



UTAH DEPARTMENT of
**ENVIRONMENTAL
QUALITY**

Division of Air Quality

Annual Monitoring Network Plan 2023



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GLOSSARY

DAQ	Division of Air Quality
AQS	Air Quality System (EPA database)
BC	Black Carbon
CBSA	Core-Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon monoxide
CSN	Chemical Speciation Network
EMP	Enhanced Monitoring Plan
EPA	U.S. Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
LHD	Local Health Department
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NASA	The National Aeronautics and Space Administration
NATTS	National Air Toxics Trends Stations
NCore	National Core multi-pollutant monitoring stations
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Reactive nitrogen oxides
NO _y	Total reactive nitrogen
O ₃	Ozone
PAMS	Photochemical Assessment Monitoring Stations
PAHs	Polycyclic aromatic hydrocarbons
PM _{2.5}	Particulate matter with an equivalent diameter less than or equal to 2.5 μm
PM ₁₀	Particulate matter with an equivalent diameter less than or equal to 10 μm
ppb	Parts per billion (one part in 10 ⁹)
ppm	Parts per million (one part in 10 ⁶)
SIP	State Implementation Plan
SLAMS	State or Local Air Monitoring Stations
SO ₂	Sulfur dioxide
SPM	Special Purpose Monitor
μg	Microgram (10 ⁻⁶ grams)
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

Each year, the Air Monitoring Section of the Division of Air Quality (DAQ) produces a Monitoring Network Plan in accordance with federal regulations (40 CFR, section 58.10). The purpose of the document is to apprise the stakeholders (public, private, government) and other entities of the current state and the upcoming changes to the State's Air Monitoring Network being operated in compliance with the Code of Federal Regulations 40 Code of Federal Register (CFR) 58. The DAQ continually seeks input from the aforementioned parties on improvements to the current level of service or to provide additional accommodations where requested and needed. The Annual Monitoring Network Plan reflects the necessary network changes DAQ implements to enhance the quality, coverage, reliability, and cost efficiency of the division's monitoring efforts.

In 2022-2023, the Air Quality Monitoring Network underwent the following changes:

- The Bureau of Land Management did not renew the contract to operate the Escalante National Monument visitor's center site in Escalante, Garfield County and this site has been discontinued.
- The DAQ in coordination with the Local Health Department (LHD), local officials, and DAQ modelers selected a suitable location to install a PM_{2.5} monitor within the city limits of Moab. This station has been fully operational in since Q2 of 2023 and starting data collection on April 12, 2023. In addition, PM_{2.5}, ozone, and nitrogen dioxide monitors were also installed in the station. The network mod form has been included with this plan.
- The Hawthorne monitoring site is hosting a Pandora Spectrometer system which was designed to measure ozone, nitrogen dioxide, and formaldehyde total column profiles. This instrument is part of the NASA Pandora project.
- An analog sensor for detecting UV radiation was installed at Hawthorne site, it is reporting hourly averaged UV radiation.
- Four ceilometers were installed at Roosevelt, Prison, Rose Park, and Smithfield stations. The Division has joined to the University of Maryland, Baltimore County (UMBC), Unified Ceilometer Network (UCN) for data review, processing, and posting support. Currently the ceilometers data from the Hawthorne station is reported to that network program. The rest of the new ceilometers will also be reporting to the UMBC as they get set up.
- The True NO₂ chemiluminescence instrument at Hawthorne was replaced by a Cavity Attenuated Phase Shift (CAPS) Spectroscopy True NO₂. The instrument combines direct NO₂ measurements with gas phase titration (GPT) to convert and measure the NO gas component. This technology is highly accurate and requires less maintenance than Chemiluminescence technology.
- T265 O₃ chemiluminescence instruments were added to Roosevelt and Vernal for a study with NOAA and EPA.
- A new monitoring site has been established in Brigham City and is currently collecting test data while instruments are being set up. The network mod form has been included with this plan.

Statement of Compliance

According to the requirement of 40 CFR 58, Subpart B, all stations and monitors deployed within Utah's Air Quality Monitoring Network meet the requirements of appendices A, C, D, and E of the aforementioned subpart. As of 2022, Utah's Air Quality Monitoring Network has no active Prevention of Serious Deterioration (PSD) air monitoring program stations; Appendix B does not apply to any stations or monitors in Utah because this appendix pertains to PSD air monitoring stations.

Primary Monitor Designation

A primary monitor is defined as the one "identified by the monitoring organization that provides concentration data used for comparison to the NAAQS. For any specific site, only one monitor for each pollutant can be designated in AQS as primary monitor for a given period of time. The primary monitor identifies the default data source for creating a combined site record for purposes of NAAQS comparisons." (40 CFR 58.1).

Each year, DAQ carefully chooses and designates suitable primary monitors for each monitoring station and each pollutant according to data completeness and integrity. The primary monitors are designated prior to data certification in Q1 of the following year during the regular QC process. Federal Equivalent Method (FEM) PM_{2.5} monitor data was not used prior to January 1, 2015, as it did not meet quality assurance requirements. As of January 1, 2015, FEM PM_{2.5} monitoring was used for data substitution and co-locations as required in 49 CFR Part 50 Appendix N and 40 CFR Part 58 Appendix A 3.2. Table 1 lists the designated Pollutant Occurrence Code (POC) for the primary monitor designations for the year 2022

Table 1. List of designated primary monitors for 2022.

Site name	County	Site ID	POC
Smithfield (SM)	Cache	49-005-0007	1
Harrisville (HV)	Weber	49-057-1003	1
Bountiful (BV)	Bountiful	49-011-0004	1
Copperview (CV)	Salt Lake	49-035-2005	1
Environmental Quality (EQ)	Salt Lake	49-035-3015	3
Hawthorne Annex (HA)	Salt Lake	49-035-3006	1
Herriman (H3)	Salt Lake	49-035-3013	5
Near Road (NR)	Salt Lake	49-035-4002	3
Rose Park (RP)	Salt Lake	49-035-3010	1
Lake Park (LP)	Salt Lake	49-035-3014	1
Prison Site (ZZ)	Salt Lake	49-035-3016	1
Erda (ED)	Tooele	49-045-0004	3
Lindon (LN)	Utah	49-049-4001	1
Spanish Fork (SF)	Utah	49-049-5010	1
Vernal (V4)	Uintah	49-047-1004	4
Roosevelt (RS)	Duchesne	49-013-0002	4
Price (P2)	Carbon	49-007-1003	5
Enoch (EN)	Iron	49-021-0005	1
Hurricane (HC)	Washington	49-053-0007	3

Network Changes

Changes to the Utah’s Air Quality Monitoring Network are intended to improve the effectiveness of monitoring efforts and to ensure compliance with the EPA National Ambient Air Monitoring Strategy. This section of the document contains all changes that were made in 2022 and the changes that are planned for 2023.

2023 Network Changes

- A new location for the Brigham City site was selected (near 350 West 1175 South), instruments have been installed and are being tested. The site will assess population exposure in this area and will help the forecasters with ozone and PM_{2.5} predictions.
- A second Near Road site is required in the Salt Lake City Metropolitan Statistical Area (MSA). Sites are being considered and evaluated for this in consultation with EPA. The timing of the site is still uncertain and will depend on a number of factors including budget and resources. In addition, the first Near Road site has concluded at least 3 years of data collection and the DAQ is looking to shut it down. The DAQ is conferring with EPA to get permission to close the site and use the assets

at other locations. The near road sites do not meet and, in fact, violate other siting criteria that are used to locate sites used for NAAQS compliance determination

- Future new monitoring activities and/or sites are required in the Wasatch Front in order to meet Enhanced Monitoring Plan (EMP) requirements as the Wasatch Front was re-designated to Moderate nonattainment for ozone.

The DAQ is developing an EMP in fulfillment of federal regulations, 40 CFR Part 58, Appendix D 5(h). These regulations, require that any states with any area designated moderate and above 8-hour O₃ nonattainment, and any state within the Ozone Transport Region (OTR), develop, implement, and submit an EMP for O₃ to the regional office of the Environmental Protection Agency (EPA) no later than October 1, 2019, or two years following the effective date of a designation to a classification of moderate or above O₃ nonattainment.

The EMP is intended to provide monitoring organizations the flexibility to implement any additional monitoring beyond the minimum requirements for the State and Local Air Monitoring Stations (SLAMS) to complement the needs of their area.

The DAQ is currently working on the infrastructure for four to five additional PAMS monitoring sites along the Wasatch Front.

Currently, second shelters have been installed next to the Erda and Bountiful DAQ monitoring sites to host the special instrumentation involved in the PAMS program. A third PAMS site will be placed at the Environmental Quality Technical Support Center and a fourth PAMS site has been placed next to the University of Utah Meteorological Station (near Red Butte garden). The fifth site location is still undetermined. DAQ will continue working on site preparation and gathering the instrumentation to accomplish this task. As each site is brought on line data will be reviewed to determine that each additional site location is still the preferred site.

Throughout this network expansion the DAQ will be conferring with EPA and researchers to ensure the best possible use of resources to generate the most relevant data. These new sites will contain the following measurements;

1. Hourly averaged speciated volatile organic compounds (VOCs) (PAMS target list compounds),
2. Hourly averaged formaldehyde,
3. Hourly averaged mixing-height measurements,
4. Hourly average meteorological parameters,
5. True NO₂ measurements and/or NO_y measurements, and

There may be additional measurements included in the EMP that could include low cost sensors and other parameters as DAQ gets further along. Some of these additional measurements may be collected at existing monitoring sites or will be located at new sites as it's determined what best meets the DAQ data needs.

All changes and additions to the monitoring network are contingent upon necessary resources and the approval of EPA.

The EPA is planning to require reporting of assets in the annual network plan. It will be done by data export from the asset management software (Asset Panda) and will be included as part of the network plan when EPA finalizes the requirements and provides guidelines for what needs to be reported. The network plan will indicate that the data is attached but it will not be listed as part of this report. It is unclear that the data will be included in the information that is required to go to public comment.

1.1 Utah Air Quality Monitoring Network

The Air Quality Monitoring Network currently operates monitors at 23 locations statewide. Two of the monitoring sites have been established to fulfill the Utah Senate Bill 144, which directs the Department of Environmental Quality to establish and maintain monitoring facilities to measure the environmental impact from the Inland Port development project. These sites are the Lake Park Site (LP) and the new Prison Site (ZZ).

The DAQ monitoring stations are strategically situated to measure both local and regional levels of air pollutants, including particulate matter (PM), gaseous pollutants, and meteorological variables. Currently, PM_{2.5} is measured at 20 locations, PM₁₀ is monitored at six locations, O₃ is monitored at 20 locations, NO_x/NO/NO₂ is measured at 20 locations, CO is monitored at seven locations, and SO₂ at four locations. There are 13 out of 20 PM_{2.5} monitoring sites and all PM₁₀ sites use filter-based equipment, additionally; all the sites monitoring PM_{2.5} and PM₁₀ are equipped with continuous monitors. Meteorological parameters, wind speed, wind direction, temperature, relative humidity, and solar radiation are measured at most sampling sites. The location and elevation of the monitoring sites, the EPA Air Quality System (AQS) site codes, and the measured variables at each station are provided in Table 2 and Table 3.

Moreover, the network includes stations that participate in the National Core (NCORE), Speciation Trends Network (STN), Chemical Speciation Network (CSN), Photochemical Assessment Monitoring Stations (PAMS), National Air Toxics Trends (NATTS), and Near-road station EPA monitoring programs.

Data collected at these stations is primarily used for the following objectives:

- Evaluating population exposure to air pollutants
- Tracking the spatial distribution of air pollutants
- Assessing historical trends in air pollution
- Supporting compliance with ambient air quality standards (primary and secondary)
- Supporting air quality models and research studies
- Informing the general public of air pollution levels via mobile apps and web pages
- Developing State Implementation Plans (SIPs) and legislative air pollution control measures
- Tracking the effectiveness of air pollution control strategies

- Activating control measures during high air pollution episodes, such as restricting wood burning during winter-time inversions
- Monitoring of specific emission sources and air pollutants

The sampling sites are strategically located to meet the aforementioned monitoring objectives. For instance, some sites are selected to measure PM concentrations in highly populated areas while others are selected to determine the extent of ozone (and its precursors) transport from the Wasatch Front to the Uinta Basin. The DAQ is continually working to optimize the monitoring instruments in its network. A list of the methods and equipment used to measure the parameters in the network is provided in Appendix A; and a monitoring instrument list, site-specific objectives and spatial scale, as well as measured parameters, sampling frequency, and methods are provided in Appendix B.

Table 2. Utah Air Monitoring Network Site Locations.

County	AQS code	Station Name	Station Address	Latitude	Longitude	Elevation (meters)
Cache	49-005-0007	Smithfield (SM)	675 West 220 North, Smithfield	41.84267	-111.852064	1379
Box Elder		Brigham City (B5)	350 West 1175 South, Brigham City	41.485039	-112.021484	1316
Weber	49-057-1003	Harrisville (HV)	425 West 2550 North, Harrisville	41.302685	-111.986476	1320
Davis	49-011-0004	Bountiful (BV)	171 West 1370 North, Bountiful	40.902945	-111.884505	1309
	49-011-6001	Antelope Island (AI)	Great Salt Lake	41.039404	-112.231541	1355
Salt Lake	49-035-2005	Copperview (CV)	8449 South Monroe St., Midvale	40.597911	-111.894162	1343
	49-035-3015	Environmental Quality (EQ)	1950 West 240 North, Salt Lake City	40.777028	-111.94585	1284
	49-035-3006	Hawthorne (HW)	1675 South 600 East, Salt Lake City	40.734367	-111.872221	1308
	49-035-3013	Herriman #3 (H3)	14058 Mirabella Drive, Herriman	40.496412	-112.036329	1534
	49-035-3014	Lake Park (LP)	2782 South Corporate Park Dr., West Valley City	40.709905	-112.008684	1295
	49-035-4002	Near Road (NR)	5001 South Galleria Dr, Murray	40.662868	-111.901874	1305
	49-035-3010	Rose Park (RP)	1400 West Goodwin Ave., Salt Lake City	40.795514	-111.930996	1283
	49-035-3005	Saltair (SA)	6640 West 1680 North, Salt Lake City	40.805989	-112.049804	1289
	49-035-3016	Prison Site (ZZ)	1480 North 8000 West	40.80793	-112.087772	1287
Utah	49-049-4001	Lindon (LN)	50 North Main St., Lindon	40.339505	-111.713486	1444
	49-049-5010	Spanish Fork (SF)	2050 N. 300 W., Spanish Fork (airport)	40.136369	-111.658011	1380
Tooele	49-045-0004	Erda (ED)	2135 West Erda Way, Erda	40.600565	-112.355782	1321
	49-045-6001	Badger Island (BI)	Great Salt Lake	40.94212	-112.561943	1285
Duchesne	49-013-0002	Roosevelt (RS)	290 South 1000 West, Roosevelt	40.294175	-110.008961	1585

County	AQS code	Station Name	Station Address	Latitude	Longitude	Elevation (meters)
Uintah	49-047-1004	Vernal #4 (V4)	600 North 1650 West, Vernal	40.464812	-109.560731	1667
Carbon	49-007-1003	Price #2 (P2)	351 South 2500 East, Price	39.595749	-110.770097	1737
Iron	49-021-0005	Enoch (EN)	201 Thoroughbred Way, Enoch	37.747409	-113.055482	1693
Grand	49-019-0007	Moab (M7)	691 S Mill Creek Dr. Moab	38.566055	-109.537167	1259
Washington	49-053-0007	Hurricane (HC)	147 North 870 West, Hurricane	37.179138	-113.305105	992

Figure 1. Map of Utah showing the location of all monitoring sites in the DAQ monitoring Network.

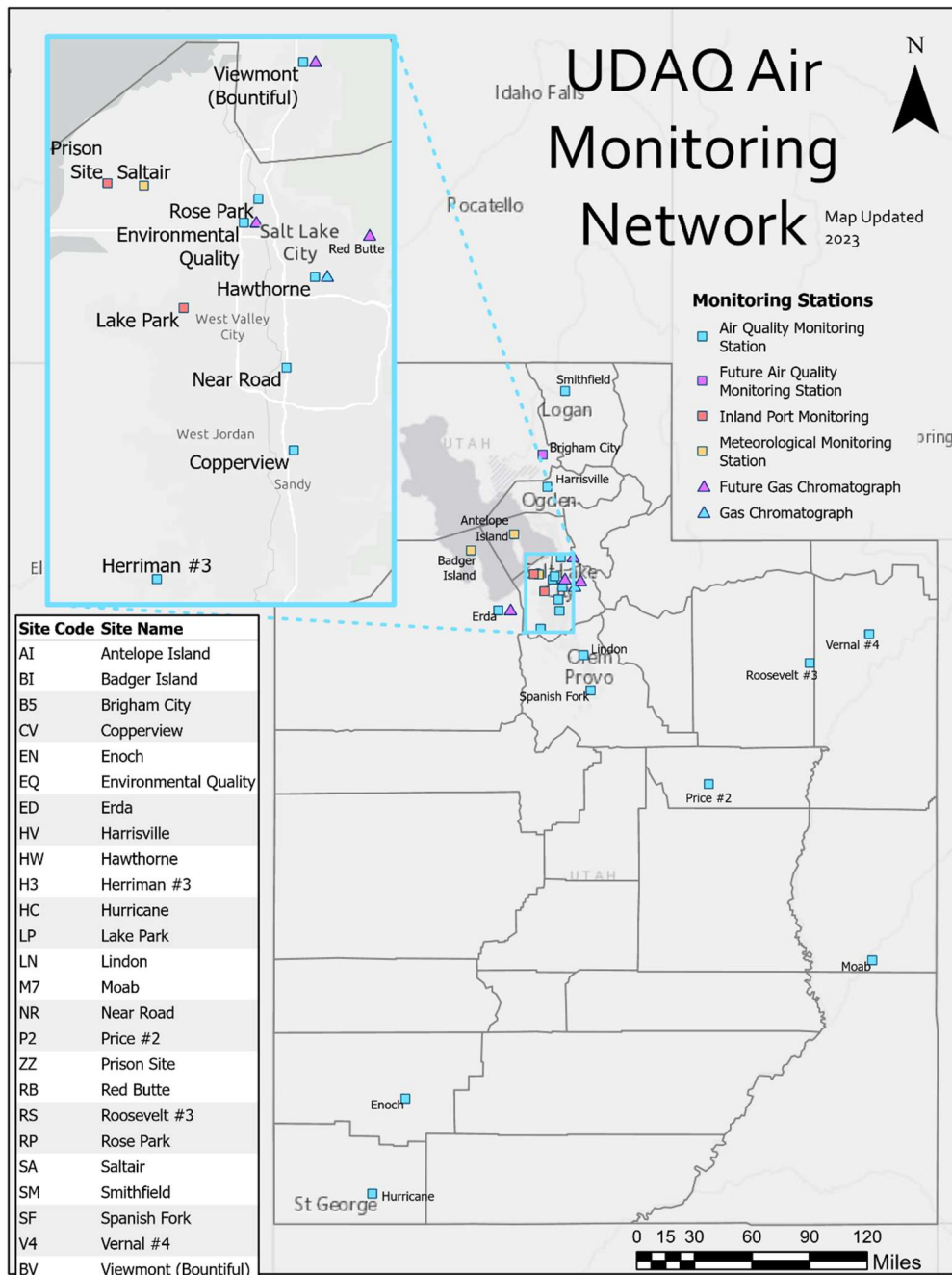


Table 3. Measured parameters at the sampling stations in Utah air monitoring network.

County	Site	PM _{2.5}			PM ₁₀			PM Coarse	Speciation PM _{2.5}	O ₃	NO _x	NO ₂	NO	NO _y	SO ₂	CO	NH ₃	Toxics	Carbonyls	VOCs PAMS	BC	MET
		FRM	Co-located (FRM)	Real-time	Co-located (Real-time)	FRM	Co-located															
Cache	Smithfield	1/1	1/1	X	X				1/6	X	X									X	X	
Box Elder	Brigham City**			X						X	X										X	
Weber	Harrisville	1/1		X		1/1		X*		X	X			X							X	
Davis	Bountiful	1/1		X					1/6	X	X						X	X		X	X	
	<i>Antelope Island</i>																				X	
Salt Lake	Copperview	1/1		X						X	X			X	X						X	
	Environmental Quality	1/1		X		1/1		X*		X	X			X	X	X					X	
	Hawthorne	1/1		X		1/1		X*	X	1/3	X	X	X	X	X	X		X	X		X	
	Herriman #3			X	X	1/1		X*	X		X	X									X	
	Lake Park			X							X	X								X	X	
	Near Road	1/1		X							X	X			X							
	Rose Park	1/1	1/1	X							X	X		X	X						X	
	<i>Saltair</i>																					X
Tooele	Prison (ZZ)			X							X	X								X	X	
	Erda	1/1		X							X	X									X	
Utah	<i>Badger Island</i>																				X	
	Lindon	1/1	1/6	X		1/1		X*	X	1/6	X	X			X					X	X	
Uintah	Spanish Fork	1/1		X							X	X									X	
	Vernal	1/1		X							X	X									X	
Duchesne	Roosevelt	1/1	1/1	X	X	1/1	1/6	X*	X		X	X									X	
Carbon	Price #2			X							X	X									X	
Iron	Enoch			X							X	X									X	
Grand	Moab			X							X	X									X	
Washington	Hurricane			X							X	X									X	

*Non-regulatory monitor; sites in *italic font* corresponds to remote stations; 1/1 are sampled daily; 1/3 are sampled every three days; 1/6 are sampled every sixth day. ** the instruments have been installed and are being tested. **Note:** Co-located means an additional monitor(s) that can either be of the same type or of a different type. It can be an FRM and an FEM or a pair of FRM's or a pair of FEM's or in some cases it may also mean a third or fourth monitor at the same location.

1.2 Criteria Pollutants DAQ Network

1.2.1 Particulate Matter-Fine (PM_{2.5})

DAQ currently operates 24-hour Federal Reference Method (FRM) and Federal Equivalent Method (FEM) PM_{2.5} samplers throughout the state to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS), evaluate population exposure, support SIP development, and model performance evaluation as well as monitor PM levels in source and receptor areas. The DAQ currently uses 13 FRM PM_{2.5} monitors and FEM continuous PM_{2.5} samplers at 20 sampling sites distributed throughout the state. Some continuous monitors operate in co-location with FRM filter-based measurements for comparability assessment. Data obtained from the continuous monitors is used to support forecasting, mobile apps, web pages, and reporting the Air Quality Index (AQI) information at the AIRNow website (www.airnow.gov).

1.2.2 Particulate Matter (PM₁₀)

The DAQ currently operates seven 24-hour FRM PM₁₀ samplers throughout the state to demonstrate compliance with NAAQS, evaluate population exposure, support PM maintenance plans and monitor PM levels in high-concentration areas.

The DAQ currently operates three FRM PM₁₀ monitors in Salt Lake City CBSA, one FRM PM₁₀ monitor within the Provo-Orem CBSA, one FRM PM₁₀ monitor within the Ogden-Clearfield CBSA, and one FRM monitor at the Duchesne CBSA.

1.2.3 Ozone (O₃)

The DAQ currently operates nine ozone monitors in the Salt Lake City CBSA, two ozone monitors within the Provo-Orem CBSA, two ozone monitors within the Ogden-Clearfield CBSA, and one ozone monitor at Roosevelt, Price, Vernal, Logan, St. George and Cedar City CBSAs. In addition, one monitor was installed at Moab.

1.2.4 Sulfur Dioxide (SO₂)

The DAQ currently operates four SO₂ monitors within the Salt Lake City CBSA. The monitor at HW was designated as population-oriented and satisfies NCore requirements.

1.2.5 Nitrogen Dioxide (NO₂)

The DAQ currently operates NO₂ monitors in 20 out of the 23 monitoring stations that are presently operational. Although Utah has demonstrated compliance with NO₂ standards, DAQ maintains NO₂ monitoring at many sites since emissions of this pollutant can lead to increased O₃ levels and PM_{2.5} formation, often resulting in pollution levels exceeding the NAAQS.

1.2.6 Carbon Monoxide (CO)

The DAQ currently operates a total of seven CO monitors in the Salt Lake City, Provo-Orem, and Ogden-Clearfield CBSAs. The samplers are used to monitor population exposure to emissions from anthropogenic activities in the area as well as to support CO maintenance plans. EPA minimum requirements for CO monitoring also include CO monitors to be sited near roads in certain urban areas, including near-roadway NO₂ monitoring sites. Currently, a CO monitor is located on I-15 at the address 5001 South Galleria Drive, Murray, Near Road (NR) site, to satisfy these requirements.

1.2.7 Lead (Pb)

Historically, major sources of lead emissions came from combustion of leaded fuel as on-road motor vehicle fuel emissions. However, given that leaded gasoline for automobiles was completely eliminated by the end of 1995 in the U.S., the only sources of lead in Utah include extraction and processing of metallic ores as well as piston-engine aircrafts' emissions.

On November 12, 2008, EPA revised the primary and secondary NAAQS for lead to 0.15 µg/m³ in total suspended particles (TSP). The previous standards, which were issued by EPA in 1978, were 10 times higher (1.5 µg/m³). To meet the standard, a rolling three-month average lead concentration may not exceed 0.15 µg/m³. The State of Utah has been in compliance with the lead NAAQS since 1982, with EPA authorizing the discontinuation of lead monitoring in Utah in 2005. However, given that EPA established new requirements for lead monitoring in 2008 and 2010, DAQ resumed lead monitoring at Magna, a point source site near the Kennecott copper smelter, from 2010 through June 2017. EPA approved the discontinued monitoring in 2017 due to extremely low concentrations. DAQ and EPA will continue observing the requirements, such as source emission thresholds, population, and NAAQS revisions that may trigger the need to resume monitoring lead in Utah. The DAQ will continue to evaluate any new or existing Pb sites that change emissions levels to determine if additional monitoring is required.

1.3 Chemical Speciation (CSN)

The DAQ currently operates four PM_{2.5} chemical speciation sites, including Hawthorne (HW), Bountiful Viewmont (BV), Lindon (LN), and Smithfield (SM). HW site in Salt Lake County is an EPA-designated CSN monitoring station, operating on a 1-in-3-day sampling schedule. BV in Davis County, LN in Utah County, and SM in Cache County are SLAMS PM_{2.5} speciation sites, operating on a 1-in-6-day sampling schedule. The DAQ is considering a CSN site for the Uintah Basin at either Roosevelt or Vernal. Data from the speciation network is primarily used to determine PM_{2.5} chemical composition and sources as well as the spatial and temporal variation in its components. There are over 50 species consisting of ions, elements, and carbon species reported by the CSN sites. A list of parameters measured in the CSN sites are provided in Table 4.

Table 4. List of parameters measured at the DAQ monitoring CSN sites.

Parameter (Method)	Compounds
PM_{2.5} Speciation (Met One SASS/SuperSASS Nylon)	Ammonium Ion, Sodium Ion, Potassium Ion, Nitrate Ion, Sulfate Ion
PM_{2.5} (Met One SASS/SuperSASS Teflon)	Antimony, Arsenic, Aluminum, Barium, Bromine, Cadmium, Calcium, Chromium, Cobalt, Copper, Chlorine, Cerium, Cesium, Iron, Lead, Indium, Manganese, Nickel, Magnesium, Phosphorus, Selenium, Tin, Titanium, Vanadium, Silicon, Silver, Zinc, Strontium, Sulfur, Rubidium, Potassium, Sodium, Zirconium
PM_{2.5} (URG 3000N w/Pall Quartz filter and Cyclone Inlet)	Elemental carbon (<i>E1 CSN, E2 CSN, E3 CSN, EC CSN TOR, EC CSN TOT</i>). Organic carbon (<i>OC1 CSN, OC2 CSN, OC3 CSN, OC4 CSN, OC CSN TOR, OC CSN TOT, OP CSN TOR</i>), OP CSN TOT, TC CSN

1.4 Multipollutant Monitoring Network (NCore)

The DAQ currently operates one multi-pollutant network NCore site, Hawthorne, located in Salt Lake County. This site is equipped with several advanced measurement systems to monitor PM (PM_{2.5} and PM₁₀), ozone, NO₂, true-NO₂, trace levels of CO, SO₂, total reactive nitrogen (NO_y), carbonyl compounds, organic, and elemental carbon as well as meteorological parameters including the Mixing Layer Height. This site satisfies federal requirements for the Photochemical Assessment Monitoring Station (PAMS) network program.

1.5 Photochemical Assessment Monitoring System (PAMS)

The DAQ currently operates one PAMS site at Hawthorne, located in Salt Lake County. The PAMS program is designed with the objective to produce an air quality database to be used to evaluate and refine ozone prediction models. In addition, the program will assist to identify and quantify the ozone precursors, establish the temporal patterns and associated meteorological conditions to assist and refine the control strategies. DAQ is measuring the following parameters at the PAMS required site:

- Carbonyls
- Meteorological parameters: ambient temperature, wind direction, wind speed, atmospheric pressure, relative humidity, precipitation, mixing layer height, solar radiation, and UV radiation
- Speciated VOCs
- True NO₂
- NO/NO_y
- Ozone

The DAQ-PAMS site collects hourly speciated VOC measurements with a Markes/Agilent autoGC (Figure 2) which operates on a year-round basis. Carbonyl species are collected in a three 8-hour averaged samples per day on a 1-in-3-day schedule from June 1 to August 31 and 1 in 24-hour on a 1-in-3-day for the remaining part of the year. The list of the speciated VOCs and carbonyls measured at the site are listed in Table 5.

Figure 2. Markes/Agilent autoGC



Table 5. List of PAMS VOCs and Carbonyls measured at the DAQ PAMS site.

Parameter	Compounds
VOCs	Total NMOC (non-methane organic compound), n-Dodecane, Ethane, Ethylene, Propane, Propylene, Acetylene, n-Butane, Isobutane, trans-2-Butene, cis-2-Butene, 1,3-Butadiene, n-Pentane, Isopentane, 1-Pentene, trans-2-Pentene, cis-2-Pentene, 3-Methylpentane, n-Hexane, n-Heptane, n-Octane, n-Nonane, n-Decane, Cyclopentane, Isoprene, 2,2-Dimethylbutane, 1-Hexene, 2-Methyl-1-pentene, 2,4-Dimethylpentane, Cyclohexane, 3-Methylhexane, 2,2,4-Trimethylpentane, 2,3,4-Trimethylpentane, 3-Methylheptane, alpha-Pinene, beta-Pinene, Methylcyclohexane, Methylcyclopentane, 2-Methylhexane, 1-Butene, 2,3-Dimethylbutane, 2-Methylpentane, 2,3-Dimethylpentane, n-Undecane, 2-Methylheptane, 2-Methylheptane, m/p Xylene, Benzene, Toluene, Ethylbenzene, o-Xylene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, n-Propylbenzene, Isopropylbenzene, o-Ethyltoluene, m-Ethyltoluene, p-Ethyltoluene, m-Diethylbenzene, p-Diethylbenzene, Styrene, 1,2,3-Trimethylbenzene
Carbonyls	Formaldehyde, Acetaldehyde, Propionaldehyde, Butyraldehyde, Hexanaldehyde, Valeraldehyde, Crotonaldehyde, Acetone, Methyl ethyl ketone, Benzaldehyde

1.6 Air Toxics Trends

The DAQ has been participating in the EPA-funded Urban Air Toxics Monitoring Program since 1999. In January 2003, the air toxics monitoring equipment was re-located from West Valley to Bountiful Viewmont (BV) in order to co-locate the air toxics monitors with PM_{2.5} speciation samplers, which would provide a more complete characterization of monitored air pollutants.

Currently, more than 50-VOCs, 10-carbonyls, 19-PAHs, and 11-metals are measured as part of the air toxics trends program. The samples are collected on a 1-in-6-day sampling schedule over a 24-hour period. The list of the air toxics measured at the site are listed in Table 6

Table 6. List of toxics measured at the DAQ NATTS site.

Parameter	Compounds
VOCs	Carbon disulfide, Propylene, Acetylene, Freon 114, 1,3-Butadiene, n-Octane, Methyl tert-butyl ether, Tert-amyl methyl ether, tert-Butyl ethyl ether, Ethyl acrylate, Methyl methacrylate, Acrolein, Methyl isobutyl ketone, Ethylene oxide, Acetonitrile, Acrylonitrile, Chloromethane, Dichloromethane, Chloroform, Carbon tetrachloride, Bromoform, Trichlorofluoromethane, Chloroethane, 1,1-Dichloroethane, Methyl chloroform, Ethylene dichloride, Tetrachloroethylene, 1,1,2,2-Tetrachloroethane, Bromomethane, 1,1,2-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, Dichlorodifluoromethane, Trichloroethylene, 1,1-Dichloroethylene, Bromodichloromethane, 1,2-Dichloropropane, trans-1,3-Dichloropropene, cis-1,3-Dichloropropene, Dibromochloromethane, Chloroprene, Bromochloromethane, trans-1,2-Dichloroethylene, cis-1,2-Dichloroethene, Ethylene dibromide, Hexachlorobutadiene, Vinyl chloride, m/p Xylene, Benzene, Toluene, Ethylbenzene, o-Xylene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, Styrene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2,4-Trichlorobenzene.
Carbonyls	Formaldehyde, Acetaldehyde, Propionaldehyde, Butyraldehyde, Hexanaldehyde, Valeraldehyde, Crotonaldehyde, Acetone, Methyl ethyl ketone, Benzaldehyde
PAHs	Naphthalene, Acenaphthene, Acenaphthylene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Chrysene, Coronene, Perylene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[e]pyrene, Dibenzo[a,h]anthracene, Benzo[g,h,i]perylene, Benzo[a]pyrene, Indeno[1,2,3-cd]pyrene
Metals (PM₁₀)	Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Nickel, Mercury, Selenium

1.7 Mercury Deposition Network

Mercury was of significant health and environmental concern in Utah. Advisories limiting the consumption of fish were issued for certain lakes and watersheds due to their elevated mercury levels in 2008. DAQ was part of the National Mercury Deposition Network, measuring mercury dry deposition from 2009 to summer 2017, and measurements were discontinued after consultation with the EPA.

1.8 Meteorological Monitoring Network

Meteorological parameters, including ambient temperature, temperature differential, relative humidity, ambient pressure, solar radiation as well as wind speed and direction are currently measured at multiple sites throughout the state of Utah in order to properly represent the complex wind patterns and micrometeorology in Utah's airshed and to support air quality models and trends in co-located air pollutants. In 2021, DAQ updated the technology used to measure the meteorological variables. Previously, the system used to measure the wind direction and speed consisted of cup anemometers and vane systems (in all the stations but Roosevelt), but, it was replaced by sonic anemometer systems (2D sonic sensors, RM Young Ultrasonic 86004). The modifications will reduce the time spent maintaining the meteorological systems and lower the detection threshold, which will allow DAQ to capture and better understand the small eddies and transports during our cold pool seasons, where the typical analog sensor will read no wind flow. The new system is smaller and more cost effective than the previous set up, which is favorable for the limited space in the monitoring shelters.

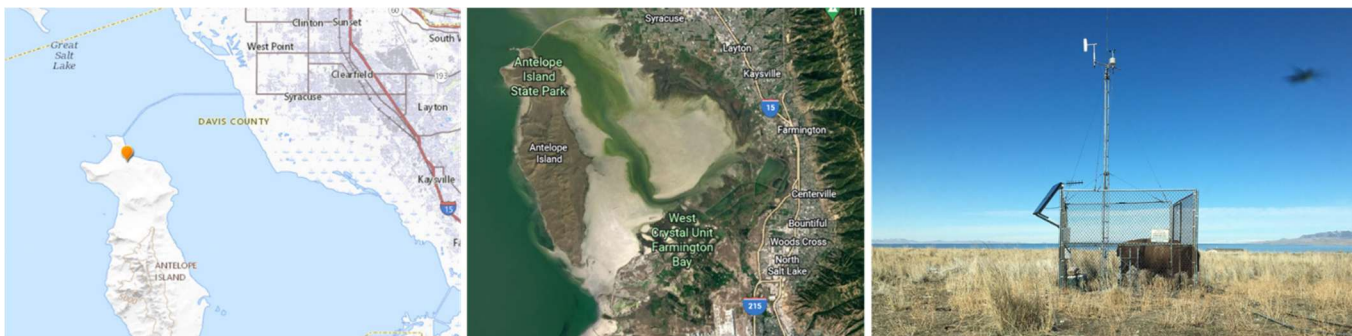
A second crucial update was to get a combination of temperature and relative humidity sensors (Campbell Scientific HMP60) at every site, which is beneficial for air quality modeling application. In addition, pyranometers (Campbell Scientific CS301) to measure incoming solar radiation were also installed.

Appendix A- List of equipment used at the DAQ monitoring sites

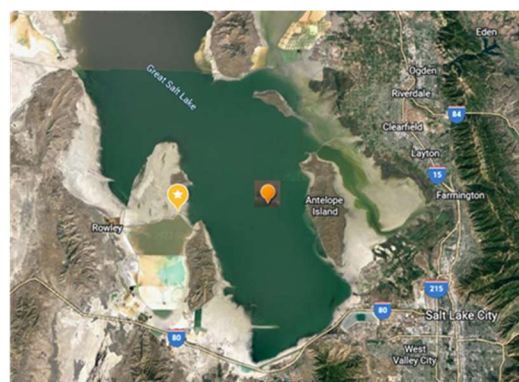
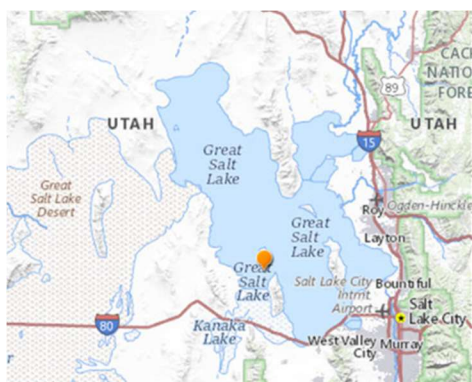
Parameter	Units	Mfg	Model #	Details
PM _{2.5} FRM	Micrograms/cubic meter (25 C)	Thermo	2025i	Low volume sampler (filter) with very sharp cut cyclone (VSCC) - Gravimetric
PM _{2.5} FEM	Micrograms/cubic meter (25 C)	Thermo	5030i Sharp	Beta Attenuation
	Micrograms/cubic meter (25 C)	Teledyne API	T640/T640X	Broadband Spectroscopy
PM ₁₀ FRM	Micrograms/cubic meter (25 C)	Thermo	2025i	Low volume sampler (filter) - Gravimetric
PM ₁₀ FEM	Micrograms/cubic meter (25 C)	MetOne	E-BAM PLUS	Beta Attenuation Mass Monitor
PM _{2.5} Speciation	Micrograms/cubic meter (LC)	Met One SASS	Met One SASS/SuperSASS	Met One SASS/SuperSASS: Teflon/Energy dispersive XRF; Nylon/Ion Chromatography
	Micrograms/cubic meter (LC)	URG	3000N	URG 3000N w/Pall Quartz Filter-Organic/Inorganic Carbon
Carbon Monoxide	Parts per million	Teledyne API	T300U	Gas Filter Correlation
Carbon Monoxide (trace level)	Parts per million	Teledyne API	T300	Gas Filter Correlation
Nitrogen Dioxide (trace)	Parts per billion	Teledyne API	T200U	Gas Phase Chemiluminescence
Nitrogen Dioxide (CAPS true)	Parts per billion	Teledyne API	N500	Cavity Attenuated Phase Shift (CAPS) Spectroscopy
Reactive Oxides of Nitrogen (NO _x)	Parts per billion	Teledyne API	T200U	Chemiluminescence Thermo Electron 42C-Y, 42i-Y
Sulfur Dioxide	Parts per billion	Teledyne API	T100	Pulsed Fluorescent 43C-TLE/43i-TLE
Sulfur Dioxide (trace)	Parts per billion	Teledyne API	T100U	Pulsed Fluorescent 43C-TLE/43i-TLE
Ozone	Parts per million	Teledyne API	T400	Ultraviolet Absorption
Ozone	Parts per million	Teledyne API	T265	Gas Phase Chemiluminescence
Black Carbon	Micrograms/cubic meter (LC)	Magee	AE33	Aethalometer - Optical Absorption
Air Toxics (carbonyls)	Parts per billion Carbon	ATEC	8000	SILICA-DNPH-CARTRIDGE-KI O3 SCRUB - HPLC
Air Toxics (VOCs)	Parts per billion Carbon	ATEC	2200	6L SUBATM SS CANISTER or SS-CANISTER-PRESSURIZED
Air Toxics (PM ₁₀ Metals)	Nanograms/cubic meter (25 C)	TISCH	TE-Wilbur10	Tisch Model TE-Wilbur10 Low-Volume Sampler
Air Toxics (PAHs)	Nanograms/cubic meter (25 C)	TISCH	TE-Wilbur-BL	High Volume Sampler (PUF) GC/MS TO-13
Air Toxics (hourly VOCs)	Parts per billion Carbon	Agilent/Marques CIA	T890B	Preconcentrator trap/thermal desorber - electronic drier - Marques CIA TD/Agilent GC dual FID - carbon response

Parameter	Units	Mfg	Model #	Details
Mixing Height	Meters	Vaisala	CL-51	Optical Scattering Ceilometer
Mixing Height	Meters	Vaisala	CL-61	Optical Scattering Ceilometer
Wind Direction/Speed	Meter per second or mile per hour	RM Young	Ultrasonic Anemometer-86004	Sonic Anemometer
Relative Humidity	Percent relative humidity			Electronic RH Sensor
Solar Radiation	Watts per square meter			Electronic Sensors
UV radiation	Watts per square meter	Apogee	SU-200-SS	Electronic Sensors
Ambient Temperature	Degrees Fahrenheit			Electronic Temperature Sensor
Barometric Pressure	Millibars			Electronic Sensors

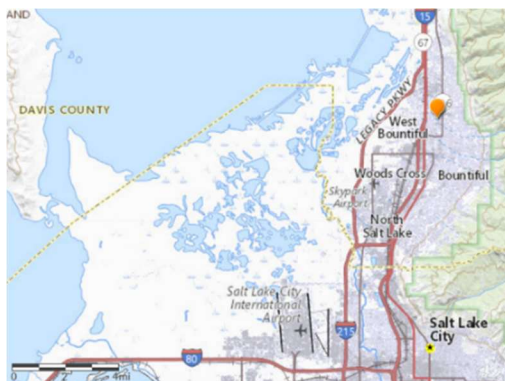
Appendix B- Site Information



Site:	Antelope Island (AI)	Longitude:	-112.231541	Station Type:	SPM
AQS#:	49-011-6001	Latitude:	41.039404	MSA:	Ogden-Clearfield
Address:	Antelope Island	Elevation (m):	1355		
City:	N/A				
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 (BI)	Longitude:	-112.231541	Station Type:	SPM
AQS#:	49-011-6001	Latitude:	40.94212	MSA:	Salt Lake City
Address:	No street address, on an Island	Elevation (m):	1285		
City:	N/A				
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 Badger Island					
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:	Bountiful Viewmont (BV)	Longitude:	-111.884505	Station Type:	SLAMS
AQS#:	49-011-0004	Latitude:	40.902945	MSA:	Ogden-Clearfield
Address:	1370 North 171 West	Elevation (m):	1309		
City:	Bountiful				
County:	Davis				

Site Objective:

The Bountiful Viewmont site is established to determine public exposure to air pollution. The site also monitors emissions from nearby 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:

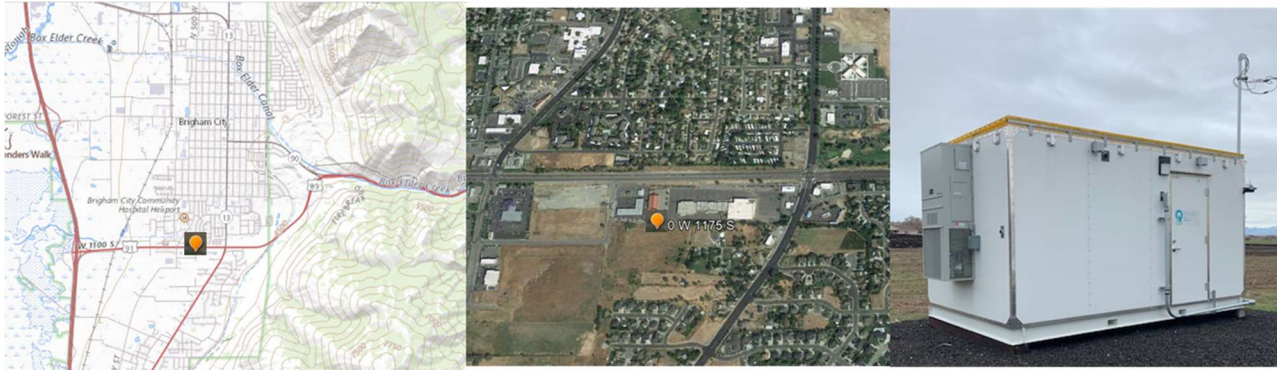
The site is located near Viewmont High School at the north end of the city of Bountiful, Davis County.

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

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide (CAPS true)	Cavity Attenuated Phase Shift (CAPS)	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood

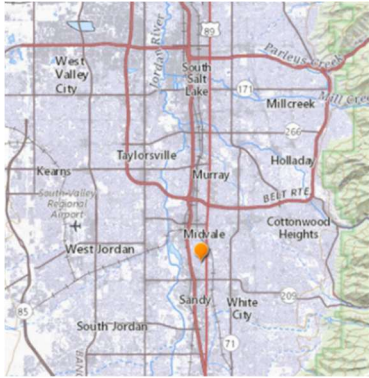
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
PM₁₀ Metals	Manual Gravimetric	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
PM₁₀ 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 NATTS	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Semi-volatile	Manual EPA NATTS	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Carbonyl compounds	Manual EPA NATTS	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
Black Carbon	Aethalometer (light absorption)	Continuous	Population Exposure	SLAMS- Population Neighborhood
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban
Precipitation	Tipping Bucket Rain Gauge	Continuous		Urban



Site:	Brigham City (B5)	Longitude:	-112.021484	Station Type:	SLAMS
AQS#:		Latitude:	41.485039	MSA:	Ogden-Clearfield
Address:	350 West 1175 South	Elevation (m):	1316		
City:	Brigham City				
County:	Box Elder				
Site Objective:					
Site established to contain to assess population exposure and to help the forecasters with ozone and PM _{2.5} predictions.					
Does the site meet the objective? Yes, all objectives are met.					
Site Description:					
The site is located in near a neighborhood area of Brigham City in Box Elder County					
Can data from this site be used to evaluate NAAQS? Yes					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood	
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood	

Meteorological Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Coppersview (CV)	Longitude:	-111.894162	Station Type:	SLAMS
AQS#:	49-035-2005	Latitude:	40.597911	MSA:	Salt Lake City
Address:	8449 South Monroe St.	Elevation (m):	1343		
City:	Midvale				
County:	Salt Lake				
Site Objective:					
Site established to assess population exposure in southeast Salt Lake County.					
Does the site meet the objective? Yes, all objectives are met.					
Site Description:					
The site is located in a neighborhood area of Midvale in Salt Lake County.					
Can data from this site be used to evaluate NAAQS? Yes					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood	
Carbon Monoxide, Trace	Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Sulfur Dioxide, Trace	Pulsed Fluorescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood	
PM _{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood	

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Enoch (EN)	Longitude:	-113.055482	Station Type:	SLAMS
AQS#:	49-021-0005	Latitude:	37.747409	MSA:	Not in MSA
Address:	3840 North 325 East	Elevation (m):	1693		
City:	Enoch				
County:	Iron				

Site Objective:

Site established to contain to assess population exposure and to help the forecasters with ozone and PM2.5 predictions.

Does the site meet the objective? Yes, all objectives are met.

Site Description:

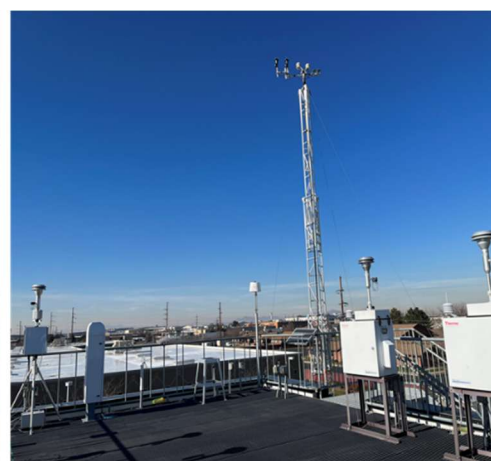
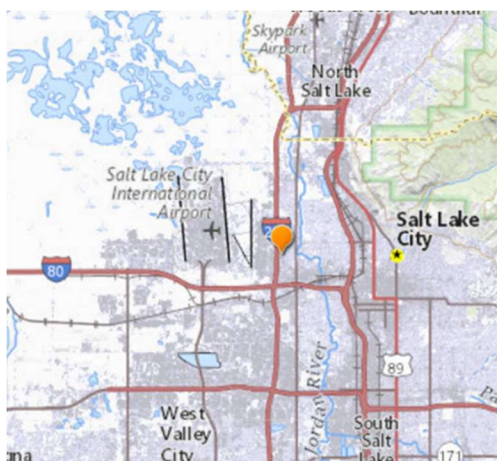
This site is located in a county area near Enoch.

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

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Environmental Quality (EQ)	Longitude:	-111.94585	Station Type:	SLAMS
AQS#:	49-035-3015	Latitude:	40.777028	MSA:	Salt Lake City
Address:	1950 West 240 North	Elevation (m):	1284		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:

The Air Monitoring Center site is established to replace the Rose Park station as an area of further investigation of PM_{2.5} in Salt Lake County.

Does the site meet the objective? Yes, all objectives are met.

Site Description:

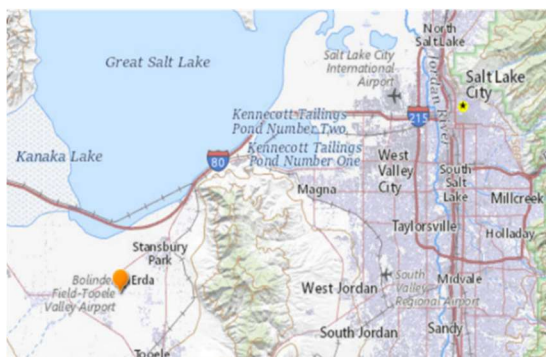
The site is located at the Technical Support Center in the city of Salt Lake, Salt Lake County.

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

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Ammonia	Manual NADP AMoN	Integrated 14 days	Population Exposure	SPM-Transport Regional
Trace Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- High Neighborhood

Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- High Neighborhood
Carbon Monoxide	Gas Phase Correlation	Continuous	Population Exposure	SLAMS- High Neighborhood
Sulfur Dioxide, Trace	Pulsed Fluorescence	Continuous	Population Exposure	SLAMS- High Neighborhood
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- High Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
PM₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS-Population Neighborhood
PM₁₀	Beta Attenuation Mass Monitor	Continuous	Air Quality Index	SLAMS-Population Neighborhood
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban
Mixing Height	Optical Scattering Ceilometer	Continuous		Urban



Site:	Erda (ED)	Longitude:	-112.355782	Station Type:	SLAMS
AQS#:	49-045-0004	Latitude:	40.600565	MSA:	Salt Lake City
Address:	2163 West Erda Way	Elevation (m):	1321		
City	Erda				
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:

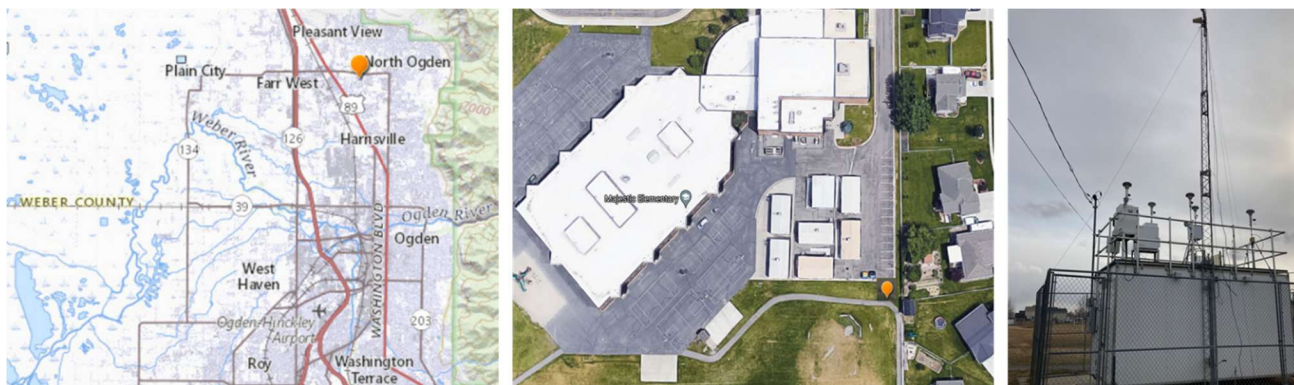
The site is located in the city of Erda, Tooele County. It is the main monitor for the Tooele county.

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

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
	Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	3 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Harrisville (HV)	Longitude:	-111.986476	Station Type:	SLAMS
AQS#:	49-057-1003	Latitude:	41.302685	MSA:	Ogden-Clearfield
Address:	425 West 2550 North	Elevation (m):	1320		
City:	Harrisville				
County:	Weber				

Site Objective:

This site is established in response to an ozone saturation study indicating this as a potentially high ozone concentration area. It is monitoring particulate matter
Does the site meet the objective? Yes, all objectives are met.

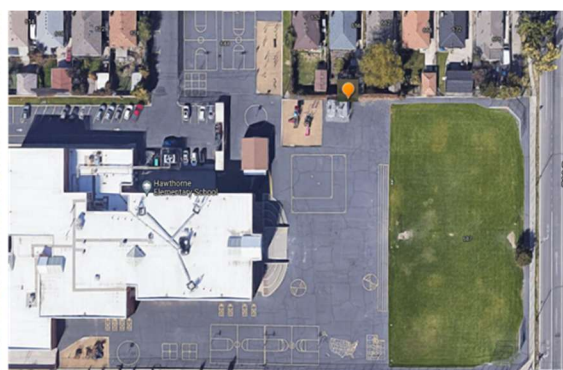
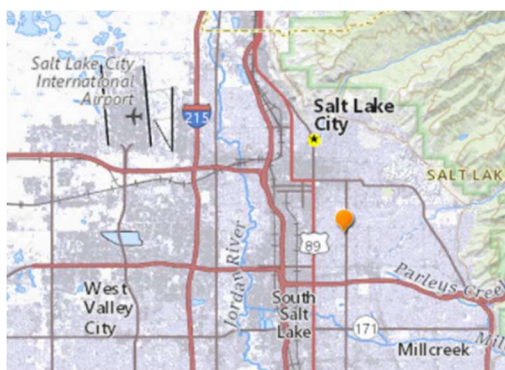
Site Description:

The site is located on the grounds of Majestic Elementary School in the city of Harrisville, Weber County.
Can data from this site be used to evaluate NAAQS? Yes

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood
Carbon Monoxide	Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Neighborhood
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood

PM₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM₁₀ Real Time	Beta Attenuation Mass Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Hawthorne (HW)	Longitude:	-111.872221	Station Type:	SLAMS
AQS#:	49-035-3006	Latitude:	40.734367	MSA:	Salt Lake City
Address:	1675 South 600 East	Elevation (m):	1308		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective:

This site is established to represent population exposure in the Salt Lake City area. This site is also designated as the EPA NCORE site for Utah.

Does the site meet the objective? Yes, all objectives are met.

Site Description:

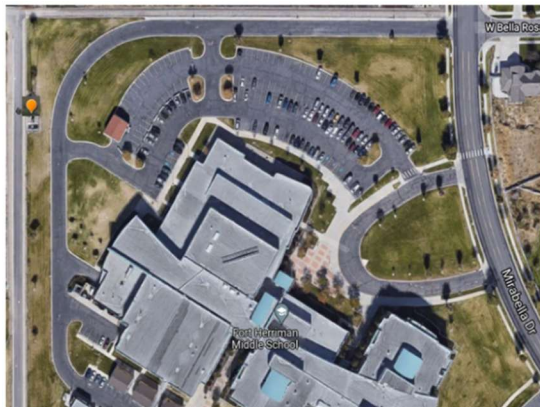
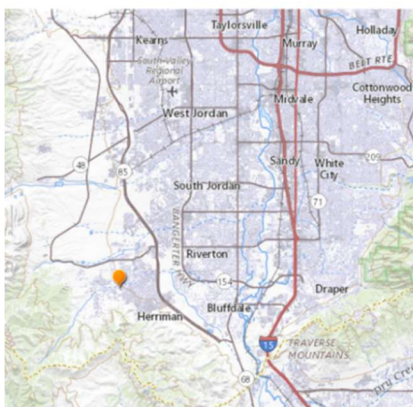
The site is located at Hawthorne Elementary School in the southeast section of Salt Lake City, Salt Lake County.

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

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Nitrogen Dioxide (CAPS true)	Cavity Attenuated Phase Shift (CAPS)	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood
Carbon Monoxide Trace Level	Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Neighborhood
NOy Trace Level	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
SO2 Trace Level	Pulsed Fluorescence	Continuous	Population Exposure	SLAMS- Population 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	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
PM₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM₁₀ Real Time	Beta Attenuation Mass Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
PM_{coarse}	Manual Gravimetric Subtraction	Daily	Population Exposure	SLAMS- Population Neighborhood
Air Toxics (hourly VOCs-PAMS)	Instrumental Gas Chromatography	Continuous	Ozone modeling input	Population Neighborhood
Meteorological Parameters				
Parameter	Sampling &	Operating	Tower	Spatial
	Analysis Method	Schedule	Height	Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	3 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Relative Humidity	Air Temperature and Relative Humidity	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	4 meters	Urban
UV Radiation	UV Radiation sensor	Continuous	4 meters	Urban
Mixing Height	Optical Scattering Ceilometer	Continuous		Urban
Precipitation	Tipping Bucket Rain Gauge	Continuous		Urban



Site:	Herriman #3 (H3)	Longitude:	-112.036329	Station Type:	SLAMS
AQS#:	49-035-3012	Latitude:	40.496412	MSA:	Salt Lake City
Address:	14058 Mirabella Drive	Elevation (m):	1534		
City:	Herriman				
County:	Salt Lake				
Site Objective:					
This site is established to represent population exposure in southwest the Salt Lake County.					
Does the site meet the objective? Yes, all objectives are met.					
Site Description:					
The site is located at Fort Herriman Middle School in southwest Salt Lake County					
Can data from this site be used to evaluate NAAQS? Yes					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood	
PM _{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood	

PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor Co-located	Continuous	Precision and Accuracy	SLAMS- Population Neighborhood
PM₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM₁₀ Real Time	Beta Attenuation Mass Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Hurricane (HC)	Longitude:	-113.305105	Station Type:	SLAMS
AQS#:	49-053-0007	Latitude:	37.179138	MSA:	St George
Address:	147 North 870 West	Elevation (m):	992		
City:	Hurricane				
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.

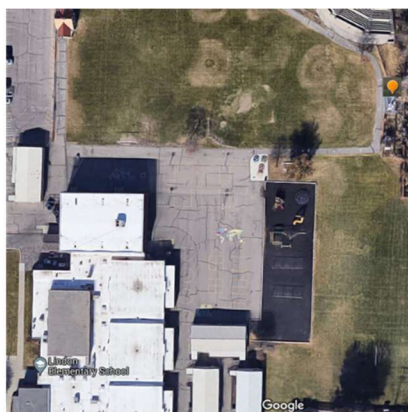
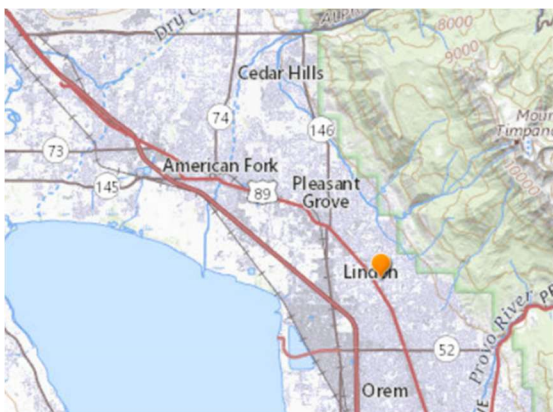
Site Description: This site is located behind the Hurricane City offices
Can data from this site be used to evaluate NAAQS? Yes

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood

Meteorological Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	2 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Lindon (LN)	Longitude:	-111.713486	Station Type:	SLAMS
AQS#:	49-049-4001	Latitude:	40.339505	MSA:	Provo - Orem
Address:	50 North Main	Elevation (m):	1444		
City:	Lindon				
County:	Utah				

Site Objective: This site is established to determine PM emissions from commercial and industrial sources. Historically, this site has reported the highest PM values in Utah County

Does the site meet the objective? Yes, all objectives are met.

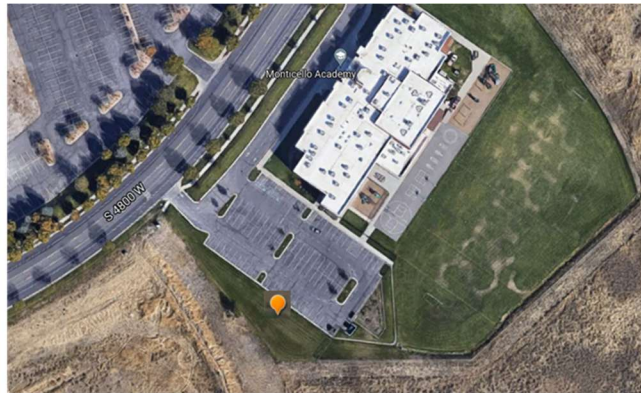
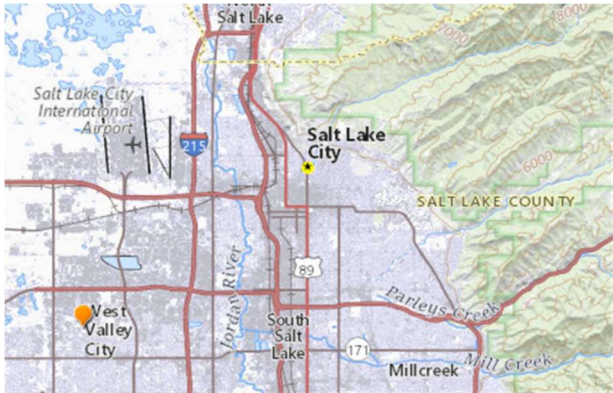
Site Description: The site is located at the Lindon Elementary School in the City of Lindon, Utah County

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

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood
Carbon Monoxide	Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Neighborhood

PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population
PM_{2.5}	Manual Gravimetric Co-located	1 in 6 days	Precision and Accuracy Assessment	SLAMS- Population
PM_{2.5} Speciation	Manual EPA CSN	1 in 6 days	Population Exposure	SLAMS- Population
PM₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS-Impact Neighborhood
PM₁₀ Real Time	Beta Attenuation Mass Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
Black Carbon	Aethalometer (light absorption)	Continuous	Population Exposure	SLAMS- Population Neighborhood
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Lake Park (LP)	Longitude:	-112.008684	Station Type:	SLAMS
AQS#:	49-035-3014	Latitude:	40.709905	MSA:	Salt Lake City
Address:	2782 South Corporate Park Dr.	Elevation (m):	1295		
City:	West Valley City				
County:	Salt Lake				

Site Objective: This site recently established to determine the potential impact of the Inland Port on the Salt Lake Valley Airshed.
Does the site meet the objective? Yes, all objectives are met.

Site Description: This site is located near the parking lot of Monticello Academy in West Valley City, Salt Lake County.
Can data from this site be used to evaluate NAAQS? Yes

Gaseous/Particulate Parameters

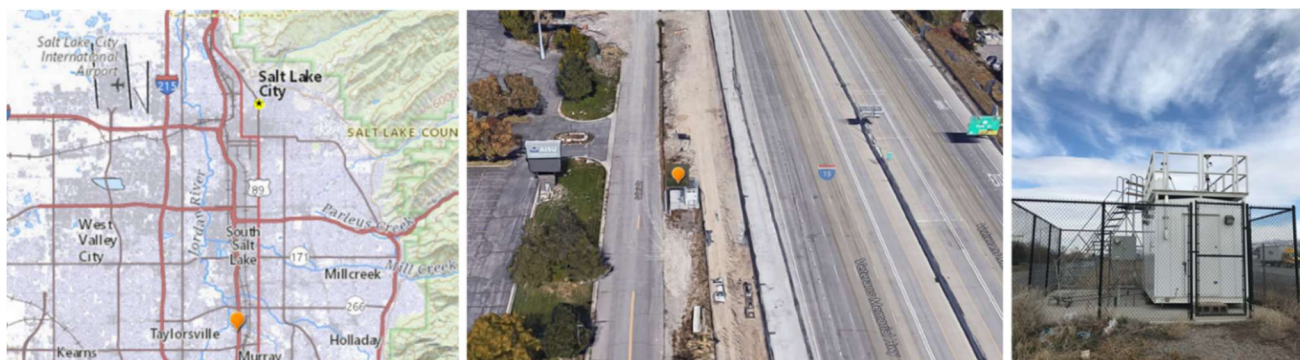
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
Black Carbon	Aethalometer (light absorption)	Continuous	Population Exposure	SLAMS- Population Neighborhood

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Moab (M7)	Longitude:	-109.537167	Station Type:	SPM
AQS#:	49-019-0007	Latitude:	38.566055	MSA:	NA
Address:	691 S Mill Creek Dr.	Elevation (m):	1259		
City	Moab				
County:	Grand				
Site Objective:					
Site established to assess population exposure					
Does the site meet the objective? Yes, all objectives are met.					
Site Description:					
in Moab, Grand County.					
Can data from this site be used to evaluate NAAQS? Yes					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SPM	
Ozone	Ultraviolet	Continuous	Population Exposure	SPM	
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SPM	

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Regional
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Regional
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Regional
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Regional
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Regional
WD Sigma	Electronic EPA Method	Continuous	10 meters	Regional
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Regional



Site:	Near Road (NR)	Longitude:	-111.901874	Station Type:	SLAMS
AQS#:	49-035-4002	Latitude:	40.662868	MSA:	Salt Lake City
Address:	5001 South Galleria Dr.	Elevation (m):	1305		
City:	Murray				
County:	Salt Lake				

Site Objective: This site recently established to assess population exposure to and to monitor vehicular contribution to air pollution as part of the EPA NO₂ monitoring
Does the site meet the objective? Yes, all objectives are met.

Site Description: A site was found for the Near Road monitor on I-15 at the address 4951 South Galleria Dr, Murray
Can data from this site be used to evaluate NAAQS? Yes

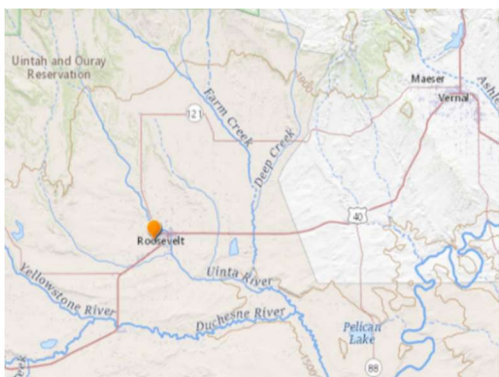
Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- Population Neighborhood
Carbon Monoxide	Gas Phase Correlation	Continuous	Population Exposure	SLAMS-High Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population



Site:	Price #2 (P2)	Longitude:	-110.770097	Station Type:	SPM
AQS#:	49-007-1003	Latitude:	39.595749	MSA:	Price
Address:	351 South 2500 East	Elevation (m):	1737		
City:	Price				
County:	Carbon				
Site Objective: This site is established in response to a three-state ozone study. It is funded by the Bureau of Land Management					
Does the site meet the objective? Yes, all objectives are met.					
Site Description: This site is located in a farm field 3.6 Km east of Price					
Can data from this site be used to evaluate NAAQS? Yes					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS-High Neighborhood	
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SPM	

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Regional
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Regional
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Regional
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Regional
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Regional
WD Sigma	Electronic EPA Method	Continuous	10 meters	Regional
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Regional

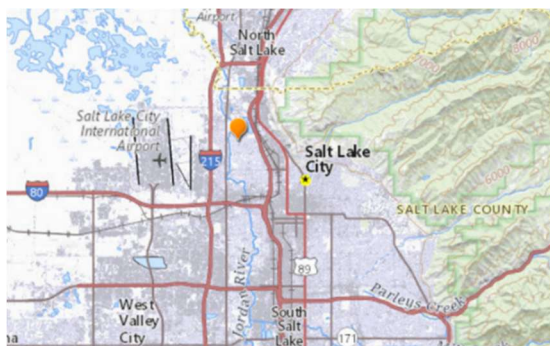


Site:	Roosevelt (RS)	Longitude:	-110.008961	Station Type:	SLAMS
AQS#:	49-013-0002	Latitude:	40.294175	MSA:	NA
Address:	290 South 1000 West	Elevation (m):	1585		
City:	Roosevelt				
County:	Duchesne				
<p>Site Objective: This site is established to determine maximum ozone and PM_{2.5} concentrations in Duchesne County Does the site meet the objective? Yes, all objectives are met.</p>					
<p>Site Description: The site is located in the city park North West section of Roosevelt. Can data from this site be used to evaluate NAAQS? Yes</p>					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
PM _{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood	

PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor Co-located	Continuous	Precision and Accuracy	SLAMS- Population Neighborhood
PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population
PM₁₀	Manual Gravimetric	Daily	Population Exposure	SLAMS-Impact Neighborhood
PM₁₀	Manual Gravimetric Co-located	1 in 6 days	Precision and Accuracy Assessment	SLAMS- Population
PM₁₀ Real Time	Beta Attenuation Mass Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood

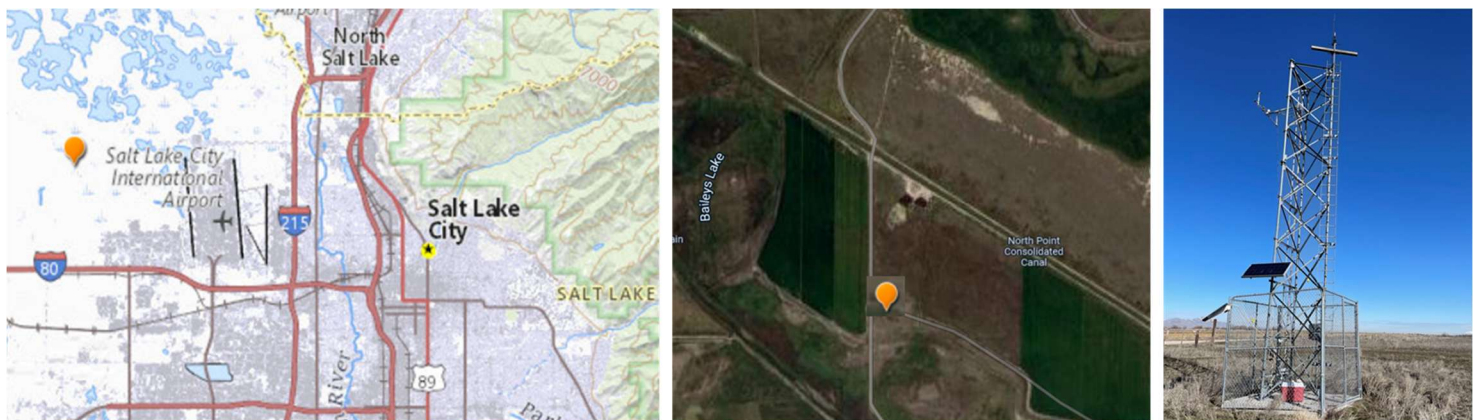
Meteorological Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban
Ambient Temperature	Elec. Resistance	Continuous	2 meters	Urban
Temperature Difference	Math Channel	Continuous	2 meters	Urban
Mixing Height	Optical Scattering Ceilometer	Continuous		Urban



Site:	Rose Park (RP)	Longitude:	-111.930996	Station Type:	SLAMS
AQS#:	49-035-3010	Latitude:	40.795514	MSA:	Salt Lake City
Address:	1250 North 1400 West	Elevation (m):	1283		
City:	Salt Lake City				
County:	Salt Lake				
<p>Site Objective: This site is established to better represent PM2.5 exposure in this area of Salt Lake City Does the site meet the objective? Yes, all objectives are met.</p>					
<p>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</p>					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Carbon Monoxide	Gas Phase Correlation	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Sulfur Dioxide	Pulsed Fluorescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
PM _{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood	
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population	

PM_{2.5}	Manual Gravimetric Co-located	Daily	Precision and Accuracy Assessment	SLAMS- Population
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban
Mixing Height	Optical Scattering Ceilometer	Continuous		Urban



Site:	Saltair (SA)	Longitude:	-112.049804	Station Type:	SPM
AQS#:	49-035-3005	Latitude:	40.805989	MSA:	Salt Lake City
Address:	No street address	Elevation (m):	1289		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective: This site is established to collect meteorological information for air quality models
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
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
Solar Radiation	Elec. LiCor	Continuous	2 meters	Urban



Site:	Smithfield (SM)	Longitude:	-111.852064	Station Type:	SLAMS
AQS#:	49-005-0007	Latitude:	41.84267	MSA:	Logan
Address:	675 West 220 North	Elevation (m):	1379		
City:	Smithfield				
County:	Cache				

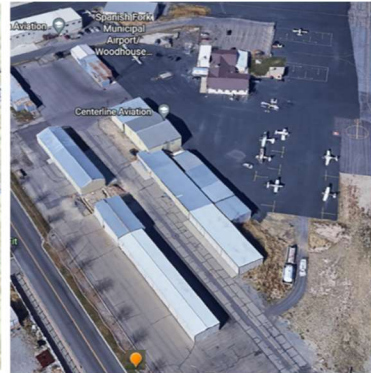
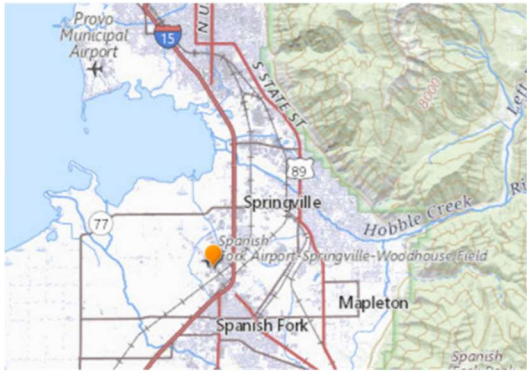
Site Objective: Site established to replace Logan site and determine general population exposure.
Does the site meet the objective? Yes, all objectives are met.

Site Description: This site is located at Birch Creek Elementary School in Cache County. It is approximately 7 miles north of Logan
Can data from this site be used to evaluate NAAQS? Yes

Gaseous/Particulate Parameters

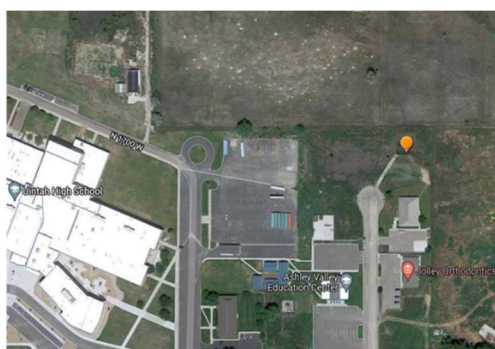
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5} Speciation	Manual EPA CSN	1 in 6 days	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Precision and Accuracy	SLAMS- Population Neighborhood
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor Co-located	Continuous	Precision and Accuracy	SLAMS- Population Neighborhood

PM_{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood
PM_{2.5}	Manual Gravimetric Co-located	Daily	Precision and Accuracy Assessment	SLAMS- Population Neighborhood
Black Carbon	Aethalometer (light absorption)	Continuous	Population Exposure	SLAMS- Population Neighborhood
Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban
Mixing Height	Optical Scattering Ceilometer	Continuous		Urban



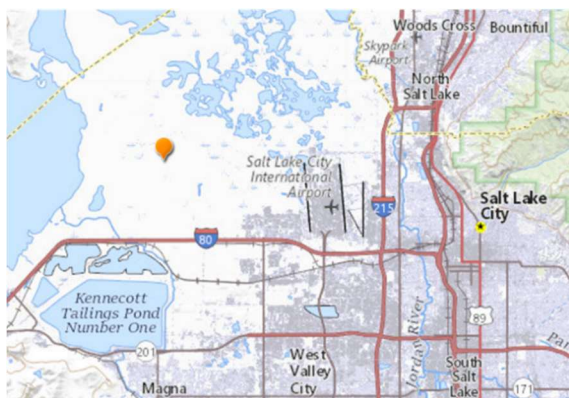
Site:	Spanish Fork (SF)	Longitude:	-111.658011	Station Type:	SLAMS
AQS#:	49-049-5010	Latitude:	40.136369	MSA:	Provo - Orem
Address:	300 West 2050 North	Elevation (m):	1380		
City:	Spanish Fork				
County:	Utah				
<p>Site Objective: This site is established to determine the boundary of the high ozone and PM_{2.5} concentrations in Utah County. Does the site meet the objective? Yes, all objectives are met.</p>					
<p>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</p>					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SLAMS- Population Neighborhood	
Ozone	Ultraviolet	Continuous	Population Exposure	SLAMS- Population Neighborhood	
PM _{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS- Population Neighborhood	
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood	

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban



Site:	Vernal (V4)	Longitude:	-109.560731	Station Type:	SLAMS
AQS#:	49-047-1004	Latitude:	40.464812	MSA:	NA
Address:	628 North 1700 West	Elevation (m):	1667		
City:	Vernal				
County:	Uintah				
Site Objective: This site is established was set up in response to an ozone study.					
Does the site meet the objective? Yes, all objectives are met.					
Site Description: The site is located at the northwest of the city of Vernal.					
Can data from this site be used to evaluate NAAQS? Yes					
Gaseous/Particulate Parameters					
Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale	
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	Regional	
Ozone	Ultraviolet	Continuous	Population Exposure	Regional	
Ozone	Gas Phase Chemiluminescence	Continuous	Population Exposure	Regional	
PM _{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SLAMS-Population	
PM _{2.5}	Manual Gravimetric	Daily	Population Exposure	SLAMS- Population Neighborhood	
Meteorological Parameters					

Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Regional
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Regional
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Regional
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Regional
Ambient Pressure	Barometric Pressure Transducer	Continuous	2 meters	Regional
WD Sigma	Electronic EPA Method	Continuous	10 meters	Regional
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Regional



Site:	Prison (ZZ)	Longitude:	-112.087772	Station Type:	SPM
AQS#:	49-035-3016	Latitude:	40.80793	MSA:	Salt Lake City
Address:	8000 W 1480 N	Elevation (m):	1287		
City:	Salt Lake City				
County:	Salt Lake				

Site Objective: This site recently established to determine the potential impact of the Inland Port on the Salt Lake Valley Airshed.
Does the site meet the objective? Yes, all objectives are met.

Site Description: This site is located at the new State Prison north of I-80 on the southern border of the Great Salt Lake in Salt Lake County
Can data from this site be used to evaluate NAAQS? Yes

Gaseous/Particulate Parameters

Parameter	Sampling & Analysis Method	Operating Schedule	Monitoring Objective	Spatial Scale
Nitrogen Dioxide	Gas Phase Chemiluminescence	Continuous	Population Exposure	SPM
Ozone	Ultraviolet	Continuous	Population Exposure	SPM
PM_{2.5} Real Time	Synchronized Hybrid Ambient Real Time Particulate Monitor	Continuous	Air Quality Index	SPM
Black Carbon	Aethalometer (light absorption)	Continuous	Population Exposure	SPM

Meteorological Parameters				
Parameter	Sampling & Analysis Method	Operating Schedule	Tower Height	Spatial Scale
Relative Humidity	Air Temperature and Relative Humidity Sensor- Electronic Thin Film	Continuous	10 meters	Urban
Ambient Temperature	Air Temperature and Relative Humidity Sensor- Electronic Resistance	Continuous	10 meters	Urban
Wind Direction	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Wind Speed	2D-ultrasonic anemometer transducers	Continuous	10 meters	Urban
Ambient Pressure	Barometric Pressure Transducer	Continuous	10 meters	Urban
WD Sigma	Electronic EPA Method	Continuous	10 meters	Urban
Solar Radiation	Solar Radiation sensor	Continuous	10 meters	Urban
Mixing Height	Optical Scattering Ceilometer	Continuous		Urban

2. Response to Public Comments