Idaho Department of Environmental Quality
Annual Ambient Air Quality Monitoring Network Plan

DRAFT

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Idaho Department of Environmental Quality
Air Quality Division
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1. Introduction

Title 40 of the Code of Federal Regulations §58.10 requires that beginning July 1, 2007, the state agency shall adopt and submit to the U.S. Environmental Protection Agency (EPA) Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network made up of the following types of monitoring stations:

- state and local air monitoring stations (SLAMS) including monitors that use:
  - federal reference method (FRM),
  - federal equivalent method (FEM), or
  - approved regional method (ARM)
- NCore stations (included in the national network of multi-pollutant monitoring stations)
- $PM_{2.5}$ chemical speciation stations (STN), and
- special purpose monitoring (SPM stations).

The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR 58 where applicable.

The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA. Any annual monitoring network plan that proposes SLAMS network modifications including new monitoring sites is subject to the approval of the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove the plan and schedule within 120 days. If the State or local agency has already provided a public comment opportunity on its plan and has made no changes subsequent to that comment opportunity, and has submitted the received comments together with the plan, the Regional Administrator is not required to provide a separate opportunity for comment.

The 2012 plan shall include all required stations to be operational by January 1, 2013. Specific locations for the required monitors shall be included in the annual network plan submitted to the EPA Regional Administrator on July 1, 2012.

The annual monitoring network plan must contain the following information for existing and proposed site(s) where appropriate:

1. The AQS (air quality system, EPA's database) site identification number.
2. The location, including street address and geographical coordinates.
3. The sampling and analysis method(s) for each measured parameter.
4. The operating schedules for each monitor.

5. Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.
6. The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to 40 CFR 58.
7. The identification of any sites that are suitable and any sites that are not suitable for comparison against the annual PM2.5 (particulate matter with diameter ≤ 2.5 microns [μ] national ambient air quality standard (NAAQS) as described in § 58.30.
8. The metropolitan statistical area (MSA), core based statistical area (CBSA), combined statistical area (CSA) or other area represented by the monitor.
9. The designation of any Pb monitors as either source-oriented or nonsource-oriented (i.e. NCore) according to Appendix D to 40 CFR Part 58.
10. Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR Part 58.
11. Any source-oriented or nonsource-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb-PM10 monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR Part 58.

The annual monitoring network plan must document how States and local agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

This document, in accordance with the above, is the Idaho Department of Environmental Quality's (DEQ) 2012 Annual Ambient Air Monitoring Network Plan. The primary goal of the annual network plan is to determine whether the state monitoring network is achieving its monitoring objectives and to identify any needed modifications.

2. Air Quality Surveillance Systems and Monitoring Objectives

Ambient air monitoring objectives have shifted over time; a situation that requires air quality agencies to re-evaluate and reconfigure monitoring networks. A variety of factors contribute to these shifting monitoring objectives:

- Air quality has changed since the adoption of the federal Clean Air Act and National Ambient Air Quality Standards (NAAQS). For example, the problems of high ambient concentrations of lead and carbon monoxide have largely been solved.

- Populations and behaviors have changed. For example, the U.S. population has (on average) grown, aged, and shifted toward urban and suburban areas over the past four decades. In addition, rates of vehicle ownership and annual miles driven have increased.
- New air quality objectives have been established, including rules to reduce air toxics, fine particulate matter ($PM_{2.5}$), and regional haze.
- The understanding of air quality issues and the capability to monitor air quality have both improved. Together, the enhanced understanding and capabilities can be used to design more effective air monitoring networks.

Ambient air monitoring networks must be designed to meet three basic monitoring objectives. These basic objectives are listed below. The appearance of any one objective in the order of this list is not based upon a prioritized scheme. Each objective is important and must be considered individually.

(a) **Provide air pollution data to the general public in a timely manner**. Data can be presented to the public in a number of attractive ways including air quality maps, newspaper articles or advertisements, Internet sites, and as part of weather forecasts and public advisories.

(b) **Provide support for determining compliance with ambient air quality standards and developing emissions control strategies**. Data from qualified monitors for NAAQS pollutants will be used for comparing an area's air pollution levels against the NAAQS. Data from monitors of various types can be used in the development of attainment and maintenance plans. SLAMS, and especially NCore station data, will be used to evaluate the regional air quality models used in developing emission strategies, and to track trends in air pollution abatement control measures' impact on improving air quality. In monitoring locations near major air pollution sources, source-oriented monitoring data can provide insight into how well industrial sources are controlling their pollutant emissions.

(c) **Provide support for air pollution research studies**. Air pollution data from the NCore multi-pollutant monitoring network can be used to supplement data collected by researchers working on health effects assessments and atmospheric processes, or for monitoring methods development work.

In order to support the air quality management work indicated in the three basic air monitoring objectives, a network must be designed with a variety of monitoring site types. Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific emissions sources. These types of sites are summarized in the following list of six general site types according to the type of information they are designed to provide:

(a) Sites located to determine the maximum concentrations of air pollutants expected to occur in the area covered by the network.

(b) Sites located to measure typical pollutant concentrations in areas of high population density.

(c) Sites located to determine the impact of significant sources or source categories on air quality.

(d) Sites located to determine general background concentration levels of air pollutants.

(e) Sites located to determine the extent of regional pollutant transport among populated areas, and to assess compliance with secondary air quality standards.

(f) Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts.

The adequacy of an ambient air monitoring network may be determined by using a variety of tools including the following:

- federal monitoring requirements and network minimums,
- analyses of historical monitoring data,
- maps of pollutant emissions densities,
- dispersion modeling,
- special studies/saturation sampling,
- SIP requirements,
- revised monitoring strategies (e.g., new regulations, reengineering of the air monitoring network),
- network maps and network descriptions with site objectives defined, and
- best professional judgment.

The appropriate location of a monitor can only be determined on the basis of stated objectives. The following tools can help determine whether monitor locations are meeting their stated objectives:

- Maps, graphical overlays, and information based on geographical information systems (GIS), which are extremely helpful for visualizing the adequacy of monitor locations.
- Plots (graphs) of potential emissions levels and/or historical monitored levels of pollutants versus monitor locations.
- Modeling or special studies (including saturation monitoring studies) may be appropriate for determining the adequacy of a particular monitor location.

3. Idaho DEQ's Ambient Air Monitoring Network

3.1. Monitoring Sites

DEQ is responsible for operating and maintaining the ambient air monitoring network for the State of Idaho. Some air monitors in Idaho are managed by tribal monitoring organizations on tribal lands. This document is limited to the monitors in the air monitoring network that are managed by DEQ. On January 1, 2012 DEQ's air monitoring network consisted of 50 monitors at 27 distinct monitoring sites. DEQ's ambient air monitoring network is operated and maintained by DEQ's six (6) Regional Office monitoring staff. Table 3-1 is a list of DEQ's air monitoring sites, including addresses, global positioning system (GPS) coordinates and AQS identifiers. Figures 3-1 through 3-6 illustrate the locations of DEQ's monitoring sites according to the responsible Regional Office.

Table 3-1. DEQ Monitoring Stations, Locations, and AQS Identification Codes

Site	Address	Latitude/ Longitude	AQS Identification
Sandpoint – USFS	1601 Ontario St. Sandpoint ,ID 83864	+48.267500/ -116.572222	160170005
Sandpoint – University of Idaho	U of I Research Center, 2105 N. Boyer Ave. Sandpoint, ID 83864	+48.291820/ - 116.556560	160170003
Coeur d'Alene – Lancaster Rd.	Lancaster Road, Hayden, ID 83835	+47.788908/ -116.804539	160550003
Coeur d' Alene LMP	Camp Cross, McDonald Point, Lake Coeur d'Alene, ID	+47.555253/- 116.817331	160550004
St. Maries	Forest Service Bldg St. Maries, ID 83666	+47.316667/ -116.570280	160090010
Pinehurst	106 Church St. Pinehurst, ID 83850	+47.536389/ -116.236667	160790017
Moscow	1025 Plant Sciences Rd Moscow, ID 83843	+46.721932/ -116.959180	160570005
Lewiston	1200 29th St Lewiston, ID 83501	+46.404722/ -116.968889	160690012
Grangeville	USFS Compound Grangeville, ID 83530	+45.931389/ -116.115278	160490002
McCall	500 N. Mission St, McCall ID 83638	+44.890197 -116.106500	160850002
Garden Valley	946 Banks Lowman Rd Garden Valley, ID 83622	+44.104498 -115.972386	160150002
Nampa	923 1st St S, Nampa, ID 83651	+43.580310/ -116.562676	160270002
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	+43.600264/ -116.348434	160010010
Boise- Eastman Garage	166 N. 9th, Boise, ID 83702	+43.616379/ -116.203817	160010014
Boise- Fire Station #5	16th & Front, Boise, ID 83702	+43.618889/ -116.213611	160010009

Site	Address	Latitude/ Longitude	AQS Identification
Boise- White Pine Elementary	401 East Linden St. Boise, ID 83706	+43.577603/ -116.178156	160010017
Garden City	Ada County Fairgrounds, Garden City, ID 83714	+43.647819 -116.269514	160010020
Idaho City	3851 Hwy 21 Idaho City, ID 83631	+43.823017/ -115.838557	160150001
Ketchum	111 West 8th St, Ketchum, ID 83340	+43.682558/ -114.371094	160130004
Twin Falls	1913 Addison Ave E, Twin Falls, ID 83301	+42.564097/ -114.446200	160830010
Kimberly	50 Highway 50, Kimberly, 83341	+42.553325/ -114.354853	160830009
Pocatello	Corner Garrett & Gould, Pocatello, ID 83204	+42.876725/ -112.460347	160050015
Pocatello- Sewage Treatment Plant	Batiste Chubbuck Rd, Pocatello, ID 83204	+42.916389/ -112.515833	160050004
Franklin	East 4800 South Road, 83237	+42.013333/ -111.809167	160410001
Soda Springs	5-Mile Rd., Soda Springs, ID 83276	+42.695278/ -111.593889	160290031
Idaho Falls	Hickory and Sycamore St., Idaho Falls, ID 83402	+43.464700/ -112.046450	160190011
Salmon – Charles St.	N Charles St. Salmon, ID 83467	+45.181893/ -113.890285	160590004
Salmon – Hwy 93	0.8 Miles South of Hwy 93/48 Intersection, Salmon ID 83468	+45.168433/ -113.888967	160590005

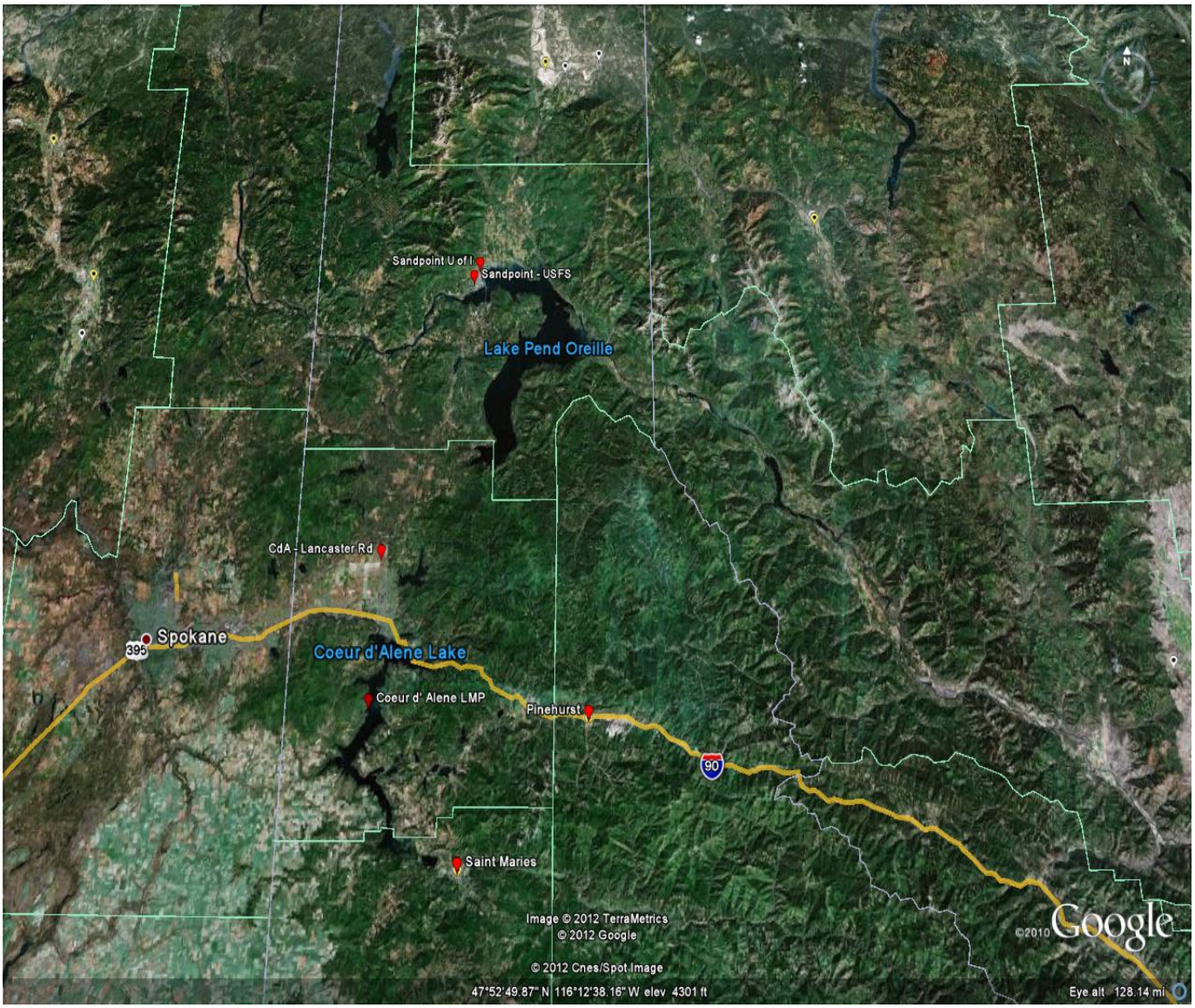


Figure 3-1. Coeur d'Alene Regional Office Monitoring Stations

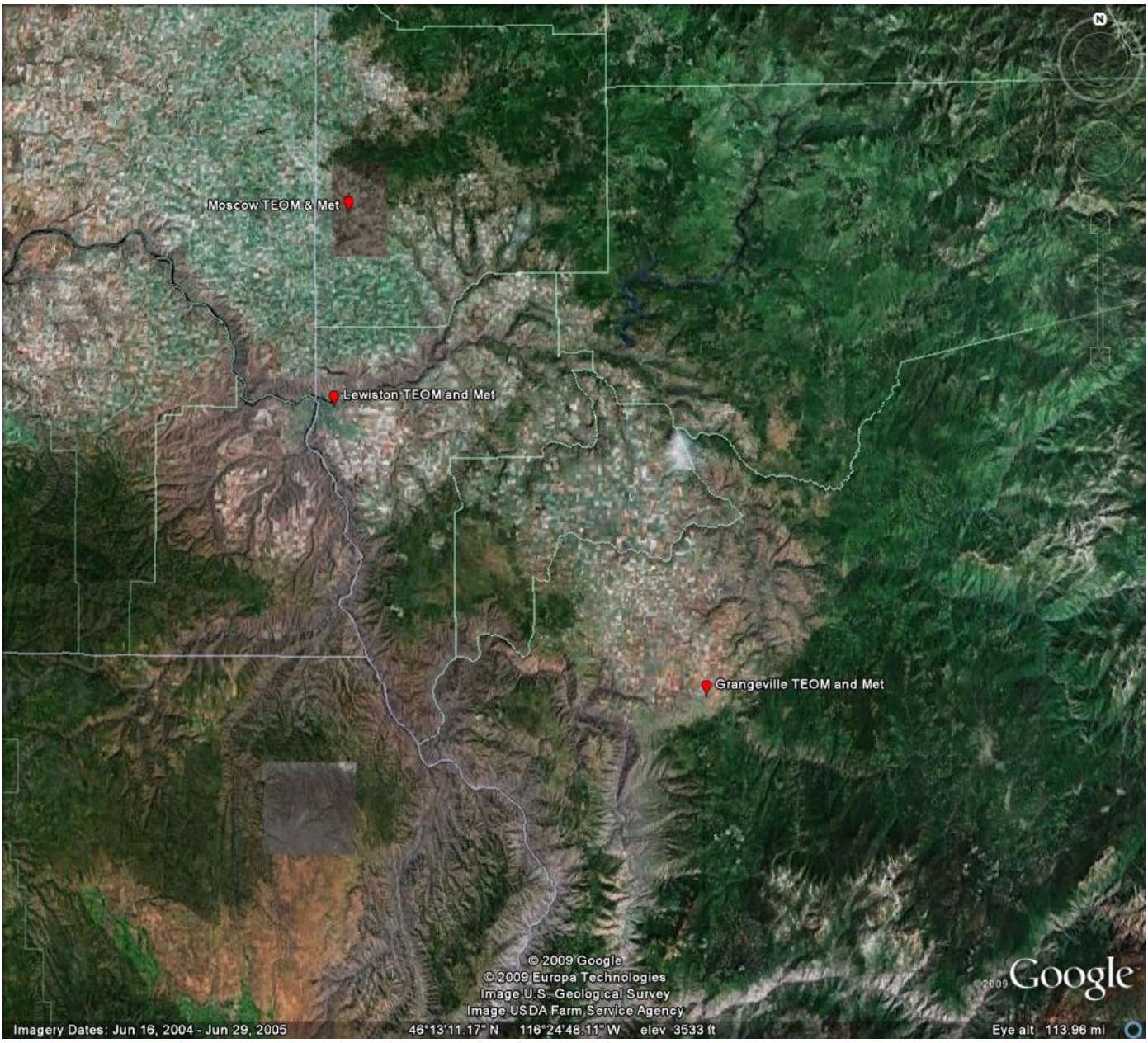


Figure 3-2. Lewiston Regional Office Monitoring Stations

Figure 3-3. Boise Regional Office Monitoring Stations

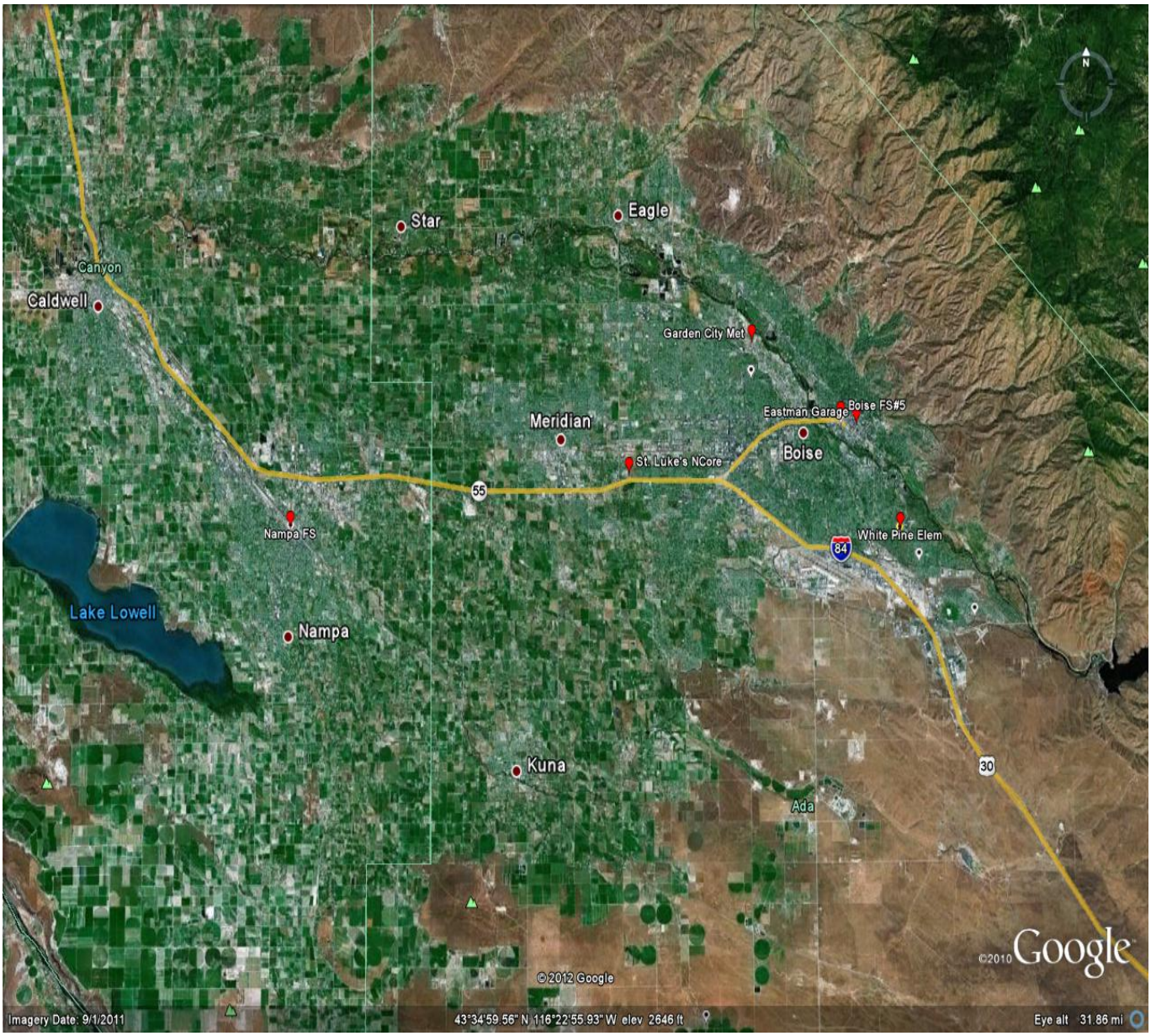


Figure 3-3. (continued)

Figure 3-4. Twin Falls Regional Office Monitoring Stations

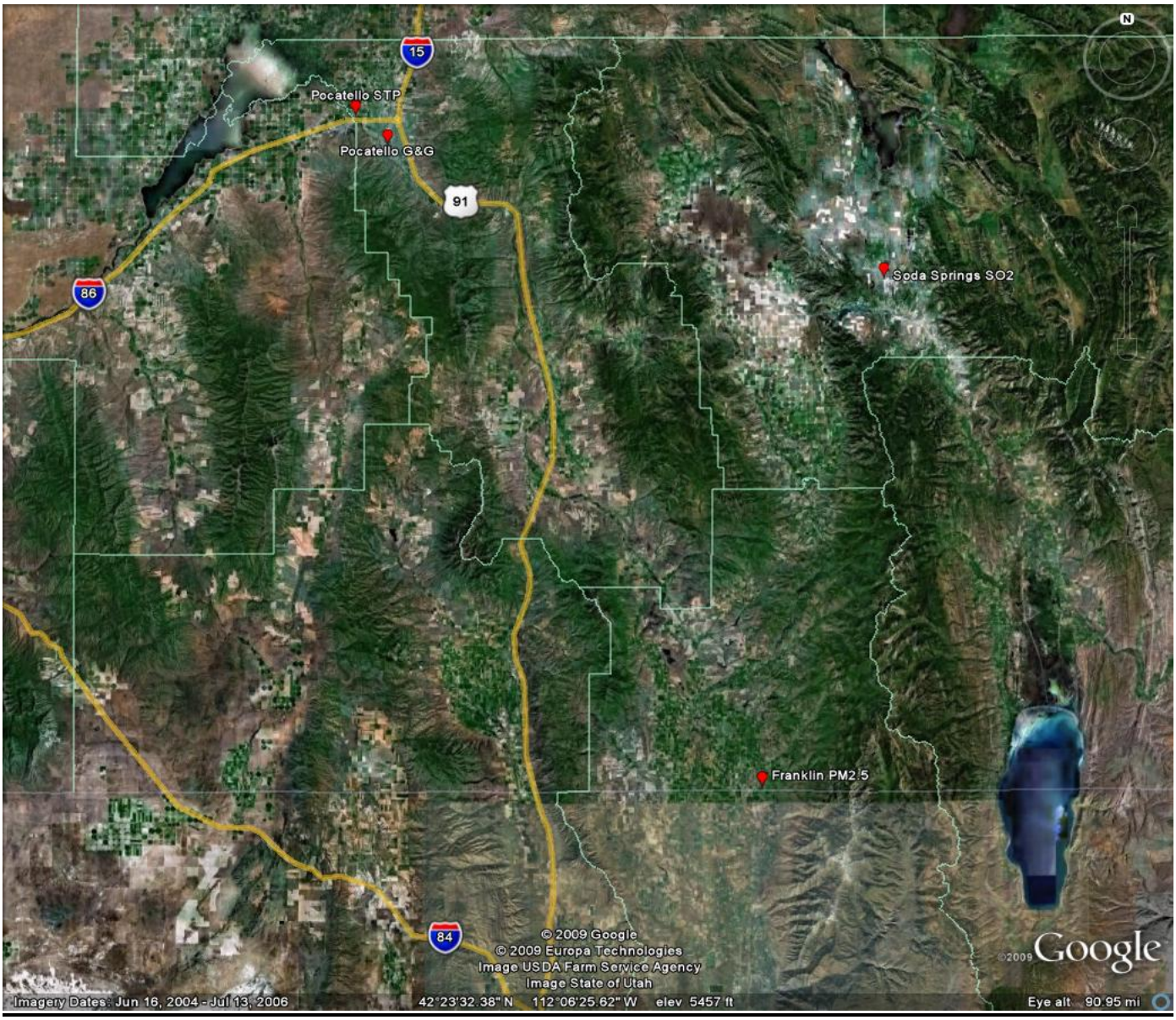


Figure 3-5. Pocatello Regional Office Monitoring Stations

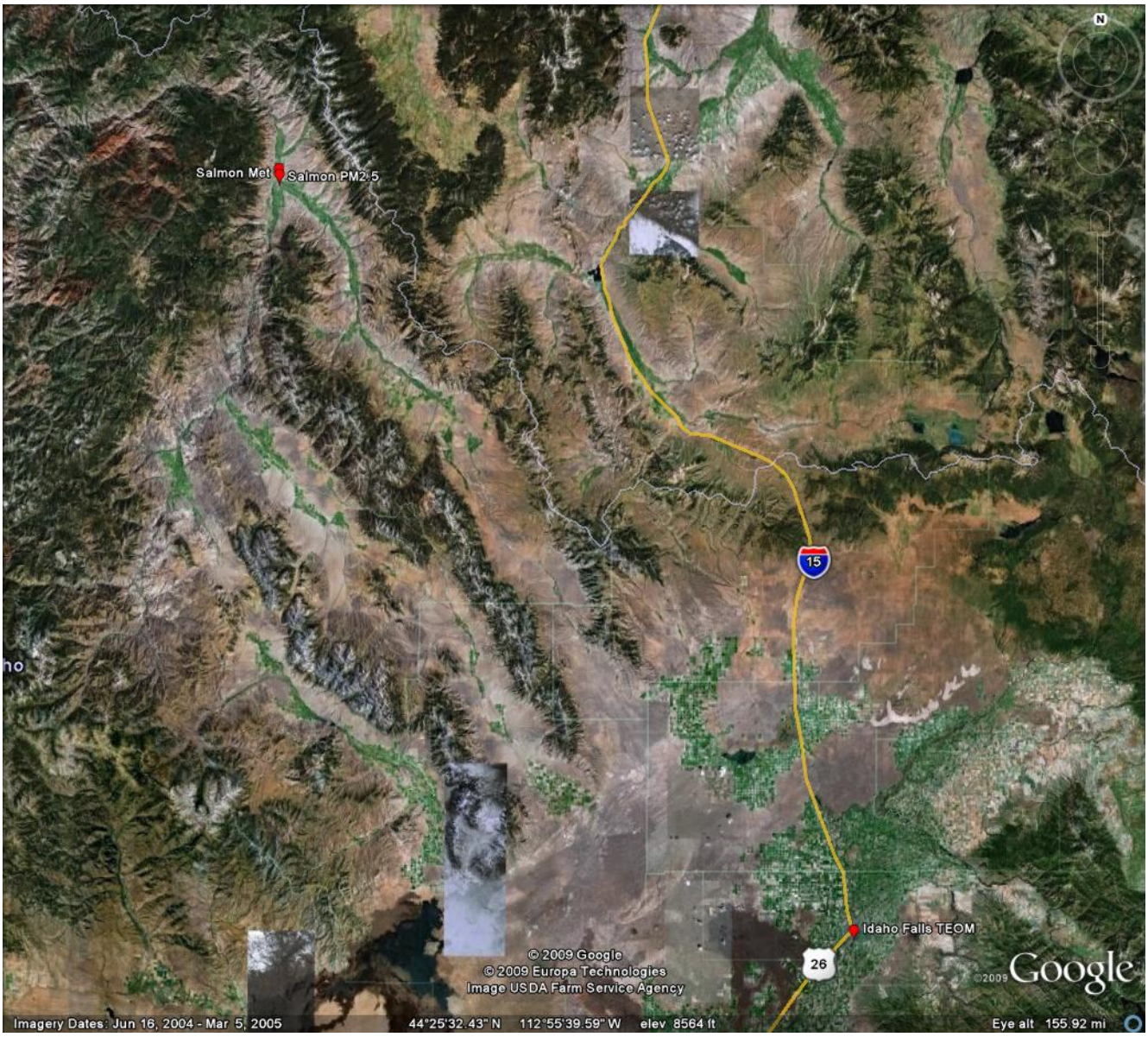


Figure 3-6. Idaho Falls Regional Office Monitoring Stations

3.2. DEQ Monitoring Network – Monitoring Objectives, Scales of Representativeness, and Area(s) Represented

The ambient air quality and meteorological data collected from DEQ's air monitoring network is used for a variety of purposes, including:

- determining compliance with the national ambient air quality standards (NAAQS),
- determining the locations of maximum pollutant concentrations,
- forecasting air quality to determine the Air Quality Index (AQI),
- providing for early detection of smoke impacts (smoke management),
- determining the effectiveness of air pollution control programs,
- evaluating the effects of air pollution levels on public health,
- tracking the progress of air quality-related state implementation plans (SIPs),
- supporting pollutant dispersion models,
- developing responsible, cost-effective air pollution control strategies, and
- analyzing air quality trends.

To clarify the nature of the link between general monitoring objectives, site types, and the physical location of a particular monitor, the concept of spatial scale of representativeness is defined. The goal in locating monitors is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, the air pollutant to be measured, and the monitoring objective. Thus, spatial scale of representativeness is described in terms of the physical dimensions of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar. The scales of representativeness of most interest for the monitoring site types described above are as follows:

(a) ***Microscale*** - Defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

(b) ***Middle scale*** - Defines the concentrations typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer.

(c) ***Neighborhood scale*** - Defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the range of 0.5 to 4.0 kilometers.

The neighborhood and urban scales listed below have the potential to overlap in applications that concern secondarily formed or homogeneously distributed air pollutants.

(d) ***Urban scale*** - Defines concentrations within an area of city-like dimensions, on the order of 4 to 50 kilometers. Within a city, the geographic placement of emissions sources may result in there being no single site that can be said to represent air quality on an urban scale.

(e) ***Regional scale*** - Defines an area that is usually rural, is of reasonably homogeneous geography without large emissions sources, and extends from tens to hundreds of kilometers.

(f) ***National and global scales*** - These measurement scales represent concentrations characterizing a nation or the globe as a whole.

Proper siting of a monitor requires specification of the monitoring objective, the types of sites necessary to meet the objective, and then the desired spatial scale of representativeness. For example, consider a case where the objective is to determine NAAQS compliance by understanding the maximum ozone concentrations for an area. Candidate areas would most likely be located downwind of a metropolitan area, probably in suburban residential areas where children and other susceptible individuals are likely to be outdoors. Sites located in such areas are most likely to represent an urban scale of measurement. In this example, physical location was determined by considering ozone precursor emission patterns, public activity, and meteorological characteristics affecting ozone formation and dispersion. Thus, spatial scale of representativeness was not used in the selection process but was a result of site location.

In some cases, the physical location of a site is determined from joint consideration of both the basic monitoring objective and the type of monitoring site desired or required. For example, to determine what $PM_{2.5}$ concentrations are typical over a geographic area that has relatively high $PM_{2.5}$ concentrations, a neighborhood scale site is most appropriate. Such a site would likely be located in a residential or commercial area having a high overall $PM_{2.5}$ emission density but not in the immediate vicinity of any single dominant source. Note that in this example the desired scale of representativeness was an important factor in determining the physical location of the monitoring site. In either case, classification of the monitor by its type and spatial scale of representativeness is necessary and will aid in interpretation of the monitoring data for a particular monitoring objective (e.g., public reporting, NAAQS compliance determination, or research support).

Table 3-2 illustrates the relationship between the various site types that can be used to support the three basic monitoring objectives, and the scales of representativeness that are generally most appropriate for each site type.

Table 3-2. Relationships Between Site Types and Scales of Representativeness

Site Type	Appropriate Siting Scales
Maximum concentration (*sometimes* urban or regional for secondarily-formed pollutants)	Micro, middle, neighborhood
Population oriented	Neighborhood, urban.
Source impact	Micro, middle, neighborhood
General/background	Urban, regional
Regional transport	Urban, regional
Welfare-related impacts	Urban, regional

Federal ambient air monitoring regulations use the statistical-based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau. These areas are referred to as metropolitan statistical areas (MSA), or micropolitan statistical areas, both of which are core-based statistical areas (CBSA), and combined statistical areas (CSA). A CBSA

associated with at least one urbanized area of 50,000 population or greater is termed a Metropolitan Statistical Area (MSA). A CBSA associated with at least one urbanized cluster of at least 10,000 population or greater is termed a micropolitan statistical area. A CSA consists of two or more adjacent CBSAs. The term MSA is used to refer to a Metropolitan Statistical Area. By definition, both MSAs and CSAs have a high degree of integration; however, many such areas cross state or other political boundaries. An MSA or CSA may also cross more than one airshed. The EPA recognizes that state or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected state or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected state or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.

Table 3-3 summarizes the monitoring objective(s), the area represented, and the monitoring scale of representativeness for DEQ's monitoring sites.

Table 3-3. Monitoring Objectives, Areas Represented, and Scales of Representation

Site	Monitoring Objective	Area Represented	Monitoring Scale
Sandpoint – University of Idaho	AQI* Modeling-meteorological	Bonner County	Urban
Sandpoint – USFS	AQI PM_{10}* SIP* PM_{10} NAAQS*	Bonner County	Urban
Coeur d'Alene – Lancaster Rd.	AQI Modeling-meteorological	Coeur d' Alene, ID MSA*	Urban
Coeur d' Alene – LMP	Modeling - meteorological	Coeur d' Alene, ID MSA*	Neighborhood
St. Maries	$PM_{2.5}$* NAAQS AQI	Benewah County	Neighborhood
Pinehurst	PM_{10} SIP PM_{10} NAAQS $PM_{2.5}$ NAAQS AQI Modeling-meteorological	Shoshone County	Neighborhood
Moscow	AQI Smoke Management Modeling-meteorological	Latah County	Neighborhood
Lewiston	AQI Smoke Management Modeling-meteorological	Lewiston ID – WA MSA	Neighborhood
Grangeville	AQI Smoke Management Modeling-meteorological	Idaho County	Neighborhood
McCall	AQI Smoke Management	Valley County	Neighborhood

Site	Monitoring Objective	Area Represented	Monitoring Scale
Garden Valley	Smoke Management	Boise County	Neighborhood
Nampa	PM_{10} NAAQS $PM_{2.5}$ NAAQS AQI	Boise City-Nampa MSA**	Neighborhood
Meridian – St. Luke's	NCore-trace gas NCore - PMcoarse $PM_{2.5}$ NAAQS $PM_{2.5}$ Chemical Speciation O_3 NAAQS Pb NAAQS AQI Modeling-meteorological	Boise City-Nampa MSA**	Neighborhood
Boise – Eastman Garage	CO* SIP CO NAAQS	Northern Ada County	Micro
Boise – Fire Station #5	PM_{10} SIP PM_{10} NAAQS	Northern Ada County	Neighborhood
Boise – White Pine Elementary	O_3 NAAQS	Boise City-Nampa MSA*	Neighborhood
Garden City	Modeling-meteorological	Boise City-Nampa MSA*	Neighborhood
Idaho City	Smoke Management AQI	Boise County	Neighborhood
Ketchum	Smoke Management AQI	Blaine County	Urban
Twin Falls	Smoke Management AQI	Twin Falls, ID Micropolitan Statistical Area	Neighborhood
Kimberly	Modeling-meteorological	Twin Falls, ID Micropolitan Statistical Area	Urban
Pocatello Garrett and Gould	PM_{10} SIP PM_{10} NAAQS AQI Modeling-meteorological	Pocatello, ID MSA	Neighborhood
Pocatello – Sewage Treatment Plant	SO_2* NAAQS	Pocatello, ID MSA	Middle
Franklin	$PM_{2.5}$ NAAQS AQI	Logan UT – ID MSA	Urban
Soda Springs	SO_2 NAAQS	Caribou County	Micro
Idaho Falls	AQI	Idaho Falls, ID MSA	Neighborhood
Salmon – Charles St.	$PM_{2.5}$ NAAQS AQI	Lemhi County	Neighborhood
Salmon – Hwy 93	Modeling-meteorological	Lemhi County	Urban

* AQI – air quality index; SIP – state implementation plan; NAAQS – national ambient air quality standard; PM10 – particulate matter less than 10 microns in diameter; MSA – metropolitan statistical area; O3 – ozone; PM2.5 -- particulate matter less than 2.5 microns in diameter; NO_2 – nitrogen dioxide; SO_2 – sulfur dioxide

** Boise City-Nampa MSA, as defined by the US Census Bureau, includes Ada, Boise, Canyon, Gem, and Owyhee counties

3.3. Monitoring Methods, Monitor Designation, and Sampling Frequency

Generally, monitoring methods used for making NAAQS compliance determinations at a SLAMS site must be designated federal reference (FRM) or federal equivalent (FEM) methods, in accordance with 40 CFR Part 53. A method for monitoring $PM_{2.5}$ concentrations that has not been designated as an FRM or FEM may be approved as an "approved regional method" (or ARM) by the EPA Regional Administrator. Special purpose monitors (SPMs) do not meet any of the above criteria and are typically used for special studies or as surrogate measures or indicators of emergency episodes (e.g., nephelometers used for early detection of smoke).

Table 3-4 lists monitoring methods used by Idaho DEQ along with associated method codes required when submitting the monitoring data to EPA's Air Quality System (AQS) database. Method codes for meteorological parameters are not included in the table.

Table 3-4. Air Monitoring Method Codes

Parameter/ Pollutant*	Method Designation	AQS Method Code	Instrument and Instrument Parameters
PM_{10}	FEM	079	TEOM* – gravimetric analysis, instrumental – R&P SA246B inlet
CO	FRM	093	Teledyne API Gas Filter Correlation M300
CO	FRM	593**	Teledyne API Model 300EU
SO_2	FEM	100	Teledyne API Model 100A – UV Fluorescent
SO_2	FEM	060	Thermo Model 43C, pulsed fluorescence
SO_2	FRM	600**	Teledyne API, Model 100EU – UV Fluorescent
O_3	FEM	087	Teledyne API, Model 400E
NO_2	FRM	099	Teledyne API, Model 200E – Chemiluminescence
NOy	FRM	599**	Teledyne API, Model 200EU
$PM_{2.5}$	FRM	118	R&P Model 2025 Sequential w/WINS, Gravimetric
$PM_{2.5}$	FRM	145	R&P Model 2025 Sequential w/ VSCC
$PM_{2.5}$	SPM	701 or 703***	R&P TEOM w/ SCC – no correction factor
$PM_{2.5}$	SPM	715 or 716***	R&P TEOM w/ VSCC – no correction factor
$PM_{2.5}$	SPM	702 or 704***	R&P TEOM w/ SCC – correction factor
$PM_{2.5}$	FEM	181	R&P TEOM w/ VSCC & FDMS
$PM_{2.5}$	FEM	170	Met One Beta Gauge (BAM)
$PM_{10\text{-}2.5}$	FRM	176	Thermo Scientific Partisol-Plus Model 2025 Sequential Sampler Pair
PM10 Pb	FEM	811	Thermo/R & P 2025 PM10 w/ XRF analysis

* PM_{10} – particulate matter less than 10 microns in diameter; CO – carbon monoxide; SO_2 – sulfur dioxide; O_3 – ozone; NO_2 – nitrogen dioxide; Noy – total reactive nitrogen; $PM_{2.5}$ – particulate matter less than 2.5 microns in diameter; TEOM – tapered element oscillating microbalance
** Trace gas monitor – NCore
*** Applicable code varies seasonally w/ instrument operating temperature settings

Monitoring sites designated as SLAMS sites, are intended to address specific air quality management interests, and as such, are frequently single-pollutant measurement sites. The SLAMS sites must be approved by the EPA Regional Administrator.

Monitoring sites designated as special purpose monitor (SPMs) stations in the annual network plan and in the Air Quality System (AQS) do not count toward meeting network minimum requirements. SPM sites using methods designated as FRMs or FEMs or approved as ARMs are bound to the quality assurance requirements of Appendix A to 40 CFR Part 58.

Gaseous pollutants and meteorological parameters are sampled continuously and typically averaged for each hour. Data completeness for a continuous monitor is computed as the number of valid hourly samples collected divided by the number of potential hourly samples for the period in question (e.g., 8,760 potential hourly samples annually).

Particulate matter (PM) can be sampled continuously or by time-integrated filter-based methods. Filter-based methods typically collect samples for 24-hour periods. For NAAQS comparison, PM data is reported as a 24-hour average, collected from midnight to midnight at local standard time. As illustrated in Figure 3-7, the minimum monitoring schedule for a site is based on the relative concentration level at that monitoring site with respect to the 24-hour standard (i.e., the ratio between the local concentration and the standard with 1:1 = 1.0) .

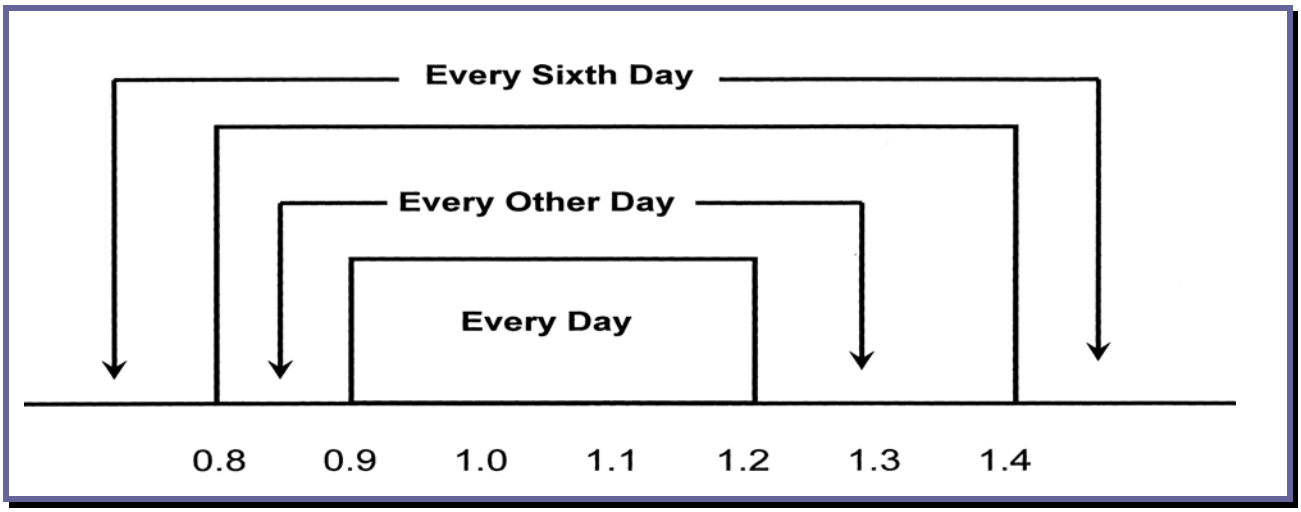


Figure 3-7. Minimum Monitoring Frequency Based on Ratio of Local Concentration to Standard

For the monitors in DEQ's ambient air quality monitoring network, Table 3-5 lists the pollutants monitored, the monitor's designation (e.g., SLAMS), the monitoring frequency, and the appropriate AQS method code (Table 3-4).

Table 3-5. Pollutants/Monitor Designation/Sampling Frequency/Method Codes

Site	Pollutant Monitored**	Monitor Designation**	Monitoring Frequency	AQS Method Code
Sandpoint – University of Idaho	10-meter meteorology	SPM	Continuous	*
Sandpoint – U.S. Forest Service	PM_{10} – TEOM $PM_{2.5}$ – TEOM	SLAMS SPM–NR***	Continuous Continuous	079 715 or 716

Site	Pollutant Monitored**	Monitor Designation**	Monitoring Frequency	AQS Method Code
Coeur d'Alene – Lancaster Rd.	$PM_{2.5}$ - TEOM 10-meter meteorology	SPM-NR*** SPM	Continuous Continuous Continuous Continuous	715 or 716 087 099 *
Coeur d' Alene LMP	10-meter meteorology	SPM	Continuous	*
St. Maries	$PM_{2.5}$ – FRM $PM_{2.5}$ – TEOM	SLAMS SPM-NR***	1/6 Continuous	145 715 or 716
Pinehurst	$PM_{2.5}$ – FRM Precision $PM_{2.5}$ – TEOM/FDMS PM_{10} - TEOM 10-meter meteorology	SLAMS QA/Collocated SLAMS SLAMS SPM	1/6 --- 1/1 Continuous Continuous	145 --- 181 079 *
Moscow	$PM_{2.5}$ - TEOM 10-meter meteorology	SPM-NR*** SPM	Continuous Continuous	702 or 704 *
Lewiston	$PM_{2.5}$ - TEOM 10-meter meteorology	SPM-NR*** SPM	Continuous Continuous	702 or 704 *
Grangeville	$PM_{2.5}$ - TEOM 10-meter meteorology	SPM-NR*** SPM	Continuous Continuous	702 or 704 *
McCall	$PM_{2.5}$ – TEOM	SPM-NR***	Continuous	715 or 716
Garden Valley	$PM_{2.5}$– TEOM	SPM-NR***	Continuous	715 or 716
Nampa	PM_{10} - TEOM $PM_{2.5}$ - FRM $PM_{2.5}$ - TEOM	SLAMS SLAMS SPM-NR***	Continuous 1/6 Continuous	079 145 715 or 716
Meridian St. Luke's	$PM_{2.5}$ - FRM $PM_{2.5}$ - TEOM $PM_{2.5}$ Chemical Speciation $PM_{10-2.5}$ O_3 SO_2 NOy CO PM_{10} Pb 10-meter meteorology	NCore SPM-NR*** NCore --- NCore NCore NCore NCore NCore NCore NCore	1/3 Continuous 1/3 --- 1/3 Continuous Continuous Continuous Continuous 1/6 Continuous	145 715 or 716 810 --- 176 087 600 599 593 811 *

Site	Pollutant Monitored**	Monitor Designation**	Monitoring Frequency	AQS Method Code
Boise- Eastman Garage	CO	SLAMS	Continuous	093
Boise- Fire Station #5	PM_{10}	SLAMS	Continuous	079
Boise- White Pine Elementary	O_3	SLAMS	Continuous	087
Garden City	10-meter meteorology	SLAMS	Continuous	*
Idaho City	$PM_{2.5}$ – TEOM	SPM-NR***	Continuous	715 or 716
Ketchum	$PM_{2.5}$ – TEOM	SPM-NR***	Continuous	715 or 716
Twin Falls	$PM_{2.5}$ – TEOM	SPM-NR***	Continuous	702 or 704
Kimberly	10-meter meteorology	SPM	Continuous	*
Pocatello	$PM_{2.5}$ - TEOM PM_{10} - TEOM 10-meter meteorology	SPM-NR*** SLAMS SPM	Continuous Continuous Continuous	715 or 716 079 *
Pocatello- Sewage Treatment Plant	SO_2	SLAMS	Continuous	100
Franklin	$PM_{2.5}$ - FRM $PM_{2.5}$ – BAM	SLAMS SPM-NR***	1/6 Continuous	145 170
Soda Springs	SO_2	SLAMS	Continuous	060
Idaho Falls	$PM_{2.5}$ – TEOM	SPM-NR***	Continuous	715 or 716
Salmon – Charles St.	$PM_{2.5}$ - FRM $PM_{2.5}$ – BAM	Precision SLAMS	1/6 1/1	145 170
Salmon – Hwy 93	10-meter meteorology	SPM	Continuous	*

* Meteorological parameters are listed in Table 3-6
** Abbreviations: PM_{10} – particulate matter less than 10 microns in diameter; $PM_{2.5}$ – particulate matter less than 2.5 microns in diameter; TEOM – tapered element oscillating microbalance; O_3 – ozone; NO_2 – nitrogen dioxide; FRM – federal reference method; FDMS – filter dynamics measurement system; BAM – beta attenuation monitor; SO_2 – sulfur dioxide; NOy – total reactive nitrogen; CO – carbon monoxide
*** SPM-NR = special purpose monitor, non-regulatory

DEQ currently operates twelve (12) 10-meter meteorological stations. Meteorological measurements are used to support air quality index forecasting and air quality modeling analyses.

Table 3-6 provides a list of parameters measured at DEQ meteorological stations. DEQ operates the meteorological monitoring network in accordance with EPA's guidance document: *Quality Assurance Handbook for Air Pollution Measurement Systems Volume IV: Meteorological Measurements Version 2.0 (Final).*

Table 3-6. DEQ Meteorological Monitoring Stations and Parameters

Site	Meteorological Parameters Monitored
Sandpoint – University of Idaho	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Pinehurst	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Coeur d'Alene – Lancaster Rd.	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Moscow	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Lewiston	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Grangeville	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Middleton – Purple Sage	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2)
Meridian - St. Luke's	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Vertical Wind Speed (m/s); Solar Radiation (Watt/cm2);
Boise – Warm Springs	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Vertical Wind Speed (m/s); Solar Radiation (Watt/cm2);
Garden City	2 m. temp (°C); 10 m. temp. (°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2)
Kimberly	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2); Precipitation (Rain – Inches)
Pocatello	2 m. temp.(°C); 10 m. temp.(°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2)
Salmon – Hwy 93	2 m. temp. (°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2)

4. DEQ Network Modifications Subsequent to the EPA-Approved 2011 Ambient Monitoring Network Plan

The following network modifications were made subsequent to gaining EPA approval of the 2011 ambient monitoring network plan, or case by case through e-mail correspondence for issues not addressed in the plan. (AQS site identifier is provided in parentheses.)

1. PM_{10} Pb monitoring was initiated at the St. Luke's NCore site (160010010) on January 1, 2011, as required by 40 CFR Part 53.

2. Meteorological monitoring was initiated at the Coeur d' Alene LMP site (160550004) on July 1, 2011. The site was established to assist the DEQ's water quality group implement the Lakes Management Plan (LMP). The group needs meteorological data to run a model they use to track and predict movement of nutrients and pollutants in Lake Coeur d'Alene. This project is part of a cooperative effort between the Coeur d'Alene Tribe and DEQ. The site was set up and is operated in accordance with EPA guidelines.

3. Meteorological monitoring was discontinued beginning January 1, 2012 at the Middleton monitoring site (160270009). It was determined that data from this station was no longer needed to support sophisticate air quality models. Meteorological monitoring is not required in 40CFR Parts 53 or 58 and thus EPA approval to terminate this station was not required.

4. $PM_{2.5}$ monitoring by the special purpose TEOM was discontinued October 1, 2012 at the Middleton monitoring site (160270009). This special purpose non-regulatory monitor consistently measured very low $PM_{2.5}$ levels. DEQ was unable to establish telecommunications with the monitor, making data unavailable in "real-time", and thus data was not available for DEQ activities or public consumption. EPA concurred and approved DEQ's request to terminate this "low value" monitor.

5. Meteorological monitoring was discontinued beginning January 1, 2012 at the East Boise Warm Springs site (160010022). It was determined that data from this station was no longer needed to support sophisticate air quality models. Meteorological monitoring is not required in 40CFR Parts 53 or 58 and thus EPA approval to terminate this station was not required.

6. Ozone monitoring was discontinued at Boise's ITD site (160010019) because DEQ believed that since it measured consistently lower ozone levels compared to nearby ozone monitors. The Boise-Nampa MSA is required to have two (2) ozone monitors. By retaining the White Pine and St. Luke's ozone monitors, DEQ fulfills this requirement. Design values calculated for the ITD monitor are consistently lower than the other two monitors, as are the daily AQI values. DEQ believed that this monitor was of "low value" and requested EPA approval to not initiate ozone monitoring at this station for the 2012 ozone season.

7. Ozone and NOx monitoring were discontinued at Coeur d' Alene's Lancaster site (160550003). The 2009-2011 ozone design value (0.056ppm) is 75% of the 8-hour NAAQS, and there is no upward trend in the annual 4th highest daily maximum 8-hour average, therefore DEQ believed this to be a "low value" monitor and requested EPA approval to not initiate both the O_3 and NO_x monitors with the 2012 ozone season. EPA concurred with our decision and approved termination.

   NO_x was being monitored at this site during ozone season only, presumably for the purpose of modeling ozone should there be an issue with ambient ozone levels. EPA concurred.

5. Network Modifications Proposed in This 2012 Ambient Monitoring Network Plan

Below is a brief discussion of DEQ's rationale in proposing network modifications (if any) for each monitored pollutant, followed by a summary of those proposed changes. Annual air quality data summaries for DEQ's air monitoring network can be found at: http://www.deq.idaho.gov/air-quality/monitoring/monitoring-network.aspx.

More information about criteria pollutants (those pollutants for which EPA has established NAAQS) and NAAQS can be located at: http://www.epa.gov/air/criteria.html.

5.1. PM_{10} Monitoring Network

Five PM_{10} monitoring sites are currently in operation. These monitors support local state implementation plans (SIPs) and/or PM_{10} maintenance plans by demonstrating compliance with the PM_{10} NAAQS, and will continue operation through 2013. PM_{10} monitoring site locations are selected to represent average population exposure to spatially representative concentrations in the middle, neighborhood, and urban scales. Airsheds classified as "moderate" nonattainment for the 24-hour PM_{10} NAAQS (150 $\mu g/m^3$) in Idaho are:

- Bonner County – partial (City of Sandpoint)
- Shoshone County – partial (excluding City of Pinehurst)
- Pinehurst (Shoshone County – partial – City of Pinehurst)
- Fort Hall Reservation (Bannock County – partial, Power County – partial)

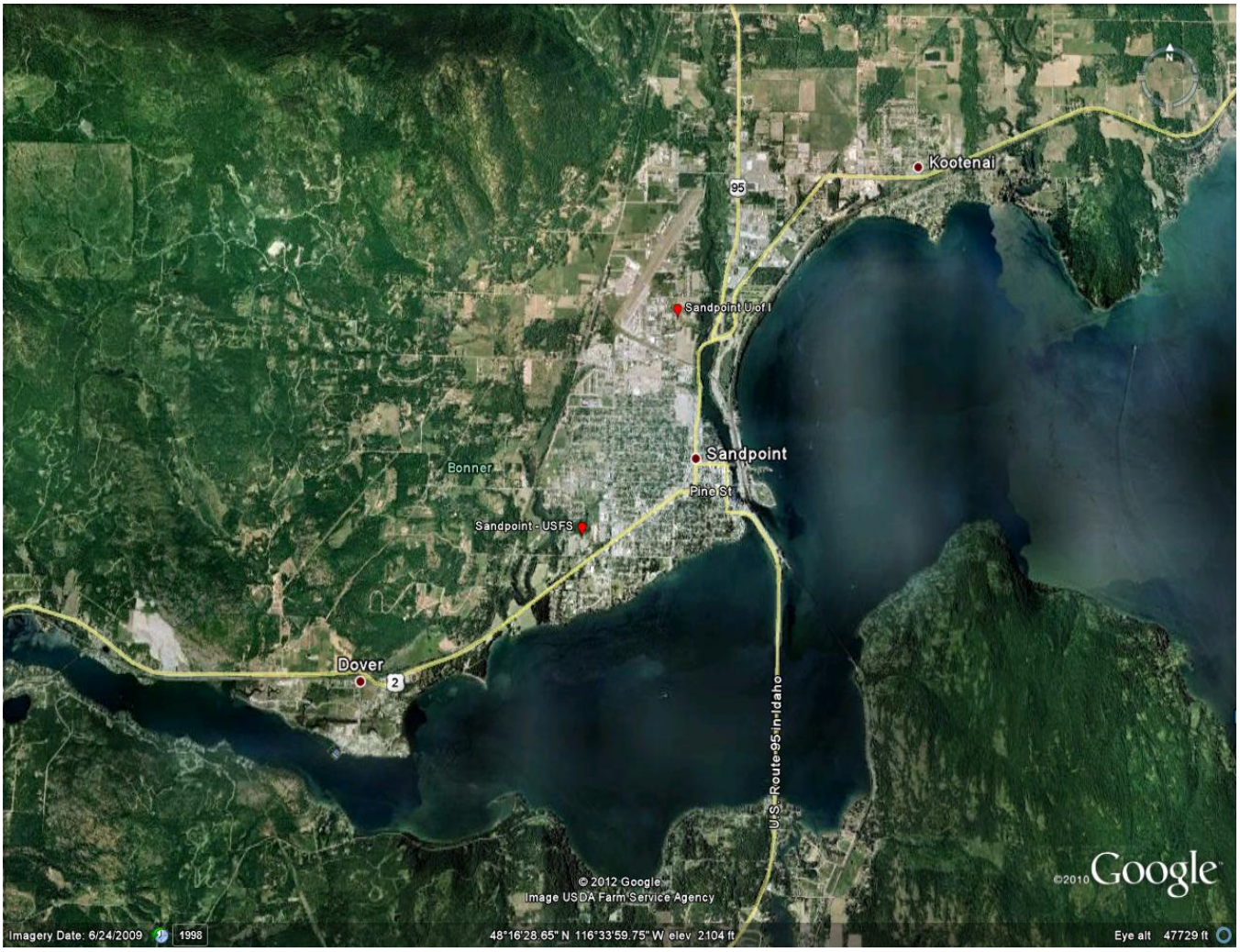
The Fort Hall Reservation nonattainment area is on Tribal land and is not administered by DEQ.

Airsheds previously classified as nonattainment, but now classified as maintenance areas with EPA-approved maintenance plans that identify specific emissions control programs and demonstrate compliance with a specific NAAQS over specific timeframes include:

- Boise-Northern Ada County
- Portneuf Valley (Bannock County – partial, Power County – partial)

2009 – 2011 PM_{10} design values are listed in Appendix A.

Due to the necessity of PM_{10} monitoring to meet the regulatory requirements associated with SIPs and maintenance plan objectives, DEQ proposes no substantive change to the PM_{10} monitoring network. However, DEQ is proposing to re-locate the Sandpoint PM_{10} monitor from its' current location at the Sandpoint USFS compound to the University of Idaho site, where a 10-meter meteorological station is currently operating. Three years ago a major lumber facility (Sandpoint LP) shut down operation, including its' industrial boiler, whose emissions prevented location of the USFS PM_{10} and $PM_{2.5}$ monitors at the University of Idaho site. This is no longer the case. The University of Idaho site will be more representative of population exposure, capturing PM contributions from the northern part of town. Another benefit is the consolidation of DEQ resources and infrastructure, including nearby meteorological data. DEQ is also proposing to relocate the special purpose non-regulatory $PM_{2.5}$ TEOM from the USFS site. See below:



5.2. $PM_{2.5}$ Core NAAQS Compliance Monitoring Network

DEQ operates a "core network" of six $PM_{2.5}$ monitoring sites for NAAQS compliance. DEQ began monitoring $PM_{2.5}$ by FRM in 1998 with an initial network of 13 sites. Over time, the network has been reduced to six sites due to either site redundancy within airsheds, or overall low ambient concentrations relative to the NAAQS. The six remaining sites are:

- Pinehurst
- St. Maries
- Treasure Valley (Nampa – Fire Station)
- Treasure Valley (Meridian – St. Luke's)
- Salmon
- Franklin

Federal regulations require a minimum of two $PM_{2.5}$ monitoring sites in the Treasure Valley, based on population. The Meridian monitor also satisfies the requirement for $PM_{2.5}$ monitoring at NCore sites.

DEQ is proposing no changes to the $PM_{2.5}$ FRM monitoring network in this 2012 Monitoring Network Plan.

$PM_{2.5}$ design values (updated for 2009 – 2011) and current sampling frequencies are listed in Appendix A.

5.3. $PM_{2.5}$ Continuous Monitoring Network

DEQ monitors $PM_{2.5}$ year-round at nineteen (19) sites throughout the state with continuous $PM_{2.5}$ monitors. The real-time and continuous $PM_{2.5}$ data support DEQ's air quality forecasting, AQI, and smoke management programs, such as emergency response for wildfire smoke impacts. The BAM 1020 at the Salmon site and the TEOM/FDMS monitor at Pinehurst are also designated as SLAMS primary monitors for NAAQS compliance assessment. The rest are special purpose, non-regulatory monitors.

The $PM_{2.5}$ continuous monitors are located at these monitoring sites:

- Sandpoint – USFS
- Coeur d'Alene – Lancaster Rd.
- St. Maries
- Pinehurst – TEOM/FDMS (SLAMS FEM-primary monitor)
- Moscow
- Lewiston
- Grangeville

- McCall
- Garden Valley
- Idaho City
- Nampa
- Meridian - St. Luke's
- Idaho City
- Ketchum
- Twin Falls
- Pocatello
- Franklin (BAM 1020 SPM-NR)
- Idaho Falls
- Salmon (BAM 1020, SLAMS FEM)

In this 2012 monitoring network plan, DEQ is proposing to relocate the Sandpoint USFS TEOM to the Sandpoint University of Idaho site (see discussion and map in Section 5.1).

DEQ will also be deploying and evaluating three (3) special purpose, non-regulatory Thermo 1405/FDMS monitors for potential future use as primary SLAMS monitors. These will be located at the Franklin, Nampa and St. Maries monitoring sites.

5.4. Ozone Monitoring Network

DEQ currently operates two ozone monitors in the Treasure Valley. Federal regulations require two ozone monitors in an urban area or MSA the size of the Boise City MSA.

One site must be designed to record the maximum concentration for the MSA. NCore sites can be counted toward minimum SLAMS ozone network requirements.

Ozone is monitored during the ozone "season" as prescribed in 40 CFR Part 58 Appendix D. For 2012 the ozone season is May 1 through September 30. It is likely to be extended to April 1 through September 30 once EPA issues a new final ruling for the ozone standard.

The Treasure Valley ozone monitors are located at:

- The Meridian St. Luke's NCore site near the Meridian St. Luke's Hospital
- The White Pine Elementary site in southeast Boise.

DEQ began monitoring at the White Pine Elementary school in 2009 when it had to relocate the Whitney Elementary School site which was demolished in 2008. The White Pine Elementary site was chosen based on evidence that it would represent the maximum ozone concentration for the Boise City MSA.

DEQ is proposing no changes to the ozone monitoring network in this 2012 monitoring network plan.

2009 – 2011 ozone design values for DEQ's monitors are listed in Appendix A.

5.5. Carbon Monoxide (CO) Monitoring Network

Monitoring for carbon monoxide (CO) in the Treasure Valley began in 1977. Violations of the health-based standard for CO occurred every winter from 1977 until 1986, and as a result Northern Ada County was designated a CO nonattainment area by EPA. In December 2002, the Northern Ada County CO Limited Maintenance Plan was approved by EPA, which reclassified the area as attainment for the CO NAAQS. No exceedances of the CO NAAQS have occurred since 1991.

DEQ operates two CO monitors, one at the Boise – Eastman site in downtown Boise, and one at the Meridian St. Luke's site. The Boise – Eastman site is an "urban canyon" site designed to measure maximum concentrations to which the population is exposed. This site is needed to demonstrate NAAQS compliance as specified in the Northern Ada County CO Maintenance Plan. The Meridian St. Luke's CO monitor is a "trace-level" monitor, measuring much lower CO than conventional CO monitors used for NAAQS compliance. The Meridian St. Luke's CO monitor is required for NCore sites.

2009 – 2011 CO design values are listed in Appendix A.

DEQ is proposing no changes to the CO monitoring network in this 2012 monitoring network plan.

5.6. Sulfur Dioxide (SO_2) Monitoring Network

Three SO_2 monitors currently operate in Idaho:

- Pocatello – Sewage Treatment Plant (STP)
- Soda Springs
- Meridian – St. Luke's

The Pocatello Sewage Treatment Plant site is a maximum concentration site used to assess impacts of local industrial emissions. The Soda Springs monitor is also a maximum concentration site for assessing industrial impacts from a nearby source. Both SO_2 monitoring locations in southeastern Idaho were identified as fence-line "hot spots" from conventional dispersion model applications. The St. Luke's monitor is a "trace-level" monitor, required for NCore monitoring.

DEQ is proposing no changes to the SO_2 monitoring network as part of this 2012 monitoring network plan.

2009 – 2011 design values for DEQ's SO_2 monitoring stations are listed in Appendix A.

5.7. Nitrogen Dioxide (NO_2) Monitoring Network

DEQ currently has no SLAMS NO_2 monitoring stations. Historically, no exceedances or violations of the NO_2 NAAQS have been measured in Idaho.

On January 22, 2010 EPA revised the NO_2 primary standard, along with revisions to the NO_2 monitoring requirements. Per this final rule, Idaho will be required to monitor NO_2 at a "near-road" monitoring station in the Boise-Nampa MSA. Initially, all monitoring is required to begin January 1, 2013. However due to funding limitations, EPA will be changing the requirement for the Boise City MSA (MSA> 500,000) to January 1, 2017.

DEQ is proposing no changes to the NO_2 monitoring network as part of this 2012 monitoring network plan.

DEQ has received a grant from EPA to pilot a near-road NO_2 monitoring station. As a result, DEQ is operating NO_2 monitoring equipment at the near-road site (~29 meters from Interstate 84) in Meridian. This is a special purpose non-regulatory monitor and no data has been submitted to AQS. In addition to monitoring NO_2, DEQ will be monitoring 10-meter meteorology, trace levels of carbon monoxide, black carbon and ultra-fine particle mass. The costs for these instruments were provided in the grant.

5.8. Lead (Pb) Monitoring Network

On December 14, 2010 EPA made final revisions to the ambient monitoring requirements for measuring lead. Core Based Statistical Areas, or CBSAs, with a population of 500,000 people or more were required to initiate lead monitoring at NCore monitoring sites beginning by January 1, 2012. DEQ met this requirement and initiated PM_{10} lead monitoring at the St. Luke's NCore site. EPA has also required Pb monitoring near facilities with Pb emissions exceeding 0.5 tons per year (tpy). Idaho has no such facilities and thus is not conducting any source-oriented Pb monitoring.

DEQ is utilizing a low-volume PM_{10} sampler to collect filter-based samples for lead analysis. A lo-vol Partisol 2025 sampler configured to collect PM_{10c} as part of the $PM_{10-2.5}$ (Section 5.9) measurement is already collecting PM_{10c} on the every sixth day schedule required for Pb. DEQ is utilizing the National Laboratory Contract and ships the filter to the contract laboratory for Pb-PM_{10} analysis by x-ray fluorescence (XRF) analysis.

Should lead concentrations exceed a three-month average greater than or equal to 0.1 $\mu g/m^3$, DEQ will be required to install and operate a Pb-TSP monitor within six months of such determination. Any Pb-PM_{10} measurements exceeding the NAAQS could lead toward a violation of the standard.

5.9. $PM_{10-2.5}$ (PMcoarse)

PMcoarse is defined as the particulate fraction with a nominal diameter between 2.5 and 10.0 µ.

PMcoarse is determined by calculating the fractional mass difference between co-located and matching (i.e., same type of monitor) FRM PM_{10c} and FRM $PM_{2.5}$ monitors. Section 3 of Appendix D, 40 CFR Part 58, requires PMcoarse monitoring at NCore monitoring stations.

DEQ initiated PMcoarse monitoring at the Meridian – St. Luke's NCore site, beginning January 1, 2011. Both the $PM_{2.5}$ and PM_{10c} samplers are operated every third day (1/3) in accordance with the national monitoring schedule. A second PM_{10c} monitor is operated every twelfth day (1/12) for the purpose of assessing lo-vol PM_{10} sampling precision.

DEQ is proposing no changes to the PMcoarse monitoring network as part of this 2012 monitoring network plan.

5.10. Summary of Proposed Network Modifications for DEQ's 2010 Air Monitoring Network Plan

- Relocation of the Sandpoint USFS PM_{10} and $PM_{2.5}$ Teoms to the Sandpoint University of Idaho site.
- Evaluate the Thermo 1405 FDMS FEM monitor as a candidate for primary sampler designation at the Franklin, St. Maries and Nampa sites. This will require initial designation for these monitors as special purpose, non-regulatory monitors and allow DEQ a period of two years for performance assessment, and to decide upon final monitor designation.

6. Future Ambient Air Monitoring Requirements and Associated Costs

EPA is required to review criteria pollutant NAAQS on a routine 5-year schedule. EPA has recently completed their review of a number of pollutants and through rulemaking is proposing changes to ambient air monitoring requirements for those pollutants. In most cases, additional monitors and new monitoring sites will be required in Idaho. New funding sources for new monitoring initiatives have yet to be identified. Below is a summary of recent proposals and final rules for certain criteria pollutants.

6.1. Ozone (O_3)

EPA expects to issue the final ozone monitoring requirements in July 2012. At this time there is no indication that additional ozone monitors will need to be deployed. Indications are that the ozone season in Idaho will be extended by one month, April 1 through September 30.

6.2. Nitrogen Dioxide (NO_2)

Current indications are that the Boise City MSA will be required to monitor NO_2 in the near-road environment beginning January 1, 2017. This is a change from the originally proposed date of January 1, 2012.

Given that DEQ has established its' near-road monitoring site through the EPA Pilot Study grant process, and whether DEQ continues to monitor NO_2 through 2017, although not required, the annual operation and maintenance cost will be approximately $10,000.

APPENDIX A

DEQ AMBIENT MONITORING NETWORK DESIGN VALUES

2009-2011 Design Values for Core $PM_{2.5}$ Monitoring Stations – Federal Reference or Federal Equivalent Method (Primary Monitor)

Monitoring Site	County/ AQS ID	98th Percentile 24-hour Concentration (µg/m³)			24-hour Design Value (µg/m³)	Required Sampling Frequency (Current Frequency)
		2009	2010	2011		
Meridian St. Luke's	Ada 160010010	17.0	12.3	29	19.4	1:3 **(1:3)**
St. Maries	Benewah 160090010	26.6	26.8	29	27.5	1:6 **(1:6)**
Nampa Fire Station	Canyon 160270002	18.3	14.9	23	18.7	1:6 **(1:6)**
Franklin	Franklin 160410001	40.3	70.0	40	50.1	1:6 **(1:3)**
Salmon	Lemhi 160590004	42.2*	34.7	37	38.0*	1:1 **(1:1)**
Pinehurst	Shoshone 160790017	34.7	36.0	43	37.9	1:1 **(1:1)**

Notes: 1- A monitor violates the 24-hour $PM_{2.5}$ NAAQS if the 3-year average of the annual 98th percentile 24-hour average exceeds 35 µg/m³.

* Values not meeting data completeness criteria are marked with an asterisk ("*").

3- SLAMS monitors that determine the design value for an area, with a design value within ±5 % of the daily NAAQS are required to operate on a daily basis.

4- SLAMS monitors that determine the design value for an area, with a design value within ±10 % of the daily NAAQS are required to operate every third day.

5- SLAMS monitors that determine the design value for an area, with design values in excess of ±10 % of the daily NAAQS are required to operate every sixth day.

6- NCore monitors are required to operate every third day.

2009 – 2011 PM2.5 Continuous SPM Monitoring Sites Design Values

Monitoring Site	County/AQS ID	98th Percentile 24-Hour Block Average Concentration (µg/m^3)			24-Hour Block Average Design Value (µg/m^3)
		2009	2010	2011	
Twin Falls	Twin Falls 160830010	17.0	13.2	14.6	15
Moscow	Latah 160570005	12.0	10.8	15.3	13
Grangeville	Idaho 160490002	10.1	11.2	8.4*	10
Lewiston	Nez Perce 160690012	15.0	17.7	15.3	16
Sandpoint	Bonner 160170005	14.7	14.1	12.8	14
Pocatello G&G	Bannock 160050015	17.7	10.3	14.0	14
McCall	Valley 160850002	18.0	13.7	19.5	17
Lancaster	Kootenai 160550003	10.1	11.1	11.7*	11
Ketchum	Blaine 160130004	9.0	5.5	9.0	8
Idaho Falls - Penford	Bonneville 160190011	8.5	9.7	9.7	9
Idaho City	Boise 160150001	16.2	17.1	16.8	17
Garden Valley	Boise 160150002	10.2	10.9	11.0*	11

Notes: 1- Data is "non-regulatory" due to special purpose monitor type
2- "na" = not applicable, 3-years of complete data is needed to calculate design value
* Monitors not meeting data completeness requirements are marked with an asterisk ("*").

2009-2011 O_3 Design Values

Site	County/ AIRS ID	4th – Highest Daily Maximum 8-hour Average (ppm)			3-year Design Value (ppm)
		2009	2010	2011	
Boise White Pine	Ada 160010017	0.073	0.069	0.062	0.068
Lancaster	Kootenai 160550003	0.056	0.056	0.058	0.056
Meridian St. Luke's	Ada 160010010	0.068	0.067	0.069*	0.068*
Boise ITD	Ada 160010019	0.062	0.064	0.060	0.062

Notes: 1- A monitor violates the 8-hour ozone NAAQS if the 3-year average of the annual 4th daily maximum average exceeds 0.075 ppm.
* Monitors not meeting data completeness requirements are marked with an asterisk ("*").

2009-2011 PM_{10} Design Values

Site	County/ AQS ID	Estimated Exceedances			3-year Estimated Exceedances
		2009	2010	2011	
Sandpoint	Bonner 160170005	0*	1*	0	0.3*
Pinehurst	Shoshone 160790017	0	1	0	0.3
Nampa	Canyon 160270002	0*	0	1	0.3*
Boise	Ada 160010009	0*	0	2.1	0.7*
Pocatello PM_{10} TEOM	Bannock 160050015	1.2	0	0	0.4

Notes: 1- A monitor violates the 24-hour PM_{10} NAAQS if the 3-year average of estimated exceedances (>150 µg/m^3) is more greater than 1.
* Monitors not meeting data completeness requirements are marked with an asterisk ("*").

2009- 2011 CO Design Values

Site	County/ AQS ID	1st / 2nd Highest 1-hour Average (ppm)		
		2009	2010	2011
Boise Eastman	Ada 160010014	10.0/9.5	28.1/7.5*	20.4/8.7
Meridian St. Luke's	Ada 160010010	3.4/3.2	1.3/1.2	1.4/1.4

Notes: 1- A monitor violates the 1- hour CO NAAQS if it exceeds 35 ppm more than once per year.
* Monitors not meeting data completeness requirements are marked with an asterisk ("*").

Site	County/ AQS ID	1st / 2nd Highest 8-hour Average (ppm)		
		2009	2010	2011
Boise Eastman	Ada 160010014	3.8/3.3	5.8/2.3*	4.5/1.6
Meridian St. Luke's	Ada 160010010	3.0/2.2	0.8/0.8	1.0/0.8

Notes: 1- A monitor violates the 8- hour CO NAAQS if it exceeds 9 ppm more than once per year.
* Monitors not meeting data completeness requirements are marked with an asterisk ("*").

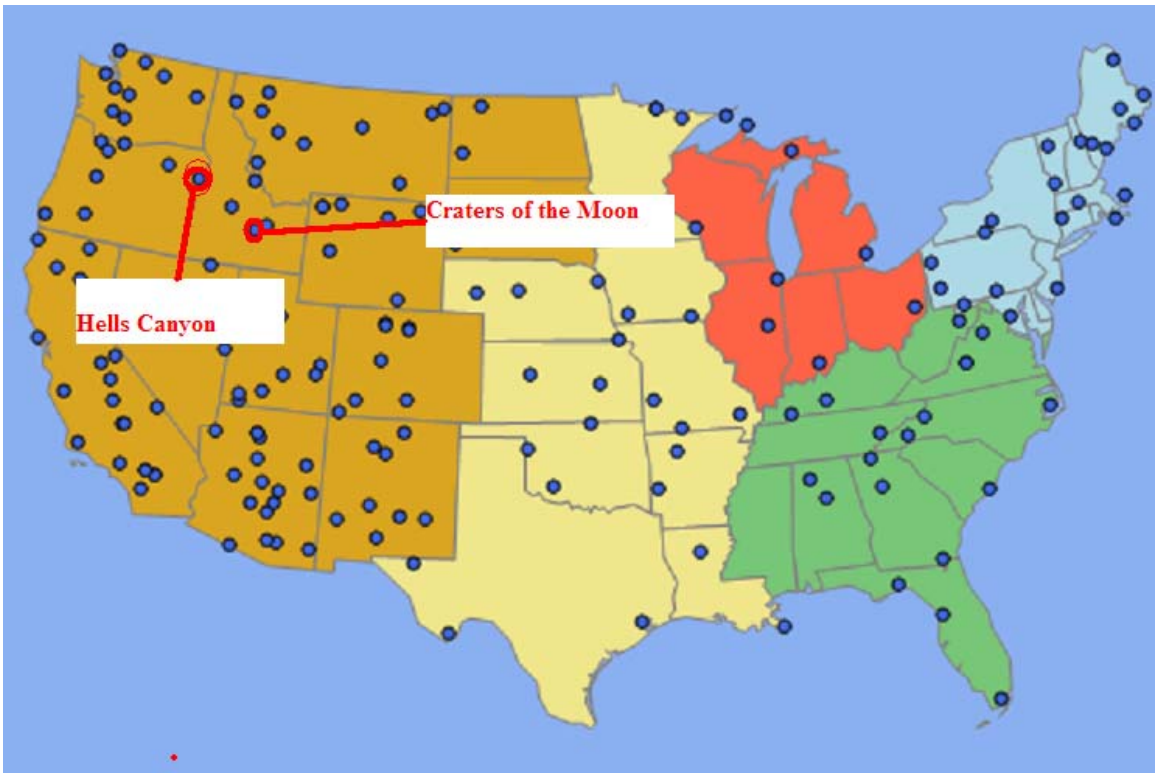
2009- 2011 SO_2 Design Values

Site	County/ AIRS ID	99th Percentile – Highest Daily Maximum 1-hour Average (ppm)			3-year Design Value (ppm)
		2009	2010	2011	
Pocatello STP	Bannock 160050004	0.058	0.053	0.075*	0.062
Soda Springs	Caribou 160290031	0.047	0.076	0.053	0.059
Meridian St. Luke's	Ada 160010010	0.006*	0.003	0.008	nsd

Notes: 1- A monitor violates the 1- hour SO_2 NAAQS if the 3-year average of the annual 99th percentile highest daily maximum 1-hour averages exceeds 75 ppb.
2- Monitors not meeting data completeness requirements are marked with an asterisk ("*").
3- "nsd" – insufficient data - 3 years of "complete" data are needed to calculate the design value

APPENDIX B

CRATERS OF THE MOON AND HELLS CANYON MONITORING STATIONS (IMPROVE NETWORK)



IMPROVE Monitoring Network

DEQ is leveraging the IMPROVE monitoring network to fulfill requirements for the $PM_{2.5}$ transport (Hell's Canyon) and $PM_{2.5}$ background (Craters of the Moon National Monument) monitoring sites.

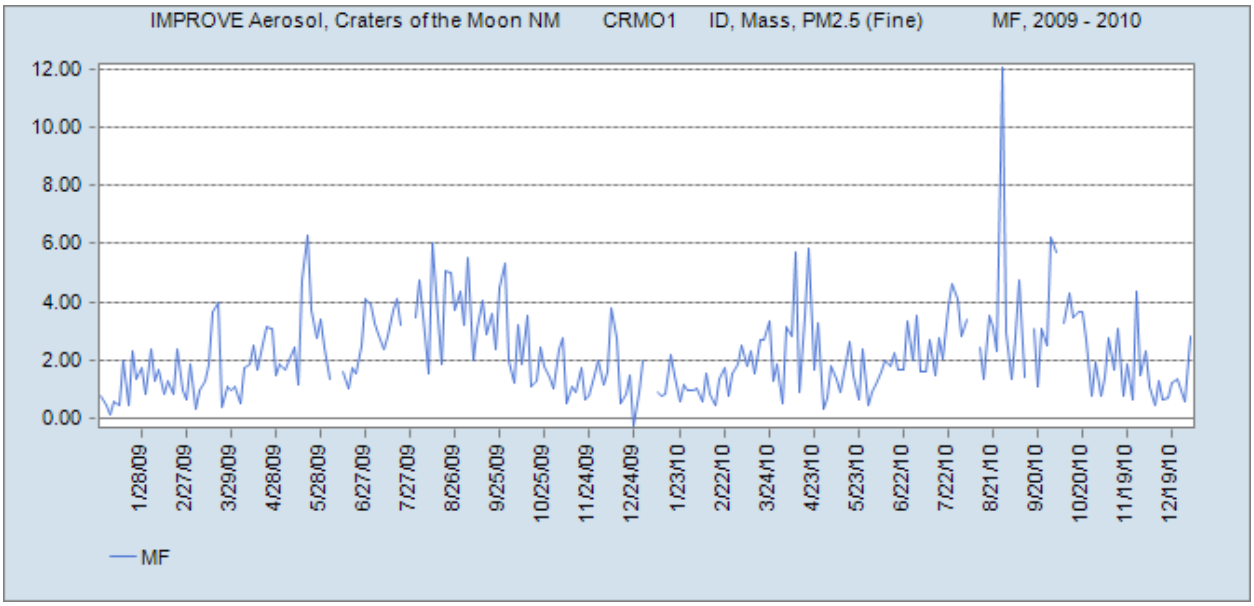
A history of the IMPROVE monitoring network can be found at: http://vista.cira.colostate.edu/improve/Default.htm. The IMPROVE program was initiated in 1985 as an extensive long term monitoring program to establish the current visibility conditions, track changes in visibility and determine causal mechanism for the visibility impairment in the National Parks and Wilderness Areas**.**

Craters of the Moon

Monitoring began at the Craters of the Moon site in 1992. Metadata for the site can be found at: http://vista.cira.colostate.edu/improve/Web/Sitebrowser/Sitebrowser.aspx?SiteID=69.

Raw data gathered at this site can be found at:
http://views.cira.colostate.edu/web/

Craters of the Moon sampling platform.



2009-2010 $PM_{2.5}$ measured at Craters of the Moon IMPROVE site.

The graph above shows the typical background concentration of $PM_{2.5}$ of 1-6 µg/m^3. On occasion the monitor is impacted by smoke from regional fires and other burning activities (e.g August 2010).

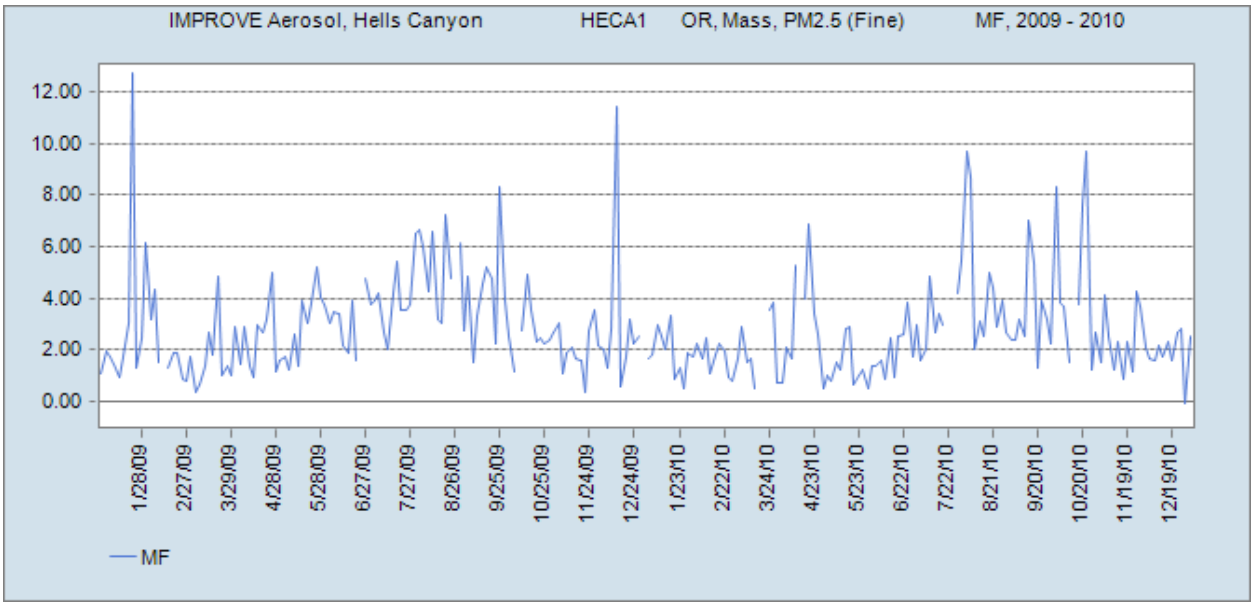
Hells Canyon

Monitoring began at the Hells Canyon site in 2001. Metadata for the site can be found at: http://vista.cira.colostate.edu/improve/Web/Sitebrowser/Sitebrowser.aspx?SiteID=69

Raw data gathered at this site can be found at: http://views.cira.colostate.edu/web/

Hells Canyon monitoring station.

The graph below shows the Hells Canyon $PM_{2.5}$ measurements for 2009-2010. Typical transport concentrations of 2-6 $\mu g/m^3$ are represented, however on occasion(s) values can be higher. Typically elevated levels of $PM_{2.5}$ are associated with either summer/fall smoke impacts or regional winter-time stagnation events.



2009-2010 $PM_{2.5}$ measured at Hell's Canyon IMPROVE site.