg.	35
08 031 0002	Denver – CAMP	109
08 031 0017	Denver Visitor Center	123
08 031 0025*	Denver – DMAS	47

Eastern Plains Counties

This area includes Elbert and Prowers Counties. The population of the Elbert County area is 23,086 according to the 2010 census data. The population of Prowers County is 12,551. The sources of PM₁₀ in the eastern plains are mainly agricultural with some mobile sources near cities and towns. Agricultural sources of PM₁₀ include feed lots, grazing, tilling, and other dry land agricultural activities. There is also a coal fired power plant in Lamar and a flour mill that contribute to PM₁₀ in Lamar.

There were two PM₁₀ exceedances at the Lamar Power Plant site, and none at the Lamar Municipal site in 2011. The highest concentration recorded at the Lamar Power Plant site was 192 µg/m³, while that at the Lamar Municipal site was 122 µg/m³. Both samplers are high volume samplers.

The PM₁₀ monitoring sites 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 804,676 according to the April 2010 census data. 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 645,613 people, according to the April 2010 census.

There were four exceedances in this area in 2011, two at Alamosa – Adams State College, and two at Alamosa Municipal. The table below shows the maximum concentration values recorded at each site in 2011. Sites with a star (*) after the site ID number indicate low volume samplers are in operation. No star indicates a high volume sampler.

The high values seen at the Alamosa sites are under consideration as exceptional events by the department, and are most likely due to strong wind gusts.

Table 11. 2011 Maximum PM₁₀ Concentrations in Southern Front Range Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)
08 003 0001	Alamosa – Adams State College	440
08 003 0003	Alamosa – Municipal	635
08 041 0017*	Colorado College	63
08 043 0003	Cañon City – City Hall	71
08 101 0015	Pueblo – Fountain School	117

Mountain Counties

The mountain counties consist of those counties generally along the Continental Divide. The monitoring sites 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 Pagosa Springs is 1,727 people (April 2010 census data). The Crested Butte and Mt. Crested Butte area population is 2,288 people (2010 census). The Aspen 2010 population is 6,658 people. The Steamboat Springs 2010 population is 12,088 people. The Breckenridge 2010 population is 4,540 people.

There were no PM₁₀ exceedances in the mountain counties. The table below lists the maximum concentrations recorded at each of the sites in 2011.

Table 12. 2011 Maximum PM₁₀ Concentrations for Mountain Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)
08 007 0001	Pagosa Springs	109
08 051 0004	Crested Butte	74
08 051 0007	Mount Crested Butte	65
08 097 0006	Aspen – Library	51
08 107 0003	Steamboat Springs	135
08 117 0002	Breckenridge	86

Western Slope Counties

The Western Slope consists of the 21 counties west of the Continental Divide, minus the mountain counties mentioned above. The population of the area is 552,564 (April 2010 census data). However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to the April 2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

There were no PM₁₀ exceedances in the western counties in 2011. 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. Sources of PM₁₀ in the Western region include: motor vehicle activity, industries and manufacturing processes, which include lumber processing, mining, gravel pits, and rock quarries. There are also a variety of agricultural sources of PM₁₀ including feed lots, grazing, tilling, and other dry land agricultural activities.

Table 13. 2011 Maximum PM₁₀ Concentrations in Western Slope Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)
08 029 0004	Delta	51
08 045 0005	Parachute	96
08 045 0007	Rifle – Henry Building	54
08 067 0004	Durango – River City Hall	51
08 077 0017*	Grand Junction – Powell	41
08 077 0019	Clifton	60
08 113 0004	Telluride	68

Planned Changes in PM₁₀ Monitoring

The Lamar Power Plant monitor will be considered for removal in 2012 because it is not located in ambient air. The Denver – DMAS site will be relocated in 2012 due to a change in the surrounding land use. The Breckenridge site will be decommissioned in 2012 due to low concentrations in the last ten years, and difficulty accessing the site.

VII. 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). Additionally, the PM_{2.5} from speciation is reported as 88502. In 2011, the APCD operated PM_{2.5} monitors at 18 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 (averaged over a three year period) and 35 µg/m³ in a 24-hour period. The 24-hour standard was lowered on September 20, 2006.

Northern Front Range Counties

Larimer and Weld counties have a population of 552,455 (April 2010 census data). 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 source of

particulate matter. There are also several small industries and manufacturing processes located within the two counties that may contribute to particulate levels. These industries include breweries, power plants, cement plants, mining, electronics and film manufacturing facilities and rock quarries. Weld County is also an area of significant oil and gas development.

The PM_{2.5} sites listed below with manual method FRM sites in the APCD network as of December 31, 2011, are suitable for comparisons to the annual PM_{2.5} NAAQS.

There were no PM_{2.5} exceedances in 2011 in the Larimer and Weld County area. The table below lists the maximum PM_{2.5} concentrations recorded at each of the sites in Larimer and Weld Counties, as well as the weighted annual average values. The monitoring data listed below are all from FRM monitors. It should be noted that the annual average value for Platteville does not meet summary criteria.

Table 14. 2011 Maximum PM_{2.5} Concentrations in Northern Front Range Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)	Annual Average Value (µg/m ³)
08 069 0009	Fort Collins – CSU	30.0	5.70
08 123 0006	Greeley – Hospital	28.7	6.66
08 123 0008	Platteville	29.8	7.36

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 2,784,228 (April 2010 census data). 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 2011. It was at the Commerce City site. The table below lists the maximum PM_{2.5} concentrations recorded in 2011 for each site in the Denver Metro area. All the monitoring data listed in the table are from FRM monitors. It should be noted that the annual average value for the Boulder Chamber of Commerce site does not meet summary criteria.

Table 15. 2011 Maximum PM_{2.5} Concentrations in the Denver Metro Area

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)	Annual Average Value (µg/m ³)
08 001 0006	Commerce City	41.9	7.55
08 005 0005	Arapahoe Community College	22.4	5.93
08 013 0003	Longmont – Municipal	23.8	6.39
08 013 0012	Boulder Chamber of Commerce	25.0	5.82
08 031 0002	Denver – CAMP	31.6	7.51
08 031 0023	Denver – Swansea	33.7	7.04
08 031 0025	Denver – DMAS	30.3	6.92
08 035 0004	Chatfield Reservoir	21.7	5.60

The following sites are micro-scale sites and are EPA approved. Also, the Denver CAMP

site has been determined, by an extensive analysis by the Division in 2001, to be representative of the neighborhood scale. This is essentially because there are several contiguous micro-scale sites with similar emissions, meteorology and land uses in the area of downtown Denver.

- 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

The Boulder Chamber of Commerce building site is considered a middle scale site, but it has been approved by the EPA as representative of a neighborhood scale site. The Division performed a land use and gridded emissions inventory analysis to demonstrate to EPA that the area surrounding the Boulder Chamber of Commerce building has many contiguous middle scale sites with similar emissions densities, meteorology and land uses.

Southern Front Range Counties

This area has a population of 804,676 people, according to the April 2010 census data. 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.

There were no exceedances of the PM_{2.5} NAAQS standard in the El Paso, Park, Pueblo, Elbert and Teller County area in 2011. The table below lists the maximum PM_{2.5} values recorded in 2011. All monitoring data listed here are from FRM monitors. It should be noted that the Elbert County monitor, which measures background PM_{2.5} concentrations, is no longer in operation as of 5/1/2011, and the data listed below do not span the entirety of 2011. The Division will be installing a replacement site at Castlewood Canyon State Park. See Appendix H for the Elbert close-out network modification form.

Table 16. 2011 Max PM_{2.5} Concentrations in Southern Front Range Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)	Annual Average Value (µg/m ³)
08 039 0001	Elbert County	7.7	3.80
08 041 0017	Colorado College	22.7	5.86
08 101 0015	Pueblo – Fountain School	16.2	5.74

Western Slope Counties

The Western Slope consists of the 21 counties west of the Continental Divide. The population of the area is 552,564 (April 2010 census data). However, the population is not evenly distributed among the counties and ranges from 146,723 people in Mesa County to 699 people in San Juan County, according to April 2010 census data. Grand Junction is the largest city on the western slope with a population of 58,566 (April 2010). This is due in large part to the transient oil/gas working population associated with the boom in drilling in this area.

There were no PM_{2.5} exceedances recorded in the western counties area. The table below lists the maximum PM_{2.5} concentrations recorded in 2011 for each site.

Table 17. 2011 Maximum PM_{2.5} Concentrations in Western Slope Counties

Site ID	Site Name	Max. 24-Hour Concentration (µg/m ³)	Annual Average Value (µg/m ³)
08 077 0017	Grand Junction – Powell	23.9	7.08
08 083 0006	Cortez	18.0	6.11

PM_{2.5}, TEOM, and BAM Continuous Monitors not Intended for NAAQS Comparison

All Federal Reference Method (FRM) monitors in the Colorado PM_{2.5} network can be and are compared to the NAAQS. The FRM monitors are all filter based 24-hour composite samples. The Division also employs three models of the TEOM (tapered element oscillating microbalance) continuous monitors in the Colorado network, two of which are designated as Federal Equivalent Method (FEM) monitors. One does not have federal equivalency. The three TEOM models are:

- TEOM 1400ab (not an FEM)
- TEOM 1400ab with 8500 FDMS (Filter Dynamic Measurement System) is an FEM
- TEOM 1405-DF, a dichotomous monitor that captures both PM_{2.5} (fine particles) and PM_{10-2.5} (coarse particles) and adds those two parameters to calculate PM₁₀ concentrations and uses an FDMS is an FEM.

It should be noted here that the APCD does not collect or report PM_{2.5} FEM data.

These monitors are used to gather near real-time data that are mainly used to inform and alert the public when concentrations are elevated and for short term forecasting of air pollution by the Division. Although, the TEOM 1400ab with 8500 FDMS, and the TEOM 1405-DF are federally equivalent monitors, the Division has chosen to not use these monitors for regulatory purposes due to frequent problems with the monitors. The following sites have continuous PM_{2.5} monitors that are not intended for comparison with the NAAQS:

- 08 001 0006-3 Commerce City, 7101 Birch Street
- 08 013 0003-3 Longmont-Municipal, 350 Kimbark Street
- 08 013 1001-3 Boulder CU/Athens, 2102 Athens St.
- 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
- 08 123 0006-3 Greeley-Hospital, 1516 Hospital Road

Community Monitoring Zones

Community monitoring zones are an additional method of defining an area for comparison

with the PM_{2.5} NAAQS where data from two or more monitoring sites 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.

Planned Changes in PM_{2.5} Monitoring

The Denver – DMAS site will be relocated due to a change in the surrounding land use. A possible relocation of the Boulder CU/Athens TEOM site due to new construction near the site is being investigated. The Elbert background site was unexpectedly terminated due to a change in property ownership. The new owner does not want monitoring on his property. A replacement new PM_{2.5} background site is currently being established in Douglas County in Castlewood Canyon State Park.

VIII. TSP/Pb

In December 2006 Total Suspended Particulate (TSP) monitoring by the APCD was reduced from six monitoring sites to a single site at Denver - DMAS. 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 current standard. In addition, Colorado has not recorded an exceedance of the previous lead standard (1.5 µg/m³ averaged over a calendar quarter) since the first quarter of 1980. The new lead standard, which is 0.15 µg/m³ averaged over any three rolling consecutive three-month periods, has not been exceeded using data from 2009 – 2011. The new lead standard became effective on December 15, 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 greater than one ton(s) per year (TPY) of total lead, which includes elemental lead and all lead compounds. Thus,

no new 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 had 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 exceeded the threshold for lead, the Division has located a lead sampling site at the Centennial Airport. This monitoring site was installed in March 2011 and the first sample was collected on April 3, 2011. 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). This new monitoring is on hold pending an airport lead study being conducted by EPA.

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 2,784,228 (April 2010 census data). There are various industries and manufacturing processes located in the area, but only a very few emit significant amounts of lead into the air.

There were no exceedances of the lead NAAQS in 2011. The maximum TSP value recorded by the primary DMAS TSP monitor in 2011 was 110 $\mu\text{g}/\text{m}^3$. The maximum lead value recorded by the DMAS primary lead monitor in 2011 was 0.018 $\mu\text{g}/\text{m}^3$. The maximum TSP value recorded by the Centennial TSP monitor in 2011 was 124 $\mu\text{g}/\text{m}^3$. The maximum lead value recorded by the Centennial lead monitor in 2011 was 0.060 $\mu\text{g}/\text{m}^3$.

The TSP/Lead monitoring sites in this area include:

08 005 0007 Centennial Airport, near 7800 S. Peoria Street

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

Planned Changes in TSP and Lead Monitoring

The only planned change to the network in 2012 is the relocation of the Denver – DMAS site due to a change in the surrounding land use.

IX. 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 monitoring sites 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 0025 Denver Municipal Animal Shelter, 678 S. Jason Street
08 035 0004 Chatfield State Park, 11500 N. Roxborough Park Road
08 045 0005 Parachute – Elem. School, 100 E. 2nd Street
08 045 0012 Rifle Health Dept., 195 W. 14th Street
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 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
08 081 0002 Lay Peak, no address
08 099 0003 Lamar Port of Entry, 7100 US Hwy 50
08 123 0009 Greeley – Weld County Tower, 3101 35th Ave.

Planned Changes in Meteorological Monitoring

The Rocky Flats SE site was eliminated at the end of 2011. Those sensors were installed at the Greeley-Weld County Tower site. The Denver – DMAS site will be relocated due to a change in land use around the site. In addition, meteorological sensors will be installed at the near roadway NO₂ site.

X. QUALITY ASSURANCE

Continuous Monitors

The APCD staff performs three types of gaseous analyzer performance checks: precision checks, accuracy audits, and calibrations. These audits/calibrations challenge the analyzer with pollutant gases of known concentration within the range of the analyzer. The APCD Quality Assurance staff conducts accuracy audits on all of the CO instruments at least twice per year. The APCD field staff conducts precision checks nominally once every two weeks, and 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.

Particulate 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 and collect a sample from both samplers once every sixth day. EPA requires a minimum of 15% of the FRM network to be collocated. Colorado has 16 FRM monitoring sites and, two sites are collocated (CAMP, Commerce City). The EPA also has a performance evaluation program (PEP), which checks the national network for bias by having a private contractor set up an independent FRM sampler next to the Division's PM_{2.5} sampler (between 1 – 4 m apart). Once each calendar quarter a collocated sample from 25 % of the network is sent to a private laboratory (RTI) to compare results and check for bias. All of the samples are then compared to ensure that the data are within federal limits and meet pre-established data quality objectives.

Once each calendar quarter a collocated sample is sent to the EPA Region 9 lab as part of the lead performance evaluation program (Pb-PEP), which checks the national network for bias. The samples are then compared to ensure that the data are within federal limits and meet pre-established data quality objectives.

Meteorological Monitors

Annual calibrations and audit checks are performed on the meteorological equipment to determine proper alignment and operation of the sensors. 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.

XI. SUMMARY OF NETWORK CHANGES

In 2011, several network changes occurred, and in 2012 several more changes are planned. This section summarizes the completed and planned changes below.

Completed Changes

The following changes to CDPHE's monitoring network occurred during 2011.

- Denver – Firehouse #6 CO monitor was decommissioned 12/31/2011. The site modification form was available for public comment 12/09/2011 to 01/09/2012, and is included in Appendix D.
- Longmont – Main CO monitor was decommissioned 12/31/2011. The site modification form was sent to EPA on 5/30/2012, and is included in Appendix C.
- Arvada O₃ monitor was decommissioned 12/31/2011. The site modification form was available for public comment 12/09/2011 to 01/09/2012, and is included in Appendix D.
- Rocky Flats – SE meteorological monitors were decommissioned 12/31/2011. The site modification form was available for public comment 12/09/2011 to 01/09/2012, and is included in Appendix D.
- Elbert County PM_{2.5} monitor was decommissioned in 05/2011. A network modification form is included in Appendix H.
- Denver – CAMP site began O₃ monitoring 02/09/2012. The site modification form was available for public comment 05/15/2010 to 06/15/2010, and is included in Appendix E.

- Greeley – Weld County Tower began meteorological monitoring 02/28/2012. A site modification form has not yet been developed for this change.
- Lay Peak site began O₃ monitoring 08/23/2011.

Planned Changes

The following changes to CDPHE's monitoring network are planned for 2012-2013.

- The NCore site will be relocated from the Denver – DMAS location to the Denver – La Casa site. The site modification forms were available for public comment from 01/12/2012 to 02/13/2012, and are included in Appendix B.
- A near-roadway NO₂ monitor, as well as a trace level CO monitor will be installed by January 1, 2013. A network modification form has not yet been created for this site. The site location has been secured, and the Special Use Permit is included in Appendix G.
- A new SO₂ site will be installed in Colorado Springs by January 1, 2013 to meet new monitoring requirements.
- A new background PM_{2.5} site will be installed at Castlewood Canyon State Park by the end of 2012.
- The Denver – Carriage site will be decommissioned at the end of 2012.
- Lamar Power Plant monitor will be considered for removal.
- Boulder CU/Athens TEOM site will be considered for removal.
- The Breckenridge PM₁₀ monitoring site will shut down June 1, 2012. A network modification form is under development for this change.
- The possible installation of a new ozone site in the Pueblo area will be investigated.
- In addition, a review of Front Range ozone sites for possible enhancements will take place.

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 18. 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	Arapahoe 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 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		X
08 031 0013	Denver - NJH-E								X		
08 031 0014	Denver - Carriage		X								X
08 031 0016	DESCI										X
08 031 0017	Denver Visitor Center							X			
08 031 0023	Denver – Swansea Elem.								X		
08 031 0025	Denver Municipal Animal Shelter	X	X	X		X	X	X	X	X	X
08 035 0004	Chatfield State Park		X						X		X
08 041 0013	U. S. Air Force Academy		X								
08 041 0015	Colorado Springs Hwy. 24	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 – Elem. School							X			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

<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 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
08 081 0002	Lay Peak		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 0015	Pueblo - Fountain School							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									

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

The Alsup Elementary School - Commerce City site is in a predominantly residential area with a large commercial and industrial district. It is located 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 Alsup 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 east, and gravel pits about a kilometer to the west and northwest.

PM₁₀ monitoring began in January 2001 and continues today. The maximum PM₁₀ concentration recorded at this site in 2011 was 82 µg/m³. There were no exceedances of the PM₁₀ NAAQS at this site in 2011.

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 was 41.9 µg/m³, which is an

exceedance of the standard.

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 CO 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.

CO 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 one-hour or eight-hour CO 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 eight-hour maximum value recorded in 2011 was 2.0 ppm, while the one-hour maximum value was 2.4 ppm.

O₃ monitoring began at Welby in July of 1973. The Welby monitor has not recorded an exceedance of the old one-hour O₃ standard since 1998. However, the trend in the 3-year average of the 4th maximum eight-hour average has been increasing since 2002. The first maximum eight-hour O₃ concentration recorded at this site in 2011 was 0.089 ppm. The three year average of the 4th highest eight-hour average value for this site from 2009 through 2011 is 0.070 ppm, which is only slightly less than the standard value of 0.075 ppm.

The Welby NO₂ 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 18.14 ppb in 2011, which is well below the standard of 53 ppb.

The Welby SO₂ monitor began operation in July of 1973. The maximum 24-hour concentration recorded here was 5.0 ppb in 2011. The annual average was 1.36 ppb, the maximum one-hour average was 30 ppb, and the maximum 3-hour average was 24.0 ppb. All values were well below the SO₂ standards of 140 ppb (24-hour max), 30 ppb (annual avg.), 75 ppb (one-hour) and 500 ppb (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 by the high volume sampler in 2011 was 67 µg/m³, and that recorded by the continuous monitor was 80 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 adjacent to this highway but far enough away to reduce direct impacts on the PM₁₀ levels. Meteorological data are not available from the area. The city has a

population of 8,780 (2010 Census data). This is an increase of 10.3% 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 sampling schedule. The maximum PM₁₀ concentration recorded at this site in 2011 was 440 µg/m³, which was an exceedance of the NAAQS, but was caused by a natural event (high winds/blowing dust), which may be excluded under the exceptional event rule. There were two exceedances recorded at this site in 2011. All are being documented as exceptional events.

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 2011 was 635 µg/m³, which was an exceedance of the NAAQS, but was caused by a natural event (high winds/blowing dust), which may be excluded under the exceptional event rule. There were two exceedances recorded at this site in 2011. All are being documented as exceptional events.

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 O₃ “cloud,” although it may not be in the area of maximum concentrations. This is a population oriented neighborhood scale SLAMS monitor. The first maximum eight-hour O₃ concentration recorded at this site in 2011 was 0.087 ppm. The 3-year average of the 4th maximum O₃ concentration from 2009 through 2011 is 0.074 ppm. The site was shut down for a short time in 2011 to relocate the sampling trailer 25 meters to the east of its previous location. At this time the meteorological tower was switched from a free standing tower to a shelter mounted tower. This was done to allow for the construction/installation of a back-up generator by the land owners.

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 360⁰ 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 2011 was 22.4 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 O₃ “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. This is a special projects monitor (SPM) for a regional scale. The first maximum eight-hour average recorded at this site in 2011 was 0.089 ppm. The 3-year average of the 4th highest O₃ concentration for 2009 through 2011 is 0.071 ppm.

Centennial Airport, 7800 S. Peoria Street (08 005 0007):

The Centennial Airport site was established in April of 2010 in response to the tightening of the lead standards by the EPA. The maximum TSP concentration recorded at this site in 2011 was 124 µg/m³. There is no NAAQS for TSP. The maximum lead concentration recorded was 0.060 µg/m³, which is well below the lead standard.

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. In 2011 there were no exceedances recorded by this monitor. The highest PM₁₀ concentration recorded at this site in 2011 was 109 µg/m³, which is well below 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. However, the highest wind gusts come from the west and southwest during region dust storms. This is a population oriented neighborhood scale SLAMS monitor on a daily sampling 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 followed by PM_{2.5} monitors in 1999. The maximum PM₁₀ concentration recorded at this site in 2011 was 36 µg/m³, while the maximum PM_{2.5} concentration recorded was 23.8 µg/m³. Both values are below their respective standards of 150 µg/m³, and 35 µg/m³ (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 PM₁₀ 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.

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 O₃ monitor as a part of the "summer 1993 Denver O₃ Study." During that summer a one-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 O₃ monitoring site when the instruments were moved into a new shelter.

The first maximum eight-hour value recorded at this site in 2011 was 0.082 ppm. The 3-year average of the 4th maximum O₃ concentration is 0.073 ppm for the 2009 through 2011 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 PM_{2.5} site is approximately 7,000 feet east of the base of the Front Range foothills and about 50 feet south of a small branch of Boulder Creek, the major creek that runs through Boulder.

PM₁₀ monitoring began at this site in December of 1994, while the PM_{2.5} monitoring did not begin until January of 1999. The maximum PM₁₀ concentration recorded here in 2011 was 35 µg/m³, while the maximum PM_{2.5} concentration was 25.0 µg/m³. Both the PM_{2.5} and PM₁₀ values were well below the standards.

The predominant wind direction at the Division's closest meteorological site (Rocky Flats – North) 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 middle scale, but the site has been justified to represent a neighborhood scale site in accordance with federal guidelines found in 40 CFR, Part 58 and Appendix D. This is a population oriented neighborhood scale SLAMS monitoring site 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 immediate north of the site and south of the University of Colorado football practice fields. This location provides a good neighborhood representation for particulates. The site began operation in November 2004, and may be removed in 2012 due to construction of a new covered air-filled dome covering the practice fields that obstructs air flow. The dome is erected each fall, and remains inflated until early spring. It is removed during the summer months.

The maximum 24-hour PM_{2.5} value recorded by the continuous monitor at this site in 2011 was 23.3 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 2011 was 51 µg/m³. There were no exceedances of the standard at this location in 2011. 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.

CO 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 CO 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 eight-hour maximum CO value recorded in 2011 at this site was 1.9 ppm, while the one-hour maximum was 3.5 ppm. Both values are well below the NAAQS.

The NO₂ monitor began operation in January 1973 at this location. The one-hour design value cannot be calculated due to data validity issues in previous years. The 2011 annual average at this site was 24.49 ppb, which is well below the standard. The 98th percentile value was 64.0, and the highest one-hour concentration recorded was 109 ppb.

The SO₂ monitor began operation in January 1967. The 3-hour maximum value recorded in 2011 was 26.6 ppb, while the 24-hour maximum was 9.7 ppb. The annual average was 2.07

ppb. The one-hour design value was 34.0 ppb. All values are well below the NAAQS.

Ozone monitoring was added at CAMP in February 2012.

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 2011 by the monitor was 109 µg/m³. The maximum recorded by the continuous monitor was 96 µg/m³. The 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 2011 by the monitor was 31.6 µg/m³. The value is 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 24-hour PM_{2.5} concentration recorded by the continuous monitor at this site in 2011 was 36.2 µg/m³, which is an exceedance of the 24-hour NAAQS. However, data from this continuous TEOM monitor is not compared with the NAAQS. It is used for short term forecasting and public notifications. 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 O₃ exposure since it is isolated enough to be unaffected by local traffic. O₃ levels at this site have not exceeded the old one-hour NAAQS since 1987. The first maximum eight-hour O₃ concentration recorded at this site in 2011 was 0.090 ppm. The 3-year average of the 4th highest O₃ concentration from 2009 through 2011 is 0.069 ppm, which is less than the current standard of 0.075 ppm. This is a population oriented neighborhood scale SLAMS monitor. Site will be decommissioned in 2012.

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 had been 119 µg/m³ in 2001. In 2011, though, the maximum value recorded was 123 µg/m³, which is higher than the 2001 value, but below the NAAQS of 150 µg/m³. In the past ten years, the 24-hour maximum levels have trended downward. This is a population oriented middle scale SLAMS monitor operating on a daily sample schedule.

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

The Denver - Swansea Elementary school site was first 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 later established in December of 2004 as a special purpose monitor to gather pre-construction background concentrations for the potential I-70 corridor planned move to the north. Since then, high PM_{2.5} concentrations have been recorded at the PSM site, so the Division decided to keep the site and made it a permanent SLAMS site. The highest concentration recorded at this site in 2011 was 33.7 µg/m³, which is below the NAAQS. This population oriented neighborhood scale SLAMS monitor is operating 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 monitoring site when the building was demolished and another constructed nearby. The Gates site was located at 1050 S. Broadway, about one half mile south-southeast and on the east 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. The site has been established as the NCore site for the Denver Metropolitan area and includes a trace gas/precursor-level CO analyzer, and a NO_y analyzer, in addition to the trace level SO₂, O₃, meteorology and particulate monitors. The site represents a population oriented neighborhood scale monitoring area.

The trace level SO₂, CO, and NO_y analyzers began operation in January 2011. The maximum one-hour CO concentration recorded in 2011 was 2.450 ppm, and the maximum eight-hour value was 1.5 ppm. For SO₂, the maximum one-hour concentration was 36.1 ppb, with the 99th percentile one-hour value equal to 29.9 ppb. The maximum 24-hour concentration was 6.9 ppb, and the annual average SO₂ concentration was 2.22 ppb. The annual average value does not satisfy the summary criteria, however. There are no reportable NO₂/NO_y values, as there is no current NO_y standard, and there were several issues with the instrument that caused a data capture rate of less than 75%.

The first maximum eight-hour O₃ concentration recorded at this site in 2011 was 0.075 ppm. The 3-year average of the 4th maximum O₃ concentration for this site from 2009 through 2011 is 0.065 ppm.

The meteorological monitoring began in July of 2008. During the course of 2012 additional sensors will be added to the met monitoring network. These sensors will include barometric pressure, solar radiation, and precipitation.

PM₁₀ monitoring began in July 2005. Currently, there is a pair of collocated high volume samplers on a platform next to the trailer, and a Lo-Vol PM₁₀ on the trailer roof. These concurrent PM₁₀ measurements will be compared prior to removing the Hi-Vol PM₁₀ monitors. The Lo-vol PM₁₀ concentrations are more useful as they can be used with the PM_{2.5} measurements to calculate PM_{10-2.5} or coarse PM. The maximum PM₁₀ value recorded by the primary monitor was 47 µg/m³, and that recorded by the continuous monitor was 63 µg/m³. Both values are well below the NAAQS.

PM_{2.5} monitoring began in April 2007 with the installation of an FRM monitor. A continuous TEOM/FDMS FEM instrument was added in September 2007, and a supplemental PM_{2.5} speciation monitor was added in January 2011. A carbon speciation monitor was added in 2011. The maximum PM_{2.5} value recorded by the monitor in 2011 was 30.3 µg/m³, which is below the NAAQS.

TSP/lead (Pb-TSP) monitoring began in July of 2005. The largest value recorded by the lead monitor was 0.018 µg/m³, which is well below the level of the standard at 0.15 µg/m³. The largest TSP concentration recorded was 110 µg/m³.

This site will be decommissioned in 2012 due to a change in the use of the surrounding land. A new NCore site will be established as a replacement.

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 O₃ 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 O₃ formation in the Denver metro area.

The Chatfield monitor has exceeded the O₃ standard each of the past five years and the trend of the 3-year averages is increasing. The eight-hour maximum concentration recorded at this site in 2011 was 0.099 ppm. The 3-year average of the 4th maximum O₃ concentration for 2009 through 2011 is 0.077 ppm, which exceeds the current standard. 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 2011 was 21.7 µg/m³, which is below the NAAQS.

Meteorological monitoring began in April of 2004.

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

The United States Air Force Academy site was installed as a replacement maximum concentration O₃ monitor for the Chestnut Street (08 041 0012) site. Modeling in the Colorado Springs area indicates that high O₃ 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 one-hour standard in 2003, but it would not have recorded any exceedances of the current eight-hour standard. However, the trend in values over the past ten years is increasing. The first maximum eight-hour O₃ concentration recorded at this site in 2011 was 0.083 ppm. The 3-year average of the 4th maximum O₃ concentration for 2009 through 2011 is 0.067 ppm, which is below the current NAAQS.

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) CO 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 CO 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 eight-hour maximum CO value recorded at this site in 2011 was 1.7 ppm, and the one-hour max was 3.0 ppm, which are both well below their respective NAAQS.

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

Manitou Springs is located 4 miles west of Colorado Springs. It was established because of concern that the “O₃ cloud” was traveling farther up the Fountain Creek drainage 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 six seasons of operation it has not recorded any levels greater than the current standard. The trend in eight-hour concentrations is increasing, however.

The eight-hour maximum O₃ value recorded at this site in 2011 was 0.080 ppm, which is above the current NAAQS. The 3-year average of the 4th maximum O₃ value for 2009 through 2011 is 0.070. 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 January, 2007 after the revised particulate regulations required that Colorado Springs needed a continuous PM_{2.5} monitor. The Division 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 FRM PM_{2.5} monitor and added a low volume FEM PM₁₀ monitor in November, 2007. The continuous monitor began operation in April 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 monitoring sites 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 2011 was 63 µg/m³, which is well under the NAAQS. The maximum value recorded by the PM_{2.5} monitor at this site in 2011 was 22.7 µg/m³; 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 2011 was 71 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 is 150µg/m³. The maximum value recorded at this site in 2011 was 96 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 monitoring for particulates 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 monitoring sites: 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 2011 was 54 µg/m³, which is well 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 O₃ 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 eight-hour maximum O₃ concentration recorded at this site in 2011 was 0.068 ppm. The 3-year 4th maximum O₃ concentration for 2009 through 2011 is 0.064 ppm.

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 continuous monitor. Crested Butte has recorded one exceedance of the NAAQS since it began monitoring, and that was in 2010. The maximum PM₁₀ value recorded at this site by the monitor in 2011 was 74 µg/m³, while the value recorded by the continuous monitor was 77 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 2011. A CMB source apportionment from 10 PM₁₀ filters identified crustal material as the mostly likely source (91%) of PM₁₀. Carbon, which is most likely from residential wood smoke, made up 8% of the statistically composite sample and secondary species made up the remaining one percent. The Mt. Crested Butte site was also selected because it is an area representative of the residential impact of PM₁₀. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The maximum PM₁₀ value recorded at this site in 2011 was 65µg/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 O₃ “cloud.” As a result, when conditions are proper for daylong O₃ 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. In the 5-Year Network Assessment Plan the Arvada site was deemed to be redundant. The last valid ozone sample was taken 12/31/2011, and the instrument was removed shortly after that.

Meteorological monitoring began in 1975.

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

The Division conducted a short-term O₃ 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 O₃ 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.

Since 2002 the trend in O₃ values is increasing, and in 2008 the 3-year average was above the level of the standard. In 2011 the first maximum eight-hour O₃ value recorded at this site was 0.087 ppm. The 3-year average of the 4th maximum O₃ concentration is 0.073 ppm for 2009 through 2011, which is just below the level of the current standard of 0.075 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 O₃ monitor and meteorological monitors as a part of the first phase of the APCD's monitoring effort around the Rocky Flats Environmental Technology Site.

O₃ monitoring began as a part of the "Summer 1993 Ozone Study." The monitor recorded some of the highest O₃ levels of any of the sites during that study. Therefore, it was included as a regular part of the APCD O₃ 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 eight-hour maximum O₃ concentration recorded at this site in 2011 was 0.104 ppm. The 3-year average of the 4th maximum O₃ concentration for 2009 through 2011 is 0.078 ppm, which exceeds the level of the current standard. This is a highest concentration oriented urban scale SLAMS monitor.

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 eight-hour O₃ concentrations in the Denver area. It has exceeded the current standard each of the past 15 years it has been in operation. The eight-hour maximum concentration recorded at this site in 2011 was 0.096 ppm. The 3-year average of the 4th maximum O₃ concentration for 2009 through 2011 is 0.075 ppm, which is equal to the level of the current standard. 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 O₃ levels. In addition, passive O₃ monitors used in the area in a 2007 study indicated the possibility of higher O₃ 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 O₃ levels that are larger than those seen in the metro area, as O₃ 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 eight hour maximum O₃ concentration recorded at this site in 2011 was 0.078 ppm. The 3-year average of the 4th maximum eight-hour O₃ concentration for 2009-2011 is 0.070 ppm.

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 2011 was 51 µg/m³, which is below the NAAQS.

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 2011 was 53 µg/m³, while that recorded by the continuous monitor was 45 µg/m³. The maximum PM_{2.5} concentration recorded was 30.0 µg/m³. All 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 the Fort Collins area. The levels recorded for the first season of operation showed consistently higher concentrations than the 708 S. Mason Street monitor. For 2011 the 3-year average of the 4th maximum eight-hour average value was 0.076 ppm. This site exceeds the current standard of 0.075 ppm. The highest eight-hour average recorded here in 2011 was 0.086 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 O₃ levels in this area. The site is intended to verify/refute the model prediction. This is an urban scale special purpose monitor.

In 2011, the largest eight-hour average O₃ concentration recorded at this site was 0.080 ppm. The 3-year average of the 4th maximum O₃ concentration for 2009 through 2011 is 0.071 ppm.

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 one-hour CO standard of 35 ppm as a one-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 eight-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 CO monitor under Federal regulation. However, it is one of the largest cities along the Front Range and was declared in nonattainment for CO in the mid-1970s after exceeding the eight-hour standard in both 1974 and 1975. The current level of monitoring is in part a function of the resulting CO State Monitoring Plan (SMP) for the area. It is a population oriented neighborhood scale SLAMS monitor. The eight-hour maximum concentration recorded at this site in 2011 was 1.5 ppm. The one-hour max recorded was 2.8 ppm. Both values are well below the NAAQS for CO.

O₃ monitoring began in 1980, and continues today. The eight-hour average O₃ maximum value recorded here in 2011 was 0.071 ppm. The 3-year average of the 4th maximum O₃ concentrations for 2009 through 2011 is 0.065 ppm, which is below the level of the current standard.

In March 2012 the meteorological tower was relocated from a freestanding tower on the west side of the shelter to a shelter mounted tower on the south side of the shelter due to the Mason Street Redevelopment Project.

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 2011 was 41 µg/m³, which is below the level of the standard. The maximum PM_{2.5} concentration recorded here in 2011 was 23.9 µg/m³. This is not an exceedance of the standard.

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 CBD would provide a better representation of CO concentration values for the city. The CO concentrations at the Stocker Stadium site had been declining from an eight-hour maximum in 1991 of 7.8 ppm to 3.3 ppm in 2003. The Pitkin monitor has shown a continuing decline in the maximum eight hour average values to 1.1 ppm in 2011, which is well below the standard. The maximum one-hour average was 1.8 ppm, also well below the NAAQS. 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 2011 was 60 µg/m³, which does not exceed 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 O₃ 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 first maximum eight-hour average O₃ concentration recorded at this site in 2011 was 0.068 ppm. The 3-year average of the 4th maximum eight-hour O₃ values for this site for 2009 through 2011 is 0.066 ppm.

Lay Peak, (08 081 0002):

The Lay Peak site was established in support of the 3-State Pilot Study program. It began operations in 08/2011. The site monitors for O₃ and meteorological parameters, including relative humidity. It is a regional site.

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 O₃ and PM_{2.5} monitors in operation at this site.

The O₃ site was established to address community concerns of possible high O₃ 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 first maximum eight-hour average value recorded here in 2011 was 0.073 ppm, which is below the level of the current standard. This could change, however, when the proposed new O₃ standard is announced. It is expected to be in the range of 0.060 to 0.070 ppm. The 3-year average of the 4th maximum eight-hour O₃ values for this site for 2009 through 2011 is 0.065 ppm.

The maximum recorded value for PM_{2.5} in 2011 was 18.0 µg/m³.

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.

The population oriented neighborhood scale SLAMS monitor is operating on a 1 in 3 sample schedule. The largest PM₁₀ concentration recorded at this site in 2011 was 51 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 2011 was 192 µg/m³, which exceeds the level of the standard. There were two exceedances at this site in 2011, both of which were due to blowing dust natural events.

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 µg/m³, and both sites regularly record values above 100µg/m³ as a 24-hour average. This is a population oriented neighborhood scale SLAMS monitor on a daily sample schedule.

The highest PM₁₀ concentration recorded at this site in 2011 was 122 µg/m³, which is below the level of the standard.

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 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 2011 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 2011. 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 PM₁₀ concentration recorded in 2011 was 117 µg/m³, which is lower than the level of the standard. The largest PM_{2.5} concentration here in 2011 was 16.2 µg/m³, 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 PM₁₀ concentration recorded at this site in 2011 was 135 µg/m³, 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 ½ 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 PM₁₀ concentration recorded at this site in 2011 was 68 µg/m³, which does not exceed 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 2011 was 86 µg/m³, which is below the level of the standard. This monitoring location will be decommissioned in June 2012. The site has recorded low concentrations in the past ten years, and is difficult to access.

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 2011 was 46 µg/m³, which is below the level of the standard. The largest PM_{2.5} concentration recorded at this site in 2011 was 28.7 µg/m³, which does not exceed the level of the standard.

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 will burn 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 operating on a 1 in 3 day sample schedule, while the speciation monitor is operating 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 2011 was 29.8 µg/m³, which is below the level of the standard.

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

The Weld County Tower O₃ 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. This is a population oriented neighborhood scale SLAMS monitor.

The first maximum eight-hour average O₃ concentration recorded at this site in 2011 was 0.081 ppm, which is above the level of the current standard (0.075 ppm). The 3-year average of the 4th maximum O₃ concentrations from 2009 through 2011 is 0.072 ppm, which is just below the level of the current standard.

Meteorological monitoring began 02/25/2012.

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

Greeley does not have the population to require a CO monitor under Federal regulation. However, it is one of the larger cities along the Front Range and was declared in nonattainment for CO in the late-1970s after exceeding the eight-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 eight-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 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 eight-hour standard.

The maximum eight-hour average CO concentration recorded at this site in 2011 was 2.0 ppm, which is below the level of the current standard (9 ppm). The one-hour maximum CO concentration recorded at this site was 2.7 ppm, which is also below the standard (35 ppm).

Appendix B - National Core (NCore) Network Modification Forms

STATE OF COLORADO

John W. Hickenlooper, Governor
Christopher E. Urbina, MD, MPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

Carl Daly
Air Program Chief
US Environmental Protection Agency
8P-AR
1595 Wynkoop St.
Denver, CO 80202-1129

February 12, 2012

Dear Mr. Daly:

The Colorado Department of Public Health and Environment – Air Pollution Control Division (APCD) is being required to relocate Colorado’s current National Core Monitoring Network (NCore) site located at the now vacated Denver Municipal Animal Shelter. A replacement NCore site has been identified at Denver Health’s La Casa – Quigg Newton Family Health Center and the APCD is requesting your acceptance of the proposed site.

The existing Denver Municipal Animal Shelter (08-031-0025) site was established at 678 S. Jason St., Denver, Colorado in July 2005 and became fully operational as Colorado’s NCore site in January 2011. A current list of NCore parameters operating at the site and a medium scale map of the site are given in Attachments 1 and 2, respectively. However, this site will have to be relocated due to a change in use of the adjacent former animal shelter building and land uses changes that will create an environment that will no longer be suitable for ambient air quality monitoring. A conceptual drawing from “The River South Greenway Master Plan” of the land redevelopment to occur at this site can be seen in Attachment 3. As can be seen, roads will be relocated and new trees will be planted to make this area part of a larger park system as part of Denver’s “River South Greenway” project.

Based upon review of Front Range air quality monitoring and emissions inventory data in the Denver area, a new NCore site has been identified and is being proposed to Environmental Protection Agency (EPA) for acceptance. The proposed site is located at Denver Health’s La Casa – Quigg Newton Family Health Center, 4545 Navajo St., Denver, Colorado 80211 (coordinates 39° 46’ 46.04” N, 105° 0’ 18.68”

W). An initial investigation of the site shows that all siting criteria can be reasonably met and initial conversations with the Denver Health's facility management are favorable. The spatial relationship between the existing DMAS NCore site and this proposed NCore site can be seen in Attachment 4, with more detailed Google Earth views of the site in Attachments 5, 6 and 7.

During the last EPA/National Association of Clean Air Agencies (NACAA) Monitoring Steering Committee meeting, which was held in Denver on October 24th – 26th, 2011, both regional and national EPA staff had the opportunity to visit the proposed site, which resulted in favorable reviews.

Listed below is a summary of attachments for this application:

- Attachment 1: Denver Municipal Animal Shelter – Parameter List
- Attachment 2: Denver Municipal Animal Shelter NCore Site Map
- Attachment 3: The River South Greenway Master Plan – DMAS NCore Site Redevelopment
- Attachment 4: Existing and Proposed NCore Sites (Large Scale Map)
- Attachment 5: Proposed Denver Colorado NCore Site Location (Large Scale Map)
- Attachment 6: Proposed Denver Colorado NCore Site Location (Medium Scale Map)
- Attachment 7: Proposed Denver Colorado NCore Site Location (Small Scale Map)
- Attachment 8: Region 8 Network Modification Request Form

As part of this process, this letter was made available for a 30 day public comment period (January 12, 2012 thru February 13, 2012) and details of the new location will be included in the 2012 Annual Network Plan. The APCD welcomes your consideration of our request and looks forward to your response. Please let me know if you have any questions.

Sincerely,



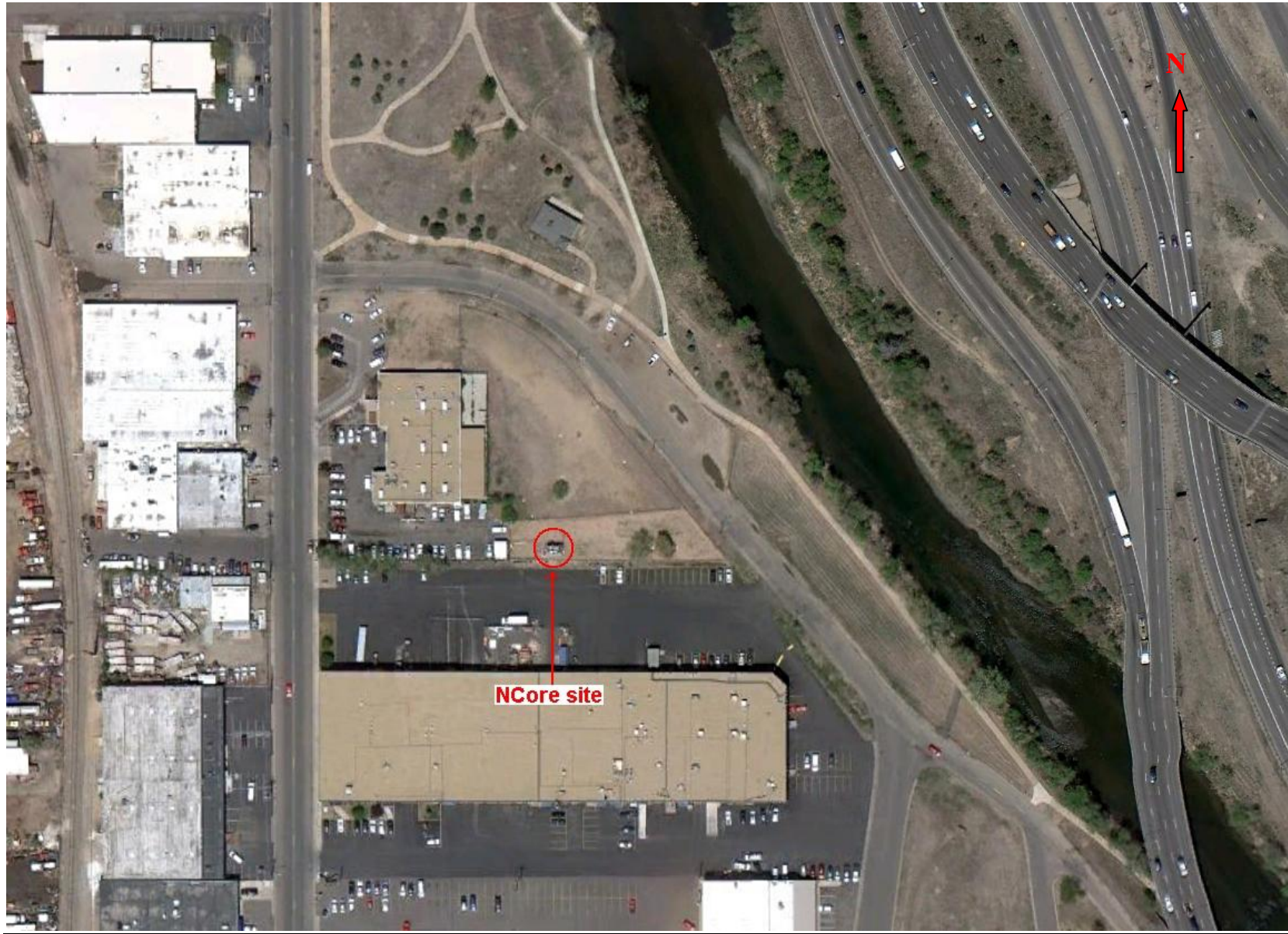
Gordon Pierce
Technical Services Program Manager
Air Pollution Control Division
Colorado Department of Public Health and Environment
APCD-TS-B1
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

303-692-3238
gordon.pierce@state.co.us

Attachment 1 - Denver Municipal Animal Shelter (DMAS) – Parameter List

NCORE Denver Municipal Animal Shelter – Parameter List	
Gaseous Measurements	
<u>Parameter</u>	<u>Analyzer / Sampler / Sensor</u>
Carbon Monoxide (CO)	Thermo 48i-TLE
Nitric Oxide (NO)	Teledyne/API 200EU
Oxides of Nitrogen (NOy)	Teledyne/API 200EU
Ozone (O3)	Teledyne/API 400E
Sulfur Dioxide (SO2)	Teledyne/API 100EU
Particulate Measurements	
<u>Parameter</u>	<u>Analyzer / Sampler / Sensor</u>
Lead – Total Suspended Particulates	Sierra Anderson – High Volume Sampler
Particulate Matter < 10 microns (filter)	R&P 2025 Sequential Sampler
Particulate Matter < 10 microns (continuous)	Thermo 1400 TEOM
Particulate Matter < 2.5 microns (filter)	R&P 2025 Sequential Sampler
Particulate Matter < 2.5 microns (continuous)	Thermo 1400 TEOM
Particulate Matter < 2.5 microns Chemical Speciation	MetOne SASS Sampler
Particulate Matter < 2.5 microns Carbon	URG 3000N
Meteorological Measurements	
<u>Parameter</u>	<u>Analyzer / Sampler / Sensor</u>
Wind Speed - Scalar	MetOne 010C
Wind Speed - Vector	MetOne 010C
Wind Direction - Scalar	MetOne 020C
Wind Direction - Vector	MetOne 020C
Wind Direction – Sigma Theta	(calculated)
Temperature (10 meters)	MetOne 060C
Temperature (2 meters)	MetOne 060C
Relative Humidity	Climatronics

Attachment 2 – Denver Municipal Animal Shelter NCore Site Map



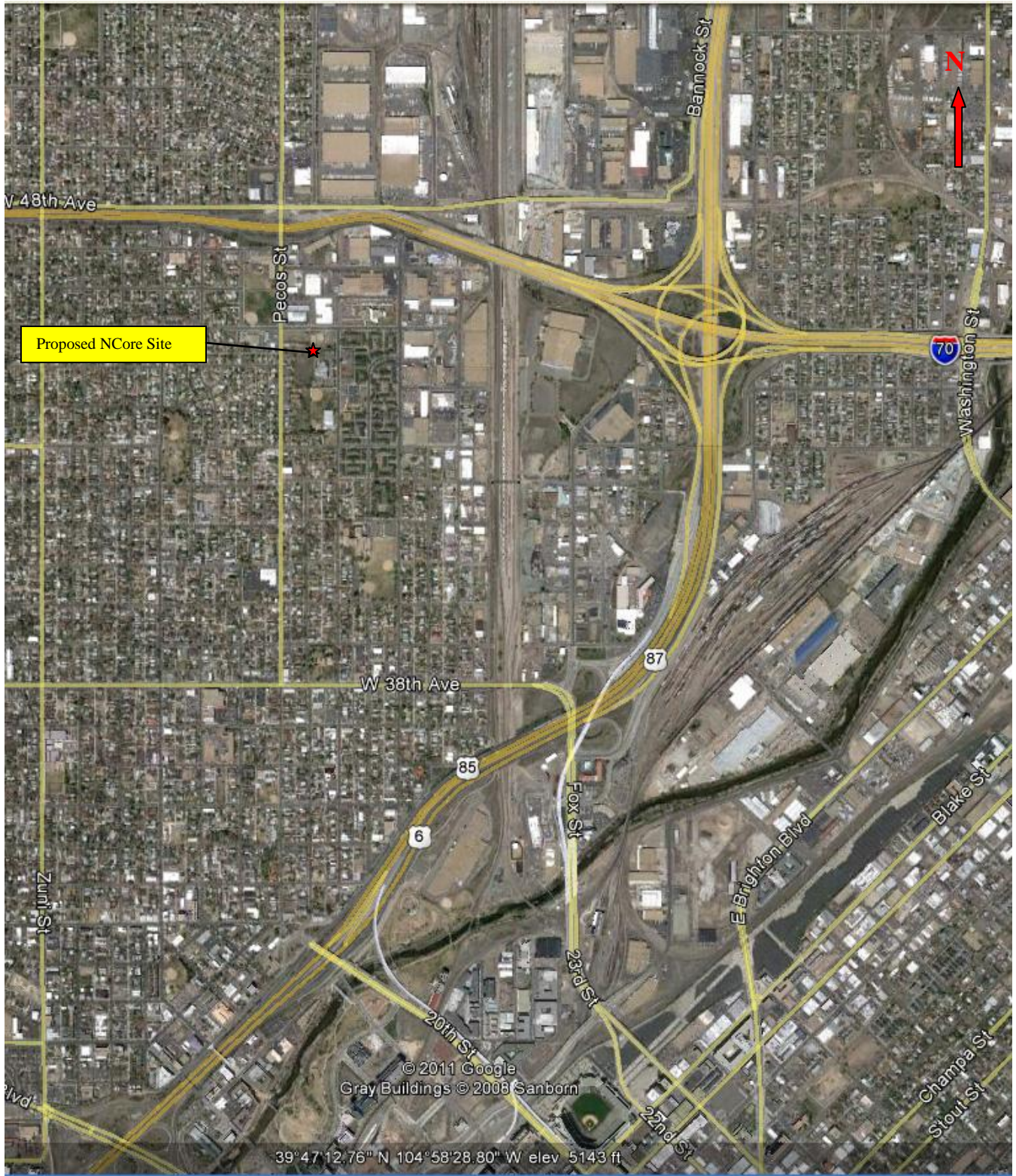
Attachment 3 – The River South Greenway Master Plan – DMAS NCore Site Redevelopment



Attachment 4 - Existing and Proposed NCore Sites (Large Scale Map)



Attachment 5 – Proposed Denver Colorado NCore Site Location (Large Scale)



Attachment 6 – Proposed Denver Colorado NCore Site Location (Medium Scale)



Attachment 7 – Proposed Denver Colorado NCore Site Location (Small Scale)



Attachment 8 – Proposed Denver Colorado NCore Site Network Modification Request Form

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM						
(VERSION 2, 4/1/04)						
DATE: 1/10/12		CITY: Denver		STATE: Colorado		
AQS SITE ID: 08-031-????			SITE NAME: LaCasa			
<p>PROPOSED MODIFICATION/REASON WHY: The Colorado Department of Public Health and Environment (CDPHE) - Air Pollution Control Division (APCD) is proposing to relocate the Denver Municipal Animal Shelter NCore site (08-031-0025) to Denver Health's La Casa – Quigg Newton Family Health Center, 4545 Navajo St., Denver, Colorado 80211 (coordinates 39° 46' 46.04" N, 105° 0' 18.68" W). This relocation is being requested due to a change in use of the adjacent former animal shelter building and land uses changes at the Denver Municipal Animal Shelter site that will create an environment that will no longer be suitable for ambient air quality monitoring. See attached letter.</p>						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
CO (trace)	NCore			X		Thermo 48i-TLE
NO/NOy	NCore			X		T-API 200EU
O3	NCore			X		T-API 400E
SO2 (trace)	NCore			X		T-API 100EU
PM10	NCore			X		R&P 2025 & Thermo 1400 TEOM
PM2.5	NCore			X		R&P 2025 & Thermo 1400 TEOM
PM2.5 Speciation	NCore			X		MetOne SASS & URG 3000N Carbon
Pb	NCore			X		R&P low-vol PM10
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed start 5/1/2012						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:						
LOCATION (LAT./LONG. OR UTM' S): 39° 46' 46.04" N, 105° 0' 18.68" W						
SITE ELEVATION (M. MSL): 1602			PROBE HEIGHT (M. AGL): 3			
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	

UNRESTRICTED AIR FLOW: **>270 DEG.** >180 DEG. <CRITERIA _____ DEG.

DISTANCE TO FLUES/INCINERATORS (M): **none**

DISTANCE TO INTERSECTIONS (M): **100**

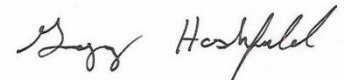
DISTANCE FROM SUPPORTING STRUCTURES (M):
VERT. 1 HORIZ. 1

DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
110	W. 46 th Ave.	NORTH	5375	2005	Local	
82	Navajo St.	EAST	1415	2008	Local	
320	W. 44 th St.	SOUTH	1540	2005	Local	
100	Pecos St.	WEST	17900	2003	Local	
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)	DIRECTION TO AREA SOURCES	COMMENTS		

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: **Gregory Harshfield**

Signature: _____



FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status Given: _____ Email Response Date: _____ Letter Response Date: _____

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES:
Support/required for NCore sites.

PROPOSED MONITORING SCHEDULE/DURATION: **Continuous/hourly averages**

PROPOSED START / REMOVAL DATE
OR DATE STARTED / REMOVED: **Proposed start 4/1/2012**

DATA ACQUISITION SYSTEM:

PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
DRDAS Ultimate			
BACKUP	WIND SPEED/DIRECTION	X	10

EQUIPMENT MANUFACTURER/MODEL: WS, WD, T = MetOne RH = Climatronics	SOLAR RADIATION		
	RELATIVE HUMIDITY	X	2
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA	X	10
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE	X	2 & 10
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		
TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):			
COMMENTS:			

EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM
(VERSION 2, 4/1/04)

DATE: 1-12-12	CITY: Denver	STATE: Colorado
AQS SITE ID: 08-031-0025	SITE NAME: Denver Municipal Animal Shelter	

PROPOSED MODIFICATION/REASON WHY:
 Site Closure. The Denver Municipal Animal Shelter will be relocated due to a change in use of the adjacent former animal shelter building and land use changes that will create an environment that will no longer be suitable for ambient air quality monitoring. The site will be relocated to the LaCasa Quigg-Newton Family Health Center located at 4545 Navajo St, Denver Colorado. The proposed decommissioning data is 5/1/2012.

AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
CO (trace)	NCore			X		Thermo 48i-TLE
NO/NOy	NCore			X		T-API 200EU
O3	NCore			X		T-API 400E
SO2 (trace)	NCore			X		T-API 100EU
PM10	NCore			X		R&P 2025 & Thermo 1400 TEOM
PM2.5	NCore			X		R&P 2025 & Thermo 1400 TEOM
PM2.5 Speciation	NCore			X		MetOne SASS & URG 3000N Carbon
Pb	NCore			X		SA hi-vol TSP

PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: Proposed Closed Date 5/1/2012

ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:

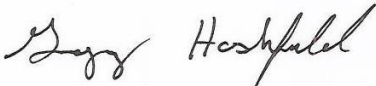
LOCATION (LAT./LONG. OR UTM ' S):

SITE ELEVATION (M. MSL):

PROBE HEIGHT (M. AGL):

DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS

UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA _____ DEG.

DISTANCE TO FLUES/INCINERATORS (M):						
DISTANCE TO INTERSECTIONS (M):			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. _____ HORIZ. _____			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
		NORTH				
		EAST				
		SOUTH				
		WEST				
DISTANCE TO NEAREST POINT SOURCES (MILES)		DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS
CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal. Printed Name: <u>Gregory Harshfield</u> Signature: _____ 						
FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status Given: _____ Email Response Date: _____ Letter Response Date: _____						

<u>FOR METEOROLOGICAL PARAMETERS ONLY:</u>			
MONITORING PURPOSE/OBJECTIVES: Site Closure. The Denver Municipal Animal Shelter will be relocated due to a change in use of the adjacent former animal shelter building and land use changes that will create an environment that will no longer be suitable for ambient air quality monitoring. The site will be relocated to the LaCasa Quigg-Newton Family Health Center located at 4545 Navajo St, Denver Colorado. The proposed decommissioning date is 5/1/2012.			
PROPOSED MONITORING SCHEDULE/DURATION: <u>Proposed Closed Date 5/1/2012</u>			
PROPOSED START / REMOVAL DATE OR DATE STARTED / REMOVED:			
DATA ACQUISITION SYSTEM:			
PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP	WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:	SOLAR RADIATION		

	RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE		
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		
TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):			
COMMENTS:			

<p>FORM KEY: PAGE 1:</p> <p>MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A SITE ELEVATION = GROUND LEVEL ELEVATION PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL</p>
--

Appendix C - Longmont CO Network Modification Form

STATE OF COLORADO

John W. Hickenlooper, Governor
Christopher E. Urbina, MD, MPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

May 30, 2012

Joseph Delwiche
8P-AR
US Environmental Protection Agency Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Mr. Delwiche,

As required, the Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) is submitting a network site modification request form for the proposed discontinuation of the Longmont - Main Street carbon monoxide monitor, AQS ID: 08-013-0009. This letter and Network Modification form was made available on the Air Pollution Control Division website from 3/22/12 thur 5/8/12; no comments were received.

The Longmont – Main Street carbon monoxide air monitoring site is being terminated due to an alley reconstruction project that requires the removal of the current air monitoring shelter. The last valid sample collected at the site was December 31, 2011 at 23:00 hr. Construction in the alley began on March 5th, 2012 and the shelter was removed from the site on March 14, 2012. It is currently APCD's intention not to reinstall the shelter at the Main Street location.

The need for ambient carbon monoxide monitoring has diminished due to declining carbon monoxide levels across the nation. Carbon monoxide levels at the Longmont – Main Street site are less than 50% of the 1-Hour and 8-Hour NAAQS, and have less than a 10 percent chance of exceeding 80 percent of the applicable NAAQS during the next three years, as listed in 40 CFR 58.14 (c)(1) (see Attachment 1). APCD's primary reason for continued monitoring in the Longmont area is the inclusion of a monitoring requirement in the Longmont Carbon Monoxide Maintenance Plan. EPA has set a precedent allowing states to build contingency measures into their maintenance plans to give greater flexibility in network planning and design. One example is allowing surrogate monitoring locations for compliance monitoring. Contingency measures are further supported if they coincide with EPA's effort to disinvest in redundant sites so that resources can be reallocated to further enhance multi-pollutant sites where applicable and/or further expand the existing network as needed. The APCD has been in communication with EPA Region 8's Air Quality Planning – State Implementation Plan Group to discuss the possibility of allowing the Denver - CAMP carbon monoxide monitor to serve as a surrogate

for the Longmont – Main Street monitor within the Longmont Carbon Monoxide Maintenance Plan. Based upon these conversations, EPA concurs with CDPHE’s intentions and indicated they would consider the modification, as the Denver - CAMP monitor is in an adjacent maintenance area, and typically records the highest carbon monoxide concentrations in the Denver/North Front Range area.

Enclosed is the associated Ambient Air Monitoring Network Modification Request Form (see Attachment 2). If you have any questions or need further information, you can reach me at (303) 692-3232.

Sincerely,

Gregory Harshfield
Scientist/Supervisor
Continuous Monitoring and Data Systems Support

cc: Gordon Pierce

Enclosures:

Attachment 1: Carbon Monoxide, 2nd Max by Year

Attachment 2: Longmont Carbon Monoxide Ambient Air Monitoring Network Modification Form.

Attachment 1 – Carbon Monoxide, 2nd Max by Year, 1 Hour Average and 8 Hour Average

Carbon Monoxide – 2nd Max of 1 Hour Averages

	DMAS	CAMP	Welby	Longmont	Greeley Annex	Fort Collins - CSU
	08-031-0025	08-031-0002	08-001-3001	08-013-0009	08-123-0010	08-069-1004
2001	-	9.3	5.8	6.4	-	6.8
2002	-	7.4	4.8	4.8	-	5.5
2003	-	14.9	5.2	4.2	5.6	4.4
2004	-	8.7	4	4.3	6.4	5.3
2005	-	4.3	3.3	4.8	4.8	5.0
2006	-	4.6	3.8	2.8	5.6	3.9
2007	-	5.9	3.0	3.4	3.9	3.5
2008	-	7.0	3.1	3.3	3.2	4.6
2009	-	6.8	2.6	3.2	3.6	3.0
2010	Insufficient Data	4.0	2.3	4.4	3.9	2.9
2011	2.39	3.1	2.4	4.3	2.5	2.5

Carbon Monoxide – 2nd Max of 8 Hour Averages

	DMAS	CAMP	Welby	Longmont	Greeley Annex	Fort Collins - CSU
	08-031-0025	08-031-0002	08-001-3001	08-013-0009	08-123-0010	08-069-1004
2001	-	4.1	3.3	3.5	-	3.0
2002	-	3.7	2.6	3.2	-	2.9
2003	-	4.5	3.0	3.3	3.3	2.5
2004	-	4.1	2.8	3.2	3.7	3.1
2005	-	2.5	2.2	2.4	2.8	2.4
2006	-	3.1	2.5	1.8	3.3	2.7
2007	-	2.8	2.1	1.9	2.4	2.4
2008	-	2.3	1.7	2.4	2.2	2.2
2009	-	2.4	2.0	1.8	2.2	1.8
2010	Insufficient Data	2.4	1.8	1.9	2.3	1.7
2011	1.50	1.8	1.6	2.1	1.5	1.3

Note: Highlighted site are within the Denver Metro Carbon Monoxide Maintenance Plan area.

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: _____

Signature: _____

FOR EPA USE ONLY: Received Date: _____ **Follow-up**
Actions: _____ **Approval Status Given:** _____ **Email**
Response Date: _____ **Letter Response Date:** _____

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES:

PROPOSED MONITORING SCHEDULE/DURATION:

PROPOSED START / REMOVAL DATE
OR DATE STARTED / REMOVED:

DATA ACQUISITION SYSTEM:

PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP	WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:	SOLAR RADIATION		
	RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE		
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		

TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):

COMMENTS:

FORM KEY:

PAGE 1:

MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A

SITE ELEVATION = GROUND LEVEL ELEVATION

PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL

Appendix D - Arvada, Auraria Firestation #6 and Rocky Flats SE Site Modification Forms

STATE OF COLORADO

John W. Hickenlooper, Governor
Christopher E. Urbina, MD, MPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

December 1, 2011

Adam Eisele
8P-AR
US Environmental Protection Agency Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Adam,

As required, the Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) is submitting three network site modification request forms for the proposed discontinuation of the Arvada ozone monitor (meteorology to be retained), Auraria carbon monoxide monitor and Rocky Flats Southeast meteorology monitors. Sites common name and AQS ID are as follows:

- Arvada AQS ID: 08-059-0002
Ozone SLAMS Monitor Proposed Removal
- Auraria AQS ID: 08-031-0019
Carbon Monoxide SLAMS Site/Monitor Proposed Removal
- Rocky Flats Southeast AQS ID: 08-059-0008
Meteorological Special Purpose Monitors Proposed Removal

Arvada AQS ID: 08-059-0002

The last sample to be collected from the Arvada ozone monitor is planned for December 31, 2011 at 23:00 hr, with the monitor removed early January 2012 as weather and time permits. The APCD plans to shut down the Arvada ozone monitor for the following reasons:

- The APCD has and will continue to operate an appropriate air quality monitoring network of State/Local Air Monitoring System monitors (SLAMS) in accordance with 40 CFR Part 58 to verify the attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) and with Colorado's Ozone Maintenance Plan. Annual network plans and 5 year network assessments of the SLAMS air quality surveillance network is conducted in accordance with 40 CFR Part 58.10 to determine whether the network continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58. These reports are made available for public comment and public download on the APCD/Technical Services website at: <http://www.colorado.gov/airquality/tech.aspx> . Findings within these reports indicate that the Arvada ozone monitor is lower in concentration than, and is redundant with the NREL and Rocky Flats North (RFN) monitors and is therefore recommended for removal. The NREL site is located approximately 9.25 km to the southwest and the RFN site is located approximately 14.5 km to the northwest of the Arvada site. The Arvada site is located within the Denver/Front Range non-attainment area and has a current 3-year average of the 4th max of 74 ppb (thru 2011), which is slightly below the current 75 ppb standard. There are currently 12 ozone sites in the Denver Metropolitan Ozone Maintenance Plan area, of which three record consistently higher values. It is the Department's position that an evaluation of the 8-hour ozone standard can be adequately performed without the Arvada monitor and because there are no contingencies tied to the Arvada monitor in any of the State's proposed or concurred Ozone State Implementation Plans. Therefore, it is recommended for removal.
- The closure of this monitor is in accordance with EPA's effort to disinvest in redundant sites so that resources can be reallocated to further enhance multi-pollutant sites where applicable and/or further expand the existing network as needed.

Auraria AQS ID: 08-031-0019

The last sample to be collected from the Auraria carbon monoxide monitor is planned for December 31, 2011 at 23:00 hr, with the monitor removed early January 2012 as weather and time permits. The APCD plans to shut down the Auraria carbon monoxide monitor for the following reasons:

- Since the Denver metropolitan area has been redesignated to attainment status by EPA, the APCD operates and continues to operate an appropriate air quality monitoring network of SLAMS monitors in accordance with 40 CFR Part 58 to verify the continued attainment of the carbon monoxide standard as part of the Denver Maintenance Plan. The APCD operates four carbon monoxide monitors within the Denver maintenance area, two of which are in the downtown area, CAMP and Auraria. Findings from the annual network plan and 5 year network assessment indicate that the Auraria carbon monoxide monitor typically reports lower concentrations than, and is redundant with the CAMP monitor and is therefore recommended for removal. Attachment 1 gives a summary of the annual first max of 1-hour averaged data for all APCD current carbon monoxide sites that have at least one year of quality assured data. While similar, the CAMP monitor typically has max values greater than the Auraria monitor. It is the Department's position that carbon monoxide measurements collected at CAMP and Auraria are similar enough to be considered redundant and compliance with the Carbon Monoxide Maintenance Plan for the Denver Metropolitan Area can be adequately demonstrated in the downtown area by the CAMP monitor alone. Therefore the Auraria carbon monoxide monitor is recommended for removal.

- Carbon Monoxide levels are less than 50% of the NAAQS, and has less than a 10 percent chance of exceeding 80 percent of the applicable NAAQS during the next three years, as listed in 40 CFR 58.14 (c)(1).
- The closure of this monitor is in accordance with EPA's effort to disinvest in redundant sites so that resources can be reallocated to further enhance multi-pollutant sites where applicable and/or further expand the existing network as needed.

Rocky Flats Southeast AQS ID: 08-059-0008

The last sample to be collected from the Rocky Flats Southeast meteorological sensors is planned for December 31, 2011 at 23:00 hr, with the shelter, tower and sensors removed early January 2012 as weather and time permits. The APCD plans to shut down the Rocky Flats Southeast meteorological sensors for the following reasons:

- The Rocky Flats Southeast (RFSE) site was initially installed as a perimeter monitoring site for the Rocky Flats facility. At its height, the APCD operated five perimeter monitoring sites around the facility. Three sites were closed in 2005 as remediation efforts wound down. The RFSE remained in operation due to other monitoring needs. With the discontinuation of these other monitoring efforts at the site, the need for meteorological monitoring at two locations around Rocky Flats is no longer needed. Meteorological monitoring at the Rocky Flat North site where an ozone monitor is located will continue.

Enclosed is the associated Ambient Air Monitoring Network Modification Request Form.

If you have any questions or need further information, you can reach me at (303) 692-3232.

Sincerely,

Gregory Harshfield
Continuous Monitoring and Data Systems Support Supervisor

cc: Gordon Pierce

Enclosures:

Attachment 1: Denver Ozone, 8hr 4th Max and 8hr 3 Year Average of 4th Max by Year

Attachment 2: Carbon Monoxide, 1st Max by Year

Attachment 3: Arvada Ozone Ambient Air Monitoring Network Modification Form.

Attachment 4: Auraria Carbon Monoxide Ambient Air Monitoring Network Modification Form.

Attachment 5: Rocky Flats Southeast Ambient Air Monitoring Network Modification Form.

Attachment 1: Denver Ozone, 8hr 4th Max and 8hr 3 Year Average of 4th Max by Year

4th Maximum 8-hr. (ppm)												
Year	Denver Metro Area											
	Welby 08-001- 3001	Highland 08-005- 0002	S. Bldr. Ck. 08-013- 0011	Carriage 08-031- 0014	DMAS 08-031- 0025	Chatfield Park 08-035- 0004	Arvada 08-059- 0002	Welch 05-059- 0005	R. Flats-N 08-059- 0006	NREL 08-059- 0011	Aspen Park 08-059- 0013	Aurora East 08-005- 0006
2001	0.064	0.077	0.071	0.072	-	-	0.074	0.064	0.082	0.081	-	-
2002	0.068	0.076	0.078	0.073	-	-	0.073	0.069	0.088	0.081	-	-
2003	0.066	0.091	0.082	0.085	-	-	0.083	0.077	0.091	0.095	-	-
2004	0.066	0.072	0.068	0.066	-	0.075	0.065	0.062	0.073	0.074	-	-
2005	0.073	0.080	0.076	0.074	-	0.084	0.078	0.064	0.077	0.079	-	-
2006	0.069	0.081	0.082	0.072	-	0.086	0.082	0.081	0.090	0.083	-	-
2007	0.070	0.075	0.085	0.076	-	0.082	0.079	0.080	0.090	0.085	-	-
2008	0.076	-	0.076	0.072	0.070	0.080	0.074	0.073	0.079	0.076	-	-
2009	0.072	0.069	0.073	0.063	0.062	0.071	0.070	0.070	0.079	0.068	0.067	0.066
2010	0.063	0.075	0.072	0.069	0.064	0.079	0.075	0.072	0.076	0.074	0.073	0.070
2011	0.075	0.078	0.076	0.075	0.070	0.082	0.079	0.077	0.081	0.083	0.072	0.077

(2011--- APCD thru 9/30)

NOTE: Highland shut down 4/21/08-2/5/09.

3-yr. Average of the 4th Max. 8-hr. (ppm)												
Year	Denver Metro Area											
	Welby 08-001- 3001	Highland 08-005- 0002	S. Bldr. Ck. 08-013- 0011	Carriage 08-031- 0014	DMAS 08-031- 0025	Chatfield Park 08-035- 0004	Arvada 08-059- 0002	Welch 05-059- 0005	R. Flats-N 08-059- 0006	NREL 08-059- 0011	Aspen Park 08-059- 0013	Aurora East 08-005- 0006
2001-2003	0.066	0.081	0.077	0.076	-	-	0.076	0.070	0.087	0.085	-	-
2002-2004	0.066	0.079	0.076	0.074	-	-	0.073	0.069	0.084	0.083	-	-
2003-2005	0.068	0.081	0.075	0.075	-	-	0.075	0.067	0.080	0.082	-	-
2004-2006	0.069	0.077	0.075	0.070	-	0.081	0.075	0.069	0.080	0.078	-	-
2005-2007	0.070	0.078	0.081	0.074	-	0.084	0.079	0.075	0.085	0.082	-	-
2006-2008	0.071	-	0.081	0.073	-	0.082	0.078	0.078	0.086	0.081	-	-
2007-2009	0.072	-	0.078	0.070	-	0.077	0.074	0.074	0.082	0.076	-	-
2008-2010	0.070	-	0.073	0.068	0.065	0.076	0.073	0.071	0.078	0.072	-	-
2009-2011	0.070	0.074	0.073	0.069	0.065	0.077	0.074	0.073	0.078	0.075	0.070	0.071

(2011--- APCD thru 9/30)

NOTE: The 4th decimal place has been truncated. (The third decimal place needs to be rounded to get to 2 decimal places to compare to former standard.)

NOTE: Highland shut down 4/21/08-2/5/09.

Attachment 2 – Carbon Monoxide, 1st Max by Year

Carbon Monoxide - 1st Max of 1 Hour Averages								
	Highway 24	DMAS	Auraria	CAMP	Welby	Longmont	Greeley Annex	Fort Collins - CSU
	08-041-0015	08-031-0025	08-031-0019	08-031-0002	08-001-3001	08-013-0009	08-123-0010	08-069-1004
2001	9.5	-	7.8	14.4	6.1	8.7	-	7.2
2002	10.4	-	8.5	7.4	4.8	4.8	-	6.7
2003	9.2	-	7.8	15	5.4	5.1	6.2	4.4
2004	8.4	-	5.9	8.7	4.2	5.3	7	5.6
2005	5.9	-	5.6	4.6	3.4	5	4.8	8.1
2006	4.3	-	9.3	6.4	3.8	3.9	6.4	4.4
2007	4.6	-	4.2	6	3.1	3.8	4	3.8
2008	4	-	4.8	7.1	4.1	4.2	5	5.1
2009	3.8	-	3.6	6.9	2.8	3.5	4.3	3.5
2010	4.6	Insufficient Data	3.4	4.3	2.3	4.5	4.2	2.9

Note: Highlighted site are within the Denver Metro Carbon Monoxide Maintenance Plan area.

Attachment 3

<p>Attachment 2</p> <p>EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM</p> <p>(VERSION 2, 4/1/04)</p>						
DATE: 12/1/2011		CITY: Arvada			STATE: Colorado	
AQS SITE ID: 08-059-0002			SITE NAME: Arvada			
PROPOSED MODIFICATION/REASON WHY: Removal: Site is lower in concentration than the nearby NREL and Rocky Flats North monitors and can be considered redundant. The Department believes the 8-hour ozone standard can be adequately evaluated without the Arvada monitor and because there are no contingencies tied to the Arvada monitor in any of the State's proposed or concurred Ozone State Implementation Plans it is recommended for removal.						
AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
O3	SLAMS			X		TAPI 400E
PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: REMOVAL- 12/31/11 @ 23:00 hr						
ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:						
LOCATION (LAT./LONG. OR UTM' S):						
SITE ELEVATION (M. MSL):				PROBE HEIGHT (M. AGL):		
DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS	
UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA _____ DEG.						
DISTANCE TO FLUES/INCINERATORS (M):						
DISTANCE TO INTERSECTIONS (M):			DISTANCE FROM SUPPORTING STRUCTURES (M): VERT. _____ HORIZ. _____			
DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
		NORTH				
		EAST				

		SOUTH			
		WEST			
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: _____

Signature: _____

FOR EPA USE ONLY: Received Date: _____ Follow-up Actions: _____ Approval Status Given: _____ Email Response Date: _____ Letter Response Date: _____

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES: Meteorological monitoring is to be retained for legacy particulate monitoring.

PROPOSED MONITORING SCHEDULE/DURATION:

PROPOSED START / REMOVAL DATE OR DATE STARTED / REMOVED:

DATA ACQUISITION SYSTEM:

PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP	WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:	SOLAR RADIATION		
	RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE		
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		

TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):

COMMENTS:

FORM KEY:

PAGE 1:

MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A

SITE ELEVATION = GROUND LEVEL ELEVATION

PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL

Attachment 4

**EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM
(VERSION 2, 4/1/04)**

DATE: 12/1/2011	CITY: Denver	STATE: Colorado
AQS SITE ID: 08-031-0019		SITE NAME: Auraria Fire Station

PROPOSED MODIFICATION/REASON WHY: **Removal: Site is lower in concentration than the nearby CAMP monitor and can be considered redundant. The Department believes the Carbon Monoxide Maintenance Plan for the Denver Metropolitan Area can be adequately supported without the Auraria monitor and because there are no contingencies tied to the Auraria monitor in the Carbon Monoxide Maintenance Plan for the Denver Metropolitan Area it is recommended for removal.**

AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
CO	SLAMS	X		X		Thermo 48C

PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: **REMOVAL- 12/31/11 @ 23:00 hr**

ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:

LOCATION (LAT./LONG. OR UTM' S):

SITE ELEVATION (M. MSL): _____ PROBE HEIGHT (M. AGL): _____

DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS

UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA _____ DEG.

DISTANCE TO FLUES/INCINERATORS (M):

DISTANCE TO INTERSECTIONS (M): _____ DISTANCE FROM SUPPORTING STRUCTURES (M):
VERT. _____ HORIZ. _____

DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
		NORTH				
		EAST				

		SOUTH			
		WEST			
DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: _____

Signature: _____

FOR EPA USE ONLY: Received Date: _____ **Follow-up Actions:** _____ **Approval Status Given:** _____ **Email Response Date:** _____ **Letter Response Date:** _____

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES:

PROPOSED MONITORING SCHEDULE/DURATION:

PROPOSED START / REMOVAL DATE
OR DATE STARTED / REMOVED:

DATA ACQUISITION SYSTEM:

PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP	WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:	SOLAR RADIATION		
	RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE		
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		

TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):

COMMENTS:

FORM KEY:

PAGE 1:

MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A

SITE ELEVATION = GROUND LEVEL ELEVATION

PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL

Attachment 5

**EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM
(VERSION 2, 4/1/04)**

DATE: **12/1/2011** CITY: **Unincorporated Jefferson County** STATE: **Colorado**

AQS SITE ID: **08-059-0008** SITE NAME: **Rocky Flats Southeast**

PROPOSED MODIFICATION/REASON WHY: **- Removal - See Meteorological Section**

AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	

PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED:

ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:

LOCATION (LAT./LONG. OR UTM 'S):

SITE ELEVATION (M. MSL): PROBE HEIGHT (M. AGL):

DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS

UNRESTRICTED AIR FLOW: >270 DEG. >180 DEG. <CRITERIA _____ DEG.

DISTANCE TO FLUES/INCINERATORS (M):

DISTANCE TO INTERSECTIONS (M): DISTANCE FROM SUPPORTING STRUCTURES (M):
VERT. _____ HORIZ. _____

DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS
		NORTH				
		EAST				
		SOUTH				
		WEST				

DISTANCE TO NEAREST POINT SOURCES (MILES)	DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)	DIRECTION TO AREA SOURCES	COMMENTS

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: _____

Signature: _____

FOR EPA USE ONLY: Received Date: _____ **Follow-up Actions:** _____ **Approval Status Given:** _____ **Email Response Date:** _____ **Letter Response Date:** _____

FOR METEOROLOGICAL PARAMETERS ONLY:

- **MONITORING PURPOSE/OBJECTIVES:** Removal: The Rocky Flats Southeast (RFSE) site was initially installed as a perimeter monitoring site for the Rocky Flats facility. At its height, the APCD operated five perimeter monitoring sites around the facility. Three sites were closed in 2005 as remediation efforts wound down. The RFSE remained in operation because of other monitoring needs. With the discontinuation of these other monitoring needs at the site, the need for meteorological monitoring at two locations around Rocky Flats is not longer needed. Meteorological monitoring at the Rocky Flat North site will continue.

PROPOSED MONITORING SCHEDULE/DURATION:

PROPOSED START / REMOVAL DATE OR DATE STARTED / REMOVED : **REMOVAL- 12/31/11 @ 23:00 hr**

DATA ACQUISITION SYSTEM:				
PRIMARY		PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP		WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:		SOLAR RADIATION		
		RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING?	YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP?	YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW?	YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):		TEMPERATURE		
NEARBY TERRAIN:	SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		

TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):

COMMENTS:

FORM KEY:

PAGE 1:

MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A

SITE ELEVATION = GROUND LEVEL ELEVATION

PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL

Appendix E - CAMP Network Modification Form

STATE OF COLORADO

John W. Hickenlooper, Governor
Christopher E. Urbina, MD, MPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

<http://www.cdphe.state.co.us>



**Colorado Department
of Public Health
and Environment**

February 13, 2012

Joe Delwiche
8P-AR
US Environmental Protection Agency Region VIII
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Mr. Delwiche:

As required, the Colorado Department of Public Health and Environment's (CDPHE) Air Pollution Control Division (APCD) is submitting one Network Site Modification Request Form for the proposed inclusion of a SLAMS ozone monitor at Colorado's CAMP air monitoring station.

CAMP

AQS ID: 08-031-0002

2105 Broadway

Denver, CO 80205

Monitored Parameters: (See Attachment 1)

The CDPHE is proposing to begin ozone monitoring at the CAMP station beginning 3/1/2012. The APCD plans to begin ozone monitor for the following reasons:

- A finding within Colorado's most recent 5-Year Network Assessment Report recommends that ozone monitoring be re-instated at CAMP for weight of evidence determinations and model validation. Colorado's 2010 5-Year Network Assessment Report was made available for a 30-day public comment period from 5/15/10 thru 6/15/10. No comments were received during that time period.
-
- The inclusion of ozone monitoring at CAMP would allow for concurrent ozone and NOx data for a bare minimum number of sites needed to test and validate the modeling. Odd oxygen or total oxidant estimates can be derived by combining NOx and ozone

concentrations. These estimates provide an important indicator of the ozone production potential at a location and help to differentiate low ozone production potential and NO_x quenching. As such, they can shed light on the meaning of day-of-week differences in ozone concentrations which can be an important step in understanding what areas may be NO_x or VOC limited.

- The inclusion of this monitor is in accordance with EPA's effort to invest or reallocate resources to further enhance multi-pollutant sites where applicable and/or further expand the existing network as needed.
-

The APCD has and will continue to operate an appropriate air quality monitoring network of State/Local Air Monitoring System monitors (SLAMS) in accordance with 40 CFR Part 58 to verify the attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) and with Colorado's Ozone Maintenance Plan. Annual network plans and 5-year network assessments of the SLAMS air quality surveillance network is conducted in accordance with 40 CFR Part 58.10 to determine whether the network continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58. These reports are made available for public comment and public download on the APCD/Technical Services website at: <http://www.colorado.gov/airquality/tech.aspx>.

Enclosed is the associated Ambient Air Monitoring Network Modification Request Form. If you have any questions or need further information, you can reach me at (303) 692-3232.

Sincerely,

Gregory Harshfield
Continuous Monitoring and Data Systems Support Supervisor
APCD-TS-B1
Cherry Creek Drive South
Denver, CO 80246

cc: Gordon Pierce
Enclosures:

- Attachment 1: CAMP Parameter List.
- Attachment 2: CAMP Network Modification Form.

Attachment 1 - CAMP Parameter List

CAMP – Parameter List (2/12/2012)	
Gaseous Measurements	
<u>Parameter</u>	<u>Analyzer / Sampler / Sensor</u>
Carbon Monoxide (CO)	Thermo 48C
Ozone (O ₃)m – (to be included)	Teledyne/API 400E
Nitric Oxide (NO)	Teledyne/API 200E
Nitrogen Dioxide (NO ₂)	Teledyne/API 200E
Sulfur Dioxide (SO ₂)	Teledyne/API 100E
Particulate Measurements	
<u>Parameter</u>	<u>Analyzer / Sampler / Sensor</u>
Particulate Matter < 10 microns (filter)	Sierra Anderson – High Volume Sampler
Particulate Matter < 10 microns (continuous)	Thermo 1400 TEOM
Particulate Matter < 2.5 microns (filter)	R&P 2025 Sequential Sampler
Particulate Matter < 2.5 microns (continuous)	Thermo 1400 TEOM
Meteorological Measurements	
<u>Parameter</u>	<u>Analyzer / Sampler / Sensor</u>
Wind Speed - Scalar	MetOne 010C
Wind Speed - Vector	MetOne 010C
Wind Direction - Scalar	MetOne 020C
Wind Direction - Vector	MetOne 020C
Wind Direction – Sigma Theta	(calculated)
Temperature (10 meters)	MetOne 060C

Attachment 2

**EPA REGION 8 AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM
(VERSION 2, 4/1/04)**

DATE: **2/10/2011** CITY: Denver STATE: **Colorado**

AQS SITE ID: **08-031-0002** SITE NAME: CAMP

PROPOSED MODIFICATION/REASON WHY:

The CDPHE is proposing to begin ozone sampling at the CAMP air monitoring station beginning 3/1/2012. Findings within Colorado's 2010 5-Year Network Assessment report recommend that ozone monitoring be re-instated at CAMP for weight of evidence determinations and model validation. The inclusion of ozone monitoring at CAMP would allow for concurrent ozone and NOx data for a bare minimum number of sites needed to test and validate the modeling. Odd oxygen or total oxidant estimates can be derived by combining NOx and ozone concentrations. These estimates provide an important indicator of the ozone production potential at a location and help to differentiate low ozone production potential and NOx quenching. As such, they can shed light on the meaning of day-of-week differences in ozone concentrations which can be an important step in understanding what areas may be NOx or VOC limited. Additionally, the inclusion of this monitor is in accordance with EPA's effort to invest or reallocate resources to further enhance multi-pollutant sites where applicable and/or further expand the existing network as needed.

•

AIR QUALITY PARAMETER (PM10, SO2, CO, NO2, ETC.)	MONITOR TYPE (NAMS, SLAMS, SPM, TRIBAL, etc.)	CHECK ONE OR MORE OF THE APPLICABLE CATEGORIES BELOW:				LIST SAMPLER EQUIPMENT
		MAX CONC	SOURCE IMPACT	POPULATION EXPOSURE	BACKGROUND	
Ozone	SLAMS			X		TAPI 400E

PROPOSED SAMPLING START / REMOVAL DATE OR DATE STARTED / REMOVED: **Install- 3/1/2012**

ESTIMATED MEASUREMENTS FOR AIR QUALITY PARAMETERS:

LOCATION (LAT./LONG. OR UTM 'S): **39°45'4.15"N, 104°59'15.42"W**

SITE ELEVATION (M. MSL): **1,592 M** PROBE HEIGHT (M. AGL): **~5 meters**

DISTANCE TO TREE DRIPLINE (M)	DIRECTION TO TREE	DISTANCE TO OBSTACLE (M)	DIRECTION TO OBSTACLE	OBSTACLE HEIGHT ABOVE PROBE (M)	OBSTACLE COMMENTS
~8 Meters	South	7.9 Meters		~ 8 meters	Tree part of park

UNRESTRICTED AIR FLOW: **>270 DEG.** >180 DEG. <CRITERIA _____ DEG.

DISTANCE TO FLUES/INCINERATORS (M):

DISTANCE TO INTERSECTIONS (M): DISTANCE FROM SUPPORTING STRUCTURES (M):
VERT. _____ HORIZ. **0.5 meters**

DISTANCE TO EDGE OF NEAREST ROADWAY	NAME OF ROADWAY	DIRECTION	DAILY TRAFFIC ESTIMATES	YEAR OF TRAFFIC ESTIMATES	TYPE OF ROADWAY	COMMENTS

11 meters	Champa	NORTH			3 Lanes	
10 meters	Broadway	EAST			6 Lanes Major Through Fare	
		SOUTH				
11 meters	21 st St.	WEST			2 lanes	
DISTANCE TO NEAREST POINT SOURCES (MILES)		DIRECTION TO POINT SOURCES	DISTANCE TO NEAREST AREA SOURCES (MILES)		DIRECTION TO AREA SOURCES	COMMENTS
Central Business District						

CERTIFICATION: I certify the network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Printed Name: Gregory Harshfield

Signature: _____

FOR EPA USE ONLY: Received Date: _____ **Follow-up Actions:** _____ **Approval Status Given:** _____ **Email Response Date:** _____ **Letter Response Date:** _____

FOR METEOROLOGICAL PARAMETERS ONLY:

MONITORING PURPOSE/OBJECTIVES:

PROPOSED MONITORING SCHEDULE/DURATION:

PROPOSED START / REMOVAL DATE
OR DATE STARTED / REMOVED:

DATA ACQUISITION SYSTEM:

PRIMARY	PARAMETERS:	APPLICABLE √ those that apply	SENSOR HT (M)
BACKUP	WIND SPEED/DIRECTION		
EQUIPMENT MANUFACTURER/MODEL:	SOLAR RADIATION		
	RELATIVE HUMIDITY		
WILL THE DATA BE USED FOR MODELING? YES NO	PRESSURE		
IS SITE REQUIRED FOR SIP? YES NO	SIGMA THETA		
UNRESTRICTED AIRFLOW? YES NO	PRECIPITATION		
DISTANCE TO TREE DRIPLINE (M):	TEMPERATURE		
NEARBY TERRAIN: SMOOTH ROLLING ROUGH	OTHER (DESCRIBE)		

TOPOGRAPHIC FEATURES (E.G HILLS, MOUNTAINS, VALLEYS, RIDGES, BODIES OF WATER):

COMMENTS:

FORM KEY:

PAGE 1:

MONITOR TYPE: NAMS = 1, SLAMS = 2, SPM = 3, TRIBAL = A

SITE ELEVATION = GROUND LEVEL ELEVATION

PROBE HEIGHT (M. AGL) = PROBE HEIGHT METERS ABOVE GROUND LEVEL

Appendix F- Near Roadway NO₂ Work Plan

WORK PLAN FOR

***Colorado Department of Public Health and Environment
Near-Roadway NO₂ Monitoring Shelter
Denver, Colorado***

Near-Roadway Work Plan

Prepared for:

***United States Environmental Protection Agency
Region 8 – Air Permitting, Monitoring and Modeling Unit
1595 Wynkoop Street
Mail Code 8P-AR
Denver, Colorado 80202***

Near-Roadway Work Plan

Prepared by:

***Colorado Department of Public Health and Environment
Air Pollution Control Division
4300 Cherry Creek Drive South
Denver CO, 80246***

1. Introduction

In February 2010, new minimum monitoring requirements for the nitrogen dioxide (NO₂) monitoring network were promulgated (75 FR 6474) in support of a revised National Ambient Air Quality Standard (NAAQS) for NO₂. The NO₂ NAAQS was revised to include a 1-hour standard with a 98th percentile form and a level of 100 ppb, reflecting the maximum allowable NO₂ concentration anywhere in an area, while retaining the annual standard of 53 ppb. In this rule, EPA required changes to the monitoring network that will focus monitoring resources to capture short-term NO₂ concentrations, and to assess NO₂ concentrations for vulnerable and susceptible populations. In the new monitoring requirements, state and local air monitoring agencies are required to install near-road NO₂ monitoring stations at locations where peak hourly NO₂ concentrations are expected to occur within the near-road environment in larger urban areas. State and local air agencies are required to consider traffic volumes, fleet mix, roadway design, traffic congestion patterns, local terrain or topography, and meteorology in determining where a required near-road NO₂ monitor should be placed, while meeting all siting criteria set forth in 40CFR Part 58.

State and local ambient air monitoring agencies are required to submit their plans for any required near-road NO₂ monitoring station in their annual monitoring network plans due by July 1, 2012, with the near-road NO₂ monitoring network implemented and operational by January 1, 2013. Due to the magnitude of resources required to implement a large national near-road network in accordance with the rule, the USEPA has decided to do a phased deployment of near-road sites. The first phase is to be established by January 1, 2013, with a second phase established by January 1, 2014. The Denver-Aurora-Boulder area has been identified for a near-road site and is to be included in the first phase of deployment.

The State of Colorado is requesting \$200,000 from USEPA in the form of a Section 103 non-matching grant to establish the near-road NO₂ monitoring site for the Denver-Aurora-Broomfield core based statistical area (CBSA).

2. Site Requirements

Title 40 of the United States Code of Federal Regulations Part 58 Appendix D Section 4.3.2 specifies that there must be one microscale near-road NO₂ monitoring station in each CBSA with a population of 500,000 or more. An additional near-road NO₂ monitoring station is required if the CBSA population is 2,500,000 or more, or if any CBSA with a population of 500,000 or more and has one or more road segments with 250,000 or greater annual average daily traffic (AADT).

According to the 2010 Census, the CBSAs in Colorado with populations in excess of 500,000 are:

CBSA Name	Population	Max AADT Segment	Number of Sites
Denver-Aurora-Broomfield	2,552,1995	249,000	2
Colorado Springs	626,227	130,000	1

Note: AADT values are determined by Colorado DOT 2010 data.

Pursuant to EPA's "Build and Hold" Plan, the Denver-Aurora-Broomfield CBSA has been identified to receive Round 1 funding (FY 2012) for the establishment and implementation of a near-road NO₂ monitoring station. The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division (APCD) will be responsible for the establishment of this station. A NO₂ Monitoring Plan will be included in the Division's Annual Network Monitoring Plan in accordance with Appendix D and submitted to EPA by July 1, 2012. It is CDPHE's intent to have this monitoring station install and operational by January 1, 2013.

3. Monitoring Plan Approach

The CDPHE will identify and install the near-road NO₂ monitoring station in accordance with Title 40 Part 58 of the Code of Federal Regulations. Additionally, the "Draft Near-Road NO₂ Monitoring Technical Assistance Document" (TAD) dated December 21, 2011 will also be used to determine the best and most feasible site location for the station and used as a guide for parameters to be monitored.

4. Potential Monitoring Station Locations

In accordance with EPA's TAD, CDPHE has evaluated Colorado Department of Transportation (CDOT) traffic count data for high density arterials through the Denver Metropolitan area. Table 1 lists the top road segments for both the AADT and the fleet equivalent- annual average daily traffic counts (FE-ADDT). Figure 1 maps the location of the top three ranked FE-AADT road segments. These road segments have been surveyed for potential sites in accordance with guidance given in the TAD. Potential sites have been located on all of the top three road segments shown in Figure 1. All potential sites in these road segments have been rank ordered according to criteria set forth in the TAD. The CDPHE is currently working with CDOT to determine the feasibility for a Special Use Permit for the highest priority site. Figure 2 shows the location of the highest priority site. During the last EPA/National Association of Clean Air Agencies (NACAA) Monitoring Steering Committee meeting, which was held in Denver on October 24th – 26th, 2011, both regional and national EPA staff had the opportunity to visit the proposed site which resulted in favorable reviews. An application for a Special Use Permit will be submitted to CDOT in February 2012.

5. Parameters to be monitored

The TAD discusses a number of pollutants of interest in the near-road environment due to their direct emission by on-road mobile sources, or the formation from or interaction with on-road mobile source emissions. Table 16-1 in the TAD lists the Clean Air Science Advisory Committee (CASAC) Ambient Air Monitoring and Methods Subcommittee's (AAMMS) recommended priorities for the parameters to be monitored at a near-road environment. Table 2 lists these parameters and Colorado's intentions for monitoring.

Table 1 – Highest Traffic Road Segments Ranked by Fleet Equivalent (FE) Annual Average Daily Traffic

Segment Description	AADT	AADT Rank	Percent Truck	Heavy Duty Vol	Heavy Rank	Fleet Equiv AADT.	FE Rank	County
I-25, 8th Ave. to Colfax Ave.	249000	1	6.3	1568.7	11	263118.3	1	Denver
I-25, 38th Ave. to I-70	240000	2	9.1	2184	4	259656	2	Denver
I-25, 20th St. to 38th Ave.	238000	3	9.4	2237.2	2	258134.8	3	Denver
I-25, I-76 to SH-224 (70th Ave.)	235000	4	10	2350	1	256150	4	Adams
I-25, Alameda Ave. to 6th Ave.	228000	5	5.3	1208.4	35	238875.6	5	Denver
I-25, SH-224 (70th Ave.) to US-36 (Boulder Turnpike)	219000	9	10	2190	3	238710	6	Adams
I-25, Belleview Ave. to I-225	223000	6	5	1115	45	233035	7	Denver
I-25, I-225 to Hampden Ave.	222000	7	5	1110	46	231990	8	Denver
I-25, Arapahoe Rd. to Orchard Rd.	218000	10	6.1	1329.8	24	229968.2	9	Arapahoe
I-25, Orchard Rd. to Belleview Ave.	219000	8	5.1	1116.9	44	229052.1	10	Arapahoe
I-25, 6th Ave. to 8th Ave.	214000	11	6.4	1369.6	20	226326.4	11	Denver
I-25, 58th Ave. to I-76	206000	15	9.5	1957	6	223613	12	Adams
I-25, 23rd Ave. to Speer Blvd.	208000	14	7.4	1539.2	12	221852.8	13	Denver
I-25, Colfax Ave. to Walnut St./Mile High	208000	13	6.8	1414.4	19	220729.6	14	Denver
I-25, Santa Fe Dr. to Alameda Ave.	208000	12	5.7	1185.6	38	218670.4	15	Denver
I-25, County Line Rd. to Dry Creek Rd.	203000	16	7.1	1441.3	18	215971.7	16	Arapahoe
I-25, Speer Blvd. to 20th St.	198000	20	9.7	1920.6	7	215285.4	17	Denver
I-25, Dry Creek Rd. to Arapahoe Rd.	203000	17	6.6	1339.8	23	215058.2	18	Arapahoe
I-25, I-70 to 58th Ave.	192000	23	10.9	2092.8	5	210835.2	19	Denver
I-25, Hampden Ave. to Yale Ave.	202000	18	4.7	949.4	65	210544.6	20	Denver
I-25, Franklin St. to Downing St.	199000	19	6.4	1273.6	27	210462.4	21	Denver
I-25, Colorado Blvd. to University Blvd.	195000	22	6.5	1267.5	28	206407.5	22	Denver
I-25, Walnut St./Mile High to 23rd Ave.	191000	25	8.4	1604.4	10	205439.6	23	Denver
I-25, Yale Ave. to Evans Ave.	196000	21	5	980	60	204820	24	Denver
I-25, Evans Ave. to Colorado Blvd.	191000	24	6.1	1165.1	40	201485.9	25	Denver

Figure 1 - Map of Top Three Ranked FE-AADT Road Segments

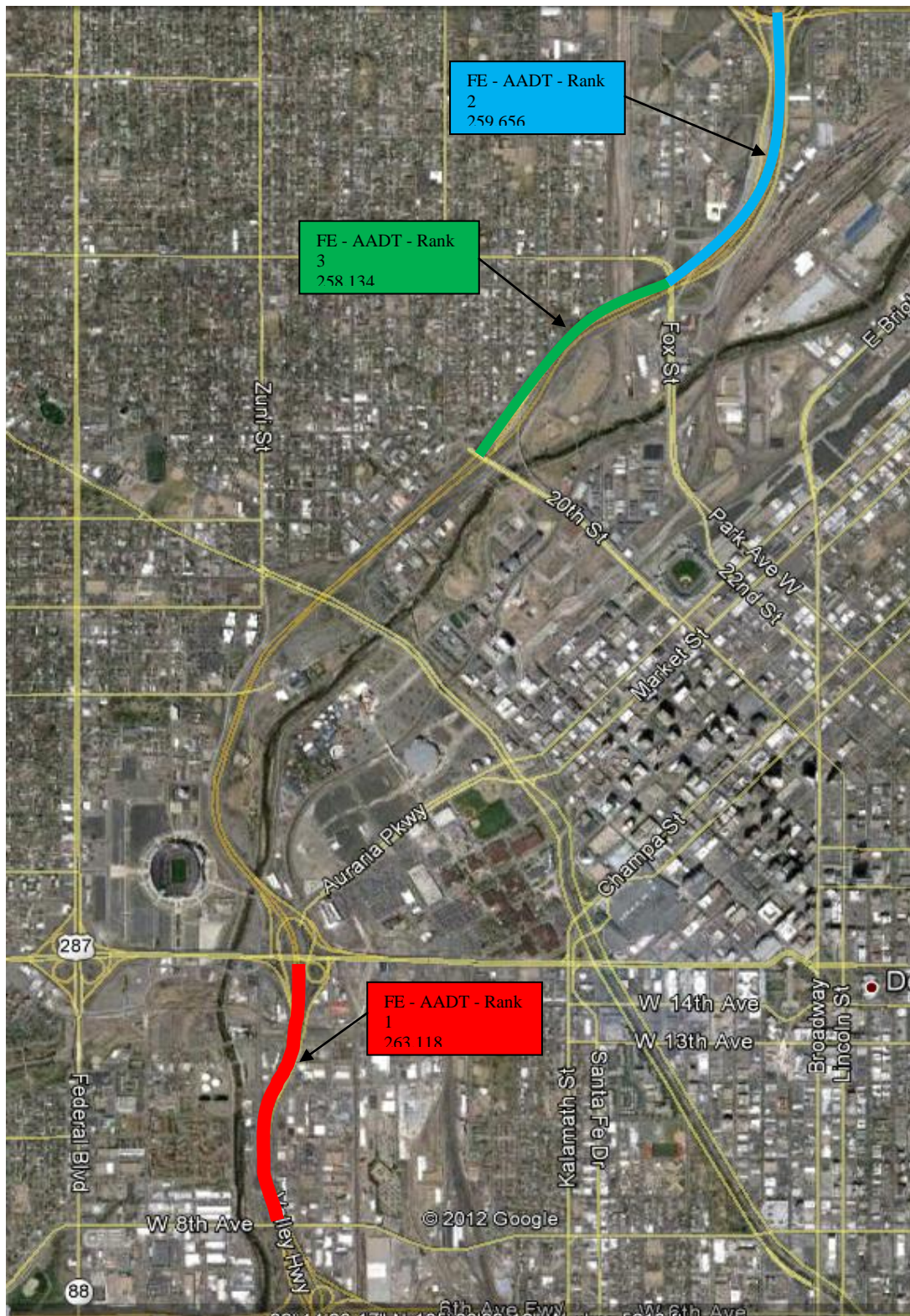


Figure 2 - First Priority Near-Road Site



Table 2 – CASAC AAMM’s Monitoring Priorities

Priority	Parameter	Colorado’s Plan	Grant Purchase
Primary			
	NO & NO ₂	Include	Grant Funds
	CO	Include	Grant Funds
	Black Carbon	Include	Grant Funds
	Wind Speed / Direction / Temp	Include	Grant Funds
Secondary			
	Ozone	Exclude	NA
	Air Toxics	Exclude	NA
	Ultrafine Particle Dist.	Include	Grant Funds
	Traffic Count	Exclude	NA
Tertiary			
	PM _{2.5} - Continuous	Consider * (see notes)	Grant or Other Funds
	PM _{2.5} - 10	Exclude	NA
	CO ₂	Exclude	NA
	OC/EC	Exclude	NA
Other – EPA recommendations			
	RH/BP	Consider * (see notes)	Grant or Other Funds
	Precipitation, SR, & BP	Exclude	NA
	Sonic WS/WD	Consider * (see notes)	Grant or Other Funds
* (asterisks) = Will consider if funds become available.			

6. Site Development and Timeline

Since the summer of 2011, the CDPHE has been working with CDOT to establish a near-road NO₂ monitoring station. Initial discussions and meetings have focused on preliminary road segment investigations and possible siting limitations. Based upon findings from these initial meetings, field survey work was conducted and several viable sites emerged. All potential sites in these road segments have been rank ordered according to criteria set forth in the TAD. The CDPHE is currently working with CDOT to determine the feasibility for a Special Use Permit for the highest priority site. Figure 2 shows the location of the highest priority. During 2012, CDPHE will finalize and permit a location through CDOT; complete the NO₂ Network Plan as part of the Annual Network Review; procure equipment and supplies; and install and make operable the site. Table 3 gives a proposed timeline for site development activities.

Table 3 – Near Road Site Development Timeline

Activity	Milestone	Time Period or Completion Date
Start Dialog with CDOT – Review TAD	Develop an understanding of project requirements and criteria	July – August 2011

Gather traffic data	Develop list of potential road segments	August – Early September 2011
CDPHE and CDOT site survey	Identify potential sites	September 2011
Identify list of preferred sites	Identify viable sites	October 1, 2011
Identify preferred site	Highest priority site determined	November 1, 2011
Develop intent to apply of Special Use Permit proposal (CDOT)	Determine feasibility of site with CDOT	November – December 2011
Develop application for Special Use Permit (CDOT)	Apply for Special Use Permit	January – February 2012
Develop and submit Work Plan and Budget to EPA	Apply for EPA funding	February 2012
Draft Memorandum of Understanding (MOU)	Start development of MOU between CDPHE and CDOT/Others	March 2012
Draft Monitoring Plan	Start development of Monitoring Plan	March 2012
Submit MOU for signature	Signed MOU between CDPHE and CDOT	April 2012
Draft and submit Region 8 Network Modification Form	Gain EPA concurrence	May 1, 2012
Finalize Near-Road Monitoring Plan	Submit for public comment	May 1, 2012
Begin requisition process for shelter	Develop and post shelter bid request	May 2012
Develop site infrastructure	Site prepared to accept shelter	June - August
Submit Annual Network Plan to EPA	Submit plan	June 30, 2012
Begin requisition process for equipment.	Post equipment bid request and place equipment orders	July 2012
Install Shelter	Shelter installed	August – September 2012
Receive and acceptance test equipment	Equipment operational in workshop	September – October 2012
Install monitoring equipment at site	Equipment set up at site	November 2012
Site test equipment	Site determined operational	December 2012
Begin data collection	Site operational	January 1, 2013

7. Colorado's Monitoring System

The CDPHE is currently transitioning from Agilaire's EDAS system to Agilaire's AirVision system for central data polling and processing. These central systems are currently located at CDPHE main offices. Colorado utilizes Environmental Systems Corporation (ESC) data loggers to collect and store data at monitoring stations. ESC data loggers are used exclusively except for one DRDAS Ultimate system that is employed at Colorado's NCore station. The central data system polls data loggers in the field at

designated time intervals via phone modem or wireless modems. The central data system stores the data, allows for data validation, produces on demand tabular and graphical reports, and generates AQS compatible data sets. All data collection and validation is done in accordance with 40CFR Part 58. The CDPHE will purchase and install the necessary equipment and supplies to install and operate Colorado's near-road site and ensure it's compatibly with all data processing systems and other monitoring sites across the state.

Appendix G - Near Roadway NO₂ CDOT Special Use Permit

STATE OF COLORADO

John W. Hickenlooper, Governor
Christopher E. Urbina, MD, MPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

2/6/2012

Mike Smith
CDOT Region 6 - Permit Coordinator
2000 S. Holly
Denver, CO 80222

Special Use Permit Application – Near Roadway Air Monitoring Site

Mr. Mike Smith:

The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division (APCD) respectfully request your acceptance of the attached Special Use Permit application for the installation and operation of a near-roadway air quality monitoring shelter for a minimum of 10 years, to be located on the median between northbound I-25 and Yuma St., just north of the West Mulberry Place (8th Ave) onramp to northbound I-25.

The CDPHE is tasked by the Environmental Protection Agency (EPA) under a Performance Partnership Agreement to monitor outdoor air quality and use that data to determine compliance with existing National Ambient Air Quality Standards (NAAQS). In February of 2010, EPA promulgated new minimum monitoring requirements for the nitrogen dioxide (NO₂) monitoring network in support of a newly revised 1-hour NO₂ NAAQS (75 FR 6474). In the new monitoring requirements, state and local air monitoring agencies are required to install near-road NO₂ monitoring stations at locations where peak hourly NO₂ concentrations are expected to occur within the near-road environment in larger urban areas. Local air agencies are required to consider traffic volumes, fleet mix, roadway design, traffic congestion patterns, local terrain or topography, and meteorology in determining where a required near-road NO₂ monitor should be placed.

The APCD has determined the most desirable location for the near-roadway site is on the strip of land between the north bound I-25 lanes and Yuma Street just north of the northbound West Mulberry Pl. (8th Ave.) onramp to I-25. This strip of land is approximately 650 feet in length and has several low terraced landscape features that are populated with shrubs and low trees (**Figure 1**). The shelter will be located between two terraced landscape features approximately 150 feet north of the southern terminus of the median and approximately 15 feet west of Yuma Street. Figure 2 shows two pictures taken of the potential site to the west of Yuma. The left photo shows the site looking north, and the right photo shows the site looking south.

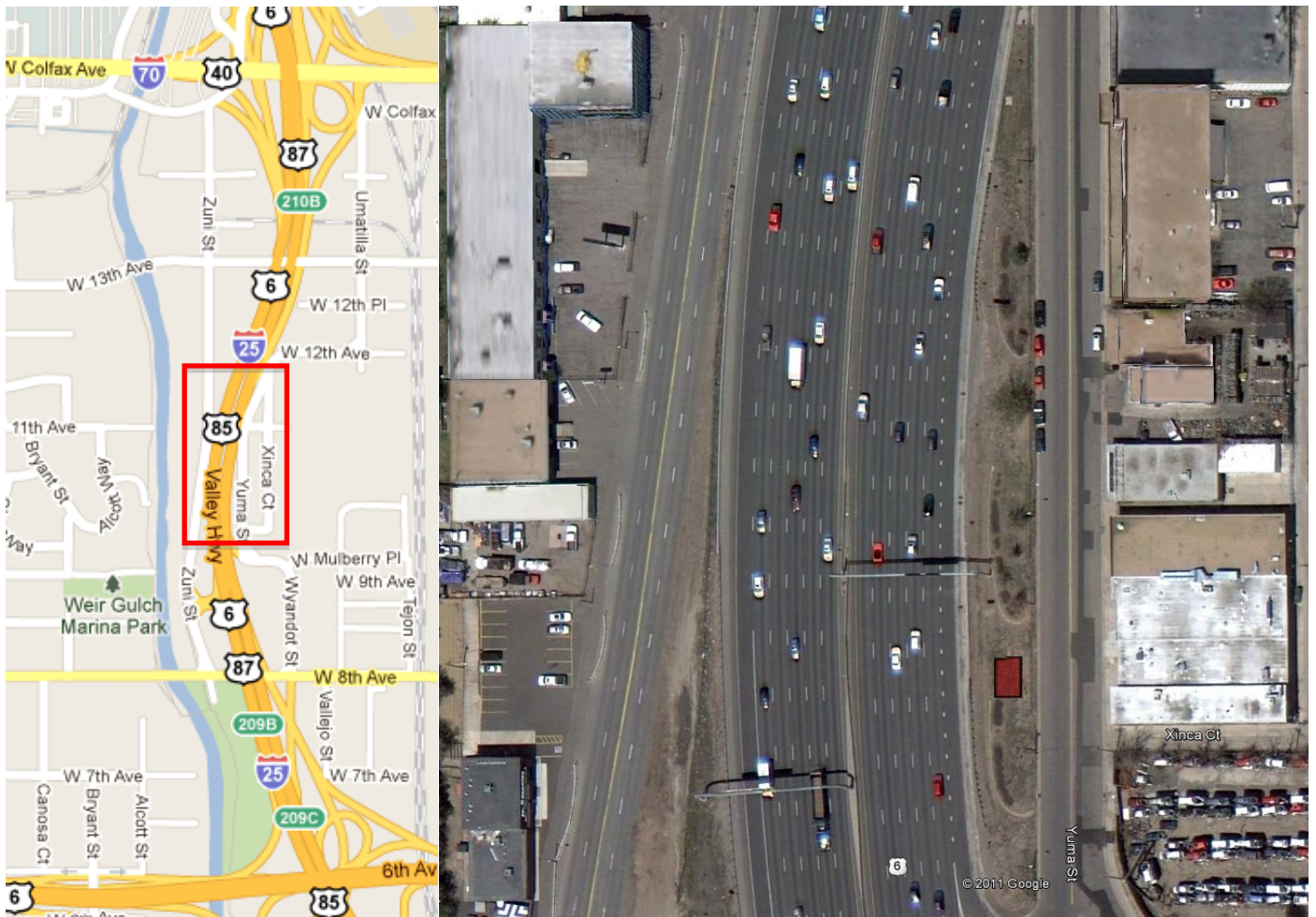


Figure 1 – Area (left) and Detail (right) of proposed Near Roadway Monitoring Station



Figure 2 – Proposed Near Roadway site viewed from the south (left) and the north (right)

This location has been determined to be within the Colorado Department of Transportation (CDOT) Right of Way (ROW) (Figure 5). This location is desirable because: 1) the site meets all EPA near-roadway site requirements as set forth in 40CFR Appendix 58; 2) the location was determined and is in concurrence with EPA’s “Near-Road NO₂ Monitoring Technical Assistance Document (TAD)”; 3) site access can be made from a side street

(Yuma St.); 4) line power is readily available; 5) it is protected by guard rails or jersey walls; and 6) the immediate area where the shelter is to be located is free of all known underground utilities.

This site will be installed, operated, and maintained entirely by the State of Colorado and will require 24 hr/day, 365 day/year access. The CDPHE will be responsible for installation and continued operations of the shelter, power and communications. The CDPHE will also be responsible for the decommissioning of the shelter upon termination of the project and the return of the site to as found conditions. Typical air quality monitoring shelters require weekly or 2x weekly visits to ensure the security of the shelter and equipment operability. Additional visits will also be made quarterly (once every three months) to perform instrument calibrations and audits and as needed to make repairs. Otherwise, the shelter will operate unattended. Data from this site will be polled hourly and made public on the Department's website at <http://www.colorado.gov/airquality/report.aspx>

Plan and Profile

The air quality monitoring station will consist of an 8' x 18' air quality monitoring shelter, one 10-meter meteorological tower that will be attached to the shelter, and security fencing. This shelter will be placed within 20 meters of the outside edge of the nearest lane of through traffic. The shelter will be pre-manufactured and transported to the site by flat bed truck/trailer. Installation of the shelter into its final position will be by crane or by a smaller dump type delivery vehicle. The shelter will rest upon a 16' x 26' concrete slab and will be anchored on all four corners. A 7' security fence with a gate on the southern aspect will surround the shelter and will be set to allow for a 4' easement between the shelter and the fence. The ground under the shelter and the easement between the shelter and fence will be concrete to allow for minimal maintenance of the grounds. Maintenance of the meteorological tower will be accomplished by rotating the tower down through a gate in the security fence into the grassy area to the south of the shelter. The shelter will be temperature controlled, require at least 100 amp electrical service, and access to either land or wireless communications. Power to the shelter will be brought in from a power pole located approximately 40 feet to the southeast. Ideally, power will be brought in underground from the power pole, however, because of underground utilities in the area the feasibility of this will be determined by an electrician. The alternate option of bringing power in overhead is also feasible. The CDPHE will be responsible for power and telecommunication hookups and all consumption charges. All damages incurred during the installation of the shelter will be repaired to "as-found" condition. Though it is not anticipated, permanent damage resulting in the loss of trees or shrubs will be replaced on a 1:1 ratio.

Figure is a sketch of the station with approximate dimensions. Figure shows a model of the proposed monitoring station on the preferred site (still in a red polygon). Clockwise from top left are views from the south, east, north, and west.

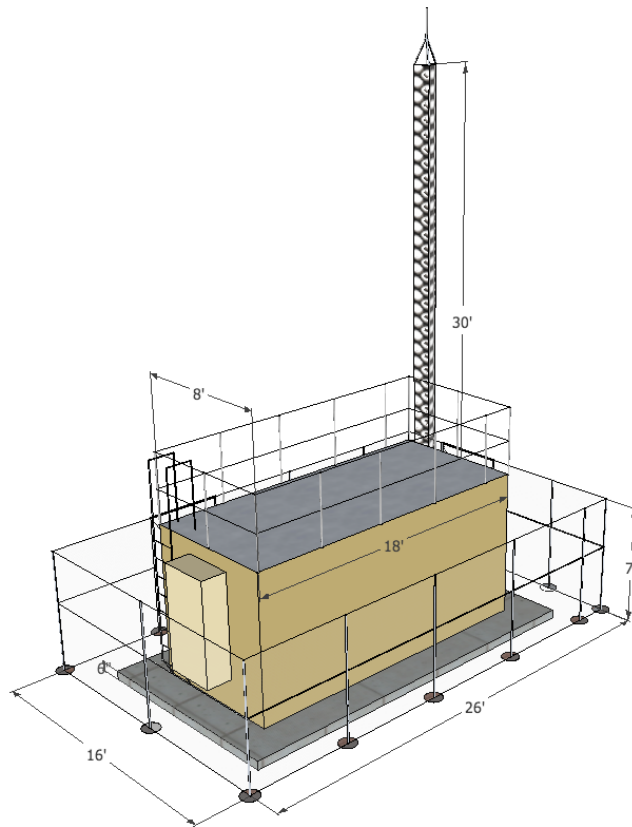


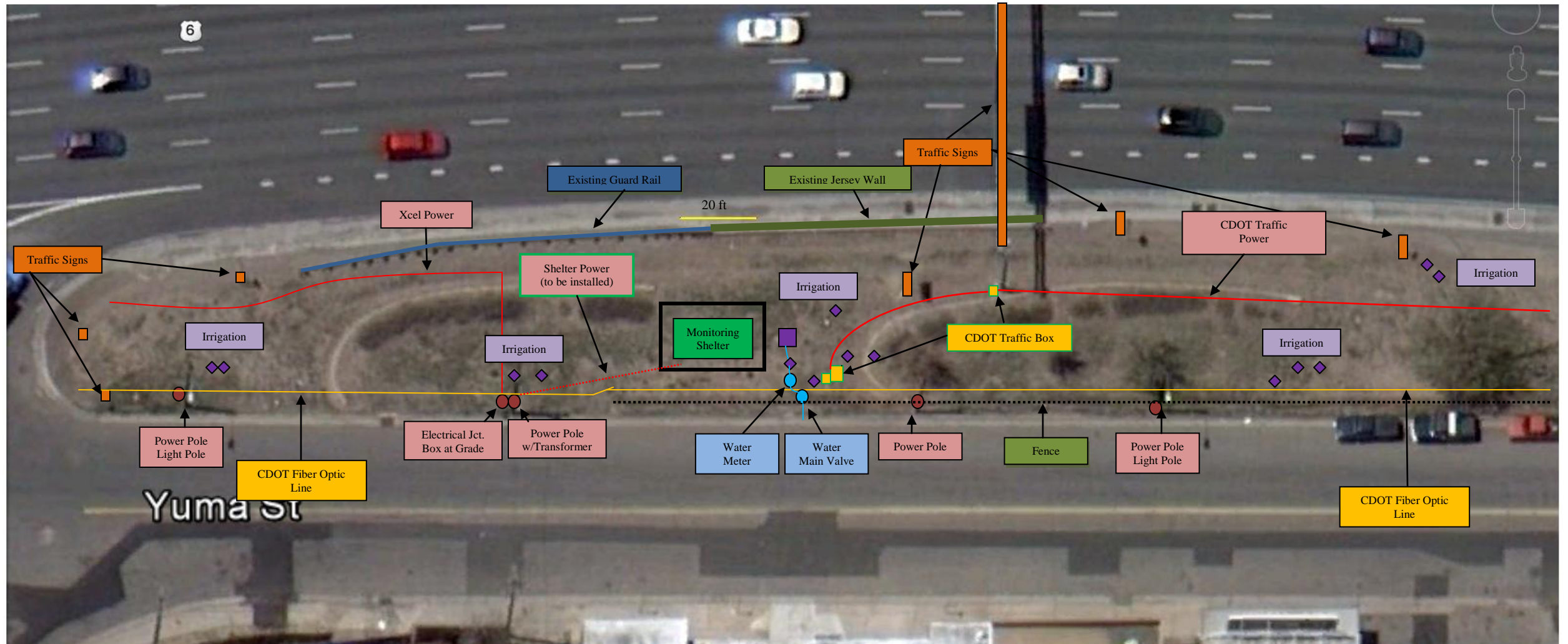
Figure 1 – Orthographic model of Near Roadway Monitoring Station



Figure 2 – Near Roadway Monitoring Station viewed, clockwise, from the South, East, North, and West

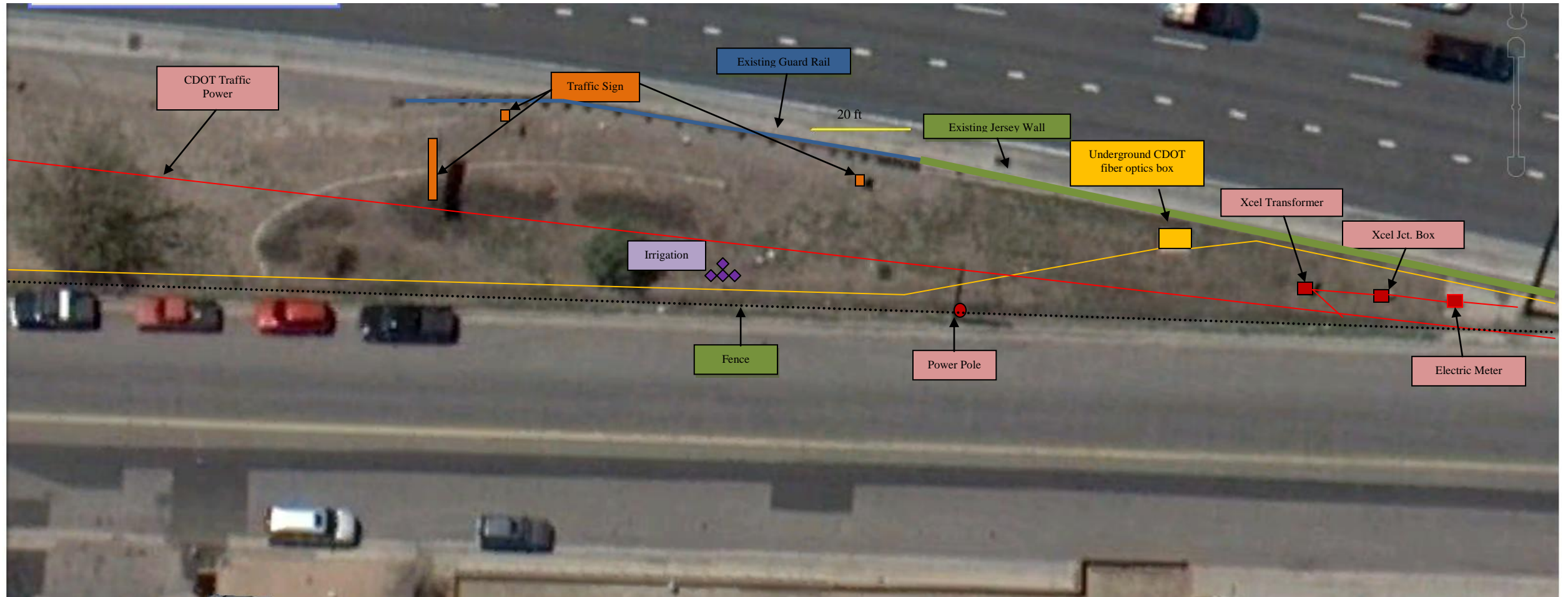
Utility locates of the entire length of the median were ordered on December 12, 2011 and performed over the course of a week. Information gained from these locates is shown in Figure 6. Not shown on this map is the defunct underground landscape sprinkler system. CDPHE could not obtain any information regarding this system beyond the identification of its major components where the main water valve is located. The proposed shelter location, as seen in Figure 6, takes into account all known above and below grade utilities.

Figure 6 - Proposed Near-Roadway Site: South Section of Median



Note: Irrigation system is not operational

Figure 6 (continued) - Proposed Near-Roadway Site: North Section of Median



Note: Irrigation system is not operational

Traffic Control Plan

The median where the air quality monitoring shelter is to be installed is between northbound I-25 and Yuma Street. All access to the site during shelter installation and routine maintenance will be made from Yuma Street. There will be no traffic impacts or access from I-25 due to the presence of a guardrail or jersey wall that inhibits access to the proposed shelter location.

Southbound Yuma Street allows for on-street parallel parking that site operators will utilize for routine maintenance of the shelter. Pedestrian traffic along the west side of Yuma Street is limited due to the absence of a public sidewalk and the presence of a 7 foot chain link fence that is set 2 feet from the curb and runs approximately 75% of the length of the median. Outside of the initial installation of the shelter there will be no vehicle or pedestrian traffic impacts on Yuma Street. During the installation of the shelter, several on-street parking spots will be temporary blocked for several hours to allow equipment access to the median.

Insurance Requirements

The CDPHE operates under the State of Colorado's self insurance policy. The state is self-insured for liability losses and is responsible for processing claims brought against state agencies and state employees.

All contractors hired by the CDPHE who will perform work within the State Highway ROW will be required to have the kinds and amounts of coverage as specified in the "Insurance Requirements for CDOT Utility and Special Use Permits".

Environmental Clearances

- **Initial Site Inspection**

When the initial site selection inspections were conducted on September 14, 2011 the site at Yuma Street was in rough condition. Many of the existing trees and shrubs landscaped in and around timber bunkers were dead or severely stressed. Irrigation hose was exposed and severed at 3 or 4 locations, and multiple sprinkler heads were crushed or damaged. At least 2 irrigation manifold covers were dislodged and the irrigation backflow preventer (vacuum breaker) was missing with the vacuum breaker manifold open and filled with debris. The median retained some grassy cover. It was apparent that the irrigation had not been operational and the area had not been maintained for some time.

Additionally, a filled trench exists from the east post of the traffic sign that arches over the northbound lanes of I-25 and extends south east along a low retaining wall to a junction box near the irrigation water main. This filled trench surface was uneven and unseeded. There was the typical amount of litter and roadway debris present.

- **Prairie Dog Survey**

On December 16, 2011 a CDOT Wildlife Specialist (Jeff Peterson) performed a prairie dog survey at the proposed Yuma Street air quality monitoring shelter location. The Yuma Street median was identified as potential prairie dog habitat, however, no prairie dogs were present in the proposed location. The proposed location does not support the habitat for other possible endangered State species. See Figure 7 for CDOT's Threatened and Endangered Species Clearance Form.

- **Invasive Weeds Survey**

On December 14, 2011 a CDOT Wildlife Specialist (Jeff Peterson) performed a weed survey at the proposed Yuma Street air quality monitoring shelter location. During this survey the following weeds

were identified: field bindweed (*Convolvulus arvensis*), curly dock (*Rumex crispus*) and Kochia. Of these, the field bindweed is the only one considered noxious by the State of Colorado. In compliance with the State of Colorado's integrated management goal for this species, all disturbed areas that are not being controlled for foot traffic (easement between shelter and security fence) will be smoothed, stabilized, and reseeded with natural vegetation. See Figure 7 for CDOT's Threatened and Endangered Species Clearance Form.

- **Migratory Bird Treaty Act (MBTA)**

Installation of infrastructure to house and support the monitoring shelter and the monitoring shelter itself is projected to be installed during the summer and fall months of 2012. The proposed shelter location will be within 50 feet of low shrubs vegetation to the south and within 50 feet of low shrubs and evergreen species to the north. In order to avoid violating the MBTA of 1918, a nest survey will be performed between April 1 and August 31 to identify active nests. If active nest(s) are found no work will be done within 50 feet of the nest(s) until the nest(s) become inactive.

- **Grading Plan**

The proposed location for the air quality monitoring shelter was intentionally identified because it is flat and will require minimal grading. Over the length of the shelter there is approximately 5 inches of rise. An area of 26 feet by 16 feet will be graded and a six inch concrete pad constructed to support the shelter. Excess fill generated from the grading of the concrete pad and digging of fence postholes will be used to provide grading up to the concrete slab and stabilized as described in the attached Storm Water Management Plan. Up to one cubic yard of fill may be removed offsite.

- **Storm Water Management Plan (SWMP) – with less than 1 acre of disturbance**

See Attachment A of original document.

Figure 7 - CDOT Threatened and Endangered Species Clearance

CDOT Threatened and Endangered Species Survey						
Project name:	Access permit of I-25 median					
Project number:	CDPHE project	County(s):	Denver			
Sub-acct:	n/a	Region	6			
Due date:	12/16/2011	Date completed:	12/16/2011			
location:	NB I-25 at 8th Ave. ramp, flanked by Yuma Street					
Description:	Installation of AQ monitoring shed, pad and fence (approx 26'x16' in size) Trenching FO cable may be needed.					
Site Visit	y					
Photo?	n	Contact:	Jill Schlaefer			
Elevation:	5206'					
Habitat:	Urban, roadside grasses and weeds, several stressed trees and bushes					
SGPI?	n					
Ownership	CDOT					
ESA Species	Habitat?	NDIS	Other	Impact?	Rationale	
S. Platte Species	n			n	No depletions to the S. Platte	
Preble's meadow jumping mouse	n			n	No habitat will be impacted	
Ute ladies'-tresses orchid	n			n	No habitat will be impacted	
State species	Habitat	NDIS	Other	Impact?	Rationale	
Black-tailed prairie dogs	y	n	n	n	No p-dogs are present in project area	
Burrowing Owl	n			n	No habitat will be impacted	
Northern leopard frog	n			n	No habitat will be impacted	
USFS/Other	Habitat	NDIS	Other	Impact?	Rationale	
n/a						
Depl	none					
SB40	no					
Summary	There are expected to be no T&E impacts as a result of this project.					
MBTA	In order to avoid violating the Migratory Bird Treaty Act of 1918, if any trees or shrubs are to be removed or work on/under bridges is to be completed between April 1 and August 31, a survey must be completed for active nests. If an active nest(s) is found no work may be done within 50' of the nest(s) until the nest(s) becomes inactive.					
Weeds	A weed survey was completed on 12/14/2011. The following weeds were identified: field bindweed (<i>Convolvulus arvensis</i>) curly dock (<i>Rumex crispus</i>) Kochia					
	Of these, the field bindweed is the only one considered noxious by the State of Colorado. Reseeding disturbed areas with native vegetation will support the goal of integrated management for this species.					

This clearance is valid for 1 year from the date of completion

We welcome your consideration of our request and look forward to talking with you in the future. I thank you for your time and I am available to answer any questions you may have.

Regards,

Gregory Harshfield
Colorado Department of Public Health and Environment
Air Pollution Control Division
Continuous Monitoring & Data Systems Supervisor
APCD-TS-B1
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

303-692-3232

gregory.harshfield@state.co.us

**COLORADO DEPARTMENT OF TRANSPORTATION
UTILITY/SPECIAL USE PERMIT APPLICATION**

Please print or type

Instructions:

Complete this form, attach all required documents, and submit it to the appropriate permit office. To determine which documents are required, refer to page 2 of this form and/or contact the Permit Office. **You must submit all required documents or the application will be deemed to be incomplete and will not be accepted.** Please do not FAX completed forms or documents.

Permittee: property or utility owner

Name **Colorado Department of Public Health and Environment**

Address **4300 Cherry Creek Drive South, Denver, Colorado 80246**

Contact person **Gregory Harshfield** e-mail address **gregory.harshfield@state.co.us** Telephone **303-692-3232**

Applicant if other than permittee

Name

Address

Contact person e-mail address Telephone

Activity Description: (furnished by permittee)

Purpose of Utility Permit

Installation Adjust/relocation Removal Maintenance of existing facility

Facility (type, size, class of transmittant, design pressure or potential, etc.)

Nature of installation Longitudinal (parallel) Buried* Aerial/Ground-mounted
 Transverse (crossing) Attach to Highway Structure #:

Purpose if for other than Utility Permit

Landscaping Survey Spill cleanup Site restoration
 Construction within right-of-way Other (describe): **Install Air Quality Monitoring Shelter**

State Highway No. **I-25** County **Denver** City/Town **Denver**

Location relative to SH milepost(s)
see below

Location relative to intersecting feature(s), e.g., cross street, str. #, etc.
150 feet North of W.Mulberry Pl. and Yuma St. intersection on I-25 and Yuma St. median.

Intended start date and planned duration of work
July 1, 2012

Additional remarks
see attached letter

If Permittee will own or operate underground facilities in State Highway rights-of-way: Indicate contact person for underground location information: **Gregory Harshfield** Telephone **303-692-3232**

*Notice to Excavators: Pursuant to 9-1.5-103 C.R.S., excavators shall not make or begin any excavation without first notifying the Utility Notification Center of Colorado (UNCC) and if necessary, then notifying the tier two members having underground facilities in the area of such excavation. Notification shall also be given to the CDOT regional permitting office, or as otherwise directed by the Special Provisions of the permit that is issued. Notice of the commencement, extent and duration of the excavation work shall be given at least two business days prior thereto, not including the day of actual notice. The UNCC may be called at 1-800-922-1987.

See reverse side for additional instructions

Appendix H – Elbert County Network Modification Form

REGION VIII AMBIENT AIR MONITORING NETWORK MODIFICATION REQUEST FORM (VERSION 2, 4/1/2004)

Date: 5/17/2011 **City:** N/A- Elbert County **State:** Colorado
AIRS #: 08-039-0001 **Site Name:** Elbert- Running Creek Station
Address: 24950 Ben Kelly Road

Proposed Modification/ Reason Why: Change of land ownership. The new land owner doesn't want air monitoring on property.

Check One or More Boxes Below						
Air Quality Parameter	Monitor Type	Max Conc.	Source Impact	Population Exposure	Background	Equipment
PM2.5-88101	2				x	Partisol 2000 FRM

Proposed Sampling Start or Removal Date: 5/4/2011

Check One:
Started:
Removed:

Estimated Measurements For All Air Quality Parameters:

Location (Lat./Long. or UTM): Zone 13, 531523 E, 4342517 N
Probe Height (M. AGL): 4
Site Elevation (M. MSL): 2139

Distance to Tree Drip line	Direction to Tree	Distance to Obstacle (M.)	Direction to Obstacle	Obstacle Height Above Probe (M.)	Obstacle Comments
N/A					

Unrestricted Air Flow (check one):

> 270 Deg.
> 180 Deg.
< Criteria Deg.

Distance to Flues/ Incinerators (M):

N/A

Distance to Intersections (M):

270

Distance to Edge of Nearest Roadway	Name of Road	Direction	Daily Traffic Estimates	Year of Traffic Estimates	Type of Roadway	Comments
		North				
		East				
		South				
270m	Ben Kelly Rd	West	25	Est. only	6-Local	Dirt Road

Distance From Supporting Structures (M):

Vertical:

2

Horizontal:

Distance From Nearest Point Source (Miles):	Direction To Point Source	Distance to Nearest Area Source (Miles)	Direction to Area Source	Comments

CERTIFICATION:

I certify the site or network modification proposed above meets all 40 CFR 58, Appendix E siting criteria, except as noted with submittal.

Signature:

[Redacted Signature]