

UTAH

2010 AIR MONITORING NETWORK PLAN

Prepared by the Division of Air Quality
Utah State Department of Environmental Quality



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MONITORING NETWORK PLAN

1.0 INTRODUCTION

This Air Monitoring Network Plan meets the requirements of 40 CFR 58.10(a)(1). The purpose of this plan is to describe the establishment and maintenance of an air quality monitoring network in Utah. This network consists of State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitoring (SPM) sites.

The Utah air monitoring network has been described in network reviews from 1982 through 2009. A complete description of each historical monitoring station is on file at the Air Monitoring Center and is available to review upon request. Monitoring sites that will be retained for 2010 are presented in section 1.5.

1.1 COMMENTS ON UTAH AIR MONITORING NETWORK PLAN

This Monitoring Network Plan will be made available for public review for 30 days starting June 17, 2010 to July 19, 2010. Comments can be sent to: Utah Department of Environmental Quality, Division of Air Quality, Attn: Bo Call, PO Box 144820, Salt Lake City, UT 84114-4820

Comments will be reviewed and retained as attachments to the report.

1.2 CURRENT UTAH AIR MONITORING NETWORK

The following pages list the SLAMS and SPM sites in Utah's current air monitoring network and identifies the location (address), objective, and spatial scale represented by each site. The location identified is the local street address where each monitoring site is situated. The Aerometric Information Retrieval System (AIRS) # is a unique number that identifies the site by state, county, and location in the EPA AIRS database.

Under the listed parameters:

- A station may be designated as a State and Local Air Monitoring Station (SLAMS) or as a Special Purpose Monitor (SPM).
- The spatial scale represented is described in terms of the physical dimensions of the air parcel surrounding an air monitoring station throughout which pollutant concentrations are reasonably homogeneous. The scales used for Utah's network are:

Micro: Several meters to about 100 meters

Middle: About 100 to 500 meters

Neighborhood:	About 500 meters to 4 kilometers
Urban:	Overall citywide conditions, usually about 4 to 50 kilometers, requires more than one station to define
Regional:	Defines a rural area, usually of reasonably homogeneous geography, extending for tens to hundreds of kilometers

- The monitoring site should represent; population exposure (Population), source impact (Source), highest expected concentration (High), or background concentration (Background).

The following tables provide a technical summary of the current monitoring network including: the type of telemetry used to retrieve the data, the type of analyzer used and frequency of data collection, the source of gases used to calibrate the gaseous monitors, other parameters monitored at each site, and the latitude and longitude of each site.

In addition, Utah conducts some “survey” monitoring using state funding to get an initial assessment of some areas of interest. This monitoring is less formal than the SPM monitoring discussed above and focuses on a local project or issue. Based on the results of the survey monitoring, the State may determine that more formal monitoring would be appropriate.

1.3 METROPOLITAN STATISTICAL AREAS (MSA)

Population statistics are used to assess various characteristics of populated areas. The primary descriptor used is Metropolitan Statistical Areas (MSA’s). It is convenient to use the MSA designations when discussing air pollution monitoring. Each MSA is composed of a large number of people in similar geographic settings exposed to similar air pollution emissions and similar air pollution concentrations. The MSA for each monitoring site is identified so air pollution concentration for monitoring stations in the same MSA can be compared.

There are five MSA’s in Utah. The following populations are based on the Governor’s Planning Office July 1, 2009 population estimates:

Salt Lake MSA	1,141,693
Ogden-Clearfield MSA	544,862
Provo-Orem MSA	541,633
Logan MSA	126,952
St. George MSA	145,466

The following graphic shows the counties that make up each MSA. The monitoring stations in each MSA are identified in the discussion of each monitoring location.

New Metropolitan Statistical Areas in Utah



One New Combined Statistical Area



Two New Micropolitan Statistical Areas

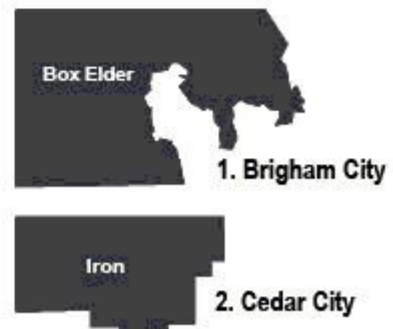


Figure 1

1.4 MONITORING DATA QUALITY ASSURANCE

A Quality Monitoring Plan (QMP) was prepared by the Utah Department of Environmental Quality and approved by EPA Region 8. The air monitoring network meets the criteria identified in the QMP.

A Quality Assurance Project Plan (QAPP) was prepared by the Utah Division of Air Quality and also approved by EPA Region 8. The QAPP identifies in greater detail the monitoring effort and quality assurance procedures the data must meet before it is considered quality assured and acceptable for submittal to the public and EPA.

A Standard Operating Procedure (SOP) manual has been prepared by the Utah Division of Air Quality that identifies the steps, procedures, and criteria that must be met in operating the monitoring network and validating the air pollution data.

1.5 **MONITORING SITE DISCUSSION**

The following pages discuss each monitoring site and the objective of the monitoring site.

The instruments used at each site are also identified. Monitoring for the criteria pollutants identified by EPA is to be performed using EPA reference or equivalent samplers or analyzers. In all cases the instruments used in the DAQ monitoring network are EPA reference or equivalent instruments. The instruments used to measure the criteria pollutants comply with 40 CFR Part 58, appendix C.

UTAH AIR MONITORING STATION LOCATION

<u>SITE CODE</u>	<u>STATIONS</u>	<u>CITY</u>	<u>COUNTY</u>	<u>ADDRESS</u>
AMC	Air Monitoring Center	Salt Lake	Salt Lake	2861 W Parkway Blv.
AI	Antelope Island	Not in a city	Davis	Antelope Island
BI	Badger Island	Not in a city	Tooele	Badger Island
B4	Beach #4	Magna	Salt Lake	1200 South 12100 West
BV	Bountiful	Bountiful	Davis	200 West 1380 North
BR	Brigham City	Brigham City	Box Elder	140 West Fishburn
CW	Cottonwood	Holladay	Salt Lake	5717 South 1300 East
HV	Harrisville	Harrisville	Weber	425 West 2550 North
HW	Hawthorne	Salt Lake	Salt Lake	1675 South 600 East
HG	Highland	Highland	Utah	10865 North 6000 West
LN	Lindon	Lindon	Utah	30 North Main
L4	Logan #4	Logan	Cache	125 West Center Street
MG	Magna	Magna	Salt Lake	2935 South 8560 West
NP	North Provo	Provo	Utah	1355 North 200 West
N2	North Salt Lake #2	Salt Lake	Salt Lake	1795 North Warm Springs Rd
O2	Ogden #2	Ogden	Weber	228 East 32 nd Street
RP	Rose Park	Salt Lake City	Salt Lake	1354 West Goodwin Ave
SA	Saltaire	Salt Lake City	Salt Lake	6640 West 1680 North
SC	Santa Clara	Santa Clara	Washington	1215 N Lava Flow Dr.
SF	Spanish Fork	Spanish Fork	Utah	312 West 2050 North
SY	Syracuse	Syracuse	Davis	4700 West 1700 South
T3	Tooele #3	Tooele	Tooele	434 North 50 West
W2	Washington Blvd #2	Ogden	Weber	2540 South Washington Blvd
WJ	West Jordan	West Jordan	Salt Lake	4540 West 8700 South

Table 1

Site:	Air Monitoring Center	Longitude:	111.9612	Station Type:	SPM
AQS#:	49-035-3011	Latitude:	40.7118	MSA:	Salt Lake City-1,141,693
Address:	2861 West Parkway Blvd.	Elevation (M):	1292		
City:	West Valley				
County:	Salt Lake				

Site Objective:

This site is established to determine mercury in wet deposition and dry deposition.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Air Monitoring Center, in the city of West Valley, Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: No

Gas/Particulate parameters:				
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Dry Dep. Mercury	Cold Vapor Atomic Absorption	Continuous	Population Exposure	SPM- Transport Regional
Wet Dep. Mercury	Manual NADP MDN	Integrated 7 day	Population Exposure	SPM- Transport Regional

Site:	Antelope Island	Longitude:	112.2313	Station Type:	SPM
AQS#:	49-011-6001	Latitude:	41.0393	MSA:	Salt Lake City-1,141,693
Address:	Antelope Island	Elevation (M):	1359		
City:					
County:	Davis				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is on Antelope Island state park, near the ranger residences, in Davis County.

Can data from this site be used to evaluate NAAQS ?:

No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	6 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	6 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	6 meters	Urban
WD Sigma	Elec. EPA method	Continuous	6 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	6 meters	Urban

Site:	Badger Island	Longitude:	112.5620	Station Type:	SPM
AQS#:	49-045-6001	Latitude:	40.9420	MSA:	Salt Lake City-1,141,693
Address:	Badger Island	Elevation (M):	1282		
City:					
County:	Tooele				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the south end of the Great Salt Lake on the remnants of Badger Island in Tooele County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Precipitation	Tipping cup	Continuous	2 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. LiCor	Continuous	2 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Beach #4	Longitude: 112.2103	Station Type: SLAMS
AQS#: 49-035-2004	Latitude: 40.7342	MSA: Salt Lake City-1,141,693
Address: 12100 West 1200 South	Elevation (M): 1289	
City: Magna		
County: Salt Lake		

Site Objective:

This site is established to determine SO₂ concentrations near the Kennecott Copper smelter. Ozone is monitored based on an ozone saturation study and the interaction with the Great Salt Lake.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Great Salt Lake Marina on the south east end of the Great Salt Lake.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Bountiful Viewmont	Longitude:	111.8845	Station Type:	SLAMS
AQS#:	49-011-0004	Latitude:	40.903	MSA:	Salt Lake City-1,141,693
Address:	1380 North 200 West	Elevation (M):	1316		
City:	Bountiful				
County:	Davis				

Site Objective:

The Bountiful Viewmont site is established to determine public exposure to air pollution. The site also is to monitor the ambient air near the oil refineries and local sand and gravel operations. Previous monitoring and saturation studies have recorded high ozone concentrations. This site is chosen for intensive speciation of PM_{2.5} under the EPA Chemical Speciation Network (CSN) and gaseous Volatile Organic Compounds under the EPA National Air Toxics Trends Network (NTTN) including hexavalent chromium and carbonyl compounds. Nitrogen dioxide is monitored in support of the ozone monitoring.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located near Viewmont High School at the north end of the city of Bountiful, Davis County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS-High Neighborhood
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-Impact Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM ₁₀ metals	Manual Gravimetric	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
PM ₁₀ metals co-located	Manual Gravimetric	6 samples/year	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Speciation	Manual EPA CSN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
VOC	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Semi-volatile	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Carbonyl compounds	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Hexavalent Chromium	Manual EPA NTTN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Black Carbon	Aethalometer	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Pressure	Barometric Pressure Transducer	Continuous	1 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Brigham City	Longitude:	112.0176	Station Type:	SLAMS
AQS#:	49-003-0003	Latitude:	41.4929	MSA:	Not in an MSA, but is in the Salt Lake-Ogden-Clearfield CSA
Address:	140 West Fishburn Dr.	Elevation (M):	1334		
City:	Brigham City				
County:	Box Elder				

Site Objective:

This site is established to determine the boundary of ozone concentrations greater than the NAAQS and PM_{2.5} comparison to Cache County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in a neighborhood area of Brigham City in Box Elder County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Real time	Instrumental TEOM FDMS	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Cottonwood	Longitude: 111.8496	Station Type: SLAMS
AQS#: 49-035-0003	Latitude: 40.6446	MSA: Salt Lake City-1,141,693
Address: 5717 South 1300 East	Elevation (M): 1338	
City: Holladay		
County: Salt Lake		

Site Objective:

This site is established to determine ozone and ozone precursor compounds.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the southeastern section of Salt Lake County at Cottonwood High School.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Harrisville
AQS#: 49-057-1003
Address: 425 West 2550 North
City: Harrisville
County: Weber

Longitude: 111.9865
Latitude: 41.3028
Elevation (M): 1322

Station Type: Slams
MSA: Ogden-Clearfield-544,862

Site Objective:

This site is established in response to an ozone saturation study indicating this as a potential high ozone concentration area.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the grounds of an elementary school in the city of Harrisville, Weber County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

	Sampling &	Operating	Monitoring	Spatial
Parameter	Analysis Method	Schedule	Objective	Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Background Regional

Meteorological parameters:

	Sampling &	Operating	Tower	Spatial
Parameter	Analysis Method	Schedule	Height	Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Hawthorne	Longitude: 111.8721	Station Type: SLAMS
AQS#: 49-035-3006	Latitude: 40.7343	MSA: Salt Lake City-1,141,693
Address: 1675 South 600 East	Elevation (M): 1312	
City: Salt Lake City		
County: Salt Lake		

Site Objective:

This site is established to represent the population exposure in the Salt Lake City area. The Hawthorne site is also proposed as the EPA Ncore site for Utah.

Does the site meet the objective:

Yes, all current objectives are met. Ncore monitoring is required January 2011.

Site Description:

The site is located at Hawthorne Elementary School in the southeast section of Salt Lake City, Salt Lake County .

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide, trace	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS-High Neighborhood
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Speciation	Manual EPA CSN	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Real time n-core	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM ₁₀ Real time n-core	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM _{coarse} Real time n-core	Instrumental TEOM FDMS	Continuous	Population Exposure	SLAMS- Population Neighborhood
H2O soluble ions	Instrumental Ion Chromatography	Continuous	Population Exposure	SLAMS- Population Neighborhood
Methane & Non-methane	NDIR of converted carbon	Continuous	Population Exposure	SLAMS- Population Neighborhood
Organic & Elemental Carbon	Instrumental Gas Chromatography	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological Parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Pressure	Barometric Pressure Transducer	Continuous	3 meters	Urban
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. EPPLY	Continuous	4 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Highland	Longitude: 111.8039	Station Type: SLAMS
AQS#: 49-049-5008	Latitude: 40.4282	MSA: Provo-Orem-541,633
Address: 10865 North 6000 West	Elevation (M): 1479	
City: Highland		
County: Utah		

Site Objective:

This site is established in response to an ozone saturation study indicating elevated ozone levels. The site is to evaluate ozone concentrations.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at an elementary school in the city of Highland, Utah County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS-High Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Lindon	Longitude: 111.7133	Station Type: SLAMS
AQS#: 49-049-4001	Latitude: 40.3396	MSA: Provo-Orem-541,633
Address: 30 North Main	Elevation (M): 1442	
City: Lindon		
County: Utah		

Site Objective:

This site is established to determine particulate matter from commercial and industrial sources. Historically this site has reported the highest particulate matter values in Utah County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Lindon Elementary School in the City of Lindon, Utah County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood
PM _{2.5} Speciation	Manual EPA CSN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS-Impact Neighborhood
PM ₁₀ Real time	Instrumental TEOM	Continuous	Air Pollution Index	SLAMS-Impact Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Logan #4	Longitude:	111.8382	Station Type:	SLAMS
AQS#:	49-005-0004	Latitude:	41.731	MSA:	Logan-126,952
Address:	125 West Center Street	Elevation (M):	1384		
City:	Logan				
County:	Cache				

Site Objective:

This site is established to determine general population exposure based on increased population.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located downtown in the city of Logan, Cache County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood
PM _{2.5} Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. EPPLY	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Magna	Longitude:	112.0947	Station Type:	SLAMS
AQS#:	49-035-1001	Latitude:	40.7068	MSA:	Salt Lake City-1,141,693
Address:	2935 South 8560 West	Elevation (M):	1308		
City:	Magna				
County:	Salt Lake				

Site Objective:

This site is established to determine SO₂ and particulate matter & lead (Pb) concentrations from Kennecott smelter.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the roof of Brockbank Junior High School in the city of Magna located in western Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-Impact Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS-High Neighborhood
Pb	Manual Gravimetric	1 in 6 days	Population Exposure	SLAMS-High Neighborhood
Pb co-located	Manual Gravimetric	1 in 12 days	Population Exposure	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: North Provo
AQS#: 49-049-0002
Address: 1355 North 200 West
City: Provo
County: Utah

Longitude: 111.6633
Latitude: 40.2538
Elevation (M): 1410

Station Type: SLAMS
MSA: Provo-Orem-541,633

Site Objective:

This site is established to determine general population exposure to air pollutants.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at north end of the city of Provo, Utah county. It is located on the grounds of the Dale Rex Army Armory.

Can data from this site be used to evaluate NAAQS ?:

Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM ₁₀	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood
PM ₁₀ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	North Salt Lake #2	Longitude:	111.921	Station Type:	SLAMS
AQS#:	49-035-0012	Latitude:	40.8055	MSA:	Salt Lake City-1,141,693
Address:	1795 North Warm Springs Road	Elevation (M):	1283		
City:	Salt Lake				
County:	Salt Lake				

Site Objective:

This site is established to determine SO₂ concentrations at a site near the petroleum refineries.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Salt Lake, in Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Sulfur Dioxide	Instrumental Pulsed Florescent	Continuous	Industrial Exposure	SLAMS-High Middle Neighborhood
PM ₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS-High Middle Neighborhood
PM ₁₀	Manual Gravimetric	1 in 12 days	Precision and accuracy assessment	SLAMS-High Middle Neighborhood
PM ₁₀ Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS-High Middle Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	6 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	6 meters	Urban
WD Sigma	Elec. EPA method	Continuous	6 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	6 meters	Urban

Site: Ogden #2
AQS#: 49-057-0002
Address: 228 East 32nd Street
City: Ogden
County: Weber

Longitude: 111.9751
Latitude: 41.207
Elevation (M): 1318

Station Type: SLAMS
MSA: Ogden-Clearfield-544,862

Site Objective:

This site is established replace the original Ogden site to determine population exposure based on population.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Ogden in Weber County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide	Instrumental Chemiluminescence	Continuous	Population Exposure	SLAMS-High Neighborhood
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS-High Neighborhood
PM _{2.5} Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS-High Neighborhood
PM ₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS-High Neighborhood
PM ₁₀ Real time	Instrumental TEOM	Continuous	Air Pollution Index	SLAMS-High Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Rose Park	Longitude:	111.9309	Station Type:	SLAMS
AQS#:	49-035-3010	Latitude:	40.7955	MSA:	Salt Lake City-1,141,693
Address:	1354 West Goodwin Avenue	Elevation (M):	1298		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:

This site is established to better represent this area of Salt Lake City for PM_{2.5} exposure.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the community of Rose Park at the north end of Salt Lake City, Salt Lake County.

Can data from this site be used to evaluate NAAQS ?:

Yes

Parameter	Sampling & Analysis Method	Gas/Particulate parameters:		Spatial Scale
		Operating Schedule	Monitoring Objective	
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric co-located	1 in 12 days	Precision and accuracy assessment	SLAMS- Population Neighborhood

Site: Saltaire	Longitude: 112.0497	Station Type: SPM
AQS#: 49-035-3005	Latitude: 40.8061	MSA: Salt Lake City-1,141,693
Address: 6640 West 1680 North	Elevation (M): 1282	
City: Salt Lake City		
County: Salt Lake		

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located west of the Salt Lake Airport in Salt Lake County.

Can data from this site be used to evaluate NAAQS ?:

No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Solar Radiation	Elec. LiCor	Continuous	2 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Santa Clara	Longitude:	113.6363	Station Type:	SLAMS
AQS#:	49-053-0006	Latitude:	37.1291	MSA:	St George-145,466
Address:	1215 North Lava Flow Drive	Elevation (M):	852		
City:	Santa Clara				
County:	Washington				

Site Objective:

This site is established to determine population exposure to ozone in Washington County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located on the grounds of the Snow Canyon Middle School in the city of Santa Clara in Washington County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Instrumental Chemiluminescence	Seasonal	Population Exposure	SLAMS- Population Neighborhood
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site: Spanish Fork
AQS#: 49-049-5010
Address: 312 West 2050 North
City: Spanish Fork
County: Utah

Longitude: 111.6603
Latitude: 40.1364
Elevation (M): 1395

Station Type: SLAMS
MSA: Provo-Orem-541,633

Site Objective:

This site is established to determine the boundary of the high ozone and PM_{2.5} concentrations in Utah County.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located at the Spanish Fork airport in the city of Spanish Fork, Utah County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Transport Regional

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Syracuse	Longitude:	112.1185	Station Type:	SPM
AQS#:	49-011-6002	Latitude:	41.0886	MSA:	Ogden-Clearfield-544,862
Address:	4700 West 1700 South	Elevation (M):	1284		
City:	Syracuse				
County:	Davis				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Syracuse near the causeway to Antelope Island State Park, Davis County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Tooele #3	Longitude:	112.2997	Station Type:	SLAMS
AQS#:	49-045-0003	Latitude:	40.5393	MSA:	Salt Lake City-1,141,693
Address:	434 North 50 West	Elevation (M):	1513		
City:	Tooele				
County:	Tooele				

Site Objective:

This site is established to determine population exposure to air pollutants.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of Tooele, Tooele County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ozone	Instrumental Ultra Violet	Seasonal	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5}	Manual Gravimetric	1 in 3 days	Population Exposure	SLAMS- Population Neighborhood
PM _{2.5} Real time	Instrumental TEOM FDMS	Continuous	Air Pollution Index	SLAMS- Population Neighborhood

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	3 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

Site:	Washington Boulevard #2	Longitude:	111.9703	Station Type:	SLAMS
AQS#:	49-057-0006	Latitude:	41.2201	MSA:	Ogden-Clearfield-544,862
Address:	2540 South Washington Blvd	Elevation (M):	1338		
City:	Ogden				
County:	Weber				

Site Objective:

This site is established to monitor ground level, mid-block, mid-sidewalk exposure to carbon monoxide.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in downtown city of Ogden in Weber County.

Can data from this site be used to evaluate NAAQS ?: Yes

Gas/Particulate parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Carbon Monoxide	Instrumental Gas Phase Correlation	Continuous	Population Exposure	SLAMS- High Microscale

Site:	West Jordan	Longitude:	112.001	Station Type:	SPM
AQS#:	49-035-3004	Latitude:	40.6112	MSA:	Salt Lake City-1,141,693
Address:	4540 West 8700 South	Elevation (M):	1414		
City:	West Jordan				
County:	Salt Lake				

Site Objective:

This site is established to collect meteorological information for air quality modeling inputs.

Does the site meet the objective:

Yes, all objectives are met.

Site Description:

The site is located in the city of West Jordan, Salt Lake County.

Can data from this site be used to evaluate NAAQS ?: No

Meteorological parameters:

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Elec. Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	10 meters	Urban
Wind Direction	Elec. Resistance Level 1	Continuous	10 meters	Urban
WD Sigma	Elec. EPA method	Continuous	10 meters	Urban
Wind Speed	Elec. Chopped signal Level 1	Continuous	10 meters	Urban

1.6 NETWORK MODIFICATION PROCESS

Utah's monitoring network is reviewed annually to verify that the objectives of the network are being met. The most recent emissions inventories for each pollutant are reviewed along with population data and ambient data gathered in the area. When it is available, current computer air pollution dispersion modeling is also reviewed. Based on that information, the State may identify the need for an additional monitoring station or the need to relocate a station to better meet the objectives of the site. The State may also identify sites that are no longer needed to meet the monitoring needs of the State. If a change is needed in the monitoring network, a Network Modification Form is submitted to EPA Region 8 prior to or as part of installing, modifying, or removing a monitor.

1.7 REVIEW OF NETWORK MODIFICATIONS IN 2009

Source oriented, year around lead (Pb) samplers were installed at Magna sampling site to monitor lead ambient concentrations near the Kennecott smelter and high stack to comply with the new federal regulations for Pb monitoring. The high-volume sampler operates on a one-in-six day basis, with a co-located sampler running every twelve days.

A methane/non-methane hydrocarbon analyzer was installed at the NCore site at Hawthorne Elementary School. Additionally, an ambient ion analyzer (URG-9000) and a PM_{2.5} carbon analyzer (Sunset labs) were installed to provide chemical speciation information.

1.8 PROPOSED NETWORK MODIFICATIONS

With increasing monitoring needs and fiscal constraints, the State determined that it is critical to verify that the monitoring network is operating as efficiently as possible. To meet that goal each station must be evaluated to determine if the station addresses a critical need without duplicating existing information. To that end, the following criteria have been used to review the Utah air monitoring network.

1. Ensure that the air monitoring network meets the requirements of 40 CFR 58.
2. Identify the monitoring sites that are required to evaluate compliance with the NAAQS and provide public notification of air quality conditions.
3. Provide the technical information needed to support SIP development, including monitoring data for modeling and control strategy selection.
4. Meet the available budget allocations by consolidating monitoring equipment to selected sites and removing monitoring stations that are collecting redundant or immaterial data.

As a result of this review, some modifications to the monitoring network may need to occur in the coming year.

DAQ Identified Data Needs

The DAQ staff have met to consider how to collect the air monitoring data needed to meet the goals and objectives of DAQ and implement the new EPA monitoring regulations while, at the same time, receiving significantly reducing federal EPA funding for the monitoring program. A number of primary objectives were identified and served as the basis for a major realignment of Utah's monitoring network. Those objectives are:

- Provide timely air quality data to the public to support and enhance DAQ's public notification process whenever unhealthy air quality conditions are forecast or already exist. This notification allows the public to take the appropriate precautions to protect their health while providing them and local industry the opportunity to reduce their emissions and their impact on air pollution.
- Collect air pollution data to evaluate areas against the NAAQS.
- Focus on monitoring air pollutants of current concern. Carbon monoxide and SO₂ are currently considered "solved problems" because it has been many years since either pollutant violated their respective NAAQS. At the same time, EPA has revised the NAAQS for PM_{2.5} and ozone to lower levels. CO and SO₂ at levels well below the NAAQS may participate in the formation of secondary PM_{2.5} and ozone. The assessment of the role these pollutants play in the formation of secondary pollutants requires measuring them at very low concentrations.
- Collect detailed, continuous, and short-term multi-pollutant data at common sites in each urban area to be used in scientific research, including the support of photochemical computer modeling required for SIP development. PM_{2.5} and ozone are generally formed from the reaction of other pollutants over time under the right meteorological conditions; therefore, multiple hotspot-type monitors are not necessary. The current network has shown that PM_{2.5} and ozone concentrations are generally homogeneous in each of the air sheds with only slight variability; therefore, DAQ is proposing concentrating the monitoring efforts into fewer sites. Selection of those sites was based on how well the site represented the air shed, how long of a historic perspective was available for the site, and how well the site met the monitoring siting criteria for all of the pollutants to be monitored as well as meteorological data collection. This objective parallels EPA's emphasis on NCore monitoring sites.
- Increase the capability of the monitoring network to measure non-criteria or toxic air pollutants.
- Increase the capability of the monitoring network to provide detailed atmospheric information during short-term intensive measurement campaigns and special studies.
- Monitor air quality in areas with significant oil and gas development to determine whether this development is adversely affecting air quality.

- Gather baseline monitoring data in rural Utah to determine if and where air pollution problems may exist.
- Define future nonattainment areas for pollutants based on air quality data rather than geographical boundaries.
- Increase the instrumentation at the NCore site at Hawthorne with NO_y and trace level SO_2 .
- Extending the ozone monitoring season at all of our ozone sites.
- Consider establishing a new Sandy/Draper site.
- Look at establishing rural ozone monitoring sites.
- Conduct an ozone saturation study.

Based on the above changes in DAQ data needs and changes in EPA's focus and funding, the following changes to the Utah air monitoring network are necessary to meet future needs of the DAQ. Details of these changes will be discussed in the sections discussing individual pollutants.

2.0 UTAH AIR MONITORING NETWORK

The following sections discuss the air monitoring network in Utah for the criteria pollutants identified by EPA that have a National Ambient Air Quality Standard (NAAQS). The need for ambient air monitoring for each criteria pollutant is different. The requirements for selecting an appropriate monitoring site are identified by EPA in 40 CFR 58.

2.1 SULFUR DIOXIDE

The sulfur dioxide (SO_2) monitoring sites were installed at their present locations based on proximity to large SO_2 emission sources; the results of early computer modeling; or in response to concerns expressed by the public.

Monitoring sites were established at Beach and Magna locations in response to emissions from a nearby copper smelter operation. Changes made in the operations and emissions control by the smelter, have reduced the SO_2 emissions by over 99% from those years when violations of the SO_2 NAAQS were monitored. Concentrations at the Beach and Magna monitors are now less than 10% of the NAAQS. On-going compliance activities assure the current level of control will be maintained into the future. Since the last violation of the SO_2 standard occurred in 1978, the need to measure SO_2 around the smelter operation is for support of the State Implementation Plan (SIP).

The Bountiful/Viewmont and North Salt Lake sites are population oriented sites in the area of oil refineries. A violation of the SO₂ NAAQS has never been reported since the start of monitoring SO₂ at the North Salt Lake site in November 1981. As with the copper smelter, compliance activities will assure continued control of the oil refineries. DAQ plans to continue SO₂ monitoring year around at Bountiful and will be able to continue a trend analysis of SO₂ concentrations in North Salt Lake.

Salt Lake County and a portion of Tooele County are still officially designated nonattainment, pending EPA approval of Utah's SO₂ maintenance plan. The SO₂ maintenance plan is based on more than 25 years of continued monitoring, showing attainment of the NAAQS. Once the area is redesignated to attainment, at least one monitor will need to be operated in the maintenance area to ensure that the area continues to maintain the standard.

A trace level SO₂ monitor will be installed at the Hawthorne consolidated site to ensure that the area continues to maintain the SO₂ standard as well as to comply with the NCore site requirements.

Data Review from the Existing Monitoring Network

The following graph displays the highest and second highest 24-hour values for the monitoring stations. As can be seen, the highest values are much less than the standard.

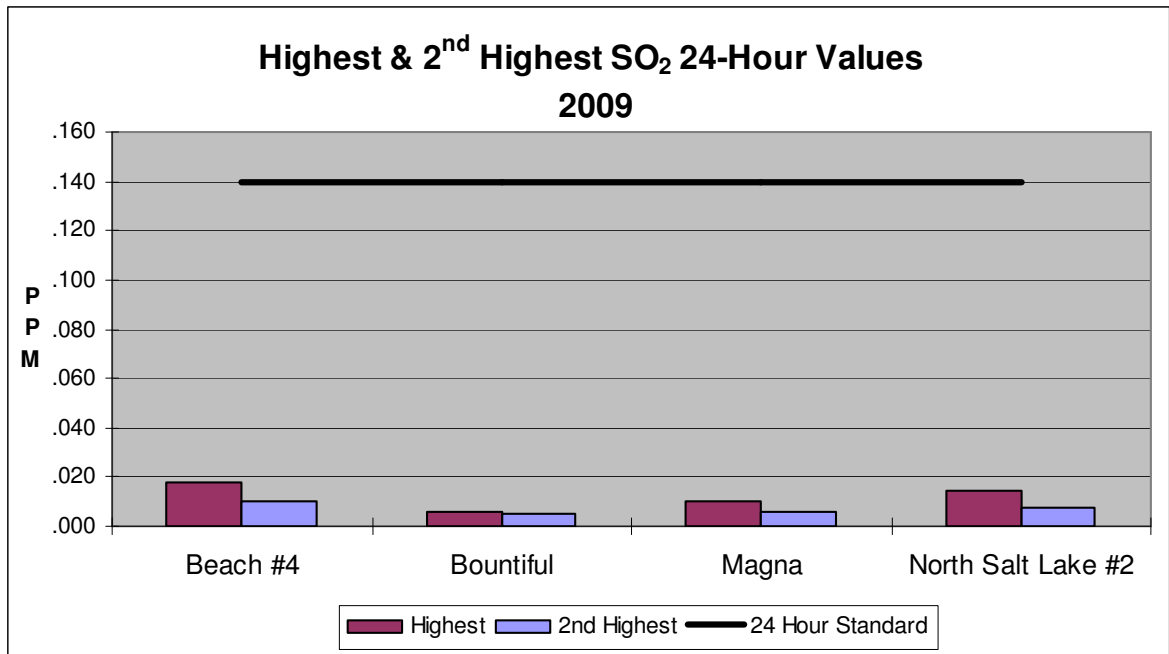


Figure 2

The following graph shows the history of SO₂ concentrations measured in Utah. It shows the last time the standard exceeded was 1981. Since that time, SIP requirements and control measures implemented by industrial operations have resulted in low SO₂.

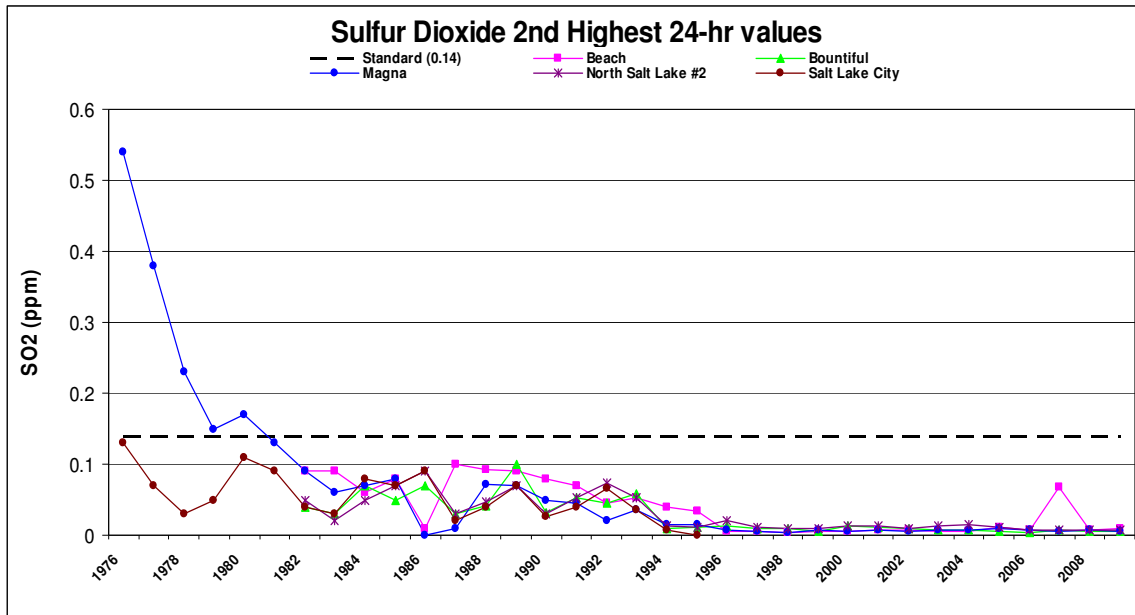


Figure 3

New SO₂ Standard

The U.S. Environmental Protection Agency (EPA) has issued a final new health standard for sulfur dioxide (SO₂). The one-hour health standard will protect millions of Americans from short-term exposure to SO₂, which is primarily emitted from power plants and other industrial facilities. Exposure to SO₂ can aggravate asthma and cause other respiratory difficulties. People with asthma, children, and the elderly are especially vulnerable to the effects of SO₂.

EPA has set the one-hour SO₂ health standard at 75 parts per billion (ppb), a level designed to protect against short-term exposures ranging from five minutes to 24 hours. EPA is revoking the current 24-hour and annual SO₂ health standards because the science indicates that short-term exposures are of greatest concern and the existing standards would not provide additional health benefits.

EPA has also changed the monitoring requirements for SO₂. The new requirements assure that monitors will be placed where SO₂ emissions impact populated areas. Any new monitors required by this rule must begin operating no later than Jan. 1, 2013. EPA is expecting to use modeling as well as monitoring to determine compliance with the new standard.

An exceedance will be based on the 99% or 4th highest 1-hour value. By using the new 1-hour standard looking at the last three years' (2007, 2008, and 2009) values, we would still meet the new standard at our four SO₂ stations.

The following table shows the values for the last three years.

Evaluation of Utah Monitors for New SO₂ Primary Standard				
Year	B4	BV	MG	N2
2007	0.056	0.028	0.033	0.029
2008	0.038	0.014	0.029	0.057
2009	0.069	0.013	0.028	0.038
3 yr Average	0.054	0.018	0.030	0.041
Standard	0.075	0.075	0.075	0.075

Table 2

Changes to the SO₂ Monitoring Network

The State will continue SO₂ monitoring at Beach, Bountiful, Magna, and North Salt Lake stations. This new SO₂ standard could possibly have a change to the network by requiring a SO₂ instrument in Utah and Weber Counties.

Special Studies

No special studies are planned.

2.2 NITROGEN DIOXIDE

The existing Nitrogen Dioxide (NO₂) monitoring stations were installed at their current locations based on a combination of emissions inventories and population centers. EPA's guidance that monitoring should be performed in areas with a population of 200,000 or greater was considered; but monitoring for the NO₂ NAAQS has been a secondary consideration in Utah. The oxides of nitrogen (NO_x) are important precursors in the secondary formation of particulate matter and ozone. These pollutants tend to be more regional in nature rather than occurring directly downwind of major sources of NO_x. For this reason, NO₂ monitoring stations have been co-located with PM_{2.5} and ozone monitors to better understand and model the formation of these pollutants. All NO₂ monitoring sites have consistently measured concentrations well below the NAAQS.

Data Review from the Existing Monitoring Network

The existing NO₂ monitoring stations are: Ogden #2, North Provo, Bountiful, Hawthorne, Logan #4, Cottonwood, and Santa Clara.

The following figure displays the annual average NO₂ values for the monitoring stations. As can be seen, the highest values are much less than the standard.

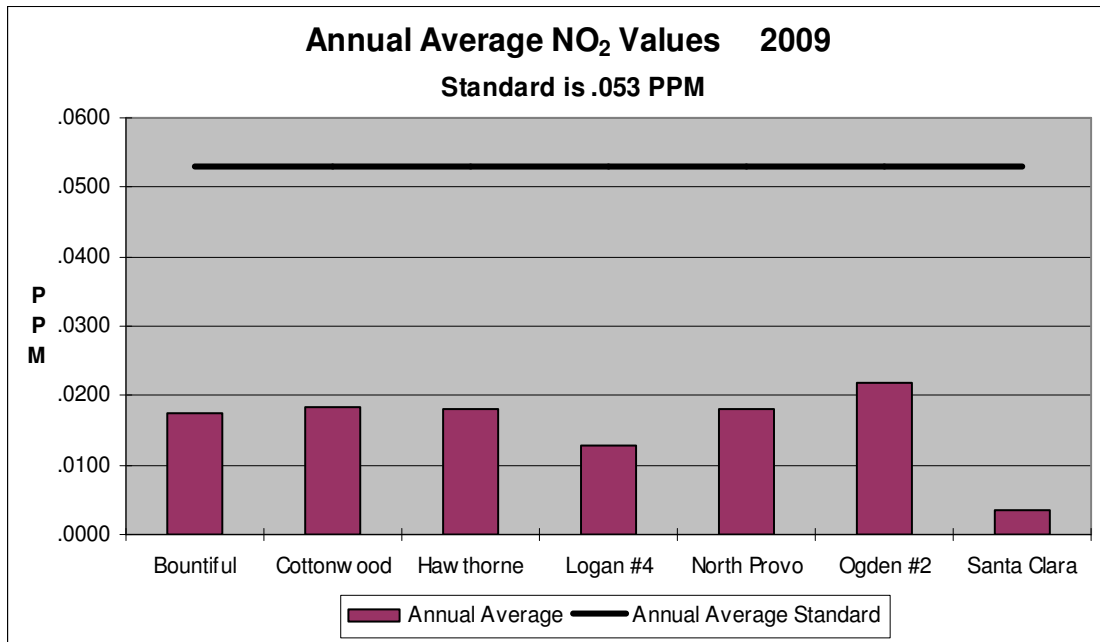


Figure 4

Over the years, NO₂ has not been close to exceeding the standard-as the following graph displays. The concern from NO₂ is its involvement in the creation of ozone and fine particulate matter. Because of that concern, NO₂ controls have been required on vehicles and industry. As a result of those controls, a close review of the graph shows a slight decreasing trend.

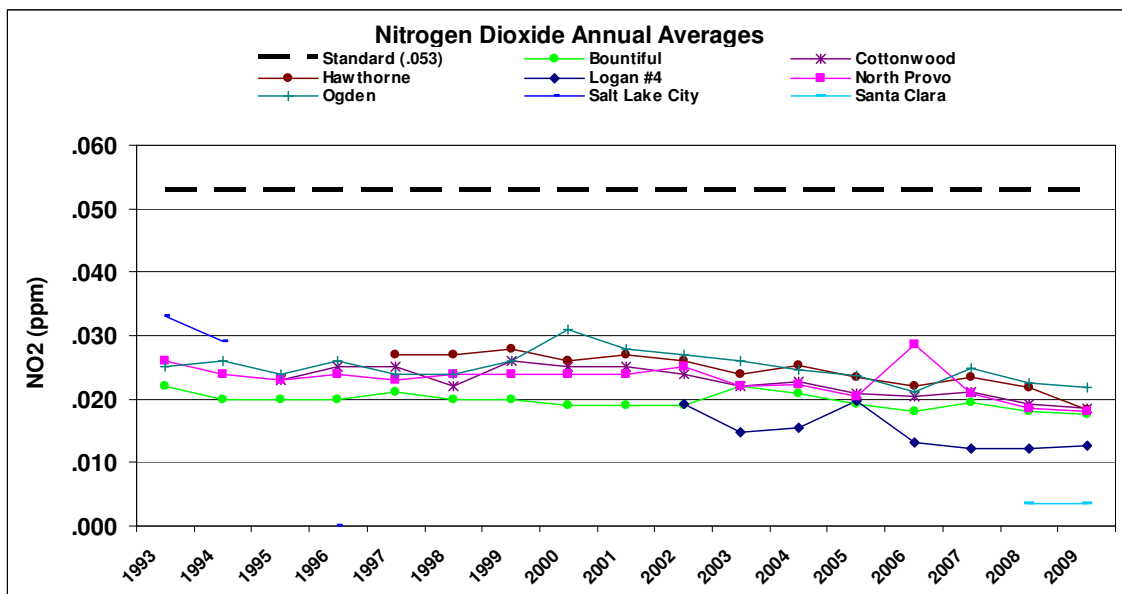


Figure 5

New NO₂ Standard

On January 22, 2010, EPA strengthened the health-based National Ambient Air Quality Standard for nitrogen dioxide (NO₂). The new standard will protect public health, including the health of sensitive populations – people with asthma, children and the elderly. EPA is setting a new 1-hour NO₂ standard at the level of 100 parts per billion (ppb). This level defines the maximum allowable concentration anywhere in an area. In addition to establishing an averaging time and level, EPA also is setting a new “form” for the standard. The form is the air quality statistic used to determine if an area meets the standard. The form for the 1-hour NO₂ standard is the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations. EPA also is retaining, with no change, the current annual average NO₂ standard of 53 ppb, which Utah has never exceeded. Below is a table which shows where Utah stands with the new NO₂ standard for the last four years (2006-2009).

Evaluation of Utah Monitors for New NO₂ Primary Standard								
	Year	BV	CW	HW	L4	NP	O2	SC
Yearly 98% Daily Max. 1-Hr NO₂ Concentrations	2006	0.059	0.057	0.059	0.055	0.057	0.066	
	2007	0.072	0.070	0.069	0.046	0.063	0.065	
	2008	0.063	0.063	0.064	0.047	0.057	0.067	0.019
	2009	0.062	0.059	0.056	0.046	0.056	0.064	0.021
3 yr Average	2006-2008	0.065	0.063	0.064	0.049	0.059	0.066	0.019
	2007-2009	0.066	0.064	0.063	0.046	0.059	0.065	0.020
Standard		0.100	0.100	0.100	0.100	0.100	0.100	0.100

Table 3

Changes to the NO₂ monitoring network:

EPA has made revisions to the NO₂ NAAQS. Changes to the monitoring network will be assessed when guidance concerning the revision of the monitoring networks and NAAQS are available. Trace level NO_y monitoring will be conducted at the Hawthorne NCore site.

Special Studies

No additional studies are necessary.

2.3 CARBON MONOXIDE

Historically, elevated CO concentrations occurred near high traffic areas. Therefore, traffic information was obtained from the Utah Department of Transportation and the two local Municipal Planning Organizations (Wasatch Front Regional Council for Salt Lake, Davis and Weber Counties and Mountainlands Association of Governments for Utah

County) to establish CO monitoring sites based on traffic patterns and densities. Two saturation studies were conducted to support the representativeness of our monitoring site locations

At the time the monitors were first installed, violations of the CO NAAQS were routinely recorded in Ogden, Provo, and Salt Lake City. The State developed and implemented State Implementation Plans and Maintenance Plans for those three areas that were subsequently approved by EPA. The implementation of those plans has resulted in all three areas attaining the CO NAAQS and being redesignated as attainment areas. In addition to the control measures identified in the plans, increasing federal controls on automobiles have significantly lowered emissions-resulting in monitored ambient concentrations of CO that are presently significantly below the NAAQS.

The existing CO monitoring stations that operate all year are: Hawthorne, Cottonwood, North Provo, Ogden #2, and Washington Blvd #2 (downtown Ogden site). CO monitoring began at the Ogden #2 site in December 2007. The intent is to evaluate the CO data from Washington Blvd #2 and Ogden #2. If the data shows one site can represent the area, we propose to close the single site station (Washington Blvd #2), and have the Ogden #2 site continue as the long term trend site for Weber County.

Data Review from the Existing Monitoring Network

The following graph displays the highest and second highest 8-hour values for the monitoring stations. As can be seen, the highest values are much less than the standard.

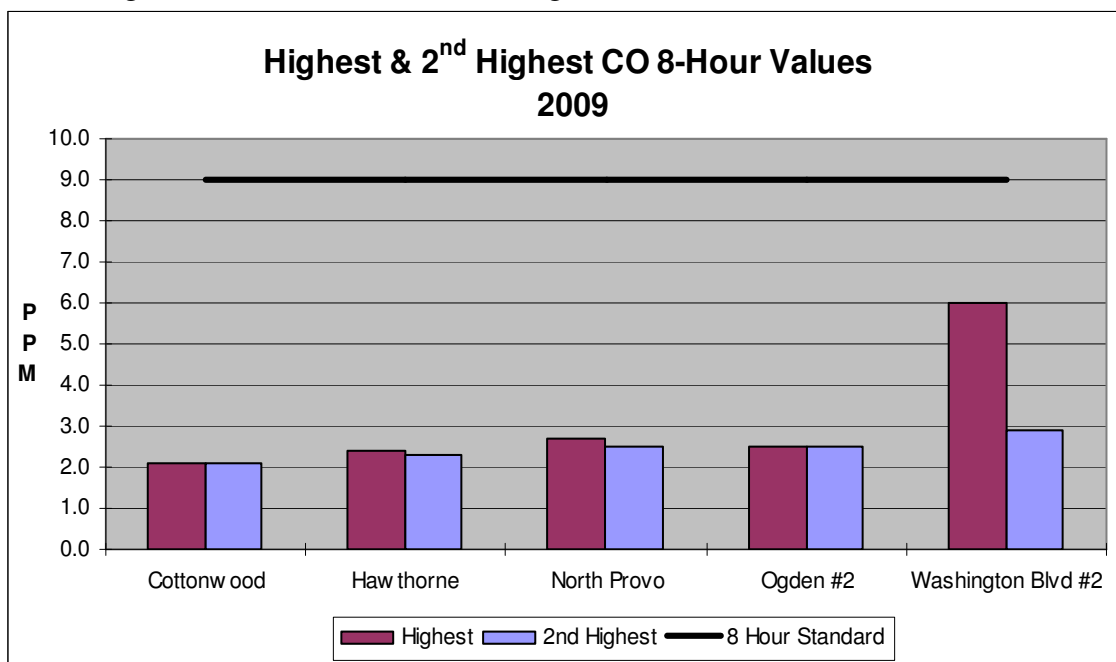


Figure 6

The following graph shows the trend in the second highest CO concentrations from 1993 through 2009. The decrease in CO levels is a result of the controls that are required on new vehicles-the impact of the county vehicle inspection and maintenance programs and controls on industry.

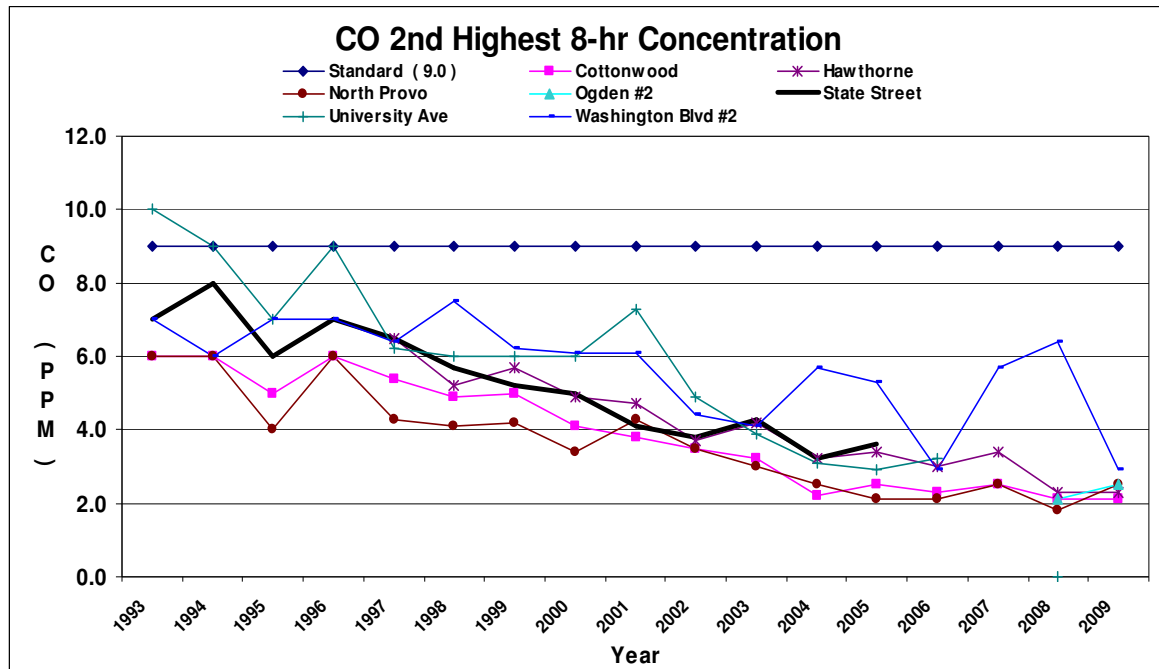


Figure 7

Additional Monitoring

Carbon monoxide can be considered as a problem solved; therefore, no additional CO monitoring is planned.

Changes To The CO Monitoring Network

The State of Utah DEQ will continue to monitor CO at: North Provo, Cottonwood, Ogden #2, and Washington Blvd #2 sites. The NCORE trace level CO monitor will continue to support health affects studies and fulfill NCORE requirements. No changes to the CO monitoring network are planned.

Special Studies

No special studies are planned.

2.4 OZONE

Unlike carbon monoxide, SO₂ and NO₂ ozone is generally not emitted directly into the atmosphere in quantities high enough to result in a violation of the NAAQS. It is produced in the atmosphere from precursors nitrogen oxides, hydrocarbons, and CO react in the presence of sunlight to form a number of photochemical compounds. The

photochemical reaction takes time to occur; therefore, ozone monitoring should be conducted down wind from the sources or precursors.

The valley setting of the major urban areas along the Wasatch Front complicates ozone monitoring. Typically, peak ozone stations should be located five to seven hours downwind from an urban area. However, summer wind patterns along the Wasatch Front result in a diurnal up-valley/down-valley wind flow pattern, such that after five to seven hours, the polluted air mass may be right back over the urban area. Ozone concentrations at all DAQ monitoring sites fluctuate seasonally-with higher values measured only during the warm months. Ozone is also created during winter temperature inversions as part of the complex photochemical reaction that is also creating PM_{2.5}. Therefore, some of the DAQ ozone monitors are operated seasonally, while others are operated year-round.

The existing ozone monitoring sites are located where the highest hourly and 8-hour ozone concentrations occur, located primarily in the populated counties along the Wasatch Front. Many of the sites routinely observe exceedances of the old 8-hour ozone NAAQS and the new 8-hour ozone NAAQS. Analysis of data from rural areas throughout Utah and the bordering states indicates that ozone is potentially much more of a regional problem in the Western United States than was originally thought. Utah is actively participating with other states in the region to further analyze this; and this analysis may result in the need for an expanded ozone monitoring network.

Data Review from the Existing Network

The following graph displays the highest and fourth highest 8-hour values for the monitoring stations.

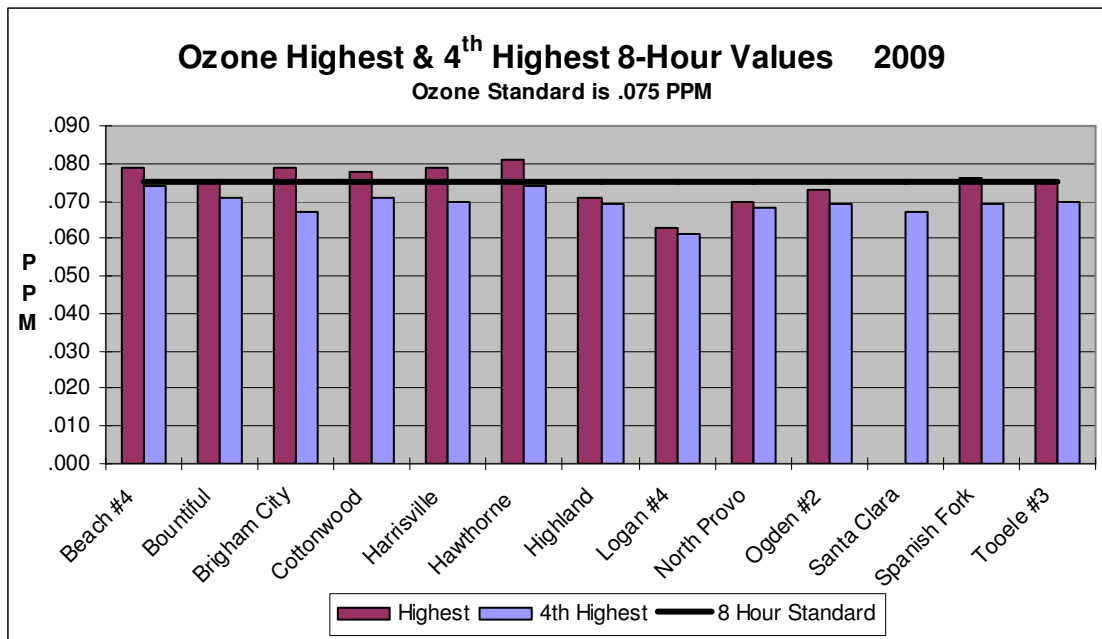


Figure 8

The following graph shows the trend of the 4th highest 8-hour average concentrations of ozone through 2009 for all of the monitoring sites. To comply with the standard, the rolling average of the 4th highest 8-hr ozone average over a three year period should not exceed 75 parts per billion. A review of the ozone data for 1995-2009, shows that even though several stations came very close, the last year was the first one with no exceedance of the new yearly ozone standard of 0.075 ppm.

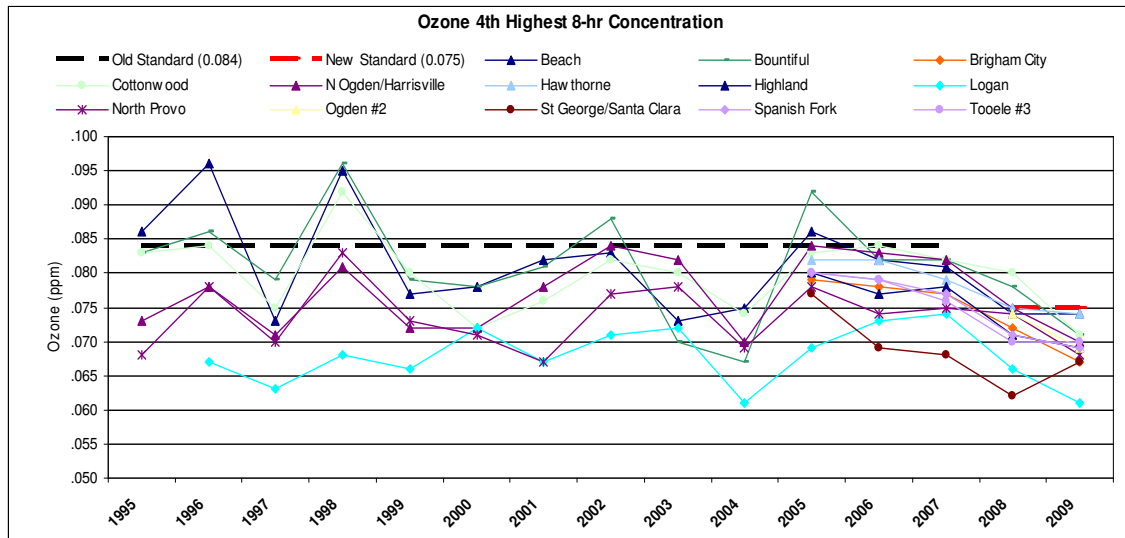


Figure 9

The following graph shows the trend for the rolling 3-year average of the 4th highest 8-hour average ozone concentration for 1995 through 2009. Ozone concentrations have declined slightly over the past three years despite significant population growth. This is due to emission control devices on new vehicles, the county-operated vehicle emission inspection and maintenance programs, a requirement for Stage I vapor controls at gasoline dispensing facilities, and significant control measures installed by industrial sources.

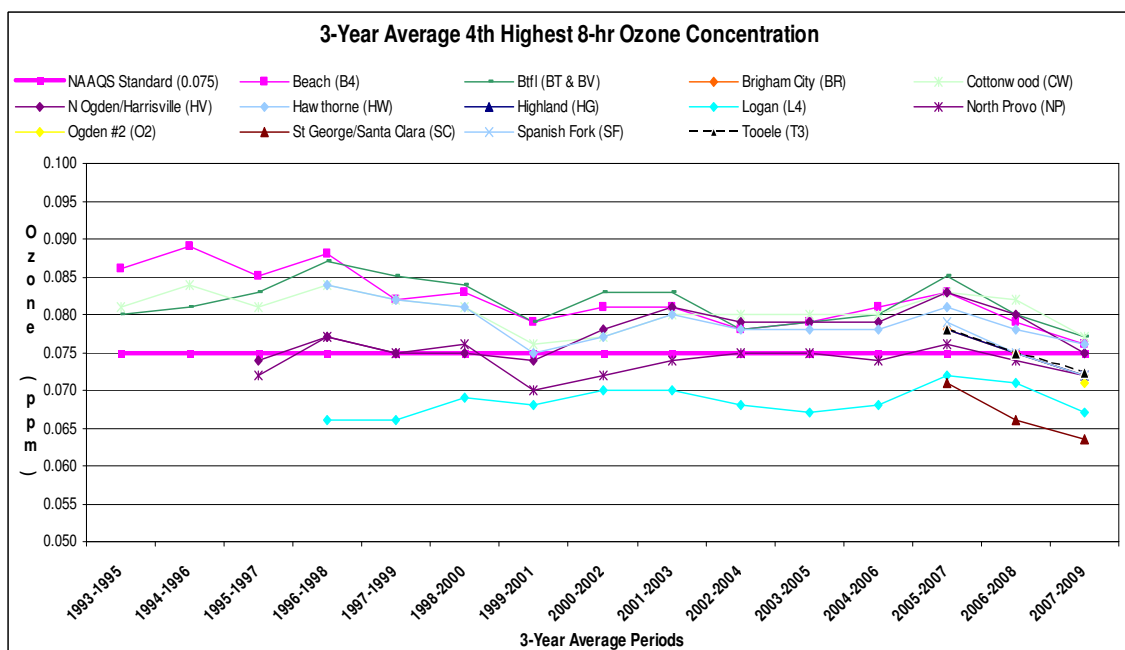


Figure 10

Additional Monitoring

No additional monitoring is planned for the ozone monitoring network.

Analysis of years of monitoring data has shown that the polluted air mass moves around the valley, analogous to water sloshing around in a bathtub. At any given time, the ozone concentrations at some sites may be higher than others in the network. DAQ currently operates four ozone monitors in the Salt Lake / Davis County Maintenance Area. It has been our experience that the Cottonwood and Bountiful monitors usually record the highest ozone concentrations in the air shed. The Hawthorne site will be the Salt Lake County consolidated monitoring site. The Beach monitor, located at the edge of the Great Salt Lake where no people live, at times shows elevated ozone concentrations although it is not a location to which a significant portion of the population may be exposed. The Beach Monitor will continue as an intermittent maximum ozone site. DAQ is planning to locate additional ozone monitors in the southern part of Salt Lake Valley as resources allow.

Ozone monitoring will continue at Beach #4, Brigham City, Bountiful, Cottonwood, Harrisville, Hawthorne, Highland, Logan #4, North Provo, Ogden #2, Santa Clara, Spanish Fork, and Tooele #3. We are planning to locate monitors in the southern part of the valley as resources allow. Additional ozone monitoring sites may be established to respond to growth or to supplement the information regarding regional ozone concentrations.

Special Studies

A number of portable ozone monitors will be placed along the western border of the state, as well as the eastern side of Salt Lake and southern border of Utah Valley, to monitor ozone transferred into the state and urban areas from Nevada and rural areas. This study will help determine the influence of ozone transported into Utah and help in planning for further ozone reduction strategies.

Utah will participate with Colorado and Wyoming in the proposed three state ozone study beginning in 2010.

2.5 PM₁₀

The PM₁₀ samplers were initially installed at the same sites as the Total Suspended Particulate (TSP) samplers because computer modeling was not available to assist in locating the sites. TSP monitoring had been performed for many years at those locations and showed many violations of the TSP standard. TSP is considered particulate matter approximately 40 microns and smaller in aerodynamic diameter.

PM₁₀ monitoring is complicated by the fact that there are two types of PM₁₀ particles. Primary particles are released from the source as particles and their concentration

decreases from the point of release dependent on dispersion characteristics. Secondary particles are released as gases and become PM₁₀ particles through chemical reactions in the atmosphere. Concentrations of secondary particles can be greater some distance from the source or after some time has elapsed from the time of release to allow the reactions to occur. Monitored PM₁₀ concentrations are a combination of both primary and secondary particles. Establishing monitoring sites to measure both types of particles can be a concern. Historically, TSP and PM₁₀ sites have been located based on primary particulates.

Data Review from the Existing Monitoring Network

The following graph displays the highest and second highest 24-hour values for the monitoring stations.

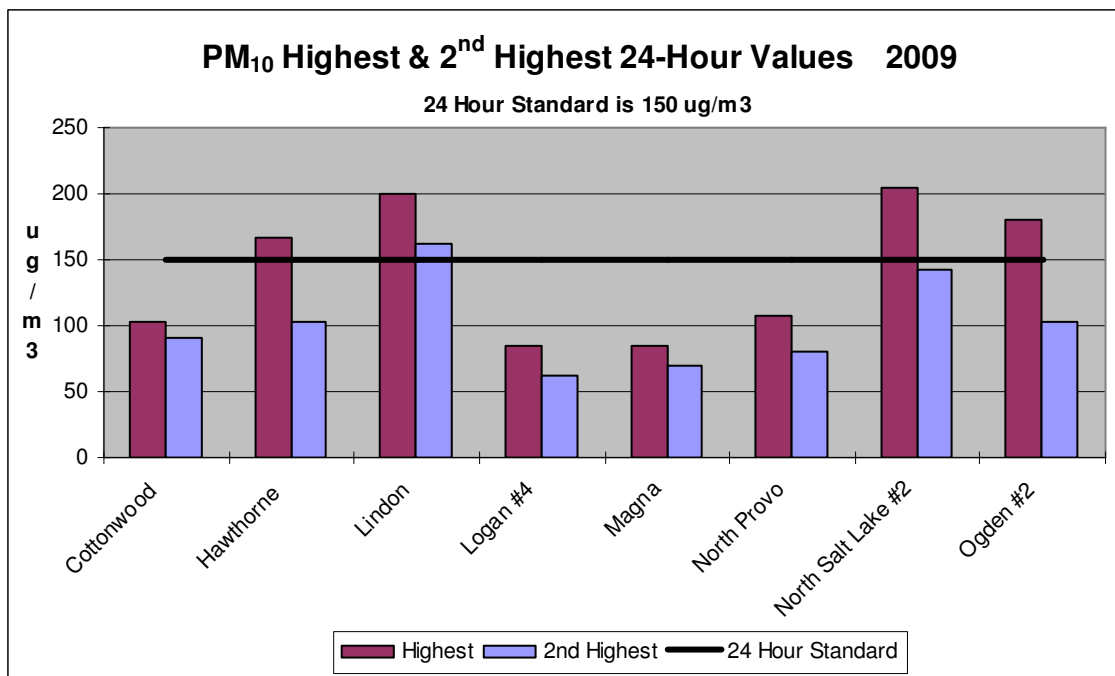


Figure 11

The graphs below show the PM₁₀ trends from 1990 through 2009. Although the PM₁₀ concentrations stayed mostly below the NAAQS threshold through 2005, an increasing trend is observed starting 2006. These violations are attributed to high wind gust episodes in the Utah and Salt Lake valleys and resulted in exceptionally high PM₁₀ readings.

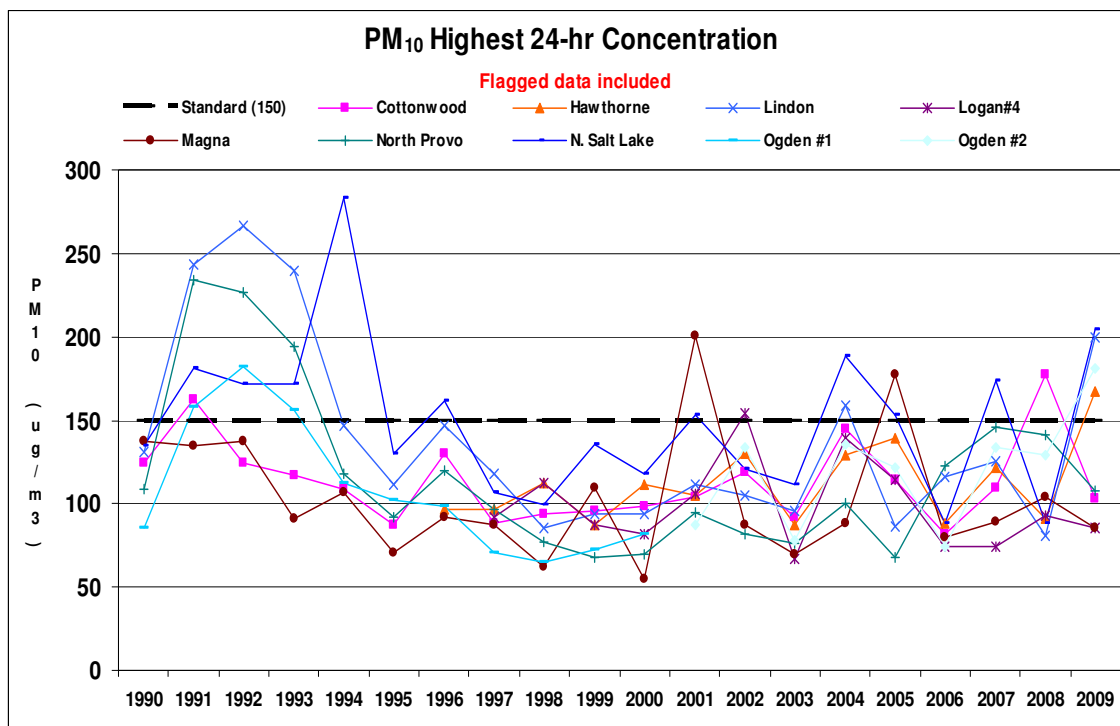


Figure 12

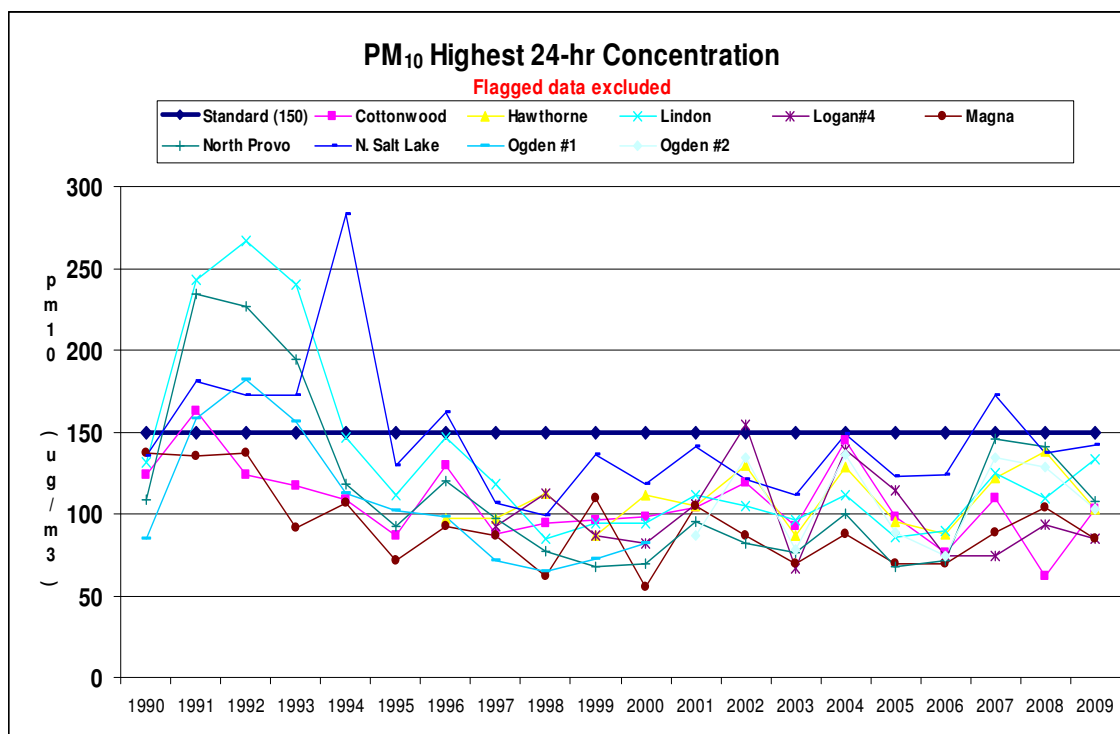


Figure 13

Additional Monitoring

No additional PM₁₀ monitoring is necessary at this time.

Special Studies

No special studies are planned for the next year.

Changes To The PM₁₀ Monitoring Network

No changes to the PM₁₀ monitoring network are planned for 2010.

2.6 PM_{2.5} (Particulate matter 2.5 micron and smaller in aerodynamic diameter.)

On September 20, 2006, the Environmental Protection Agency promulgated a new NAAQS for particulate matter measured as PM_{2.5}. The promulgation changed the 24-hour standard from 65 ug/m³ to 35 ug/m³, effective December 18, 2006. The more stringent standard increased the importance of PM_{2.5} sampling.

PM_{2.5} is comprised of two different types of particles. Primary PM_{2.5} particles are released from the source as particles and their concentration decreases from the point of release, dependent on dispersion characteristics. Secondary particles are released as gases and become PM_{2.5} particles through chemical reactions in the atmosphere. Measured PM_{2.5} concentrations are a combination of both primary and secondary particles.

In Utah, elevated PM_{2.5} concentrations principally occur during the winter time when the ground is covered in snow and strong cold inversions set up along the Wasatch Front, resulting in stagnant air and foggy conditions. During these times, nearly all of the monitored PM_{2.5} is secondary particulate. DAQ has operated many monitors along the Wasatch Front and participated in studies in the Cache Valley. DAQ has found that PM_{2.5} concentrations are generally fairly homogeneous throughout the valleys during the winter inversions.

In the summer, strong wind events may cause elevated concentrations of PM_{2.5}, most of which is primary particulate (wind-blown dust). Smoke from prescribed and wild land fires can influence the PM concentrations.

Particulate sampling was first conducted for TSP, then PM₁₀ at several locations in each county. Previous particulate monitoring has shown that the existing locations have elevated particulate concentrations. In addition, computer modeling for TSP and PM₁₀ and some limited PM₁₀ saturation sampling also showed existing particulate sampling sites are located in the areas of high concentrations for particulates. Therefore, when the initial PM_{2.5} monitors were set up, it was done at those historic sites. PM_{2.5} remains suspended in the air much longer than larger size particulates. Concentrations between sites can show the same levels of material due to the lower settling times

Historically, TSP and PM₁₀ sites were located based on primary particulates, and the PM_{2.5} monitoring sites were located based on concentrations of PM₁₀. The appropriateness of that decision will be reviewed as modeling for PM_{2.5} is performed. To complete the modeling, emission inventory information must be collected and the reactive models need to be verified; however, our finding thus far of the homogeneity of PM_{2.5} concentrations throughout the air shed indicates that one or two PM_{2.5} monitors in

each air shed are adequate to demonstrate compliance with the NAAQS. PM_{2.5} monitors that sample every three days are of limited value because continuous hourly data are needed for public notification and modeling. DAQ is proposing on developing a more robust network by going to a 24-hour network, with enough data to be helpful in modeling.

Data Review from the Existing Monitoring Network

The following graph displays the highest and 98% highest 24-hour values for the monitoring stations.

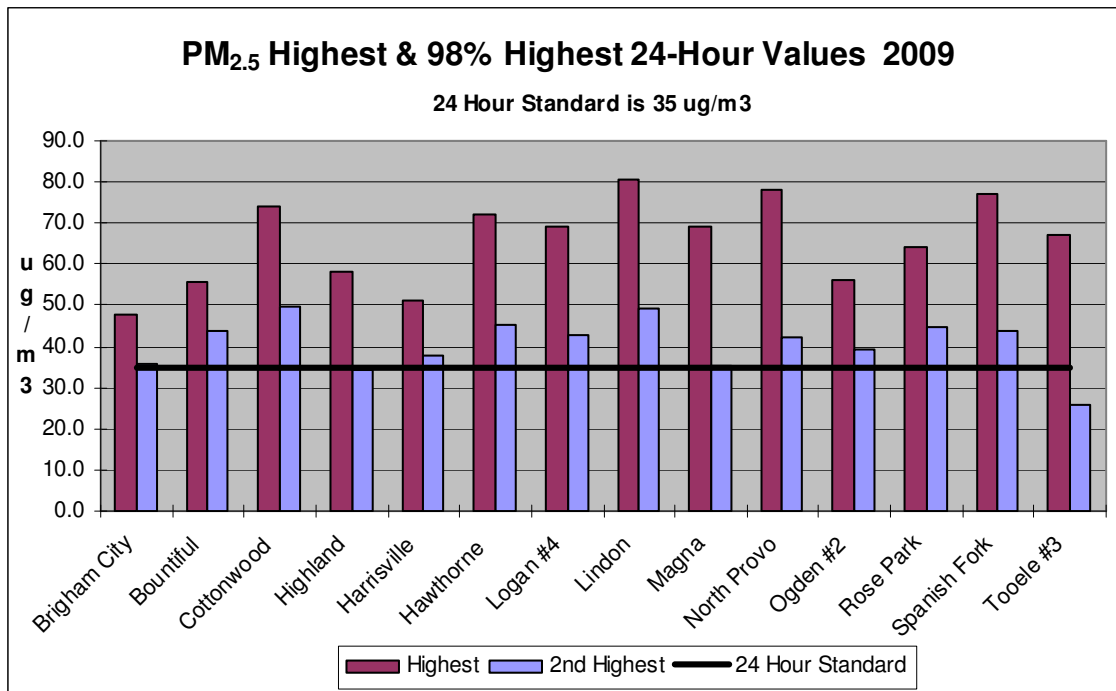


Figure 14

The following graph shows the historical trend of 3-year rolling average of the PM_{2.5} 98th percentile concentrations measured in Utah. PM_{2.5} concentrations remained steady in violation of the new standard (35 ug/m³) over the last decade.

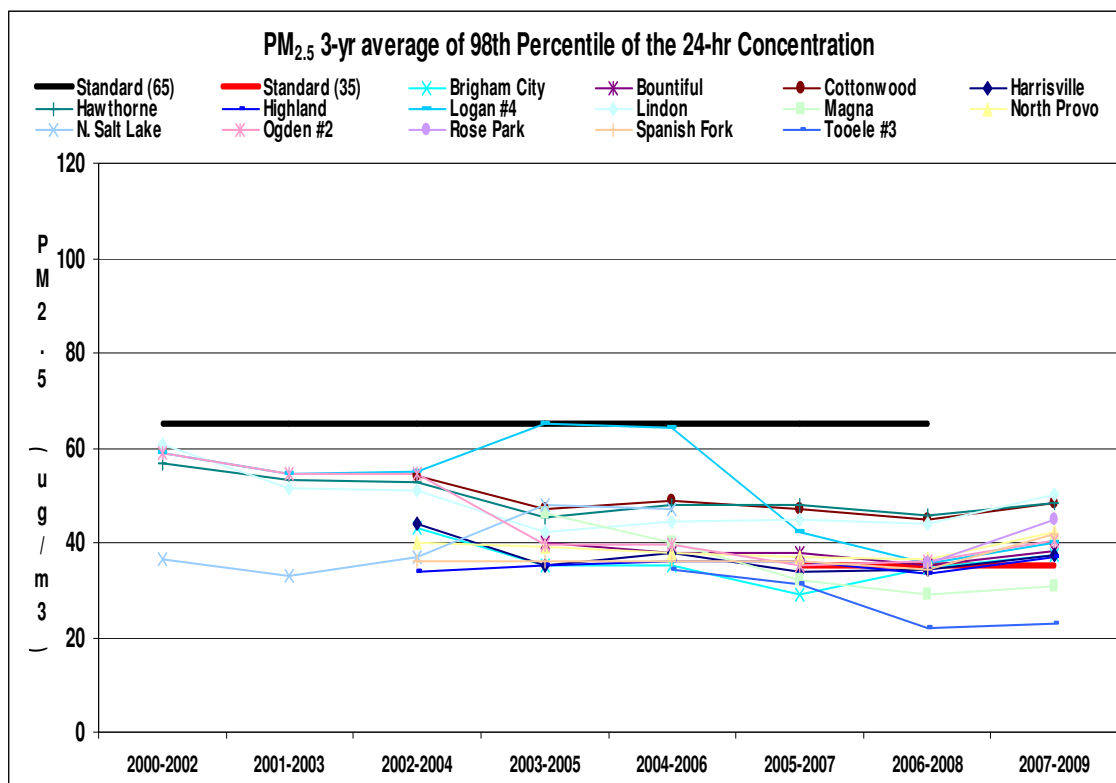


Figure 15

Additional Studies

No special PM_{2.5} studies are planned for this next year.

Changes to the PM_{2.5} Monitoring Network

Real time monitors have recently received EPA equivalent designation. Real time data is useful for modeling PM_{2.5} concentrations. To support real time notification to the public, we propose the addition of real time monitors at selected sites.

EPA has considered monitoring for PM_{coarse} which is the PM material between PM_{2.5} and PM₁₀. The Federal courts have determined that NAAQS for PM₁₀ and PM_{2.5} presents double jeopardy since both include the smaller particulate fractions. If the regulation is published in the Federal Register, we will incorporate that into the PM monitoring plan. PM_{coarse} is presently required at NCORE sites and is monitored at our NCORE site.

No changes to the PM_{2.5} network are planned for 2010.

2.6.1 PM_{2.5} Speciation

DAQ operates three PM_{2.5} speciation sites. The Hawthorne site in Salt Lake County, is one of 54 Speciation Trends Network sites (STN) operated nationwide on an every third day sampling schedule. Sites at Bountiful/Viewmont in Davis County, and Lindon in Utah County, are SLAMS PM_{2.5} speciation sites that operate on an every sixth day sampling schedule. Samples are prepared by the EPA contract laboratory and shipped to Utah for sampling. Samples are collected for particulate mass, elemental analysis, major

cation and anions, elemental, and organic carbon. Carbon sampling and analysis changed in 2007 to match the IMPROVE method using a modified IMPROVE sampler at all sites. Samples are returned to the EPA contract laboratory as soon as possible after sampling packed with ice substitutes to retain the volatile compounds sampled. Individual samples are distributed to separate laboratories dependant on the specific compounds of interest. Data undergoes level one and two review and data checks by the laboratory. The data is then submitted to the state for level 3 review and concurrence. The data are submitted to the AIRS database by the contractor. Data from the speciation network shows the importance of volatile secondary particulates during the colder months. These particles are significantly lost in FRM PM_{2.5} sampling. The speciated samples have been useful in identifying impacts from wild fire and residential wood burning smoke and holiday firework events. Data has identified the contribution of soils during high wind events.

2.7 TOTAL SUSPENDED PARTICULATE, LEAD

Starting in 2009, DAQ began operating a particulate lead (Pb) sampler at the Magna site. Source oriented, year around lead (Pb) samplers were installed at Magna sampling site to monitor ambient air to comply with the new federal regulations for Pb monitoring. The high-volume sampler operates on a one-in-six day basis, with a co-located sampler running every twelve days.

Additional Monitoring

No additional lead (Pb) monitoring is necessary at this time.

Special Studies

No special studies are planned for the next year.

Changes To The Lead (Pb) Monitoring Network

No changes to the lead (Pb) monitoring network are planned for 2010.

2.8 METEOROLOGICAL DATA

By measuring surface wind speed and direction, one can attempt to determine where a pollutant-laden air mass has come from and where it is going. This information is essential any time an attempt is made to determine the cause of high pollution periods. The wind patterns in the mountainous terrain of Utah can be very difficult to analyze. Winds affected by geographical features can, and often do, control air mass movement in the mountain valleys where most industrial and urban activities are concentrated.

Because of these complex wind patterns, it has been the policy of the DAQ that many major air monitoring stations of middle scale or larger should record meteorological data. Each station must be evaluated separately because of the complex micrometeorology in Utah. Because the terrain produces complex wind patterns, it is difficult to collect enough monitoring data to adequately represent the meteorology within the air shed.

There is a need to collect Solar Radiation/Delta T (SRDT) data for use in computer modeling. Delta T is the differential temperature at 2 and 10 meters and shows the

stability of the air mass that is being modeled. Sources outside the Wasatch Front will be required to collect SRDT data as part of any PSD permitting actions. However, in non-attainment areas such as along the Wasatch Front where PSD permitting is not required, it may be necessary for DAQ to begin to collect SRDT data, based on available funding.

Existing Monitoring

The current meteorological monitoring network is described in the monitoring site discussions of this plan.

Additional Monitoring

The importance of measuring meteorological parameters has increased as a result of more complex computer modeling. Modifications to the meteorological monitoring network have occurred as a result of a report prepared by the Technical Analysis Section. DAQ will be using the CMAQ computer model to analyze PM_{2.5} and ozone data. CMAQ requires an extensive amount of meteorological information.

Changes To The Meteorological Monitoring Network

No changes to the meteorological monitoring network are planned for 2010.

2.9 AIR TOXICS

The Clean Air Act of 1990 identified 189 toxic air pollutants, which became the focus of the toxic monitoring program. That list has since been modified to 187 Toxic Air Pollutants. EPA has chosen 33 toxic air pollutants to focus on in its Integrated Urban Air Toxics Strategy. The pressure to increase monitoring for toxic air pollutants has been increased by the National Monitoring Policy. In response, EPA is reducing the number of criteria pollutant monitors required by regulation, allowing states to refocus the cost savings toward additional toxics monitoring. Any increase in the toxic monitoring network will depend on additional funding by EPA.

Mercury as an air toxic is of significant interest in Utah. Advisories to limit the consumption of fish from certain lakes and water sheds have been issued because of the mercury content of the fish flesh. The sediment of the Great Salt Lake has mercury to an extent that has raised concern about its origin. DAQ became part of the National Mercury Deposition Network and in May 2007, began monitoring for mercury in the ambient air.

Sampling Locations

Specific sources of toxic pollutants have been identified using SARA 313 information and a toxic air pollution survey conducted by Radian for DAQ. Toxic monitoring at these sources was not conducted for the initial sampling phase of the program; rather a general survey of the air contaminants was initiated. Monitoring near specific sources is being performed based on identified need. Historic sampling has been performed at Salt Lake City, Lindon, and North Provo stations. DAQ has been part of the EPA funded Urban Air Toxics Monitoring Program since a site was installed at West Valley in October 1999. In West Valley, VOCs, aldehydes and particulate metals were sampled.

In January 2003, the air toxics monitoring was moved to the Bountiful monitoring station so Urban Air Toxics equipment would be co-located with the PM_{2.5} speciation equipment. This will provide for a more complete evaluation of the air mass being monitored. Using EPA funds, an aethalometer has been added to the Bountiful site to measure ambient carbon particles. In addition, sampling for hexavalent chromium (Cr^{VI}) was initiated in 2005. A new carbon sampler began operation in 2007.

The wet Mercury Deposition Network sampler is located on the roof of the Air Monitoring Center in the western Salt Lake City suburb of West Valley City. Monitoring for Mercury began in May 2007. Gaseous, particulate bound and reactive mercury is also monitored at the AMC site. Meteorological monitoring to support mercury deposition is monitored at this site. Additional monitoring for leaf wetness is included in the suite of instrumentation. Dry deposition mercury monitoring began in 2009.

Existing monitoring

The one Urban Air Toxics monitoring site provides a baseline for air toxics data in the urban areas along the Wasatch Front.

Additional Monitoring

EPA has indicated a desire to increase monitoring for non-criteria pollutants. EPA is re-allocating \$6.3 million nationwide from existing funds for measuring criteria pollutants to increased monitoring of air toxics. As more guidance comes from EPA, that information will be used to assess needed changes in air toxics monitoring.

Additional Studies

No additional studies are planned for next year.

Changes to the Air Toxics Monitoring Network

EPA's National Monitoring Policy recommends increasing the number of sites and number of parameters being measured as part of identifying toxic air pollutants in the urban areas. As regulations are promulgated that implement the National Monitoring Policy, DAQ will identify needed changes to the toxics monitoring network.

3.0 EMERGENCY EPISODE MONITORING

One of the responsibilities of the Division is to assure that the public is protected from air pollution concentrations that will cause immediate damage or impact on their health. Rule R307-105 establishes emergency response criteria in accordance with Subpart H and Appendix L of 40 CFR 51. Whenever air pollution concentrations meet or exceed the Alert, Warning, or Emergency levels, an Emergency Episode is determined to exist and actions are taken to reduce the emissions of air pollutants. It is the responsibility of the monitoring section to collect the air pollution data used to determine when an Emergency Episode exists. The data collection telemetry system is alarmed and the monitoring staff is alerted whenever the Alert, Warning, or Emergency levels are approached. The monitoring staff has the primary responsibility to notify the director of the division that an

emergency episode exists. This is a critical function that is required by State and Federal law. The telemetered stations along the Wasatch Front are included in the Emergency Episode network. The Emergency Episode Plan has been reviewed to allow it to remain current.

No changes have been identified in the emergency episode monitoring effort.

The Air Monitoring Center retains equipment that can be deployed for emergency situations. We work with the incident commanders, as requested for air monitoring activities including data from existing monitoring sites.

4.0 NETWORK MODIFICATION FORMS

Network modification forms will be prepared for submittal to EPA Region 8 to implement the network modifications identified in this network plan.

5.0 SUMMARY AND CONCLUSIONS

The monitoring requirements identified by federal regulation are currently being met with the existing monitoring network in Utah. The procedures that are being used and the instruments that are being operated meet the standards that have been established by EPA.

A.0 APPENDIX A- Proposed NCore Site at Hawthorne Station

The following documentation and pictures are in regards to the proposed NCore site at the Hawthorne station which is located at Hawthorne Elementary School in Salt Lake City, Utah.

The air monitoring site located at Hawthorne Elementary School was identified as a suitable potential site for NCore network. The target date for NCore stations to be fully operational is Jan 1st, 2011. Located near a major street intersection (1700 South & 700 East) and inside a large residential neighborhood, Hawthorne site is a favorable location to represent both, the condition in the Salt Lake Valley and the population exposure. EPA and Utah DEQ agreed that Hawthorne site is a suitable location for the future NCore network.

However, the site's proximity to trees belonging to nearby properties has become a significant issue in formal approval of Hawthorne as an NCore site. The following is the siting regulation in relation to the samplers proximity to trees:

40 CFR Part 58, Appendix E, Section 5. Spacing From Trees

“(a) Trees can provide surfaces for SO₂, O₃, or NO₂ adsorption or reactions, and surfaces for particle deposition. Trees can also act as obstructions in cases where they are located between the air pollutant sources or source areas and the monitoring site, and where the trees are of a sufficient height and leaf canopy density to interfere with the normal airflow around the probe, inlet, or monitoring path. To reduce this possible interference/obstruction, the probe, inlet, or at least 90 percent of the monitoring path *must* be at least 10 meters or further from the drip line of trees.” (italics added)

40 CFR Part 58, Appendix E, Footnote 3 to Table E-4 (for parameters other than CO)

“³Should be >20 meters from the dripline of tree(s) and *must* be 10 meters from the dripline when the tree(s) act as an obstruction.” (italics added)

In the quoted text, ‘must’ is defined as a requirement and the exceptions may be approved only through waiver provisions. ‘Should’ is defined as general goals to move toward for consistency and are not requirements.

Currently, no sample inlet at Hawthorne site meets the 10 meter separation requirement. The newly installed CO inlet is approximately 2 meters away from the closest drip line. The continuous and speciation PM inlets are 4 meters and NO_x and Ozone are 8 meters away from the closest drip line.

At this time, removal of Hawthorne site to a different location is both impractical and logistically unviable. An option is to move the sampling site approximately 7 meters due west. This would improve the current violation of proximity to nearby trees. The trace CO, NO_y and trace SO₂ inlet (the closest one to the drip line) will be moved to the southwest corner of the new sampling site, increasing the distance to approximately 10 meters.

Ozone, NO_x, and other sample line inlets will be moved to the southeast corner of the second new trailer. This will increase the separation from the closest drip line to approximately 8-9 meters. Continuous and speciation PM inlets will also be moved significantly.

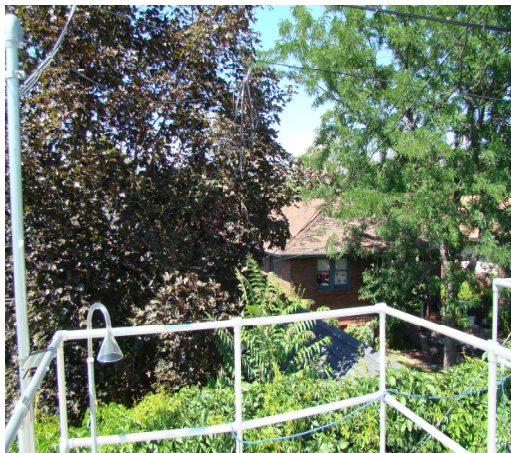
A possible reposition of the sampling site 7 meters due west could solve most of the tree proximity violations.

Conclusion:

Although all of the inlets at Hawthorne air monitoring site are in proximity to nearby residential trees, the site remains the most suitable location for NCore sampling. This is due to proximity to a major roadway, location inside a large residential area, and a favorable geographic location.

The issues regarding the proximity to nearby trees will be alleviated by moving the sampling inlets as far away as possible from the trees.





Aerial View

Below is an aerial view of the existing Hawthorne Station which is located to the right of the red circle. The location of the new proposed Ncore trailers will be in the area inside the red circle. This will help make the distance between the drip line of the trees and the inlet probe close to or greater than the required 10 meters.



NCore Readiness Self-Assessment for State/Local/Tribal Agencies
 Agency Name **State of Utah, Division of Air Quality** Date Prepared **May 27, 2010** By **Bo Call & Kevin Hart**

A. NETWORK DESIGN

a. Proposed NCore Station #1 ___NEW SITE **X**EXISTING SITE AQS # **490353006**_____

	Item	Criteria	Status	Next Steps
1	Urban or Rural	Largest MSA(s) covered by urban station.	Urban	
2	Scale of Representation	Neighborhood <u>X</u> Urban ___ Regional ___ Other ___	Neighborhood	Neighborhood scale or larger highly recommended.
3	Population Oriented	Yes <u>X</u> No ___	Yes	Population oriented monitoring highly recommended.
4	Proximity to local emissions sources	No biasing local sources within 500 meters for urban stations. No biasing sources or large urban population centers within 50 km for rural stations.	Streets 700 East - 103' 1700 South - 285' Milton Ave. - 145'	
5	Suitability for meteorological measurements	Distance from obstructions is 10x height of obstruction above station. See Volume IV: Meteorological Measurements Version 1.0 (Draft)	School - 30' high 130' between station and school	
6	Information (including site photographs) provided for AMTIC NCore web site	Photographs in 8 cardinal directions needed.		
7	Station Coordinates	Determined by GPS	UTM Coord. (Zone 12) 4509446 Northing 00426434 Easting	
8	Site visited by EPA in past 3 years	Meets applicable Appendix D and E criteria.	Yes	New sites should be visited by EPA before final NCore approval is requested

	Item	Criteria	Status	Next Steps
9	Network leveraging	Collocation with other networks encouraged: STN__ Supplemental CSN__ NATTS __ CASTNET __ IMPROVE __ NADP __ PAMS __ Other __	SLAMS NAMS	
10	Applicable site fields updated in AQS including coordinates	Consider setting additional monitor type to “Proposed NCore” (station should also be categorized as SLAMS).	Yes	
LOGISTICAL CONSIDERATIONS				
11	Site access	Access for at least five years is suggested.	Yes	
12	Power requirements and availability	200A service suggested. 240vac service typically needed for a/c. Key power outlets protected by UPS units.	Yes	
13	Telecommunications	Minimum dial-up service. Broadband service suggested for polling of 1-minute data.	Yes	
14	A/C cooling capacity	Minimum 18,000BTU a/c capacity.	Yes	
15	Interior space	Sufficient for minimum of two 19” inner dimension, 6’ tall instrument racks and related equipment and accessories, or equivalent shelf space.	Yes	

	Item	Criteria	Status	Next Steps
16	Exterior space (roof and accompanying platforms)	Allow for: a) 1m spacing of low-volume PM sampler inlets – up to seven* required plus PEP audit sampler. b) 1m spacing between low-volume PM sampler inlets and gas manifold cane or Teflon tubing. Facilitate usage of TTP audit vehicle or trailer.	Yes	
17	10m tower compatibility	Required for meteorological equipment, NOy converter. Room to drop tower for calibrations and audits.	Yes	

*Notes

1. PM2.5 FRM sampler
2. PM10c FRM sampler for PM10-2.5 mass (dichotomous sampler could substitute for #1 and #2 if future FRM/FEMs available) or PM10-2.5 continuous
3. PM2.5 continuous sampler (does not have to be FEM/ARM)
4. PM2.5 speciation sampler (CSN or IMPROVE)
5. URG sampler for carbon channel (PM2.5 speciation) if using CSN samplers
6. Sampler for PM10-2.5 speciation (unless dichotomous sampler or PM2.5 speciation sampler (spare channels) is used)
7. URG sampler for PM10 carbon speciation (speculative need for PM10-2.5 carbon speciation by difference)

B. REQUIRED PARAMETER/METHODOLOGICAL EVALUATION

b. Proposed NCore Station #1 ___NEW SITE XEXISTING SITE AQS # 490353006

	Parameter	Existing Measurements		Future Measurements		Notes
		Sampling Began	Method	Date Expected	New or Relocated	
1	Ozone	Seasonal May 00 -Sept 03 Year around May 04 - present	087			Year-round operation (not seasonal)
2	Sulfur dioxide	No	---			High sensitivity
3	Carbon monoxide	Seasonal Nov 99 – Mar 06 Year around Sept 06 – Mar 09 NCore trace Apr 09 - present	054			High sensitivity
4	Nitrogen oxides (NO _y)*	NO Apr 08 – present NO ₂ /NOX Nov 99 – present	074			High sensitivity External converter mounted at 10m
5	PM2.5 mass	Daily Jan 98 – present	145			1-in-3 day FRM/FEM integrated
6	PM2.5 continuous	TEOM 1400 Nov 99 – Mar 05 FDMS Dec 03 – Nov 08 TEOM 1405 Dec 08 – present	760			FEM or ARM preferred but not required
7	PM2.5 speciation	Mar 00 – present	---			1-in-3 day (Met One & URG 3000N samplers) or IMPROVE
8	PM10-2.5 mass	No	---			Integrated samplers (FRM difference or dichot) or continuous monitor

	Parameter	Existing Measurements		Future Measurements		Notes
		Sampling Began	Method	Date Expected	New or Relocated	
9	PM10-2.5 speciation	No	---			Details to be provided later (2008) on sampling requirements.
10	Wind speed and direction**	Nov 99 – present	012 / 014			At 10 m
11	Ambient temperature**	Nov 99 – present	040			At 10 m
12	Relative humidity**	Nov 99 – present	012			At 10 m
13	Optional – Vertical wind speed, solar radiation, precipitation, barometric pressure, delta-T for 2-10m.	Solar radiation Nov 99 - present Barometric pressure Nov 99 - present	011			At 4 m At 3 m
14	Optional – Ammonia and nitric acid	NH ₃ Feb 08 – Apr 08 Dec 08 – Mar 09		URG 9000 NH ₃ - Yes HNO ₃ - Yes		Pilot project using denuders scheduled for 2008-2009.

Notes

* Although the measurement of NOy is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NOy compared to the conventional measurement of NOx, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NOy and NOx measured concentrations, the Administrator may allow for waivers that permit high-sensitivity NOx monitoring to be substituted for the required NOy monitoring at applicable NCore sites.

** EPA recognizes that, in some cases, the physical location of the NCore site may not be suitable for representative meteorological measurements due to the site's physical surroundings. It is also possible that nearby meteorological measurements may be able to fulfill this data need. In these cases, the requirement for meteorological monitoring can be waived by the Administrator.

C. SUPPORTING EQUIPMENT EVALUATION

a. Proposed NCore Station #1 ___NEW SITE XEXISTING SITE AQS # 49035336

	Item	Criteria	Status	Next Steps
1	Calibrator (field)	Suitable for trace-level dilutions, see Appendix A audit concentrations. Capable of automated QC checks. Internal O3 generator – photometer preferred.	Yes	
2	Calibrator (lab or field)	Suitable for generation of MDL-level concentrations	Yes	
3	Zero Air Source	Compliant with TAD recommendations. Ultra-pure air cylinder recommended for occasional comparison to zero air source. Capacity for 20+ LPM of dilution air.	Yes	
4	Data acquisition system	Digital-capable system	No	
5	Gas cylinder standards	Suitable for trace-level dilutions, see Appendix A audit concentrations, EPA Protocol certifications. Special low-level standards needed for MDL concentrations (CO, SO2, NOy)	Yes	
6	Meteorological calibration devices	Provide NIST traceability of required meteorological parameters.	Yes	
7	Sampling manifold	Per Appendix E. Residence time <20 seconds, only glass or Teflon materials, probe and monitor inlets acceptable heights.	Yes	
8	Auditing equipment	Independent calibrator, zero air source and gas standards compatible with trace level specifications. Independent meteorological and flow standards, if not already available.	Yes	

D. ORGANIZATIONAL FACTORS

	Item	Criteria	Status	Next Steps
1	Training considerations	Key monitoring personnel have attended OAQPS provided monitoring workshops or equivalent training.	No	
2	Monitoring station documentation	NCore station(s) described in Annual Monitoring Network Plan.	Yes	Must be included in plan due on or before July 1, 2009. Discuss siting with health researchers and other data stakeholders.
3	Section 103 funds received and obligated for equipment purchases		Yes	Work with EPA Regional contacts.

B.0 APPENDIX B- PUBLIC COMMENTS ON MONITORING PLAN

The comments received during the public review of the monitoring plan will be evaluated and the plan will be modified if determined to be appropriate. Send comments to: Utah Department of Environmental Quality, Division of Air Quality, Attn: Bo Call, PO Box 144820, Salt Lake City, UT 84114-4820