



DEPARTMENT OF
ECOLOGY
State of Washington

Washington State Department of Ecology

2009

Ambient Air Monitoring Network Report

**Washington State Department of Ecology
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Executive Summary

Purpose of the report

The Department of Ecology (Ecology) reviews its ambient air quality monitoring network each year to ensure that it collects adequate, representative, and useful air quality data. This report summarizes the results of the 2009 review. These results include:

- Identifying modifications to Ecology's ambient air monitoring network since the 2008 annual network report
- Identifying proposed modifications to the network for the upcoming year
- Documenting Ecology's ambient air quality monitoring needs, goals, and priorities

Background information

The United States Environmental Protection Agency (EPA) ambient air quality surveillance regulations (Code of Federal Regulations, Title 40, Part 58 (40 CFR Part 58) require states to establish air quality surveillance systems in their State Implementation Plans (SIPs). An air quality surveillance system consists of a network of State and Local Air Monitoring Stations (SLAMS). These stations measure ambient concentrations of those air pollutants for which 40 CFR Part 50 sets standards.

Monitoring network requirements

SLAMS must meet requirements of 40 CFR Part 58 contained in:

- Appendix A (Quality Assurance Requirements)
- Appendix C (Ambient Air Quality Monitoring Methodology)
- Appendix D (Network Design Criteria)
- Appendix E (Probe and Path Siting Criteria)

States determine if they conform to Appendices A and C in part through periodic systems and performance audits (per Section 2.4 of Appendix A). States conform with Appendices D and E by conducting an annual network review of their air quality surveillance systems (per 40 CFR 58.20(d)). The annual network review:

- Determines if an ambient air quality monitoring network is achieving its required air monitoring objectives
- Identifies changes to the network needed to enable an organization to meet its objectives

Using monitoring data

Ecology uses its air monitoring data to:

- Determine compliance with the national ambient air quality standards (NAAQS)
- Determine maximum pollutant concentrations
- Forecast air quality
- Evaluate the effectiveness of air pollution control programs,
- Evaluate the effects of air pollution on public health,
- Track the progress of SIPS
- Support dispersion models
- Determine air quality trends
- Develop responsible and cost-effective pollution control strategies



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1 Introduction

The Code of Federal Regulations, Title 40, Part 58 (40 CFR Part 58) contains the federal Environmental Protection Agency's (EPA's) ambient air quality surveillance regulations. Section 58.20 requires states to establish air quality surveillance systems in their State Implementation Plans (SIPs). The air quality surveillance system consists of a network of monitoring stations designated as SLAMS. These stations measure ambient concentrations of those air pollutants for which standards exist in 40 CFR Part 50 and Part 58, Appendices A (Quality Assurance Requirements), C (Ambient Air Quality Monitoring Methodology), D (Network Design Criteria) and E (Probe and Path Siting Criteria). States determine compliance with Appendices A and C in part through periodic systems and performance audits (per Section 2.4 of Appendix A). States comply with Appendices D and E by conducting an annual network review of their air quality surveillance systems (per 40 CFR 58.20(d)). The annual network review determines if the network achieved its required air monitoring objectives and if it should be modified (e.g., termination, relocation or establishment of monitoring stations) to meet those objectives. The main purpose of this review is to ensure that an ambient air quality monitoring network collects adequate, representative, and useful air quality data. The ambient air quality data from Ecology's network is used for a variety of purposes including:

- Determining compliance with the national ambient air quality standards (NAAQS)
- Determining the location of maximum pollutant concentrations
- Determining the effectiveness of air pollution control programs
- Evaluating the effects of air pollution on public health
- Tracking the progress of SIPs
- Supporting dispersion models
- Developing responsible, cost-effective, control strategies
- Developing air quality trends

2 Regulatory Requirements and Other Data Needs

2.1 Appendix D Requirements

Appendix D of 40 CFR 58 describes concepts for designing the SLAMS network. It addresses monitoring objectives and the criteria for selecting the location and number of air monitoring stations. The concepts and guidance in Appendix D, as well as other non-regulatory EPA data needs, should be considered when evaluating the adequacy of the SLAMS network.

2.1.1 Monitoring Objectives and Spatial Scales

Appendix D calls for the design of SLAMS networks to meet a minimum of six basic objectives:

- (1) Determine the highest pollutant concentrations expected in the area covered by the network
- (2) Determine representative pollutant concentrations in areas of high population density
- (3) Determine the impact of significant sources or source categories on pollutant concentrations in the ambient air
- (4) Determine general background pollutant concentrations
- (5) Determine the regional extent of pollutant transport between populated areas
- (6) Determine the impacts (e.g., visibility impairment, vegetation effects) in more rural and remote areas on the secondary (i.e., welfare) standards

SLAMS networks should be designed to provide data for meeting the monitoring objectives described above and to assist EPA and states in solving environmental problems.

Appendix D also provides guidance on spatial scales of representativeness for stations in a SLAMS network (Table 1). Ideally, the monitor is located so that its sample represents the air quality over the entire area that the monitoring station is intended to represent (Table 2).

Table 1: Relationship between Monitoring Objectives and Scale of Representativeness

Monitoring Objectives	Appropriate Siting Scales
Highest concentration	Micro, middle, neighborhood, urban
Population	Neighborhood, urban
Source impact	Micro, middle, neighborhood
General/Background	Neighborhood, urban, regional
Regional transport	Urban/regional
Welfare-related impacts	Urban/regional

Table 2: Summary of Spatial Scales for SLAMS

	Scales Applicable for SLAMS						
	SO ₂	CO	O ₃	NO ₂	Pb	PM ₁₀	PM _{2.5}
Micro.....	✓	✓			✓	✓	✓
Middle.....	✓	✓	✓	✓	✓	✓	✓
Neighborhood	✓	✓	✓	✓	✓	✓	✓
Urban.....	✓		✓	✓	✓	✓	✓
Regional.....	✓		✓		✓	✓	✓

2.1.2 Number of SLAMS Sites

Appendix D to 40 CFR Part 58 does not contain criteria for determining the total number of stations in the SLAMS network, except for requiring a minimum number of SLAMS lead, SO₂, and PM_{2.5} sites. For lead, EPA requires state and local agencies to focus their network design efforts on establishing monitoring stations around lead stationary sources which generate or have the potential to generate exceedances of the quarterly lead NAAQS. Sources around which lead monitoring networks should be established are those emitting five or more tons per year or smaller stationary sources which may be problematic based on the size of the facility and their proximity to populated neighborhoods. EPA recommends a minimum of two lead sites per source, one to measure stack impacts and the second to measure fugitive emissions. Other factors such as topography, source type, proximity and locations of nearby populations may affect the number of stations in the network.

SLAMS SO₂ monitoring requirements for counties not within the boundaries of any Consolidated Metropolitan Statistical Area/Metropolitan Statistical Area (CMSA/MSA) are based on the emissions of SO₂ in the airshed. A minimum number of SO₂ SLAMS sites are required for targeted sources of SO₂ emissions. Other than these requirements, the optimum size of a particular SLAMS network involves tradeoffs between data needs and available resources which can best be resolved during the network design process.

2.2 Appendix E Requirements

Appendix E contains siting criteria to be applied to ambient air quality analyzers or samplers after the general site location has been selected based on the monitoring objectives and spatial scales of representativeness presented in Appendix D and summarized in Section 2.1 of this document. The siting criteria presented in Appendix E are summarized in Table 3.

EPA believes that most sampling probes or monitors can be located so that they meet the Appendix E siting requirements. Some existing stations, however, may not meet these requirements and yet still produce useful data for some purposes. EPA will consider written requests from the State to waive one or more siting criteria for some monitoring stations provided that the State can demonstrate the following: (1) The site is as representative of the monitoring area as it would be if siting criteria were met; and (2) the siting criteria cannot be met because of physical constraints (e.g., inability to locate the station the necessary setback distance from roadways or obstructions). Waivers may be granted to existing SLAMS if one of these criteria is met; waivers may be granted for new SLAMS only if both criteria are met. Written requests for waivers must be submitted to the EPA Regional Administrator.

2.3 Other Ambient Air Monitoring Data Needs

Washington has a number of special purpose monitors (SPMs) deployed throughout the State for PM₁₀, PM_{2.5}, CO and NO₂ monitoring. They are used for a variety of purposes, including Washington's Air Quality Index program, ambient air quality assessment and special studies such as secondary aerosol and ozone precursor assessments. SPM monitoring sites often utilize Federal Reference Method (FRM) sampling equipment, and are operated in accordance with CFR requirements for quality assurance and quality control. SPM designation for criteria pollutant monitoring sites allows Ecology to assess ambient particulate levels within regions of the State, while providing the flexibility to relocate the sites if it is determined there is no concern for NAAQS violations in the area (typically after three years of data collection). SPM sites may be added to Ecology's SLAMS network when a NAAQS exceedance has been recorded, or if elevated pollutant concentrations are consistently measured at the site.

Table 3: Summary of Probe and Monitoring Path Siting Criteria

Pollutant	Scale [maximum monitoring path length, meters]	Height from ground to probe or 80% of monitoring path (meters)	Horizontal and vertical distance from supporting structures to probe or 90% of monitoring path (meters)	Distance from trees to probe or 90% of monitoring path (meters)
SO ₂	Middle [300m] Neighborhood, Urban, and Regional [1km]	3-15	>1	>10
CO	Micro, Middle [300m] Neighborhood [1km]	3±0.5; 3-15	>1	>10
O ₃	Middle [300m] Neighborhood, Urban, and Regional [1km]	3-15	>1	>10
Ozone precursors	Neighborhood and urban [1km]	3-15	>1	>10

Pollutant	Scale [maximum monitoring path length, meters]	Height from ground to probe or 80% of monitoring path (meters)	Horizontal and vertical distance from supporting structures to probe or 90% of monitoring path (meters)	Distance from trees to probe or 90% of monitoring path (meters)
NO ₂	Middle [300m] Neighborhood and Urban [1km]	3-15	>1	>10
PM ₁₀	Micro; Middle, Neighborhood, Urban and Regional	2-7 (Micro); 2-15 (All other scales)	>2 (All scales, horizontal distance only)	>10 (All scales)

3 Network Review Procedure

3.1 Network Review Team and Preparation

Network report participants include Washington Department of Ecology Air Monitoring staff and where applicable, representatives from Washington's seven local air agencies. Sufficient information must be provided to determine compliance of the network with regulatory network design and siting requirements specified in 40 CFR Part 58, Appendices D and E as well as to determine compliance of the network design and siting requirements specified for all special ambient air monitoring networks.

3.2 Network Modifications

Modifications to the SLAMS network are addressed in 40 CFR 58.25, 58.36, and 58.46, respectively. Under Section 58.25, States are required to annually develop and implement schedules to modify the SLAMS network to eliminate any unnecessary stations or to correct any inadequacies indicated by the annual network review required by 58.20(d). As part of the annual network review, evaluations of the special networks established as partnership agreements between EPA and Ecology should also be conducted. Modifications to these networks should be recommended as a result of this annual report.

An important objective of the network modification process is determining whether or not sufficient ambient air quality information and data are being provided by the regulatory and other special monitoring networks to satisfy the principal data needs. If sufficient air quality data are not being collected, the deficient area must be identified and corrective action taken to resolve the problem. Conversely, if it is determined that excessive data are being collected (e.g., there are redundant sites resulting in data that agree closely), then efforts need to be taken to determine where dis-investment should be made and on what schedule.

Network modifications may be initiated by EPA or proposed by Ecology and agreed to by EPA. Network modifications may result from revisions to the Part 58 regulations, systems audits, site visits, or performance evaluations; special studies/saturation sampling, population increases/decreases; air quality concentrations consistently recorded below the NAAQS; loss of permission to use a site; demolition of a building which is used for monitoring; building construction; growth of trees; changes in roadways; change in neighborhood type of use, etc.

Ecology uses this review to determine whether it is meeting the number of monitors required by the Part 58 Appendix D design criteria requirements, and whether the monitors properly located based on the monitoring objectives and spatial scales of representativeness presented in Appendix D. For special monitoring networks, compliance determinations will be conducted in accordance with applicable program documents.

3.3.1 Number and Location of Monitors

For SLAMS, the number of monitors required and their locations are not specified in the regulations but rather are determined by EPA Region 10 and Ecology on a case-by-case basis. EPA and Ecology ensure that SLAMS meet the monitoring objectives specified in Appendix D. Adequacy of the network is determined by using a variety of tools, including the following:

- Analyses of historical monitoring data
- Maps of emissions densities
- Dispersion modeling
- Special studies/saturation sampling
- Best professional judgment
- SIP requirements
- Revised monitoring strategies (e.g., new regulations, reengineering air monitoring network)
- Monitoring network maps and network descriptions with site objectives defined

Appropriate location of monitors can be determined on the basis of stated objectives. Maps, graphical overlays, and GIS-based information are extremely helpful in visualizing or assessing the adequacy of monitor locations. Plots of potential emissions and/or historical monitoring data versus monitor locations are especially useful. When questions arise about the adequacy of a particular location, modeling or special studies (including saturation monitoring studies) may be appropriate.

Monitor locations are based on the objectives specified in Appendix D, Section 3. Most often, these locations are those that have high concentrations and large population exposure. Population information may be obtained from the latest census data and ambient monitoring data from AQS. If the zip codes for various monitoring locations are obtained, use of electronic media census information and GIS-based information can be more easily combined with ambient monitoring data.

For special monitoring serving AQI, etc., program documents applicable to the network must be reviewed to determine the goals and specific siting criteria for the network. Compliance with monitoring objective determinations of the special network should be conducted using procedures similar to those used for Appendix D evaluations (i.e., are the number of monitors appropriate and are the monitors properly located).

3.4 Determining Compliance with Appendix E Requirements

Applicable siting criteria for SLAMS are specified in 40 CFR 58, Appendix E. The on-site visit itself consists of the physical measurements and observations needed to determine compliance with the Appendix E requirements, such as height above the ground level, distance from trees, paved or vegetative ground cover, etc.

4 Network Evaluation and Recommendations/Modifications

4.1 Carbon Monoxide (CO, 42101)

National Ambient Air Quality Standard (NAAQS):

- 1-hour average concentration not to exceed 35 ppm, on more than one occasion in a calendar year, measured at any monitoring site.
- 8-hour average concentration not to exceed 9 ppm for any 8-hour period, on more than one occasion in a calendar year, measured at any monitoring site.

Washington's carbon monoxide monitoring network is comprised of two sites statewide.

Table 4: Carbon Monoxide, 42101

AQS #	Site Name	Est.	Type	Scale	Sampling Freq.	Action for 2009
530330019	Bellevue, 148 th	12/1/98	SLAMS	Micro	Continuous	Continue
530630049	Spokane, 3 rd & Washington	1/1/97	SLAMS	Micro	Continuous	Continue

Additional Monitors: None

Recommendations/Modifications: Continue the Bellevue 148th and Spokane 3rd & Washington sites.
Note: Ecology also monitors for trace level CO at the Seattle Beacon Hill site.

Bellevue, 148th - SLAMS

AQS # 530330019

Address: 2421 148th NE, Bellevue

Monitoring objective: Highest Concentration

Method code: 054

LAT/LONG: 047 37' 54" / 122 08' 34"

MSA: Seattle-Bellevue-Everett, WA

Comments

Bellevue 148th is micro scale SLAMS site established in 1998. It is located in a commercial area near a highly-traveled commuter roadway (SR520).

Exceedences

This site has not exceeded the standard in the past 3 years.

Spokane, 3rd & Washington - SLAMS

AQS # 530630049

Address: W. 408 3rd Avenue, Spokane

Monitoring objective: Highest Concentration

Method code: 054

LAT/LONG: 047 39' 13" / 117 25' 07"

MSA: Spokane, WA

Comments

3rd & Washington is a micro scale SLAMS site established in 1997. It is located in the downtown core of Spokane in a highly-traveled commercial area. The site is currently used for maintenance plan purposes. Spokane is a former CO nonattainment area.

Exceedences

This site has not exceeded the daily or annual standard for CO in the past 3 years.

4.2 Ozone (O₃, 44201)

National Ambient Air Quality Standards (NAAQS):

- 8-hour average of the 4th highest measured O₃ concentration averaged over three consecutive years, not to exceed 0.075 ppm at any given monitoring site.

Washington's ozone monitoring network is comprised of ten sites statewide.

Table 5: Ozone, 44201

AQS #	Site Name	Est.	Type	Scale	Sampling Freq.	Action For 2009
530330080	Seattle, Beacon Hill	4/1/97	SLAMS/ NCore	Urban	Continuous	Continue
530330010	Issaquah, Lake Sammamish	12/1/75	SLAMS	Urban	Continuous	Continue
530330023	Enumclaw, Mud Mountain	7/8/98	SLAMS	Urban	Continuous	Continue
530330017	North Bend, North Bend Way	6/1/98	SLAMS	Urban	Continuous	Continue
530531008	LaGrande, Pack Forest	5/30/85	SLAMS	Urban	Continuous	Continue
530530012	Mt. Rainier, Jackson Visitor Center	7/13/98	SLAMS	NPS supported site	Continuous	Continue
530110011	Vancouver, Blairmount	4/1/90	SLAMS	Neighborhood	Continuous	Continue
530670005	Yelm, Northern Pacific	5/1/06	SLAMS	Urban	Continuous	Continue
530630001	Cheney, Turnbull	4/1/99	SLAMS	Urban	Continuous	Continue
530630046	Spokane, Greenbluff	4/1/90	SLAMS	Urban	Continuous	Continue

Additional Monitors: None

Recommendations/Proposed Modifications: Continue listed ozone sites.

Ozone

Seattle, Beacon Hill –SLAMS/ proposed NCore

AQS # 530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Population Exposure

Method code: 056

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

Comments

Beacon Hill is an urban scale NCore site located south of downtown Seattle, within a City of Seattle park/reservoir. In addition to ozone, the site is used for monitoring Trace level CO, SO₂, NO₂, PM_{2.5}, air toxics, speciation and other special studies. The Beacon Hill site is also a long-term trend site and research site.

Exceedences

This site has not exceeded the 8-hour standard.

Issaquah, Lake Sammamish - SLAMS

AQS # 530330010

Address: 20050 SE 56th (Lk. Sammamish SP), Issaquah

Monitoring objective: Population Exposure

Method code: 056

LAT/LONG: 047 33' 07" / 122 02' 40"

MSA: Seattle-Bellevue-Everett, WA

Comments

Lake Sammamish is an urban scale site established in 1975 located east of Seattle, within Lake Sammamish State Park. The Lake Sammamish site is a long-term trends site.

Exceedences

This site has not exceeded the 8-hour standard in the past 3 years.

Enumclaw, Mud Mountain Dam - SLAMS

AQS # 530330023

Method code: 056

Address: 30525 SE Mud Mountain Road, Enumclaw

LAT/LONG: 047 08' 28" / 121 56' 09"

Monitoring objective: Regional Transport

MSA: Seattle-Bellevue-Everett, WA

Comments

Mud Mountain Dam is an urban scale State and Local Monitoring Site (SLAMS) established in 1998 and located 30 miles East of Seattle, near Enumclaw. Mud Mountain is at the end of the ozone transport zone near the Cascade Mountains. Mud Mountain has been the highest reading site in the ozone network.

Exceedences

This site **has** exceeded the 8-hour standard in the past 3 years.

North Bend, North Bend Way - SLAMS

AQS # 530330017

Method code: 056

Address: 42404 SE North Bend Way, North Bend

LAT/LONG: 047 29' 23" / 121 46' 24"

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

North Bend Way is an urban scale site established in 1998 and located outside of North Bend, 25 miles East of Seattle. North Bend typically indicates some of the highest readings in the ozone network.

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

LaGrande, Pack Forest - SLAMS

AQS # 530531008

Method code: 056

Address: .6 mi North of LaGrande on SR 7, Pierce Co.

LAT/LONG: 046 50' 33" / 122 18' 55"

Monitoring objective: Highest Concentration

MSA: Tacoma, WA

Comments

LaGrande is a regional scale site established in 1985 and located in the UW Pack Forest. LaGrande has been a high concentration, transport and long term trend site.

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

Mt. Rainier, Jackson Visitor Center - SLAMS

AQS # 530530012

Method code: 056

Address: Jackson Visitor Center, Mount Rainier

LAT/LONG: 046 47' 07" / 121 43' 58"

Monitoring objective: Background

MSA: Tacoma, WA

Comments

The Jackson Visitor Center site is a regional scale site established in 1998. The site is part of ongoing environmental outreach at the Jackson Visitors Center at Mt. Rainier National Park.

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

Vancouver, Blairmount - SLAMS

AQS # 530110011

Address: 1500 SE Blairmount Drive, Vancouver

Monitoring objective: Population Exposure

Method code: 056

LAT/LONG: 045 36' 37" / 122 30' 59"

MSA: Portland-Vancouver, OR-WA

Comments

Blairmount is an urban scale site established in 1990 and located in a residential area, near downtown Vancouver. The site represents the Portland/Vancouver airshed and is part of the ozone maintenance planning effort of the Southwest Clean Air Agency (SWCAA).

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

Yelm, Northern Pacific - SLAMS

AQS # 530670005

Address: NEW - 931 Northern Pacific Road, Yelm

Monitoring objective: Population Exposure

Method code: 056

LAT/LONG: 046 57' 03" / 122 35' 43"

MSA: Olympia, WA

Comments

Yelm is an urban scale site originally established in 1997 and relocated in 2006. The Yelm site is located in a commercial/residential area. Yelm represents ozone transport impacts in the South Puget Sound area.

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

Cheney, Turnbull - SLAMS

AQS # 530630001

Address: S. 26010 Smith Road, Cheney

Monitoring objective: Population Exposure

Method code: 056

LAT/LONG: 047 24' 55" / 117 31' 49"

MSA: Spokane, WA

Comments

Turnbull is a background/transport scale site established in 1999 and located within the Turnbull Wildlife Refuge at Cheney, south of Spokane. It has been a high-concentration and background/transport site for the Spokane area. A CFR required site by population.

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

Spokane, Greenbluff - SLAMS

AQS # 530630046

Address: E. 9814 Greenbluff Road, Spokane

Monitoring objective: Population Exposure

Method code: 056

LAT/LONG: 047 49' 37" / 117 16' 31"

MSA: Spokane, WA

Comments

Greenbluff is an urban scale site established in 1990 located near Spokane. Greenbluff is used with Cheney to identify ozone patterns for the Spokane area. It is a CFR population required site.

Exceedences

This site has not exceeded the 8-hour ozone standard in the past 3 years.

4.3 Nitrogen Dioxide (NO₂, 42602)

National Ambient Air Quality Standards (NAAQS):

- Annual arithmetic average concentration not to exceed 0.053 ppm at any monitoring site.

Washington no longer monitors nitrogen dioxide.

Table 6: Nitrogen Dioxide, 42602

AQS#	Site name	Est.	Type	Scale	Sampling Freq.	Action for 2009
N/A	N/A	N/A	N/A	N/A	N/A	None

Additional Monitors: None

Recommendations/Proposed Modifications: We no longer monitor for NO₂. However we monitor for the reactive nitrogen species (NO_y) at Seattle Beacon Hill which includes NO₂. It is assumed most if not all the NO_y measured at Beacon Hill is composed of NO₂.

Nitrogen Dioxide (NO₂)**4.4 Sulfur Dioxide (SO₂, 42401)**

National Ambient Air Quality Standards (NAAQS)

- Annual arithmetic average concentration not to exceed 0.03 ppm at any monitoring site.
- 24-hour average concentration not to exceed 0.14 ppm at any monitoring site.
- 3-hour average concentration not to exceed 0.5 ppm at any monitoring site (secondary standard).

Washington no longer monitors sulfur dioxide.

Table 7: Sulfur Dioxide, 42401

AQS#	Site Name	Est.	Type	Scale	Sampling freq.	Action for 2009
N/A	N/A	N/A	N/A	N/A	N/A	None

Additional Monitors: None

Recommendations/Proposed Modifications: While we no longer monitor for SO₂. However we monitor trace level SO₂ at Seattle Beacon hill.

Sulfur Dioxide (SO₂)

National Ambient Air Quality Standard (NAAQS), 1987:

- Twenty-four hour average PM₁₀ concentration not to exceed 150 µg/m³ on more than one occasion per year when averaged over three years.
- Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the EPA revoked the annual PM₁₀ standard in 2006 (effective December 17, 2006).

Washington's PM₁₀ monitoring network consists of 5 sites statewide, including one collocated site.

Table 8: Particulate Matter 10 (PM₁₀, 81102)

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530050002	Kennewick, Metaline Ave	10/94	SLAMS	Neighborhood	Continuous	Continue
530770009	Yakima, S 4th	4/00	SLAMS	Neighborhood	1/6 only	Discontinue
530650004	Colville, S Oak	11/96	SLAMS	Neighborhood	Continuous	Continue
530710006	Burbank, Maple St	1/03	SLAMS	Middle	Continuous	Continue
530630016	Spokane, Ferry St	4/72	SLAMS	Middle	Continuous & 1/6	Continue
530630016	Spokane, Ferry St	4/72	Collocated	Middle	1/12	Continue

Additional Monitors: None

Recommendations/Proposed Modifications: Yakima Region Clean Air Agency (YRCAA) are proposing discontinuing the PM₁₀ monitoring and will be providing explanation/documentation to EPA Region 10 Continue all other PM₁₀ sites as described.

Kennewick, Metaline Ave - SLAMS

AQS # 530050002

Address: 5929 West Metaline, Kennewick

Monitoring objective: Population Exposure

Method code: 079

LAT/LONG: 046 13' 06" / 119 12' 03"

MSA: Richland-Kennewick-Pasco, WA

Comments

Metaline is a neighborhood scale site for PM₁₀ established in 1994 and located in the downtown Kennewick area. It is representative of Kennewick which is subject to windblown dust.

Exceedences

This site has not exceeded the standard for PM₁₀ in the past 3 years.

Yakima, S 4th – SLAMS - DISCONTINUE

AQS # 530770009

Address: 402 South 4th Avenue, Yakima

Monitoring objective: Population Exposure

Method code: 079/063

LAT/LONG: 046 35' 42" / 120 30' 44"

MSA: Yakima, WA

Comments

S 4th is a neighborhood scale site for PM₁₀ established in 2000 and located in a commercial/residential area near downtown Yakima. The site is representative of the Yakima area which is a past PM₁₀ nonattainment area.

Exceedences

This site has not exceeded the daily or annual standard for PM₁₀ in the past 3 years.

Colville, S Oak - SLAMS

AQS # 530650004

Address: 215 South Oak, Colville

Monitoring objective: Population Exposure

Method code: 079

LAT/LONG: 048 32' 41" / 122 54' 13"

MSA: Not in an urban area

Comments

S Oak is a neighborhood scale site for PM₁₀ established in 1996, located in the commercial/residential area of Colville.

Exceedences

This site has not exceeded the standard for PM₁₀ in the past 3 years.

Burbank, Maple St - SLAMS

AQS#530710006

Address: 755 Maple Street, Burbank

Monitoring objective: Population Exposure

Method code: 079/063

LAT/LONG: 046 12' 00" / 119 00' 30"

MSA: Not in an urban area

Comments

Maple St is a middle-scale site for PM₁₀ established in 2002 and located a residential area of Burbank. The site is within the previous Wallula PM₁₀ nonattainment area and subject to windblown dust.

Exceedences

The Burbank/Wallula site has not exceeded the standard for PM₁₀ in the past 3 years.

Spokane, Ferry St - SLAMS

AQS # 530630016

Address: E. 3530 Ferry Street, Spokane

Monitoring objective: Population Exposure

Method code: 079/063

LAT/LONG: 047 39' 39" / 117 21' 26"

MSA: Spokane, WA

Comments

Ferry St is middle scale site for PM₁₀ established in 1972, located in a commercial area of Spokane. The site is representative of the Spokane area which is a past PM₁₀ nonattainment area.

Exceedences

This site has not exceeded the standard for PM₁₀ in the past 3 years.

4.6 Particulate Matter 2.5 (PM_{2.5}, 88101, 88502)

National Ambient Air Quality Standard (NAAQS):

- Twenty-four hour average PM_{2.5} concentrations not to exceed 35 µg/m³ for a three-year average of annual 98th percentiles at any population-oriented monitoring site in a monitoring area.
- Three-year annual average PM_{2.5} concentration not to exceed 15 µg/m³ from a single community-oriented monitoring site or the spatial average of eligible community-oriented sites in a monitoring area.

Washington's PM_{2.5} monitoring network consists of thirty-seven sites statewide, including two collocated sites.

Table 9: Particulate Matter (PM_{2.5}, 88101, 88502)

AQS#	Site Name	Type	Sample Type	Sampling Freq.	Action for 2009
530272002	Aberdeen Division St	SLAMS	Continuous	Continuous	Continue
530330037	Bellevue, Bellevue Way	SLAMS	Continuous	Continuous	Continue
530730015	Bellingham, Yew Street	SLAMS	Continuous	Continuous	Continue
530030004	Clarkston	SLAMS	Continuous	Continuous	Continue
530650004	Colville	SLAMS	Continuous	Continuous	Continue
530610020	Darrington, Fir St	SLAMS	SEQ/Continuous	1/3	Continue
530130002	Dayton, W. Main	SLAMS	Continuous	Continuous	NEW
530370002	Ellensburg	SLAMS	Continuous	Continuous	Continue
530330023	Enumclaw, Mud Mountain Dam	SLAMS	Continuous	Continuous	Continue
530050002	Kennewick, Metaline Ave	SLAMS	Continuous	Continuous	Continue
530332004	Kent, James & Central	SLAMS	Continuous	Continuous	Continue
530750005	LaCrosse, Hill St	SLAMS	Continuous	Continuous	Continue
530330024	Lake Forest Park, Ballinger Way	SLAMS	Continuous	Continuous	Continue
530150015	Longview, 30 th Ave	SLAMS	Continuous	Continuous	Continue
530610005	Lynnwood, 212 th	SLAMS	Continuous	Continuous	Continue
530611007	Marysville, 7th Ave	SLAMS	SEQ/Continuous	1/1	Continue
530090009	Shelton, Mt View Dr	SLAMS	Continuous	Continuous	Continue
530351005	Meadowdale, Blackbird Dr	SLAMS	Continuous	Continuous	Continue
530210002	Mesa, Pepoit Way	SLAMS	Continuous	Continuous	Continue
530251002	Moses Lake, Balsam St	SLAMS	Continuous	Continuous	Continue
530570014	Mt. Vernon, S Second St	SLAMS	Continuous	Continuous	Continue
530330017	North Bend, North Bend Way	SLAMS	Continuous	Continuous	Continue
530670013	Lacey, College St	SLAMS	Continuous	Continuous	Continue
530090009	Port Angeles, W 14th St	SLAMS	Continuous	Continuous	Continue
530310003	Port Townsend, San Juan Ave	SLAMS	Continuous	Continuous	Continue
530750003	Pullman, Dexter Ave	SLAMS	Continuous	Continuous	Continue
530531018	Puyallup, 128 th St	SLAMS	Continuous	Continuous	Continue
530530028	Woodinville, 133 rd Ave	SLAMS	Continuous	Continuous	Continue
530010003	Ritzville, Alder St	SLAMS	Continuous	Continuous	Continue
530750006	Rosalia, Josephine St	SLAMS	Continuous	Continuous	Continue
530330080	Seattle, Beacon Hill	NAMS	SEQ/Continuous	1/3	Continue
530330057	Seattle, E Marginal Way	SLAMS	SEQ/Continuous	1/3	Continue
530330057	Seattle, E Marginal Way	Collocated	SEQ	1/12	Continue
530330048	Seattle, Olive St	SLAMS	Continuous	Continuous	Continue
530630016	Spokane, Ferry St	SLAMS	SEQ/Continuous	1/3	Continue
530630016	Spokane, Ferry St	Collocated	SEQ	1/12	Continue
530630047	Spokane, Monroe Street	SLAMS	Continuous	Continuous	Continue
530190001	Starbuck, 6 th Ave	SLAMS	Continuous	Continuous	Discontinued
530530031	Tacoma, Alexander Ave	SLAMS	Continuous	Continuous	Continue
530530029	Tacoma, S L Street	SLAMS	SEQ/Continuous	1/3	Continue
530110013	Vancouver, 4th Plain	SLAMS	Continuous	1/1	Continue
530710005	Walla Walla, 12 th St	SLAMS	Continuous	Continuous	Continue
530070006	Wenatchee	SLAMS	Continuous	Continuous	Continue
530770009	Yakima, S 4 th Ave	SLAMS	Continuous	1/3	Continue

Additional Monitors: None**Recommendations/Modifications:** The Starbuck site has been relocated to Dayton. Continue all other listed sites.

Aberdeen, Division St - SLAMS

AQS #530272002

Address: 359 North Division, Aberdeen

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 58' 21" / 123 49' 54"

MSA: Not in an MSA

Comments

The Aberdeen site is neighborhood scale. The site represents impacts to the Aberdeen and Grays Harbor area from wood burning and mobile sources.

Bellevue, Bellevue Way - SLAMS

AQS #530330037

Address: 305 Bellevue Way, Bellevue

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 36' 47" / 122 12' 06"

MSA: Seattle-Bellevue-Everett, WA

Comments

The Bellevue Way site is neighborhood scale and is representative of mobile source and smoke impacts in the area.

Bellingham, Yew Street - SLAMS

AQS #530730015

Address: 2420 Yew Street, Bellingham

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 048 45' 46" / 122 26' 25"

MSA: Bellingham, WA

Comments

Bellingham, Yew Street site is neighborhood scale and is impacted by wood burning and mobile sources in the Bellingham/Whatcom County area.

Clarkston, STP – SLAMS

AQS # 530030004

Address: 13th Street and Port Way, Clarkston

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 25' 32" / 117 3' 35"

UA: Not in an urban area

Comments

Clarkston is a neighborhood scale site established in 1993 as a PM₁₀ site, located in a mixed/residential area of Clarkston.

Colville – SLAMS

AQS # 530650004

Address: Oak Street

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 048 32' 41" / 122 54' 13"

UA: Not in an urban area

Comments

S Oak is a neighborhood scale site for PM_{2.5} originally established in 1996 as a PM₁₀ site, located in the commercial/residential area of Colville.

Darrington, Fir St - SLAMS

AQS #530610020

Address: 1085 Fir St, Darrington

Sampling: Continuous correlated, in progress

Monitoring objective: Population Exposure

Method code: 118/771

LAT/LONG: 048 14' 49" / 121 36' 11"

MSA: Not in an urban area

Comments

Darrington is neighborhood scale residential site. The primary monitoring objective is to characterize air quality conditions impacting the town of Darrington and the nearby residents. This site has an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Dayton, 206 W. Main - SLAMS

AQS # 530130002

Address:

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046.3180° / 117.9850

UA: Not in an urban area

Comments

Dayton is a neighborhood scale small-community site located in Eastern Washington that is impacted by smoke from burning activities in the area.

Ellensburg, Ruby St - SLAMS

AQS # 530370002

Address: 201 North Ruby Street, Ellensburg

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 59' 37" / 120 32' 42"

MSA: Not in an urban area

Comments

Ellensburg is a neighborhood scale site established in 1995 as a PM₁₀ site, located in a residential area of Ellensburg impacted by wood smoke.

Enumclaw, Mud Mountain Dam - SLAMS

AQS #530330023

Address: 30525 SE Mud Mountain Rd, Enumclaw

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 08' 28" / 121 56' 09"

MSA: Seattle-Bellevue-Everett, WA

Comments

Enumclaw, Mud Mountain Dam is a neighborhood scale site. It is a transport/background site for the Puget Sound.

Kennewick, Metaline Ave - SLAMS

AQS #530050002

Address: 5929 W Metaline, Kennewick

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 13' 06" / 119 12' 03"

MSA: Richland, Kennewick, Pasco, WA

Comments

Kennewick is neighborhood scale site. The site is impacted from mobile sources and is geographically representative of the Tri-Cities area.

Kent, James & Central - SLAMS

AQS #530332004

ADDRESS: 614 N Railroad, Kent

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 712/713

LAT/LONG: 047 23' 10" / 122 13' 55"

MSA: Seattle-Bellevue-Everett, WA

Comments

Kent is neighborhood scale site in the South Puget Sound that is impacted from mobile sources, light industry, wood smoke. The site is representative of the Kent Valley area.

Lacey, College St - SLAMS

AQS #530670013

Method code: 771

Address: 1900 College St SE, Lacey

LAT/LONG: 047 01' 43" / 122 49' 15"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Olympia, WA

Comments

Lacey, College St is a neighborhood scale site that is impacted by wood smoke. The site is representative of the Olympia/Thurston County area. The site is a past PM10 non-attainment area.

LaCrosse, Hill St - SLAMS

AQS #530750005

Method code: 771

Address: 100 Hill Street, LaCrosse

LAT/LONG: 046 48' 55" / 117 52' 26"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Not in an urban area

Comments

LaCrosse is neighborhood scale small-community monitor in Eastern Washington. The site is impacted by smoke and burning in the LaCrosse community. The site provides valuable modeling and mapping information.

Lake Forest Park, Ballinger Way - SLAMS

AQS #530330024

Method code: 702/704

Address: 17171 Bothell Way NE, Lake Forest Park

LAT/LONG: 047 45' 18" / 122 16' 50"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Lake Forest Park is neighborhood scale site is impacted by wood smoke and mobile sources from two adjacent arterials.

Longview, 30th Ave - SLAMS

AQS #530150015

Method code: 771

Address: 1324 30th Ave, Longview

LAT/LONG: 046 08' 22" / 122 57' 43"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Longview, WA

Comments

Longview is a neighborhood scale site which is impacted by mobile sources and wood smoke. It is representative of the Longview/Kelso area.

Lynnwood, 212th - SLAMS

AQS #530610005

Method code: 771

Address: 6120 212th SW, Lynnwood

LAT/LONG: 047 48' 23" / 122 19' 00"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Lynnwood is neighborhood scale site. The Lynnwood site is impacted by wood smoke and is representative of south Snohomish County.

Marysville, 7th Ave - SLAMS

AQS #530611007

Address: 1605 7th ST, Marysville

Sampling: 1/3 & continuous correlated

Monitoring objective: Population Exposure

Method code: 118/712/713

LAT/LONG: 048 03' 18" / 122 10' 33"

MSA: Seattle-Bellevue-Everett, WA

Comments

Marysville is a neighborhood scale site impacted by wood smoke, mobile sources, and light industry. Representative of the Marysville/North Snohomish County area. The site has an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Meadowdale, Blackbird Dr - SLAMS

AQS # 530351005

Address: 7252 Blackbird Dr NE, Bremerton

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 37' 51" / 122 38' 28"

MSA: Bremerton, WA

Comments

Meadowdale, Blackbird Dr is a middle-neighborhood scale residential site. It provides air quality information to a population of 280,000 Kitsap residents and is impacted by wood smoke sources.

Mesa, Pepoit Way - SLAMS

AQS #530210002

Address: 200 Pepiot Way, Mesa

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 34' 32" / 119 00' 25"

MSA: Not in an urban area

Comments

Mesa is a neighborhood scale small-community site in Eastern Washington. Mesa is impacted by smoke from burning in the area.

Moses Lake, Balsam St - SLAMS

AQS #530251002

Address: 412 S Balsam St, Moses Lake

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 07' 50" / 119 16' 22"

MSA: Not in an urban area

Comments

Moses Lake is a neighborhood scale small-community site in Eastern Washington. Moses Lake is impacted by smoke from burning in the area.

Mt. Vernon, S Second St - SLAMS

AQS #530570015

Address: 1600 South Second St, Mount Vernon

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 048 24' 37" / 122 20' 16"

MSA: Not in an urban area

Comments

Mt. Vernon is a neighborhood scale small-community site. It is impacted by wood smoke. The continuous monitor is representative of area.

North Bend, North Bend Way - SLAMS

AQS #530330017

Address: 42404 SE North Bend Way, North Bend

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 29' 23" / 121 46' 24"

MSA: Seattle-Bellevue-Everett, WA

Comments

North Bend is a neighborhood scale transport/background PM_{2.5} site for the Puget Sound impacted by wood smoke.

Port Angeles, W 14th St - SLAMS

AQS #530090009

Method code: 771

Address: 1139 W 14th St., Port Angeles

LAT/LONG: 048 06' 59" / 123 27' 52"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Not in an MSA

Comments

Port Angeles is a neighborhood scale site adjacent to Olympic National Park, a Class 1 Area. Port Angeles is impacted by smoke related activities.

Port Townsend, San Juan Ave - SLAMS

AQS #530310003

Method code: 771

Address: 3939 San Juan Avenue, Port Townsend

LAT/LONG: 048 07' 45" / 122 46' 46"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Not in an MSA

Comments

Port Townsend is neighborhood scale and meets the criteria for a SLAMS site. The site is impacted by wood smoke, occasional kraft pulp mill impact and is representative of the east Jefferson County area.

Pullman, Dexter Ave - SLAMS

AQS #530750003

Method code: 771

Address: 240 SE Dexter, Pullman

LAT/LONG: 046 43' 28" / 117 10' 46"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Not in an MSA

Comments

Pullman is a neighborhood scale site is in Eastern Washington impacted by smoke from burning.

Puyallup, 128th St - SLAMS

AQS #530531018

Method code: 771

Address: 9616 128th St E, Puyallup

LAT/LONG: 047 08' 24" / 122 18' 01"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Puyallup is a neighborhood scale site that is impacted by wood smoke in the South Hill area.

Ritzville, Alder St - SLAMS

AQS #530010003

Method code: 771

Address: 109 W Alder, Ritzville

LAT/LONG: 047 07' 43" / 118 22' 55"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

UA: Not in an urban area

Comments

Ritzville is a neighborhood scale small-community located in Eastern Washington. The site is impacted by smoke from burning activities in the area.

Rosalia, Josephine St - SLAMS

AQS #530750006

Address: 906 S Josephine Avenue, Rosalia

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 13' 52" / 117 22' 08"

UA: Not in an urban area

Comments

Rosalia is a neighborhood scale small-community site located in Eastern Washington. It is impacted by smoke from burning in the area.

Seattle, Beacon Hill - SLAMS/ proposed NCore

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Sampling: 1/1 & correlated continuous

Monitoring objective: Population Exposure

Method code: 118/771/702/704

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle, Beacon Hill is an urban scale NCore site.

Seattle/Duwamish - SLAMS

AQS #530330057

Address: 4401 E Marginal Way S., Seattle

Sampling: 1/3 & correlated continuous

Monitoring objective: Population Exposure

Method code: 118/771

LAT/LONG: 047 33' 31" / 122 20' 19"

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle, E Marginal Way is a neighborhood scale site located in the Duwamish River Valley. It is impacted by mobile source diesel emissions and industrial sources. This site is equipped with an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Seattle, Olive St - SLAMS

AQS #530330048

Address: 1624 Boren Avenue, Seattle

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 36' 55" / 122 19' 48"

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle, Olive Street was established in 2002 as a micro scale PM_{2.5} site adjacent to Interstate 5 designed to measure the effects of mobile source diesel emissions. This site is not suitable for comparison to the PM_{2.5} NAAQS. This site represents near roadway conditions.

Shelton, Mt View Dr - SLAMS

AQS #530450004

Address: 901 Mt View Dr, Shelton

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 13' 33" / 123 06' 53"

MSA: Not in an MSA

Comments

Shelton is a neighborhood scales site established in 2001. Shelton is impacted by wood smoke.

Spokane, Ferry St - SLAMS

AQS #530630016

Address: E 3530 Ferry, Spokane

Sampling: 1/3 & continuous

Monitoring objective: Population Exposure

Method code: 118/702/704

LAT/LONG: 047 39' 39" / 117 21' 26"

MSA: Spokane, WA

Comments

Spokane, Ferry St is a neighborhood scale site impacted by wood smoke and light industrial sources. This site is equipped with an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Spokane, Monroe Street - SLAMS

AQS #530630047

Method code: 771

Address: N 4601 Monroe St., Spokane

LAT/LONG: 047 42' 03" / 117 25' 30"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Spokane, WA

Comments

Spokane, Monroe Street is a neighborhood scale site. It is impacted by wood smoke and is representative of the area.

Starbuck, 6th Ave- SLAMS DISCONTINUED

AQS # 530130001

Method code: 771

Address: 6th & Tucannon Road, Starbuck

LAT/LONG: 046 31' 05" / 118 07' 36"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

UA: Not in an urban area

Comments

Starbuck is a neighborhood scale small-community site located in Eastern Washington that is impacted by smoke from burning activities in the area.

Tacoma, Alexander Ave - SLAMS

AQS #530530031

Method code: 771

Address: 2301 Alexander Avenue, Tacoma

LAT/LONG: 047 15' 56" / 122 23' 09"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Tacoma, Alexander Ave is a neighborhood scale site impacted by wood smoke and industrial point sources on the Tacoma tideflats. The site is representative of the NE Tacoma/Fife area.

Tacoma, S L St - SLAMS

AQS #530530029

Method code: 118/712/713

Address: 7802 South L St., Tacoma

LAT/LONG: 047 11' 11" / 122 27' 06"

Sampling: 1/3 & continuous correlated

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Tacoma, L Street is a neighborhood scale site impacted by wood smoke. This site is equipped with an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Vancouver, 4th Plain - SLAMS

AQS #530110013

Method code: 118/771

Address: 8205 E 4th Plain Boulevard, Vancouver

LAT/LONG: 045 38' 55" / 122 35' 16"

Sampling: Continuous correlated

Monitoring objective: Population Exposure

MSA: Portland-Vancouver, OR-WA

Comments

Vancouver, 4th Plain is a neighborhood scale site impacted by wood smoke. The site is equipped with an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Walla Walla, 12th St - SLAMS

AQS #530710005

Address: 200 S 12th, Walla-Walla

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 03' 32" / 118 21' 06"

UA: Not in an urban area

Comments

Walla Walla is a neighborhood scale small-community site located in Eastern Washington. It is impacted by smoke from burning activities in the area.

Wenatchee, Alaska Way - SLAMS

AQS # 530070006

Address: 600 Alaska Street, Wenatchee

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 25' 06" / 120 19' 14"

UA: Not in an urban area

Comments

Wenatchee, Alaska Way is a neighborhood scale site established in 1994 as a PM₁₀ site, located in a residential area of Wenatchee that is impacted by wood smoke.

Woodinville, 133rd Ave- SLAMS

AQS #530330028

Address: 17401 133rd Avenue NE, Woodinville

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 47.754/-122.161

MSA: Seattle-Bellevue-Everett, WA

Comments

Woodinville is a neighborhood scale site impacted by area wood smoke.

Yakima, S 4th Ave - SLAMS

AQS #530770009

Address: 402 South 4th Avenue, Yakima

Sampling: Continuous correlated

Monitoring objective: Population Exposure

Method code: 118/771

LAT/LONG: 046 35' 42" / 120 30' 44"

MSA: Yakima, WA

Comments

Yakima is a neighborhood scale site impacted by smoke from burning sources in the area. The site is equipped with an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

4.6.1 Other – Contracted Sites USFS**Table 10: Other Contracted Sites USFS**

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530070007	Chelan	2002	SLAMS	Neighborhood	Continuous	Continue
530070010	Leavenworth	2002	SLAMS	Neighborhood	Continuous	Continue
530770007	Naches	2008	SLAMS	Neighborhood	Continuous	Continue
530470009	Twisp	2002	SLAMS	Neighborhood	Continuous	Continue
530470010	Winthrop	2002	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors: None**Recommendations/Modifications:** Continue all listed sites.**Chelan, Woodin Ave - SLAMS**

AQS#530070007- USFS

Address: 428 W. Woodin Avenue, Chelan

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 50' 18" / 120 01' 23"

MSA: Not in an urban area

Leavenworth, Evans St. - SLAMS

AQS#530070010- USFS

Address: 330 Evans Street, Leavenworth

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 047 35' 56" / 120 39' 53"

MSA: Not in an urban area

Naches, Hwy 12 - SPMS

AQS#530770007- USFS

Address: 10237 Hwy 12, Naches

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 43' 47" / 120 42' 13"

MSA: Not in an urban area

Twisp, Glover St - SLAMS

AQS#530470009- USFS

Address: 118 South Glover Street, Twisp

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 48° 21' 51" / 120 12' 40"

MSA: Not in an urban area

Winthrop, W Chewuch Rd. - SLAMS

AQS#530470010-FS

Address: 24 West Chewuch Road, Winthrop

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 048 28' 38" / 120 11' 26"

MSA: Not in an urban area

4.6.2 Other – Contracted Sites Tribal/EPA**Table 11: Other - Contracted Sites Tribal/EPA**

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530090014	Neah Bay (Makah)	2008	SLAMS	Neighborhood	Continuous	Continue
530270008	Oakville (Chehalis)	2006	SLAMS	Neighborhood	Continuous	Continue
530530022	Puyallup (Puyallup)	2008	SLAMS	Neighborhood	Continuous	Continue
530270009	Taholah (Quinault)	2004	SLAMS	Neighborhood	Continuous	Continue
530770015	Toppenish (Yakama)	2006	SLAMS	Neighborhood	Continuous	Continue
530510007	Usk (Kalispel)	2006	SLAMS	Neighborhood	Continuous	Continue
530650002	Wellpenit (Spokane)	2006	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors: None**Recommendations/Modifications:** Continue all listed sites.**Neah Bay, (Makah) - SLAMS**

AQS#530090014

Address: 159 Waada View, Neah Bay

Sampling: Continuous

Method code: 771

LAT/LONG: 048 22' 19" / 124 35' 43"

Monitoring objective: Population Exposure

Oakville, Howanut Dr (Chehalis) - SLAMS

AQS#530270008

Address: 252 Howanut Drive, Oakville

Sampling: Continuous

Method code: 771

LAT/LONG: 046 49' 23" / 123 09' 40"

Monitoring objective: Population Exposure

Puyallup, 66th Ave (Puyallup) - SLAMS

AQS#530530022

Address: 5722 66th Avenue E. Puyallup

Sampling: Continuous

Method code: 771

LAT/LONG: 047 12' 19" / 122 20' 19"

Monitoring objective: Population Exposure

Taholah, Chitwhin Dr (Quinault) - SLAMS

AQS#530270009

Address: 600 Chitwin Drive, Taholah

Sampling: Continuous

Method code: 771

LAT/LONG: 047 20' 37" / 124 17' 13"

Monitoring objective: Population Exposure

Toppenish, Ward Rd (Yakama) - SLAMS

AQS#530770015

Address: 141 Ward Road, Toppenish

Sampling: Continuous

Method code: 771

LAT/LONG: 046 23' 07" / 120 18' 49"

Monitoring objective: Population Exposure

Usk, LeClerc Rd N (Kalispel) - SLAMS

AQS# 530510007

Address: 1981 LeClerc Road North, Usk

Sampling: Continuous

Method code: 771

LAT/LONG: 048 20' 45" / 117 16' 20"

Monitoring objective: Population Exposure

Wellpinit, Ford-Wellpinit Rd (Spokane) - SLAMS

AQS#530650002

Address: 5298 Ford-Wellpinit Road, Wellpinit

Sampling: Continuous

Method code: 771

LAT/LONG: 047 53' 19" / 117 59' 19"

Monitoring objective: Population Exposure

DISCONTINUED**Skokomish, Tribal Center Rd (Skokomish)**

AQS#530450006

Address: N. 533 Tribal Center Road, Shelton

Sampling: Continuous

Method code: 771

LAT/LONG: 047 19' 33" / 123 09' 01"

Monitoring objective: Population Exposure

4.7 Other - Contracted Local Air Agencies**Table 12 Other - Contracted Local Air Agencies**

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530090013	Cheeka Peak	2006	Candidate NCore	Regional	Continuous	Continue
530110018	Port of Vancouver	2007	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors: None**Recommendations/Modifications:** Continue all listed sites.**Cheeka Peak (ORCAA)**

Nephelometer, ozone, trace gas and meteorological support

AQS#530090013

Address: Cheeka Peak, Clallum County

Sampling: Continuous

Method code: 771, 056,

LAT/LONG: 048 17' 12" / 124 37' 13"

Monitoring objective: NCore Candidate site

Port of Vancouver (SWCAA)

Meteorological monitoring support

AQS#530110018

Address: 6305 NW Old Lower River Rd, Vancouver

Sampling: Continuous

Method code: 61101, 61102, 621101

LAT/LONG: 045 39' 01" / 122 44' 24"

Monitoring objective: Other

4.8 Meteorological Monitoring

Table 13: Meteorological Monitoring

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530170006	Burbank	11/05/02	WS, WD, Ta	Middle	Continuous	Continue
530330023	Enumclaw Mud Mtn.	7/08/98	WS, WD, Ta	Urban	Continuous	Continue
530330017	North Bend	6/1/98	WS, WD, Ta	Regional	Continuous	Continue
530330080	Seattle Beacon Hill	6/4/79	WS, WD, Ta	Urban	Continuous	Continue
530630016	Spokane Ferry St.	4/10/72	WS, WD, TA	Neighborhood	Continuous	Continue
530531016	Tacoma Tower	1/1/91	WS, WD, Ta	Urban	Continuous	Continue
530110011	Vancouver Blairmount	12/19/07	WS, WD, Ta	Neighborhood	Continuous	Continue

Additional Monitors: None

Recommendations/Modifications: Continue all listed sites.

Burbank, Maple St - SLAMS

AQS#530710006

Address: 755 Maple Street, Burbank

Monitoring objective: Population Exposure

Method code: 61101, 61102, 621101

LAT/LONG: 046 12' 00" / 119 00' 30"

MSA: Not in an urban area

Enumclaw, Mud Mountain Dam - SLAMS

AQS # 530330023

Address: 30525 SE Mud Mountain Road, Enumclaw

Monitoring objective: Regional Transport

Method code: 61101, 61102, 621101

LAT/LONG: 047 08' 28" / 121 56' 09"

MSA: Seattle-Bellevue-Everett, WA

North Bend, North Bend Way - SLAMS

AQS #530330017

Address: 42404 SE North Bend Way, North Bend

Monitoring objective: Population Exposure

Method code: 61101, 61102, 621101

LAT/LONG: 047 29' 23" / 121 46' 24"

MSA: Seattle-Bellevue-Everett, WA

Seattle, Beacon Hill - SLAMS/ proposed NCore

AQS # 530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Population Exposure

Method code: 61101, 61102, 621101

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

Spokane, Ferry St - SLAMS

AQS #530630016

Address: E 3530 Ferry, Spokane

Monitoring objective: Population Exposure

Method code: 61101, 61102, 621101

LAT/LONG: 047 39' 39" / 117 21' 26"

MSA: Spokane, WA

Tacoma, Tower Drive - SLAMS

AQS #530531016

Address: Tower Drive, Tacoma

Monitoring objective: Population exposure

Method code: 61101, 61102, 621101

LAT/LONG: 47.30444° / 122.4120

MSA: Seattle-Bellevue, Everett, WA

Vancouver, Blairmount - SLAMS

AQS # 530110011

Address: 1500 SE Blairmount Drive, Vancouver

Monitoring objective: Population Exposure

Method code: 61101, 61102, 621101

LAT/LONG: 045 36' 37" / 122 30' 59"

MSA: Portland-Vancouver, OR-WA

4.9 Trace Gas Monitoring

NCore – Precursor Gas & Multi-Pollutant Monitoring – From an emission source perspective, multiple pollutants and their precursors are released simultaneously (e.g., a combustion plume with nitrogen, carbon, hydrocarbon, mercury, sulfur gases, and particulate matter). Meteorological processes that shape pollutant movement, atmospheric transformations, and removal act on all pollutants. Numerous chemical and physical interactions underlie the dynamics of particle and ozone formation and the adherence of air toxics on surfaces of particles.

Overwhelming programmatic and scientific interactions across pollutants have demanded a movement toward integrated air quality management. Collocated air monitoring benefits health assessments and emissions strategy development. Health studies with access to multi-pollutant data will be better positioned to identify confounding effects of different pollutants, particularly when concentration, composition, and population types are included. Air quality models and source attribution methods used for strategy development also benefit from the multi-pollutant approach. Modelers will be able to perform more robust evaluations by checking performance on several variables to ensure the model produces results for correct reasons and not through compensating errors. As emission sources are characterized by a multiplicity of pollutant releases, related source apportionment models yield more conclusive results from use of multi-pollutant measurements. Multi-pollutant measurements also streamline monitoring operations and offer increased diagnostic capabilities to improve instrument performance.

The multi-pollutant monitoring provided for these needs by starting to fill the measurement gaps that have accumulated over the years. The objective of this strategy is to provide for the following important needs;

- Improved data flow and timely reporting to the public
- Future NAAQS compliance determinations and revisions
- Support for development of emissions strategies
- Assess effectiveness of air pollution control programs
- Data for scientific and health-based studies.

Table 14: Trace Gas Monitoring

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530330080	Seattle Beacon Hill	4/1997	SLAMS/Proposed NCore	Urban	Continuous	Continue

Additional Monitors: None

Recommendations/Modifications: Continue all listed sites.

Seattle, Beacon Hill SLAMS/ proposed NCore

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Special Studies

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle Beacon Hill is an urban scale site for carbon monoxide and ozone. Seattle Beacon Hill also measures chemical speciated particulate matter, volatile organic air toxics, carbonyls and semi-volatile (PAH) toxics. In addition, data from this site supports the Particulate Research Center activities.

5.0 Toxics/Speciation Monitoring

Toxics

Collocated National Air Toxics Trend Site (NATTS) - In addition to the STN and NCore Precursor Gas Monitoring Programs currently underway, Beacon Hill is also a designated National Air Toxics Trend Site (NATTS). The primary objectives of Washington's National Air Toxics Trends Site Monitoring Program include but are not limited to:

- Provide long-term air toxic monitoring data in order to establish and track trends.
- Evaluate the air toxic program's progress by characterizing air toxics concentrations, and determining their spatial and temporal differences between cities and regions over time.
- Provide representative air toxic data to support exposure assessments (i.e. determine health risks).
- Determine where air toxics emissions come from (source apportionment).
- Provide air toxic data for evaluating modeling results that are used for exposure assessments.
- Assess the effectiveness of the air toxic program's emission reduction and control strategies.

Table 15: Toxics

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530330080	Seattle Beacon Hill	4/1997	SLAMS/Proposed NCore	Urban	Continuous	Continue

Additional Monitors: None

Recommendations/Modifications: Continue listed site.

Seattle, Beacon Hill SLAMS/ proposed NCore

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Special Studies

Method code: 593/560/574

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle Beacon Hill is a designated National Air Toxics Trends Site (NATTS). Seattle Beacon Hill monitoring station was nominated by the National Air Toxics Committee and chosen by EPA headquarters to represent urban scale air toxics in the Pacific Northwest. As part of NATTS designation the site was selected to receive continuing funding for long-term air toxics monitoring. It is currently the only designated urban scale NATTS located in the Pacific Northwest.

National Speciation Trends Network (STN) - The PM_{2.5} Chemical Speciation Program continues to have a significant role in the new Monitoring Strategy. Washington's STN site is located at Jefferson Park on Beacon Hill in Seattle. The primary goal of the PM_{2.5} speciation monitoring is to:

- Provide long-term data in order to establish and track trends.
- Determine the spatial and temporal differences of PM_{2.5} composition between cities and regions over time.
- Provide representative PM_{2.5} speciation data to support exposure assessments (i.e. determine health risks).
- Determine where PM_{2.5} emissions come from (source apportionment).
- Evaluate modeling results that are used for exposure assessments.
- Assess the effectiveness of the program's emission reduction and control strategies.

Table 16: Speciation

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530330080	Seattle Beacon Hill	4/1997	SLAMS/Proposed NCore	Urban	Continuous	Continue
530070010	Marysville	2009	SLAMS	Neighborhood	Continuous	NEW
530770007	Tacoma L St	2008	SLAMS	Neighborhood	Continuous	Continue
530470009	Vancouver	2002	SLAMS	Neighborhood	Continuous	Continue
530470010	Yakima	2002	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors: None

Recommendations/Modifications: Spokane Ferry site relocated to Marysville. Continue all listed sites.

Seattle, Beacon Hill SLAMS/ proposed NCore

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Special Studies

Method code:

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

Supplemental Speciation Sites - In addition to the Beacon Hill STN site, the State operates four supplemental speciation sites. These supplemental sites are located at:

Spokane, Ferry St (SCRAA) Relocation to Marysville during 2009

AQS #530630016

Address: E 3530 Ferry, Spokane

Monitoring objective: Special Studies

Method code:

LAT/LONG: 047 39' 39" / 117 21' 26"

MSA: Spokane, WA

Marysville, 7th Ave – (PSCAA)- NEW

AQS #530611007

Address: 1605 7th ST, Marysville

Sampling: 1/3 & continuous correlated

Monitoring objective: Population Exposure

Method code:

LAT/LONG: 048 03' 18" / 122 10' 33"

MSA: Seattle-Bellevue-Everett, WA

Tacoma, L Street (PSCAA)

AQS #530530029

Address: 7802 South L St., Tacoma

Monitoring objective: Special Studies

Method code:

LAT/LONG: 047 11' 11" / 122 27' 06"

MSA: Seattle-Bellevue-Everett, WA

Vancouver, 4th Plain (SWCAA)

AQS #530110013

Address: 8205 E 4th Plain Boulevard, Vancouver

Monitoring objective: Special Studies

Method code:

LAT/LONG: 045 38' 55" / 122 35' 16"

MSA: Portland-Vancouver, OR-WA

Yakima, S 4th (YRCAA)

AQS #530770009

Address: 402 South 4th Avenue, Yakima

Monitoring objective: Population Exposure

Method code:

LAT/LONG: 046 35' 42" / 120 30' 44"

MSA: Yakima, WA

5.1 Pb (Lead)**Table 17: Pb Lead**

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2009
530330080	Seattle, Beacon Hill	2010	SLAMS/Proposed NCore	Urban	1/6	Propose/Document

Additional Monitors: Ecology anticipates establishing a Seattle area Pb monitor as required, based on population, starting in 2010.

Recommendations/Modifications:**Seattle, Beacon Hill SLAMS/ proposed NCore**

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Special Studies

Method code:

LAT/LONG: 047 34' 58" / 122 18' 30"

MSA: Seattle-Bellevue-Everett, WA

1. Code of Federal Regulations, Title 40, Part 58, Appendix A,B,C,D,E, U.S. Government Printing Office, 1999.
2. Code of Federal Regulations, Title 40, Part 50, U.S. Government Printing Office, 1999.
3. Code of Federal Regulations, Title 40, Part 53, U.S. Government Printing Office, 1999.
4. Code of Federal Regulations, Title 40, Part 58, U.S. Government Printing Office, 1999.
5. U.S. EPA, Revised Requirements for Designation of Reference and Equivalent Methods for PM_{2.5} and Ambient Air Quality Surveillance for Particulate Matter -Final Rule. 40 CFR Parts 53 and 58. Federal Register, 62(138):38763-38853. July 18, 1997.
6. Guidance for Network Design and Optimum Site Exposure for PM_{2.5} and PM₁₀, J.G. Watson, et. Al., U.S. EPA/OAQPS, December 15, 1997.
7. SLAMS/NAMS/PAMS Network Review Guidance, EPA-454/R-98-003, March 1998.
8. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), EPA-450/4-87-007, May 1987.
9. Guideline on Ozone Monitoring Site Selection, EPA-454/R-98-002, August 1998.