September 25, 2009
(Revised from original May 27, 2009 Document)

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

Idaho Department of Environmental Quality
Air Quality Division
1410 North Hilton
Boise, Idaho 83706

Introduction

The Clean Air Act passed by Congress in 1970 authorized the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants that threaten human health and welfare. Primary standards were set accordingly to safeguard public health and create a protective margin of safety for sensitive populations such as children, the elderly, and those with medical conditions that might be aggravated by these pollutants. Secondary standards were developed as well to protect the environment in which we live such as visibility and damage to agricultural crops, vegetation, buildings, etc.

The following seven pollutants, referred to as criteria pollutants, currently have a NAAQS: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter equal to or less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$), and lead (Pb).

The primary goal of the annual network review is to determine whether the state monitoring network is achieving its monitoring objectives and to identify any needed modifications. An effective network collects adequate, representative, and useful data. The air quality data collected by the Idaho Department of Environmental Quality's (DEQ) monitoring network is used for a the following purposes: determining compliance with the NAAQS, locating maximum pollutant concentrations, providing air quality index (AQI) forecasts, determination of the effects of air pollution on public health, tracking the progress of State Implementation Plans (SIPs), supporting dispersion models, reconciling emissions inventories, developing responsible and cost-effective pollution control strategies, and establishing air quality trends.

All monitors in the DEQ ambient air monitoring network are operated in accordance to Appendix A of 40CFR Part 58. DEQ's Quality Assurance Project Plan summarizes the quality assurance and quality control procedures implemented for routine network operation:

(http://www.deq.idaho.gov/air/data_reports/monitoring/qapp_1205_entire.pdf)

Stability in air monitoring networks is a positive attribute, as considerable lengths of time are required to establish air quality trends. Divesting in certain monitors is needed when additional data no longer adds to its interpretation. Also, the single-pollutant monitoring approach is no longer an optimal design due to recent air quality management trends, integrating the relationships of ozone, fine particulate matter, air toxics and regional haze. Providing air quality information to the public is also becoming a national monitoring priority.

This document identifies modifications to the DEQ ambient air monitoring network since the 2008 annual network review was completed and provides plans and proposals for modifications to the network for the upcoming year (Idaho SFY 2009 – July 1, 2009 through June 30, 2010).

EPA issued updated regulations in late 2006 for state and local agencies regarding the annual network review. This document provides as many of the following new requirements possible:

(1) The Air Quality System (AQS) 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 this part.

(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual PM2.5 NAAQS as described in §58.30.

(8) The MSA, CBSA, CSA or other area represented by the monitor.

Network Changes Made since the 2008 Network Review

The following network modifications have been made since the 2008 DEQ Network Review:

1. Pocatello G&G PM_{10} TEOM (16-005-0015) monitoring was reinstated December 31, 2008 when a replacement monitor was installed.
2. NNU $PM_{2.5}$ FRM (16-027-0004) was terminated June, 2008 - The monitor was relocated to NFS $PM_{2.5}$ (16-027-0002). Sampling began 6/6/08 at a 1:3 frequency.
3. Boise Mountain View $PM_{2.5}$ FRM (16-001-0011) sampling frequency was changed to 1:3 from 1:6 on 1/03/08.
4. Pinehurst precision $PM_{2.5}$ FRM (16-079-0017) sampling frequency was changed to 1:6 from 1:12 on 4/06/08.
5. Idaho City (16-015-0001) PM2.5 TEOM began operating year-round beginning June 2008.
6. St. Luke's (16-001-0010) continuous monitoring of trace levels of carbon monoxide, sulfur dioxide, and reactive oxides of nitrogen (NOy) began January, 2009.
7. St. Luke's (16-001-0010) year-round monitoring of ozone and NOx began January, 2009.
8. Data Acquisition System (DAS) equipment replacement implementation work begun – project completion date is 12/31/09.
9. Completed replacement of several $PM_{2.5}$ FRM, $PM_{2.5}$ TEOM, and PM_{10} TEOM monitors using funding supplied by the Idaho legislature. TEOM's will be reported as "un-corrected" until correlation to FRM methodology can be established.
10. Lancaster TEOM $PM_{2.5}$ (16-055-0003) monitor was added to the network to determine data correlation with Lakes Middle School TEOM $PM_{2.5}$ (16-055-0006) monitor.
11. Eastman (16-001-0014) TECO carbon monoxide monitor was replaced with a Teledyne M300 carbon monoxide monitor on 10/5/2008 due to equipment failure.

12. Idaho Falls TEOM $PM_{2.5}$ (16-019-0013) was moved to the Penford (16-019-0011) monitoring location.
13. Wendell (16-047-0001) meteorological tower was shut down due to poor site conditions and resulting equipment damage. An alternate location is being determined. Relocation project completion date is August, 2009.
14. The Sandpoint TEOM PM_{10} (16-017-0005) was moved and co-located with the Sandpoint TEOM $PM_{2.5}$ (16-017-0004) (approximately 1,500 feet distance from the current location). The move provides DEQ safer, more reliable, and more efficient operating conditions.
15. Whitney ozone monitoring site (16-001-0030) was decommissioned prior to the beginning of the 2009 monitoring season due to construction of the new school. Monitoring at White Pine Elementary (16-001-0017) began May 1, 2009 to satisfy highest census tract population density ozone monitoring requirements. St. Luke's (16-001-0010) and ITD (16-001-001) ozone monitoring sites continue un-changed.

Network Changes Proposed in this Document

The following DEQ ambient air monitoring network changes are being proposed in this 2009 Network Review:

1. St. Luke's (16-001-0010) meteorological tower to be moved approximately 30 feet adjacent to gas monitoring enclosure to support proper NOy reactor height installation - projected completion date is 7/01/09.
2. Lakes Middle School continuous $PM_{2.5}$ TEOM (16-055-0006) is expected to be shut down and removed from the network. Data correlation study is underway with a monitor located at the Lancaster site (16-055-0003) and expected to be complete January, 2010.
3. The Mountain View Elementary (16-001-0011) $PM_{2.5}$ FRM data indicates it is a duplicate monitor and therefore unnecessary for the Boise MSA. The monitor will be shut down. St. Luke's (16-001-0010) and NFS $PM_{2.5}$ (16-027-0002) FRM monitors will continue to operate.
4. The Mountain View Elementary (16-001-0011) continuous $PM_{2.5}$ TEOM data indicates it is a low value monitor. The monitor will be shut down. St. Luke's continuous $PM_{2.5}$ TEOM (16-001-0010) and NFS continuous $PM_{2.5}$ TEOM (16-027-0002) monitors will continue to operate for AQI forecasting use.
5. A new continuous $PM_{2.5}$ TEOM special purpose monitor (SPM) will be added to the network in Ketchum, Idaho (AIRS ID TBD).
6. Franklin $PM_{2.5}$ continuous BAM1020 special purpose monitor will be added to the network and collocated with the Franklin $PM_{2.5}$ FRM (16-041-0001).
7. Salmon $PM_{2.5}$ (16-059-0004) continuous TEOM $PM_{2.5}$ special purpose monitor will be replaced with a continuous BAM1020 $PM_{2.5}$ FEM monitor.
8. St. Luke's $PM_{2.5}$ (16-001-0010) continuous TEOM $PM_{2.5}$ special purpose monitor will be replaced with a continuous BAM1020 $PM_{2.5}$ FEM monitor.
9. NFS $PM_{2.5}$ (16-027-0002) continuous TEOM $PM_{2.5}$ special purpose monitor will be replaced with a continuous BAM1020 $PM_{2.5}$ FEM monitor.

10. Pinehurst $PM_{2.5}$ (16-079-0017) continuous TEOM $PM_{2.5}$ special purpose monitor will be replaced with a continuous BAM1020 $PM_{2.5}$ FEM monitor.
11. St. Maries $PM_{2.5}$ (16-009-0010) continuous TEOM $PM_{2.5}$ special purpose monitor will be replaced with a continuous BAM1020 $PM_{2.5}$ FEM monitor.
12. $PM_{10-2.5}$ (coarse) monitoring is expected to begin no later than January 2011 at the St. Luke's (16-001-0010) monitoring site. A low volume filter-based PM_{10} and $PM_{2.5}$ FRM monitor pair is expected to be installed at the site. The coarse fraction will be calculated based on the difference between $PM_{2.5}$ and PM_{10} measurements.
13. Data Acquisition System (DAS) equipment replacement implementation as necessary.
14. The DEQ Quality Assurance Project Plan will be updated to include recent changes in monitoring quality assurance requirements and improvements in internal operating procedures. Estimated project completion is December, 2009.

I.A PM_{10} Monitoring Network

Monitoring Requirements - Idaho PM_{10} Network
Five PM_{10} monitoring sites are currently in operation. These monitors support local SIPs and/or PM_{10} maintenance plans and will continue operation through 2010. PM_{10} monitoring site locations are selected to represent average population exposure to spatially representative PM concentrations in the middle, neighborhood, and urban scales.

Table 1 summarizes the PM_{10} network and NAAQS compliance for each station in 2008. The addresses and method codes for these monitors are located in Table 2.

DEQ moved the Sandpoint monitor approximately 1,500 feet to be co-located with the Sandpoint $PM_{2.5}$ monitor. No other adjustments to this portion of the network are planned during the 2009 – 2010 operating year.

Sources
Major sources of PM_{10} include agricultural tilling, motor vehicles, paved and unpaved road dust, wood stoves, outdoor and agricultural burning, and wildfires.

Table 1. DEQ PM_{10} Monitoring Network / 2008 NAAQS Data

Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Designation	4 Highest 24-Hr Values in µg/m³ (NAAQS = 150 µg/m³)
Sandpoint**	Bonner 160170005 +48.267500/ -116.572222		Continuous	Population exposure	TEOM (SLAMS*)	78 / 39 / 39 / 38
Pinehurst	Shoshone 160790017 +47.536389/ -116.236667		Continuous	Population exposure	TEOM (SLAMS)	86 / 59 / 55 / 50
Nampa	Canyon 160270002 +43.580310/ -116.562676	Boise City	Continuous	Population exposure	TEOM (SLAMS)	116 / 77 / 75 / 73
Boise	Ada 160010009 +43.618889/ -116.213611	Boise City	Continuous	Population exposure	TEOM (SLAMS)	92 / 91 / 75 / 67
Pocatello	Bannock 160050015 +42.876725/ -112.460347	Pocatello	1:3	Population exposure	Hi-vol (SLAMS)	68 / 50 / 49 / 48
Pocatello	Bannock 160050015 +42.876725/ -112.460347	Pocatello	1:12	Precision/Quality Assurance	Collocated Hi-vol (SLAMS)	68 / 48 / 45 / 42

*SLAMS = State and Local Air Monitoring Station = designations are given to those monitors that are federally required or have long-term monitoring objectives (NAAQS compliance, trends, etc.)
**Sandpoint – 4 Highest 24-Hr Values provided from previous site 16-017-0004.

Table 2. DEQ PM_{10} Monitoring Network / Addresses and Method Codes

Site	Address	Method Code
Sandpoint	310 S Division Ave, Sandpoint, ID 83864	079 - TEOM gravimetric analysis, instrumental - R&P SA246B-inlet
Pinehurst	106 Church St. Pinehurst, ID 83850	079 - TEOM gravimetric analysis, instrumental - R&P SA246B-inlet
Nampa	923 1st St S, Nampa, ID 83651	079 - TEOM gravimetric analysis, instrumental - R&P SA246B-inlet
Boise	16 Front, Boise, ID 83702	079 - TEOM gravimetric analysis, instrumental - R&P SA246B-inlet
Pocatello	Corner Garrett & Gould, Pocatello, ID 83204	079 - TEOM gravimetric analysis, instrumental - R&P SA246B-inlet
Pocatello	Corner Garrett & Gould, Pocatello, ID 83204	063 - Graseby Anderson/GMW Model 1200 High-Volume Air Sampler, Gravimetric

I.B Carbon Monoxide Network

Monitoring Requirements - Idaho CO Network

Monitoring for CO in the Treasure Valley began in 1977. Violations of the health-based standard for CO occurred every winter from 1977 until 1986. As a result of these high levels of CO, northern Ada County was designated a CO nonattainment area by EPA. To address northern Ada County's nonattainment classification, DEQ developed a CO air quality improvement plan that included a commitment to continue monitoring CO levels (Tables 3 and 4) and assurances that existing measures to control CO emissions, such as the vehicle emissions testing program in Ada County, will remain in effect. The plan also includes contingency measures that will be enacted if levels reach specified conditions.

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. Idaho runs one CO monitor at a middle scale (several city blocks in size ranging to several hundred meters to 0.5 km in representation). This Boise CO monitor was sited based on the maximum concentration identified through a saturation study performed in 1996. The demographics of the Treasure Valley have changed, but the urban canyon setting chosen for this site remains primarily the same.

Termination of this monitor could be justified by the data and the implementation of trace-level CO monitoring at the St. Luke's NCORE site; however, the Maintenance Plan will have to be modified and approved by EPA to achieve this change.

DEQ is not planning adjustment to this portion of the network during the 2009 – 2010 operating year.

Sources
Major sources of CO include on-road vehicles, non-road vehicles, and outdoor burning.

Table 3. DEQ CO Monitoring Network / NAAQS Data

						NAAQS 1-hr = 35ppm		
						1st/2nd High		
Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Designation	2006	2007	2008
Eastman	Ada 160010014 +43.616379/ -116.203817	MSA: Boise City	Continuous	Population Exposure	SLAMS	4.8/ 3.5	4.6/ 4.3	8.0/ 7.3
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	MSA Boise City	Continuous	Pop. Exposure	Proposed NCORE	-	-	*
						NAAQS 8-hr = 9 ppm		
						1st/2nd High		
Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Designation	2006	2007	2008
Eastman	Ada 160010014 +43.616379/ -116.203817	MSA: Boise City	Continuous	Population Exposure	SLAMS	2.1/ 2.1	1.7/ 1.6	2.9/ 2.9
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	MSA Boise City	Continuous	Pop. Exposure	Proposed NCORE	-	-	*

* Meridian St. Luke's CO monitor began operation in December, 2008. Monitoring data will become available in 2009.

Table 4. DEQ CO Monitoring Network / Addresses and Method Codes

Site	Address	Method Code
Eastman*	166 N. 9th, Boise, ID 83702	093 – Teledyne Advanced Pollution Instrumentation Gas Filter Correlation M300
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	593 - Teledyne Advanced Pollution Inst., Model 300EU

* Monitoring method changed during 2008 monitoring season when replacement instrument was installed.

I.C Sulfur Dioxide Network

Monitoring Requirements - Idaho SO_2 Network

Three (3) SO_2 monitors currently operate in Idaho. The Pocatello STP SLAMS monitor is a maximum concentration site used to assess impacts of local industrial emissions. The 5-Mile Soda Springs SPM monitor is also a maximum concentration site for assessing industrial impacts from a nearby source. The St. Luke's monitor is required for NCORE monitoring. These monitors operate in the neighborhood, middle, and urban scales, respectively. Both SO_2 monitoring locations in southeastern Idaho were identified as fence-line "hot spots" from conventional dispersion model applications.

DEQ is not planning further review of this portion of the network.

Sources

Major sources include large industrial facilities, indoor oil burning, and off-road vehicles and equipment.

Table 5. DEQ SO_2 Monitoring Network / NAAQS Data

Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Designation	NAAQS 24hr= 0.14 ppm		
						2006	2007	2008
						1st High/2nd High		
STP	Bannock 160050004 +42.916389/ -112.515833	UAR Pocatello	Continuous	Highest Conc.	SLAMS	0.027 / 0.024	0.026 / 0.024	0.028 / 0.023
5-Mile Soda Springs	Caribou 160290031 +42.695278/ -111.593889		Continuous	Highest Conc.	SLAMS	0.033 / 0.024	0.090 / 0.005	0.013 / 0.009
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	MSA Boise City	Continuous	Pop. Exposure	Proposed NCORE	-	-	*
						NAAQS 3-hr = 0.50 ppm (secondary std)		
						2006	2007	2008
						1st High/2nd High		
STP	Bannock 160050004 +42.916389/ -112.515833	UAR Pocatello	Continuous	Highest Conc.	SLAMS	0.064 / 0.061	0.052 / 0.051	0.068 / 0.061
5-Mile Soda Springs	Caribou 160290031 +42.695278/ -111.593889		Continuous	Highest Conc.	SLAMS	0.107 / 0.090	0.107 / 0.090	0.091 / 0.031
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	MSA Boise City	Continuous	Pop. Exposure	Proposed NCORE	-	-	*

* Meridian St. Luke's SO_2 monitor began operation in December, 2008. Monitoring data will become available in 2009.

Table 6. DEQ SO_2 Monitoring Network / Addresses and Method Codes

Site	Address	Method Code
STP	Batiste Chubbuck Rd, Pocatello, ID 83204	100 - Teledyne Advanced Pollution Instrumentation, Model 100A
5-Mile Soda Springs	5-Mile Rd., Soda Springs, ID 83276	060 - Thermo Environmental Inst. 43C, pulsed fluorescence
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	600 - Teledyne Advanced Pollution Inst., Model 100EU

I.D Ozone Network

Monitoring Requirements - Idaho Ozone (O_3) Network

DEQ currently operates three ozone monitors in the Treasure Valley, one in Kootenai County on the Rathdrum Prairie near Coeur d'Alene, and there are plans for a fourth Treasure Valley ozone monitor in the west end of the MSA.

Effective in 2008, the 8-hour NAAQS for ozone was reduced from 0.08 ppm to 0.075 ppm. With the continued growth in the Treasure Valley airshed, DEQ intends to monitor ozone indefinitely at the neighborhood to urban scale. DEQ will continue to evaluate the new ozone monitoring locations and assess whether representative daily maximum 8-hour ozone concentrations are being captured at the current monitoring sites. If not, DEQ will propose new locations for these monitors.

The original monitoring sites in the Treasure Valley were chosen in accordance to EPA guidance to represent the maximum population density and the maximum-concentration downwind of the urban center. An ozone saturation study conducted in 2004 indicated a need to relocate the maximum concentration downwind site to within the Boise city limits. To better capture the maximum downwind concentrations inside the Treasure Valley, the East of Boise location in Elmore County (Simco Road) was moved to the ITD location on State Street.

In 2007 a study was performed to analyze ambient levels of ozone and its precursors to obtain a better understanding of conditions that lead to the occurrence of elevated ozone levels in the Treasure Valley (http://www.deq.idaho.gov/air/data_reports/reports/ada_co/ozone_treasure_valley_report.pdf). The study findings provided DEQ with valuable insights into the factors that affect ozone formation in the Treasure Valley. The study confirmed that the existing network of ozone monitors provided good representation of the air quality of the Treasure Valley. However, a recommendation was made to expand the network to include an upwind transport site and a southeast Boise site in addition to the existing monitors. Due to the cost to purchase and operate additional monitors, DEQ has not yet pursued these recommendations.

The 2007 study findings provided DEQ with valuable information on the concentrations of ozone at various locations throughout the Treasure Valley. Although the monitors used to collect much of the data in the study are not Federal Equivalent or Federal Reference Methods whose data can be used for direct comparison to the National Ambient Air Quality Standards, the trending is consistent with what is expected because of local topography and air movement.

Figure 1 below demonstrates that typical conditions provide southeasterly flow in the morning that then shifts to northwesterly flow in the afternoon when ozone concentrations begin to build. Given this, sites in the southeastern parts of the valley would reasonably be expected to exhibit the highest concentrations of ozone as air flow is pushing ozone and its' precursors to those locations during peak ozone hours.

Figure 1. Average Meteorological observations from 2007 Precursor study

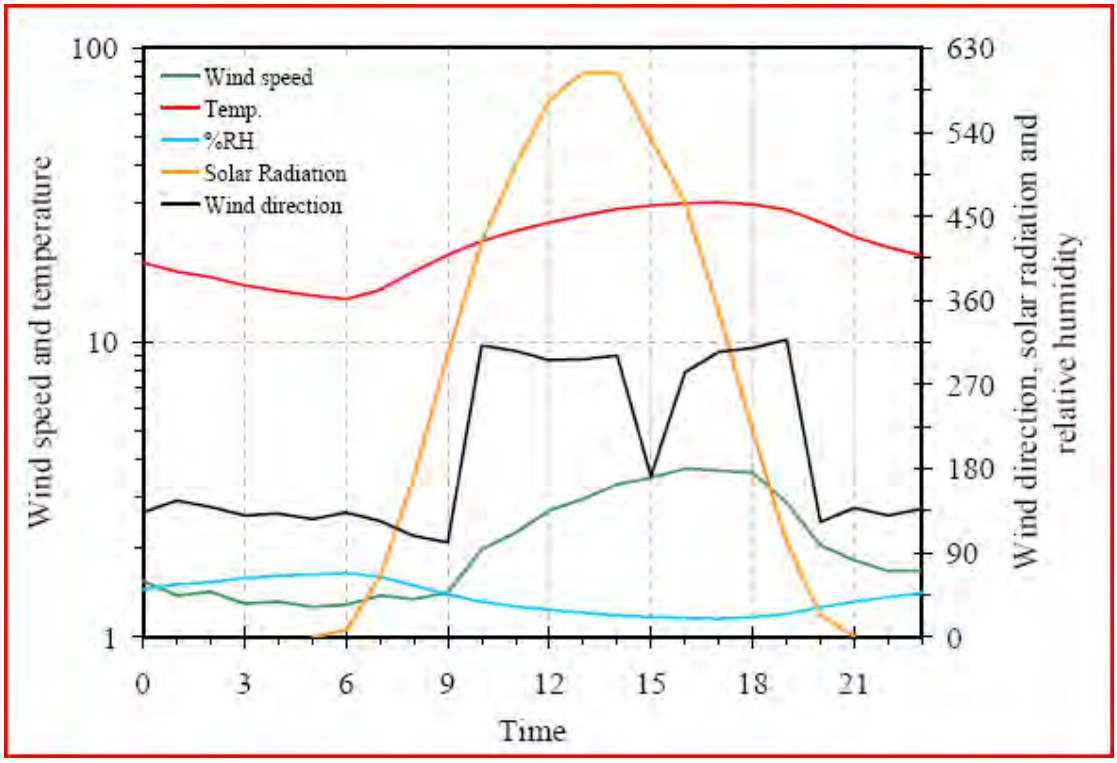
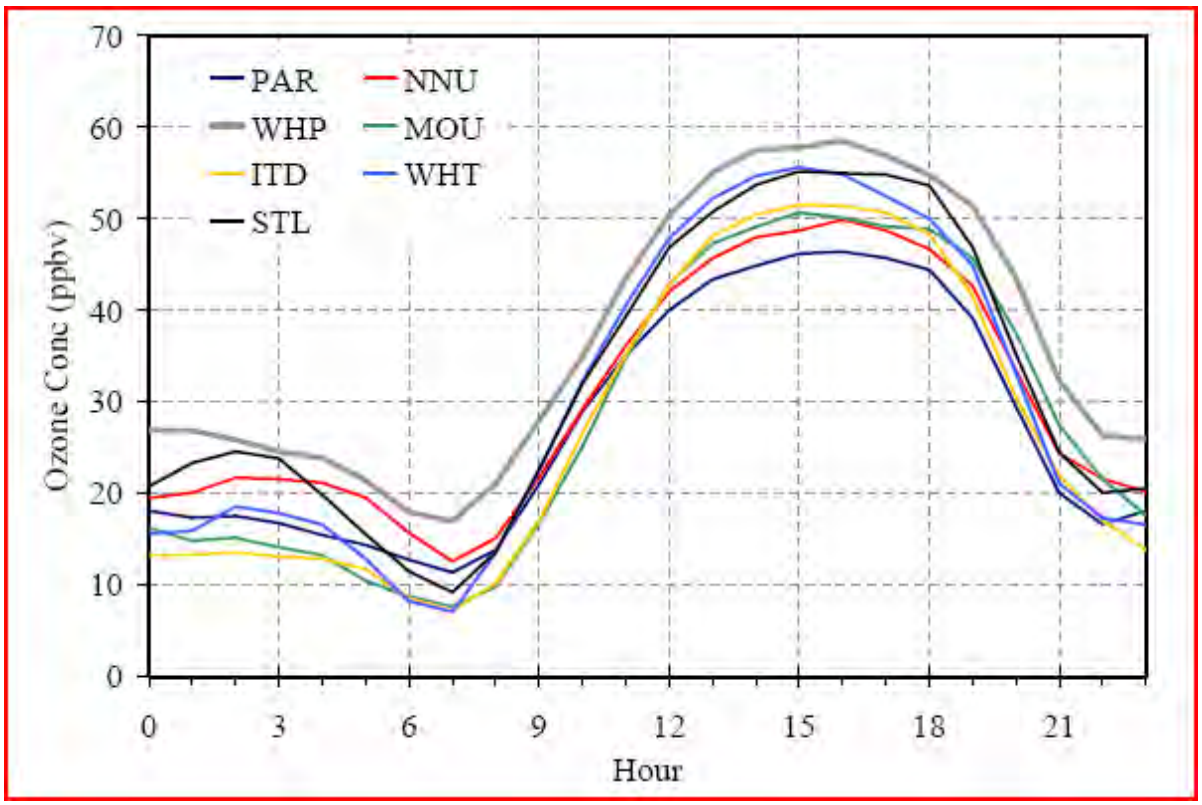


Figure 2. Relative location of 2007 study Ozone Monitors (Yellow and Green balloons)

Parma – Study boundary site northwest of Boise. Represents upwind background concentrations
Nampa – Located at Northwest Nazarene University above the influence of I-84
St. Luke's – Located at St. Luke's Hospital in Meridian, I-84 and Eagle Rd.
Mountain View – Located at Mountain View Elementary on the Boise bench above Garden City near Cole and Mountain View Dr.
ITD – Located at the Idaho Department of Transportation headquarters off State St.
Whitney – Located at Whitney Elementary on the Boise bench, 2 miles from the airport, Overland and Owyhee streets.
White Pine – Located at White Pine Elementary. Represents study boundary on the southeast side of Boise. Area of likely peak ozone concentrations.

Figure 3. Comparison of Average hourly Ozone Monitor observations



PAR = Parma
WHP = White Pine
ITD = Idaho Transportation Department
STL = St. Luke's Hospital
NNU = Northwest Nazarene University (Nampa)
MOU = Mountain View Elementary
WHT = Whitney Elementary

In 2008, the Boise School District began construction of a new Whitney Elementary School scheduled to open the fall of 2009. Construction and demolition activities prevented DEQ from monitoring at the Whitney location for the entire 2009 monitoring season. The 2007 ozone precursor study suggested that the White Pine site was likely a peak ozone concentration site for the Treasure Valley (figures 2 and 3). Given that the White Pine and Whitney sites are also similar in their population density representation the site was chosen as a replacement site to better monitor for and issue advisories for adverse public health conditions. DEQ received EPA approval to move the monitor operated at Whitney to the White Pine location to represent the highest census tract population density monitoring requirement. An additional benefit to monitoring at the White Pine site is that it will provide information on ozone concentrations in the eastern Boise metro area consistent with the 2007 precursor study recommendations.

Over the last three (3) years, the ITD and Whitney data correlate well on average. During the last two (2) years, ITD ozone concentrations have been slightly higher than Whitney. Each monitoring site represents a different monitoring objective. The ITD monitoring site represents the highest probable concentration. The Whitney monitoring site represented the highest census tract population density.

Figure 4. Daily 8-hour Maximum Ozone Concentration Comparison – 2006 ITD / Whitney

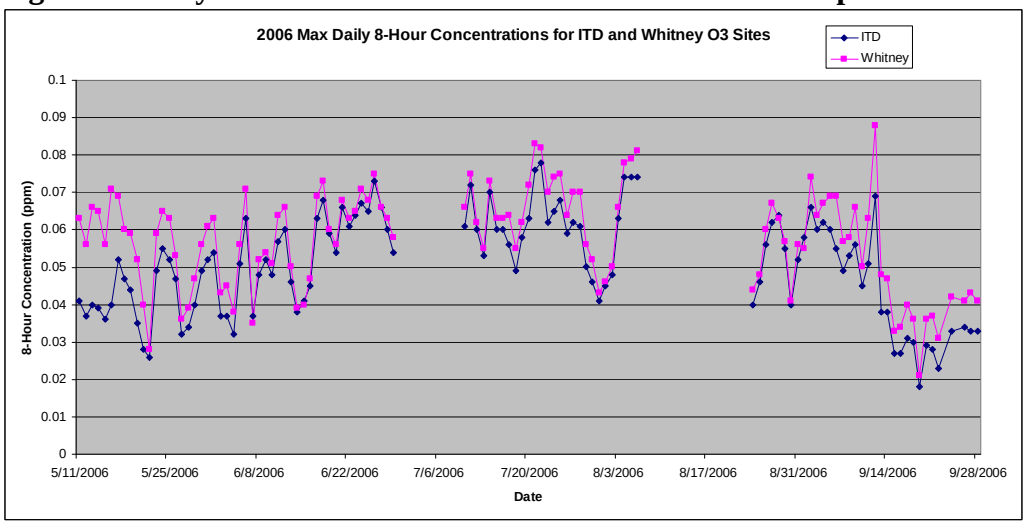


Figure 5. Daily 8-hour Maximum Ozone Concentration Comparison – 2007 ITD / Whitney

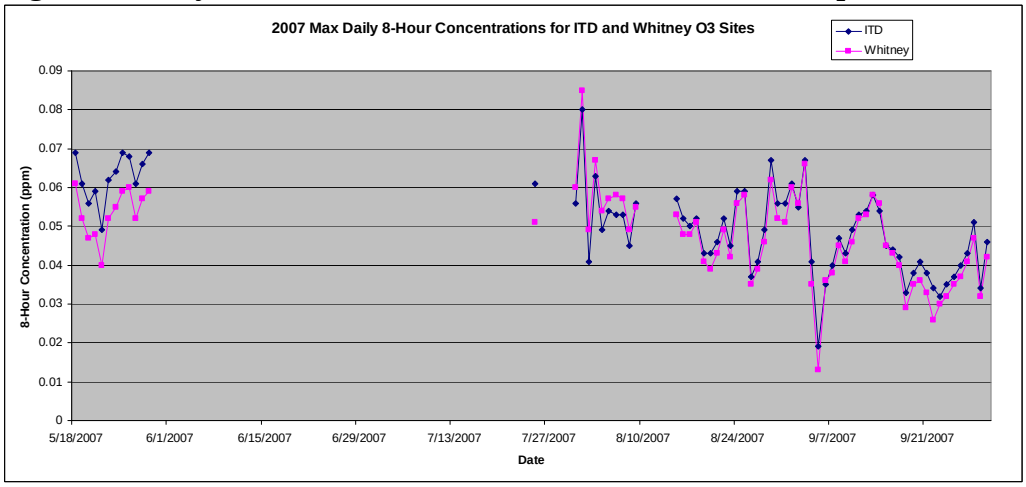
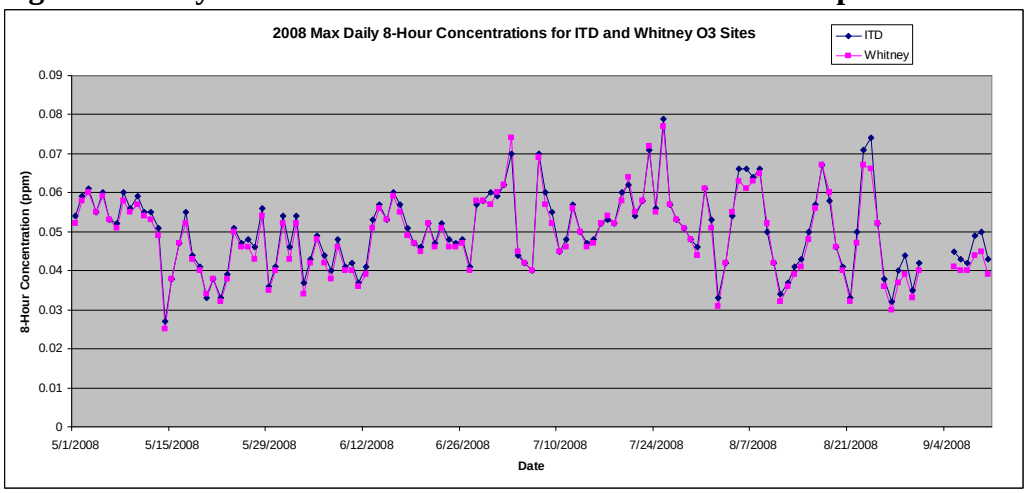


Figure 6. Daily 8-hour Maximum Ozone Concentration Comparison – 2008 ITD / Whitney

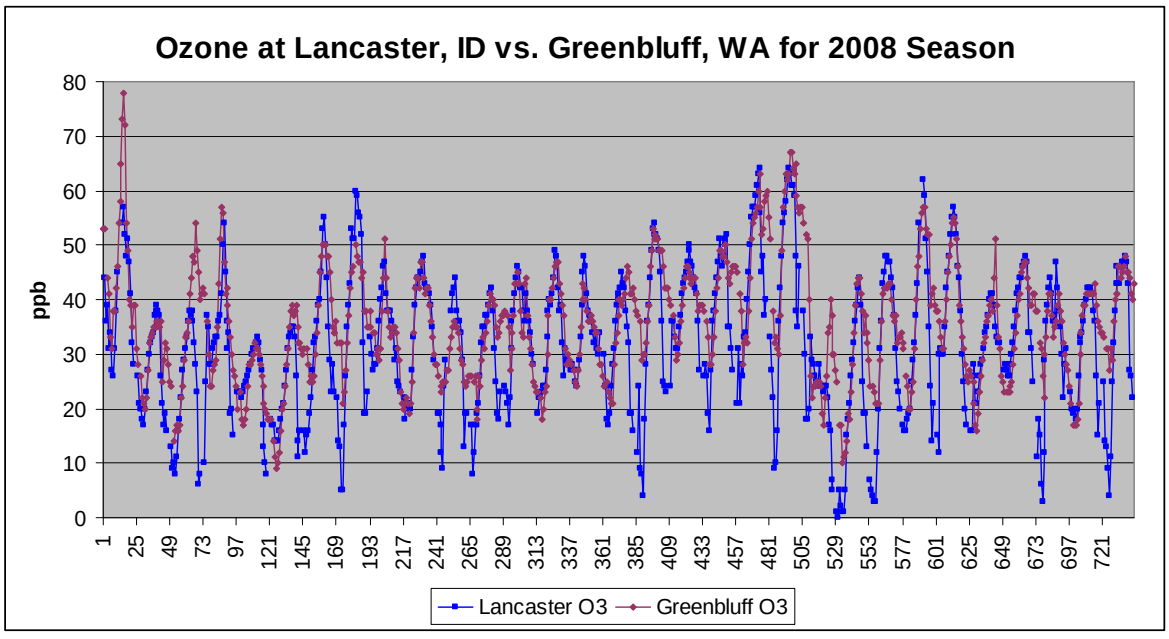


Gaps in graphs are due to data missing from one or both monitors. Graph shows only common days.

DEQ began monitoring ozone in the Coeur d'Alene area during the summer of 2005. EPA does not require DEQ to monitor ozone in this area based upon federal rules. DEQ initiated ozone monitoring in Kootenai County because it realized Kootenai County is "downwind" from Spokane, and AIRNOW maps were showing Kootenai County to be in the "moderate" category on a number of days during the ozone season. As a first step to characterize ozone concentrations in the greater Coeur d'Alene area DEQ installed a monitoring site north of Hayden, Idaho to measure potential maximum concentrations. Suitability of this site was determined through understanding of basic ozone development criteria and an assumption that a majority of ozone forming pollutant sources were located west of Kootenai County. Ozone requires at least 3 hours of heat and intense sunlight to allow the chemical reaction for the formation of ozone to build to maximum concentrations. Predominate southwesterly winds and average wind speeds during the ozone season indicated this site would likely measure the maximum concentrations in Kootenai County. Site security, accessibility, and potential interference by nearby activity are also considered when identifying any monitoring site. DEQ relied on EPA's Guidelines on Ozone Monitoring Site Selection EPA-454/R-98-002 to help select the monitoring site at Lancaster. The Lancaster site is currently the only monitoring site for ozone located within Kootenai County.

The Lancaster site located on the Rathdrum Prairie in Kootenai County represents urban scale ozone exposure of 4- to 50- km. Kootenai County has experienced growth over the past few years and shares similar air quality conditions with adjacent Spokane County, Washington. For the 2008 ozone season Lancaster data and Spokane Greenbluff data correlate very well which indicates a regional interstate relationship to ozone concentrations.

Figure 7. Comparison of Lancaster, ID ozone site to Greenbluff WA



DEQ will continue to evaluate the ozone monitoring location and assess whether daily maximum 8-hour ozone concentrations are being accurately captured at the current monitoring site. If not, DEQ will propose new locations for these monitors.

DEQ intends to add a fourth Treasure Valley ozone monitor at the Purple Sage site in Caldwell as an upwind transport site when resources allow.

Sources

Ozone is not typically emitted directly from a pollution source. It forms in the lower atmosphere through reaction of nitrogen oxides (NO_x) and certain volatile organic compounds (VOCs) in the presence of warm temperatures and ample sunshine. NO_x sources include on-road and nonroad vehicles and large industrial facilities. VOC sources include asphalt paving, on-road and nonroad vehicles, wood burning, solvent use, and industrial facilities. These precursor pollutants (NO_x and VOCs) might travel great distances before forming O_3.

Table 7. DEQ O_3 Monitoring Network / NAAQS Data

				NAAQS = 0.075 ppm daily 8-hour max		Max Daily 8-Hr Avg, 4th Highest (ppm)		
Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Desig-nation	2006	2007	2008
Boise Whitney	Ada 160010030 +43.589464/ -116.223462	MSA Boise City	Continuous	Population Exposure / Highest Census Tract	SLAMS	0.082	0.076	0.069
Lancaster	Kootenai 160550003 +47.788908/ -116.804539		Continuous	Population Exposure	SLAMS	0.068	0.067	0.058
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	MSA Boise City	Continuous	Population Exposure	Proposed NCORE		0.068*	0.071
Boise ITD	Ada 160010019 +43.634585/ -116.233919	MSA Boise City	Continuous	Population Exposure / Maximum Concentration	SLAMS	0.074	0.080*	0.071

*Monitor did not meet 75% monthly data completeness requirements.

Table 8. DEQ O_3 Monitoring Network / Addresses and Method Codes

Site	Address	Method Code
Boise Whitney	Whitney Elementary School, Boise, ID 83705	087 - Teledyne Advanced Pollution Inst., Model 400E
Lancaster	N. of Lancaster Rd. Hayden, ID 83666	087 - Teledyne Advanced Pollution Inst., Model 400E
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	087 - Teledyne Advanced Pollution Inst., Model 400E
Boise ITD	311 W. State St. Boise, ID 83703	087 - Teledyne Advanced Pollution Inst., Model 400E
Boise White Pine	401 East Linden St. Boise, ID 83706	087 - Teledyne Advanced Pollution Inst., Model 400E

I.E Nitrogen Dioxide (NO_2) Network

Monitoring Requirements - Idaho NO_2 Network

NO_2 will be monitored at the St. Luke's NCORE site on a year-round schedule and during ozone season (May through September) at the ITD and Lancaster sites. The St. Luke's site also has the capability to monitor low ("trace") levels of NO, NO_2, and total NO_y. The St. Luke's monitor began a year-round monitoring schedule in 2009 so data can be used for NO_2 NAAQS compliance assessment, while the main objective of all three monitors is to assess the role of NO_x compounds in ozone production.

Sources

NO_x sources include on-road and non-road vehicles and large industrial facilities.

Table 9. DEQ NO_2 Monitoring Network / NAAQS Data Assessment

				NAAQS = 0.053 ppm Annual Arithmetic Mean		Annual Seasonal Arithmetic Mean*		
Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Designation	2006	2007	2008
Lancaster	Kootenai 160550003 +47.788908/ -116.804539		Continuous	Population Exposure	SPM	0.006	0.006	0.003
Boise ITD	Ada 160010019 +43.634585/ -116.233919	MSA Boise City	Continuous	Population Exposure	SPM		0.004	**
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	MSA Boise City	Continuous	Population Exposure	Proposed NCORE		0.003	**

* These monitors were operated during ozone season (May through September), reported values are for the season.

** Boise ITD and Meridian St. Luke's sites were not operated during 2008. Operation for 2009 is planned.

Table 10. DEQ NO_2 Monitoring Network / Addresses and Method Codes

Site	Address	Method Code
Lancaster	N. of Lancaster Rd. Hayden, ID 83666	099 - Teledyne API, Model 200E
Boise ITD	311 W. State St. Boise, ID 83703	099 - Teledyne API, Model 200E
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	099 - Teledyne API, Model 200E 599 - Teledyne API, Model 200EU (NOy)

I.F $PM_{2.5}$ Network

Monitoring Requirements - Idaho $PM_{2.5}$ Network

A $PM_{2.5}$ monitoring network review and assessment are conducted separately each year as part of the 103-grant application process. DEQ used this review and analyses for our recent $PM_{2.5}$ nonattainment area recommendations and crop residue disposal SIP revision to determine monitoring priorities. During the latter half of 2008, DEQ began to use provided state funds to replace aging monitors in the $PM_{2.5}$ network, to add monitors in locations of sparse sampler coverage impacted by field burning and wildfire, to replace data acquisition software and enhance the real-time air quality data posted on the DEQ web site. This work is expected to be complete during 2009.

For 2009, DEQ has retained a "core network" of six $PM_{2.5}$ FRMs monitoring stations in five airsheds due to the potential exceedance of the 24-hour $PM_{2.5}$ NAAQS. Pinehurst, St. Maries, Franklin, Boise/Nampa, and Salmon comprise this network. Of these five airsheds, Pinehurst (Shoshone County) and Franklin (Franklin County / Cache Valley, Utah) were designated nonattainment for the 24-hour $PM_{2.5}$ NAAQS based on 2005 – 2007 monitoring data. DEQ has petitioned EPA to reverse non-attainment designation for Pinehurst based on 2006 – 2008 monitoring data.

DEQ monitors $PM_{2.5}$ year-round at the 19 sites listed in Table 11. The $PM_{2.5}$ TEOMs support DEQ's air quality forecasting and smoke management programs. The continuous $PM_{2.5}$ monitors (TEOMs) are not Federal Reference or Federal Equivalent Methods and therefore are not used for NAAQS compliance assessment(s). Their stated purpose is to collect data necessary for DEQ to provide daily AQI/air quality forecasts and support emergency response for episodes such as fire.

Smoke impacts from wildfire can cause high $PM_{2.5}$ conditions in Idaho, but wintertime air stagnation episodes typically cause the highest ambient air $PM_{2.5}$ in Idaho's airsheds. $PM_{2.5}$ sources include wood and agricultural burning, wildfires, on-road and non-road vehicles, and secondary formation through chemical reaction in the atmosphere. Continued growth in Idaho's monitored communities has led to increased emissions of fine particulate and precursor compounds in Idaho's airsheds. DEQ expects growth to continue for the next five (5) years and will keep its' core $PM_{2.5}$ FRM network operational to assess compliance to the $PM_{2.5}$ NAAQS. Data from this network will also help assess the effectiveness of measures DEQ has implemented in some communities, such as wood stove change outs.

Sources

$PM_{2.5}$ sources include wood and agricultural burning, wildfires, on-road and non-road vehicles, and secondary formation through chemical reaction in the atmosphere.

Table 11. DEQ $PM_{2.5}$ Monitoring Stations

Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Type	Monitor Designation	**Design Value/Years of Record**
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	Boise City	1:3	Chemical Speciation	Speciation (STN)	Proposed NCORE	
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	Boise City	1:3	Population Exposure-NAAQS	Sequential FRM	Proposed NCORE	28 µg/m^3 / 2006-2008
Meridian St. Luke's*	Ada 160010010 +43.607568/ -116.348434	Boise City	Continuous	AQI	TEOM	Proposed NCORE	25 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Boise	Ada 160010011 +43.636111/ -116.270278	Boise City	1:3	Population Exposure-NAAQS	Sequential FRM	SLAMS	26 µg/m^3 / 2006-2008
Boise*	Ada 160010011 +43.636111/ -116.270278	Boise City	Continuous	AQI	TEOM	SLAMS	27 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Pocatello*	Bannock 160050015 +42.876725/ -112.460347	Pocatello	Continuous	AQI	TEOM	SLAMS	17 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
St. Maries	Benewah 160090010 +47.316667/ -116.570280		1:6	Population Exposure-NAAQS	Sequential FRM	SLAMS	28 µg/m^3 / 2006-2008
St. Maries*	Benewah 160090010 +47.316667/ -116.570280		Continuous	AQI	TEOM	SLAMS	26 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Idaho City*	Boise 160150001 +43.823017 -115.838557		Continuous	AQI	TEOM	SLAMS	23.5 µg/m^3 / 2006 (98^{th}) 24.2 µg/m^3 / 2008 (98^{th}) *** See note on non-FRM/FEM design values**
Garden Valley*	Boise 160150002 +44.104498 -115.972386		Continuous (Seasonal)	AQI	TEOM	SLAMS	41.3 µg/m^3/ 2006 (98^{th}) *** See note on non-FRM/FEM design values**

Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Type	Monitor Designation	**Design Value/Years of Record**
Sandpoint*	Bonner 160170005 +48.267500/ -116.572222		Continuous	AQI	TEOM	SLAMS	23 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Idaho Falls*	Bonneville 160190011 +43.464700/ -112.046450	Idaho Falls	Continuous	AQI	TEOM	SLAMS	21.5 µg/m^3 / 2008 (98th) *** See note on non-FRM/FEM design values**
Nampa**	Canyon 160270002 +43.580310/ -116.562676	Boise City	1:3	Population Exposure-NAAQS	Sequential FRM	SLAMS	27 µg/m^3 / 2008 ** **See note on years of record**
Nampa***	Canyon 160270004 +43.562401/ -116.563232	Boise City	1:6	Population Exposure-NAAQS	Sequential FRM	SLAMS	26 µg/m^3 /2006-2008 *** **See note on years of record**
Nampa*	Canyon 160270002 +43.580310/ -116.562676	Boise City	Continuous	AQI	TEOM	SLAMS	20.1 µg/m^3 / 2008 (98th) *** See note on non-FRM/FEM design values**
Franklin	Franklin 160410001 +42.013333/ -111.809167		1:6	Population Exposure-NAAQS	Sequential FRM	SLAMS	27 µg/m^3 / 2006-2008 Note: 2007 data completeness requirements were not met.
Grangeville*	Idaho 160490002 +45.931389/ -116.115278		Continuous	AQI	TEOM	SLAMS	22 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Coeur d'Alene*	Kootenai 160550006 +47.682315/ -116.765530	Kootenai County	Continuous	AQI	TEOM	SLAMS	26 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Moscow*	Latah 160570005 +46.721932/ -116.959180		Continuous	AQI	TEOM	SLAMS	19 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Salmon****	Lemhi 160590004 +45.170556/ -113.892222		1:6	Population Exposure-NAAQS	Sequential FRM	SLAMS	47 µg/m^3 / 2007-2008 **** See note on Exceptional Event request**
Salmon*	Lemhi 160590004 +45.170556/ -113.892222		Continuous	AQI	TEOM	SLAMS	28 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Lewiston*	Nez Perce 160690012 +46.404722/ -116.968889		Continuous	AQI	TEOM	SLAMS	23 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**

Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Type	Monitor Designation	**Design Value/Years of Record**
Pinehurst	Shoshone 160790017 +47.536389/ -116.236667		1:1	Population Exposure-NAAQS	Primary Sequential FRM	SLAMS	34 µg/m^3 / 2006-2008
Pinehurst	Shoshone 160790017 +47.536389/ -116.236667		1:6	Population Exposure-NAAQS	Precision Sequential FRM	SLAMS	
Pinehurst	Shoshone 160790017 +47.536389/ -116.236667		Continuous	AQI	FDMS	SLAMS	41 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
Twin Falls	Twin Falls 160830010 +42.564097/ -114.446200		Continuous	AQI	TEOM	SLAMS	18 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**
McCall	Valley 160850001 +44.899318 -116.093914		Continuous	AQI	TEOM	SLAMS	38 µg/m^3 / 2006-2008 *** See note on non-FRM/FEM design values**

* Continuous PM2.5 monitors listed are not Federal Reference Method or Federal Equivalent Method monitors. Design values shown for these monitor types are for reference only and should not be used to assess NAAQS compliance. When three (3) years of complete data are not available to calculate the design value, the data shown is the 98th percentile for the year of record(s) indicated. Garden Valley is a seasonal monitor and the 98th percentile value listed does not represent year-round conditions.
** Nampa Fire Station site operational June 2008. Design value indicated represents partial year 2008.
*** Nampa Northwest Nazarene University site terminated June 2008. Design value indicated represents 2006, 2007, and partial year 2008.
**** DEQ has flagged some data from 2007 in Salmon as an exceptional event caused by nearby wildfires and submitted information to EPA. DEQ is still awaiting EPA concurrence on the exceptional event designation request. Design value indicated includes data flagged as an exceptional event.

Table 12. DEQ $PM_{2.5}$ Monitoring Stations / Addresses and Method Codes

Site	Address	Method Codes
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	701 & 703 - R&P TEOM, Gravimetric Analysis, PM2.5 SCC w/ no correction factor
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	118 - R&P Model 2025 PM2.5 Sequential Sampler w/ WINS, Gravimetric
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	810 - MetOne SASS
Boise	3500 Cabarton Lane, Boise, ID 83704	118 - R&P Model 2025 PM2.5 Sequential Sampler w/ WINS, Gravimetric
Boise	3500 Cabarton Lane, Boise, ID 83704	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Pocatello	Corner Garrett & Gould, Pocatello, ID 83204	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
St. Maries	Forest Service Bldg St. Maries, ID 83666	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
St. Maries	Forest Service Bldg St. Maries, ID 83666	145 - R&P Model 2025 PM2.5 Sequential Sampler w/ VSCC, Gravimetric
Idaho City	3851 Hwy 21 Garden City, ID 83631	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Garden Valley	946 Banks Lowman Rd Garden Valley, ID 83622	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Sandpoint	1601 Ontario St. Sandpoint ,ID 83864	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Idaho Falls	Hickory and Sycamore St., Idaho Falls, ID 83402	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Nampa	923 1st St S, Nampa, ID 83651	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Nampa	923 1st St S, Nampa, ID 83651	118 - R&P Model 2025 PM2.5 Sequential Sampler w/ WINS, Gravimetric
Franklin	East 4800 South Road	118 - R&P Model 2025 PM2.5 Sequential Sampler w/ WINS, Gravimetric
Grangeville	USFS Compound Grangeville, ID 83530	702 & 704 - R&P TEOM Gravimetric Analysis PM2.5 SCC w/ correction factor
Coeur d'Alene	Lancaster Road, Hayden, ID 83835	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Coeur d'Alene	930 N. 15th Coeur d'Alene, ID 83814	702 & 704 - R&P TEOM Gravimetric Analysis PM2.5 SCC w/ correction factor
Salmon	N Charles St. Salmon, ID 83467	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Salmon	N Charles St. Salmon, ID 83467	145 - R&P Model 2025 PM2.5 Sequential Sampler w/ VSCC, Gravimetric

Site	Address	Method Codes
Pinehurst	106 Church St. Pinehurst, ID 83850	145 - R&P Model 2025 PM2.5 Sequential Sampler w/ VSCC, Gravimetric
Pinehurst	106 Church St. Pinehurst, ID 83850	118 - R&P Model 2025 PM2.5 Sequential Sampler w/ WINS, Gravimetric
Pinehurst	106 Church St. Pinehurst, ID 83850	761 - R&P FDMS - Gravimetric Analysis, PM25. VSCC (Prior to May 30, 2007: 717 & 718 - R&P TEOM - gravimetric Analysis, PM2.5 VSCC w/ correction factor)
Twin Falls	1913 Addison Ave E, Twin Falls, ID 83301	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor
Lewiston	1200 29th St Lewiston, ID 83501	702 & 704 - R&P TEOM Gravimetric Analysis PM2.5 SCC w/ correction factor
Moscow	1025 Plant Sciences Rd Moscow, ID 83843	702 & 704 - R&P TEOM Gravimetric Analysis PM2.5 SCC w/ correction factor
McCall	500 N. Mission St, McCall ID 83638	715 & 716 - TEOM Gravimetric Analysis PM2.5 VSCC w/ no correction factor

I.G Meteorological Network

DEQ currently operates thirteen (13) ten-meter meteorological stations. Six sites are located in the northern Idaho cities of Pinehurst, Sandpoint, Moscow, Lewiston, Grangeville, and Hayden (site named for Lancaster Rd.); two sites run in Boise; and there is one each in Salmon, Pocatello, Wendell (new location to be determined in 2009), Meridian, and Caldwell.

Meteorological measurements are used to support air quality index forecasting and air quality modeling analyses. DEQ is adjusting and standardizing the meteorological parameters collected to ensure the required inputs for regulatory (e.g. AERMOD) and airshed (e.g. Calpuff) models are provided.

Table 13. DEQ Meteorological Monitoring Stations and parameters

Site	Address	Meteorological Parameters Monitored
Boise	Ada County Fairgrounds, Garden City, ID 83714	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)
Grangeville	USFS Compound Grangeville, ID 83530	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)
Lancaster	N. of Lancaster Rd. Hayden, ID 83666	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);

Site	Address	Meteorological Parameters Monitored
Lewiston	1200 29th St Lewiston, ID 83501	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)
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	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);
Moscow	1025 Plant Sciences Rd Moscow, ID 83843	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	106 Church St. Pinehurst, ID 83850	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);
Pocatello	Corner Garrett & Gould, Pocatello, ID 83204	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)
Purple Sage	15192 Purple Sage Rd. Caldwell, ID 83605	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	0.8 Miles South of Hwy 93/48 Intersection, Salmon ID 83468	2 m. temp. (°C); Barometric Pressure (mbar); Relative Humidity (%RH); Wind Direction (Degrees); Wind Speed (m/s); Solar Radiation (Watt/cm2)
Sandpoint	U of I Research Center, 2105 N. Boyer Ave. Sandpoint, ID 83864	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)
Warm Springs	Warm Springs Golf Course, 2495 W Warm Springs Ave, Boise ID 83712	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);
Wendell	New site to be determined in 2009	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)

I.H National Community-oriented (NCORE) Multi-pollutant Site

NCORE is a national network of multi-pollutant sites that will measure not only criteria pollutants, but also "trace gas" compounds that are precursors for ozone and $PM_{2.5}$. NCORE sites are required to be in full operation by 2011. DEQ proposed to EPA that the St. Luke's Hospital site in Meridian, located in the Boise City MSA, be designated as Idaho's NCORE site.

Monitoring at the St. Luke's site began in 2007 for several priority pollutants. DEQ purchased the trace gas monitoring equipment and put them in operation during the winter of 2008-2009. Compounds added by this equipment include trace levels of carbon monoxide, sulfur dioxide and reactive oxides of nitrogen. DEQ will continue development of this site as an NCORE station.

The 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 control measure impact on improving air quality in the Treasure Valley.

Table 14. DEQ NCORE Monitoring Station address and parameters

Site	Address	NCORE Monitoring
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	$PM_{2.5}$ FRM Mass (24hr average) $PM_{2.5}$ Continuous (TEOM) $PM_{2.5}$ Speciation (carbon, major ions, and trace metals) Ozone (O_3) (year-round) Nitrogen Oxide (NO-NOx) Total reactive nitrogen (Trace NO-NOy) Trace level Sulfur Dioxide (SO_2) Trace level Carbon Monoxide (CO) Meteorology (wind speed, direction, temperature, relative humidity, solar radiation) $PM_{10-2.5}$ (planned to begin 2011) $PM_{10-2.5}$ Speciation (planned to begin 2011) Lead (planned to begin 2011)

The National Park Service (NPS) operates a number of air quality monitors at the Craters of the Moon National Park as part of the IMPROVE monitoring network. DEQ is supportive of partnering with NPS and EPA to establish a rural NCore monitoring site at the Craters of the Moon location. Many of the NCore monitoring requirements are already fully implemented at this site.

I.I. PM $_{Coarse}$ ($PM_{10-2.5}$) Network

Monitoring Requirements - Idaho $PM_{10-2.5}$ Network

NCORE requirements include the monitoring of $PM_{10-2.5}$ mass and $PM_{10-2.5}$ speciation (carbon, major ions, and trace metals). $PM_{10-2.5}$ measurements have been included as part of multi-pollutant measurements to support health studies, emission strategy development, and a future $PM_{10-2.5}$ standard.

DEQ intends to begin $PM_{10-2.5}$ measurements no later than January 2011 at the St. Luke's Meridian NCORE site. This neighborhood scale of representativeness site provides relevant information regarding exposure for a large segment of the population as well as providing an assessment of the spatial extent of elevated concentrations caused by heavily traveled roadways.

$PM_{10-2.5}$ speciation measurement represents considerable difficulty as the difference between PM_{10} and $PM_{2.5}$ fractions cannot be used as a method to determine species. DEQ is awaiting clarification by EPA on appropriate $PM_{10-2.5}$ speciation methodology.

$PM_{10-2.5}$ mass will be determined by difference between collocated PM_{10} and $PM_{2.5}$ monitors. Currently, EPA-approved $PM_{10-2.5}$ methodology would require purchase of new equipment. However, a number of vendors have submitted application to EPA for FEM designation or are in the process of submitting. DEQ expects EPA to approve $PM_{10-2.5}$ methodology that will allow DEQ to use monitoring equipment that it already owns. However, if approval is not granted for this methodology, DEQ will purchase approved monitoring equipment.

Sampling frequency will be established at 1/3 frequency for the primary monitor pair and 1/6 frequency for the precision monitor pair. DEQ participates in the National Performance Evaluation Program as well as semi-annual performance audits by independent auditor and will extend these programs to include evaluation of the $PM_{10-2.5}$ monitors.

Table 15. DEQ $PM_{10-2.5}$ Monitoring Station

Site	County AIRS ID Lat/Lon	UAR/ MSA/ CMSA	Sample Frequency	Monitor Objective	Monitor Type	Monitor Designation
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	Boise City	1:3	Population Exposure	Proposed Paired Sequential FRM*	Proposed NCORE
Meridian St. Luke's	Ada 160010010 +43.607568/ -116.348434	Boise City	1:6	Population Exposure	Proposed Paired Precision Sequential FRM*	Proposed NCORE

* Monitor type indicated are approved FRM methods for individual $PM_{2.5}$ and PM_{10} measurements. Currently, only one (1) $PM_{10-2.5}$ method has been approved by EPA which, if adopted by DEQ, requires purchase of new monitoring equipment.

Table 16. DEQ $PM_{10-2.5}$ Monitoring Site Address and Method Codes

Site	Address	Method Codes*
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	$PM_{2.5}$ measurement 118 - R&P Model 2025 PM2.5 Sequential Sampler w/ WINS, Gravimetric
Meridian St. Luke's	Eagle Rd & I-84 Meridian, ID 83642	PM_{10} measurement 127 - R&P Model 2025 PM10 Sequential Sampler w/ WINS, Gravimetric

* Method codes indicated are approved FRM methods for individual $PM_{2.5}$ and PM_{10} measurements. Currently, only one (1) $PM_{10-2.5}$ method has been approved by EPA which, if adopted by DEQ, requires purchase of new monitoring equipment.

I.J Lead

On November 12, 2008 EPA substantially strengthened the national ambient air quality standards (NAAQS) for lead. EPA revised the level of the primary (health-based) standard from 1.5 micrograms per cubic meter (µg/m3) to 0.15 µg/m3, measured as total suspended particles (TSP). EPA also revised the secondary (welfare-based) standard to be identical in all respects to the primary standard. In conjunction with strengthening the lead (Pb) NAAQS, the EPA promulgated new monitoring requirements.

The new lead monitoring requirements are phased into two (2) implementation groups: 1) Source-oriented monitoring for lead emitting sources contributing one (1) or more ton per year of lead; and 2) non-source-oriented monitoring for general air quality monitoring.

DEQ has determined that source-oriented monitoring, which is required to begin in 2010, is not required because Idaho does not have any lead sources contributing 1 ton per year or more of lead. Non-source oriented monitoring will begin January 2011 and will be addressed in the 2010 network assessment.

Sources
Lead smelters, mining operations, waste incinerators, battery recycling and the production of lead-based materials (fishing sinkers or others) are major sources of lead in the air. Lead was also a gasoline additive until it began to be phased out in the 1970's.

II. SUMMARY

It is the goal of EPA for states, locals, and tribes to refine their ambient air quality monitoring networks to meet the objectives of the National Air Monitoring Strategy (NAMS) as defined in 40 CFR 58 Appendix D. The NAMS will likely be retained as the guiding document for DEQ's ambient air monitoring network and the National Ambient Air Monitoring System.

The monitoring objectives of the NAMS are:
1. Provide timely reporting of data to the public
2. Evaluate compliance with NAAQS
3. Support long-term health studies
4. Support scientific studies
5. Support development of emission control strategies.

The DEQ PM monitoring network is primarily composed of middle/neighborhood/urban-scale sites, to assess population exposure to PM_{10} and $PM_{2.5}$ and to support AQI forecasting and smoke management programs.

$PM_{2.5}$ chemical speciation, urban air toxics (HAPs) monitoring, pollutant source apportionment, emissions inventory, spatial analysis, and airshed models will provide tools for a more refined review and assessment of the ambient air monitoring network. EPA is now requiring that air monitoring agencies conduct a more detailed assessment of their networks every five years using these tools. The first of these five-year assessments is due July 1, 2010. DEQ's ultimate goal is to achieve a "mature" air monitoring network that achieves these objectives.

Figure 8. 2009 Ambient Air Monitoring Network