



DEPARTMENT OF
ECOLOGY
State of Washington

2011 Ambient Air Monitoring Network Report

*Washington State Department of Ecology
300 Desmond Drive/PO Box 47600
Olympia, Washington 98504-7600*

May 2011
Publication no. 11-02-017

Publication and Contact Information

This report is available on the Department of Ecology's website at www.ecy.wa.gov/biblio/1102017.html

For more information contact:

Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Phone: 360-407-6800

Washington State Department of Ecology - www.ecy.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Yakima 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

To ask about the availability of this document in a format for the visually impaired, call the Air Quality Program at 360-407-6800. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

2011 Ambient Air Monitoring Network Report

*by
Mike Ragan*

Air Quality Program
Washington State Department of Ecology
Olympia, Washington

This page is purposely left blank

Table of Contents

Executive Summary	iii
Purpose of the report.....	iii
Background information	iii
Monitoring network requirements	iii
Using monitoring data.....	iv
Introduction.....	1
Regulatory Requirements and Other Data Needs	1
Appendix D Requirements.....	1
Monitoring Objectives and Spatial Scales.....	1
Number of State and Local Air Monitoring Stations	2
Appendix E Requirements	3
Other Ambient Air Monitoring Data Needs.....	3
Network Review Procedure	4
Network Review Team and Preparation.....	4
Network Modifications.....	4
Determining Compliance with Appendix D and Special Monitoring Requirements	5
Determining Compliance with Appendix E Requirements	5
Network Evaluation and Recommendations/Modifications	6
Carbon Monoxide (CO, 42101).....	6
Ozone (O ₃ , 44201).....	8
Nitrogen Dioxide (NO ₂ , 42602)	11
Sulfur Dioxide (SO ₂ , 42401)	12
Particulate Matter 10 (PM ₁₀ , 81102)	13
Particulate Matter 2.5 (PM _{2.5} , 88101, 88502).....	16
Other – Contracted Sites USFS	26
Other – Contracted Sites Tribal/EPA	27
Other – Contracted Local Air Agencies	29
Meteorological Monitoring	30
Lead (Pb 11351)	32
Trace Gas Monitoring.....	33
Toxics	36
Speciation	37
References.....	39

List of Tables and Figures

Table 1: Relationship between Monitoring Objectives and Scale of Representativeness	2
Table 2: Summary of Spatial Scales for SLAMS	2
Table 3: Summary of Probe and Monitoring Path Siting Criteria	4
Table 4: Carbon Monoxide, 42101	6
Table 5: Ozone, 44201	8
Table 6: Particulate Matter 10 (PM10, 81102)	13
Table 7: Particulate Matter (PM2.5, 88101, 88502)	16
Table 8: Other Contracted Sites USFS	26
Table 9: Other - Contracted Sites Tribal/EPA	27
Table 10: Other - Contracted Local Air Agencies	29
Table 11: Meteorological Monitoring.....	30
Table 12: Pb Lead (11351)	32
Table 13: Trace Gas Monitoring.....	33
Table 14: NCore Parameters Seattle Beacon Hill.....	34
Table 15: NCore Parameters Cheeka Peak.....	35
Table 16: Toxics	36
Table 17: Speciation	37
Figure 1: Spokane CO Daily 8-hour Maximums	7

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 on which to base policy decisions. This report summarizes the results of the 2011 review. These results include:

- Identifying modifications to Ecology's ambient air monitoring network since the 2010 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 to 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
- Analyze pollution episodes
- Assist with permitting work

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 designated State and Local Air Monitoring stations (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 on which to base policy decisions. 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
- Analyze pollution episodes
- Assist with permitting work

Regulatory Requirements and Other Data Needs

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.

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 are 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.....	✓		✓		✓	✓	✓

Number of State and Local Air Monitoring Stations

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 half ton or more per year. Other factors 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.

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.

Other Ambient Air Monitoring Data Needs

Washington has had a number of special purpose monitors (SPMs) deployed throughout the State. They are used for a variety of purposes, including Washington's Air Quality Advisory 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
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)

Network Review Procedure

Network Review Team and Preparation

Network report participants include the Washington State Department of Ecology Air Quality staff. Sufficient information is 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 to determine compliance of the network design and siting requirements specified for all special ambient air monitoring networks.

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 disinvestment 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.

Determining Compliance with Appendix D and Special Monitoring Requirements

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.

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. Appropriate location of monitors can be determined on the basis of stated objectives.

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 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 needs, 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 (are the number of monitors appropriate and are the monitors properly located).

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.

Network Evaluation and Recommendations/Modifications

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 one site statewide.

Table 4: Carbon Monoxide, 42101

AQS #	Site Name	Est.	Type	Scale	Sampling Frequency	Action for 2011
530630049	Spokane, 3 rd & Washington	1/1/97	SLAMS	Micro	Continuous	Discontinue

Additional Monitors: None in 2011. Ecology will provide information on future CO monitoring in the 2012 Network Report. Washington is scheduled to operate 2 CO monitors at near-roadway NO₂ sites starting in 2013.

Recommendations/Modifications: Ecology still recommends discontinuance of the Spokane 3rd and Washington carbon monoxide site based on continued diminishing CO values and the need to reinvest resources in new monitoring efforts. Specifically for Spokane, the result of control strategies and the gradual replacement of older vehicles with less-polluting ones, CO pollution levels have fallen dramatically in over the last two decades and are now far below the NAAQS. In addition, CO levels are expected to continue to fall as new vehicles being sold in Washington meet some of the strictest emission standards in the U.S.

Ecology and its partners have divested of traditional CO monitoring and believe continuing to do so is the best use of state resources. Ecology plans to monitor for near-roadway CO as described in the revised CO rule starting in 2013.

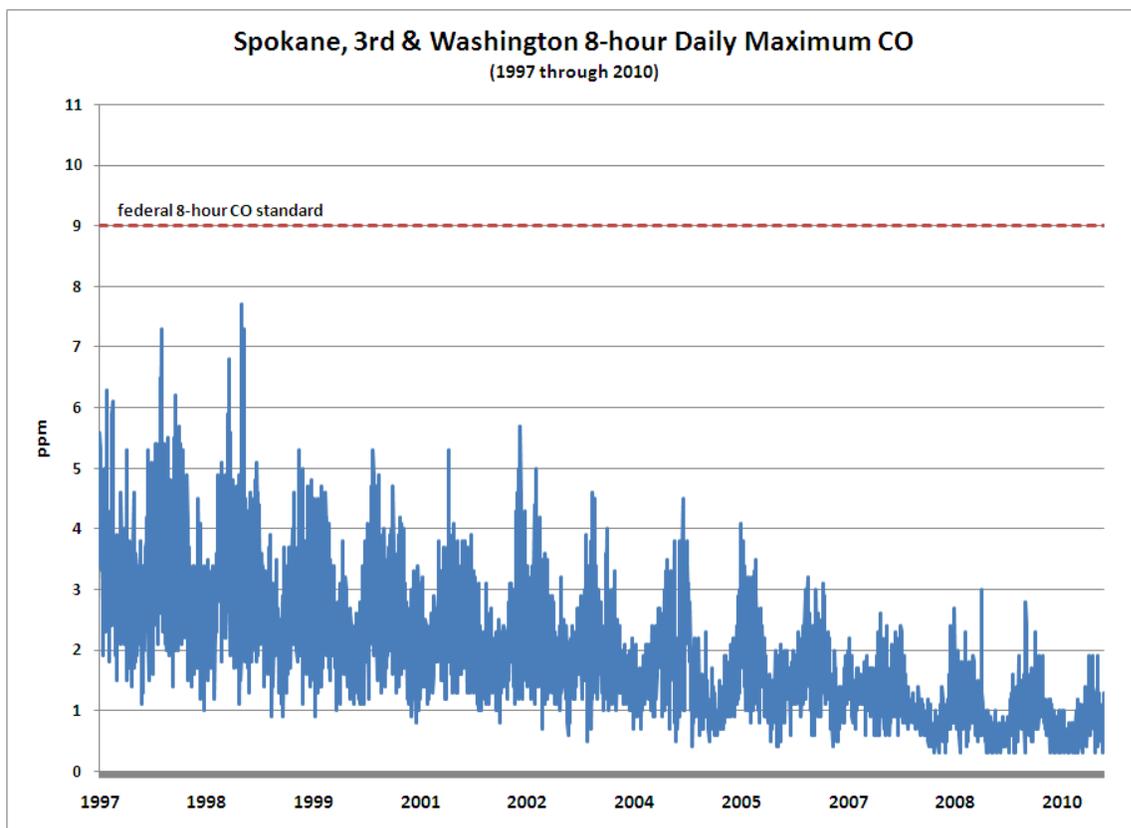


Figure 1: Spokane CO Daily 8-hour Maximums

Spokane, 3rd & Washington – SLAMS – Recommended for Discontinuance

AQS # 530630049

Method code: 054

Address: W. 408 3rd Avenue, Spokane

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

Monitoring objective: Highest Concentration

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 10 years.

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 Frequency	Action For 2011
530730005	Custer/Loomis	5/89	SLAMS	Urban	Continuous	Continue
530330080	Seattle, Beacon Hill	4/1/97	NCORE	Urban	Continuous	Continue
530330010	Issaquah, Lake Sam	12/1/75	SLAMS	Urban	Continuous	Continue
530330023	Enumclaw, Mud Mtn.	7/8/98	SLAMS	Urban	Continuous	Continue
530330017	North Bend, NB Way	6/1/98	SLAMS	Urban	Continuous	Continue
530530012	Mt. Rainier, Jackson Visitor Center	7/13/98	SLAMS	NPS supported	Continuous	Continue
530110011	Vancouver, Blairmont	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: Ecology monitored for a modeled "hot spot" in the northeast Olympic Peninsula and did not find any substantial values. Ecology now provides technical support for SRCAA's Spokane Augusta ozone site. Information on Spokane Augusta is listed under "Contracted sites".

Recommendations/Proposed Modifications:

Comment: Based on the proposed Ambient Ozone Monitoring Regulations, which were published in the *Federal Register* on July 16, 2009 (74 *Federal Register* 34525), Washington may be required to site up to seven new ozone monitors in MSA's throughout the state in 2012-2013. New ozone locations could be: Bremerton/Silverdale, Yakima, Kennewick/Richland/Pasco, Olympia, Clarkston/Lewiston, Wenatchee and Longview.

Ozone

Custer/Loomis - SLAMS

AIRS # 530730005

Method code: 056

Address: 1330 Loomis Trail Road, Custer

LAT/LONG: 048 95' 25 / -122 55' 45

Monitoring objective: Transport

MSA: Bellingham, WA

Adequacy

FCC Loomis is an urban scale Special Purpose Monitoring Site (SPMS) for Ozone established in 1989. It is located outside of Custer, 20 miles south of the US/Canadian border.

Comments

Custer/Loomis site provides data from Canadian impacts as modeling information for the Puget Sound Ozone network.

Exceedences

This site has not exceeded the one or eight hour standard for Ozone in the past 3 years.

Seattle, Beacon Hill – NCore

AQS # 530330080

Method code: 056

Address: 4103 Beacon Avenue S., Seattle

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

Monitoring objective: Population Exposure

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 studies. Seattle Beacon Hill is also a long-term trend and research site.

Exceedences

This site has not exceeded the 8-hour standard.

Issaquah, Lake Sammamish - SLAMS

AQS # 530330010

Method code: 056

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

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

Monitoring objective: Population Exposure

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** 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 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 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** 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.

Exceedences

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

Vancouver, Blairmont - SLAMS

AQS # 530110011

Method code: 056

Address: 1500 SE Blairmont Drive, Vancouver

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

Monitoring objective: Population Exposure

MSA: Portland-Vancouver, OR-WA

Comments

Blairmont is an urban scale site, near downtown Vancouver. The site represents the Portland/Vancouver airshed and part of the ozone maintenance planning effort of the Southwest Clean Air Agency (SWCAA).

Exceedences

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

Yelm, Northern Pacific - SLAMS

AQS # 530670005

Method code: 056

Address: NEW - 931 Northern Pacific Road, Yelm

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

Monitoring objective: Population Exposure

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** exceeded the 8-hour ozone standard in the past 3 years.

Cheney, Turnbull - SLAMS

AQS # 530630001

Method code: 056

Address: S. 26010 Smith Road, Cheney

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

Monitoring objective: Population Exposure

MSA: Spokane, WA

Comments

Turnbull is a background/transport scale site located at the Turnbull Wildlife Refuge, south of Spokane. It is 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

Method code: 056

Address: E. 9814 Greenbluff Road, Spokane

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

Monitoring objective: Population Exposure

MSA: Spokane, WA

Comments

Greenbluff is an urban scale site 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.

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.

Additional Monitors: None

Recommendations/Proposed Modifications: Washington no longer monitors for NO₂. Ecology does 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.

Comment: Based on the Primary National Ambient Air Quality Standard for Nitrogen Dioxide Final Rule signed on January 25, 2010, Washington will be required to site and operate new NO₂ monitors starting January 1, 2013.

NEAR-ROAD NO₂ MONITORS

- At least one monitor would be required near a major roadway in any urban area with a population greater than or equal to 350,000 people
- A second monitor would be required near a major road in areas with either
 - A population greater than 2.5 million people, or
 - One or more road segments with an annual average daily traffic count greater than or equal to 250,000 vehicles
 - NO₂ monitors area to be located within 50 meters of major roadways
- Potential impact on Washington
 - **2 monitors** in the Seattle-Tacoma-Bellevue, WA MSA
 - 1 monitor in the Portland-Vancouver Beaverton, OR-WA MSA (ODEQ)

AREA-WIDE NO₂ MONITORING

- One monitor in each MSA with 1,000,000 or more population to monitor the location of expected highest NO₂ concentrations representing neighborhood or larger spatial scales
- Some flexibility for the use of an existing monitor
- Potential impact on Washington
 - **1 monitor** in the Seattle-Tacoma-Bellevue, WA MSA
 - Total of 1 monitor in the bi-state Portland-Vancouver Beaverton, OR-WA MSA (ODEQ)

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.

Additional Monitors: None

Recommendations/Proposed Modifications: Washington no longer monitors for SO₂. Ecology monitors for trace level SO₂ at Seattle Beacon Hill.

Comment:

Based on the Primary NAAQS for Sulfur Dioxide, Washington will be required to site and operate new SO₂ roadside monitors January 1, 2013.

SO₂ monitoring takes a 2-pronged approach. The first prong is called Population Weighted Emissions Index (PWEI). The second prong is based on each state's contribution to the national emissions inventory (NEI). In Washington's case it is a 0.45 contribution. Monitors should be sited in areas of max concentrations using micro, middle or neighborhood scale. SO₂ monitors will be proposed in the 2012 network plan and implemented in 2013.

Population Weighted Emissions Index (PWEI)

- Potential impact on Washington
 - 1 monitor in the Seattle-Tacoma-Bellevue, WA MSA (PWEI, 45,728)
 - 1 monitors in the bi-state Portland-Vancouver Beaverton, OR-WA MSA (ODEQ) (PWEI, 27,863)

Washington's contribution to the national emissions inventory (NEI)

- Potential impact on Washington
 - 1 monitor in Washington

Particulate Matter 10 (PM₁₀, 81102)

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 6 sites statewide, including one collocated site.

Table 6: Particulate Matter 10 (PM₁₀, 81102)

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
530050002	Kennewick, Metaline Ave	10/94	SLAMS	Neighborhood	Continuous	Continue
530770009	Yakima, S 4th	4/00	SLAMS	Neighborhood	1/6	Continue
530650004	Colville, S Oak	11/96	SLAMS	Neighborhood	Continuous	Continue
530710006	Burbank, Maple St	1/03	SLAMS	Middle	Continuous	Discontinue
530630021	Spokane, Augusta Ave.	3/09	SLAMS	Middle	1/6	Continue
530630021	Spokane, Augusta Ave.	3/09	Collocated	Middle	1/12	Continue

Additional Monitors: None

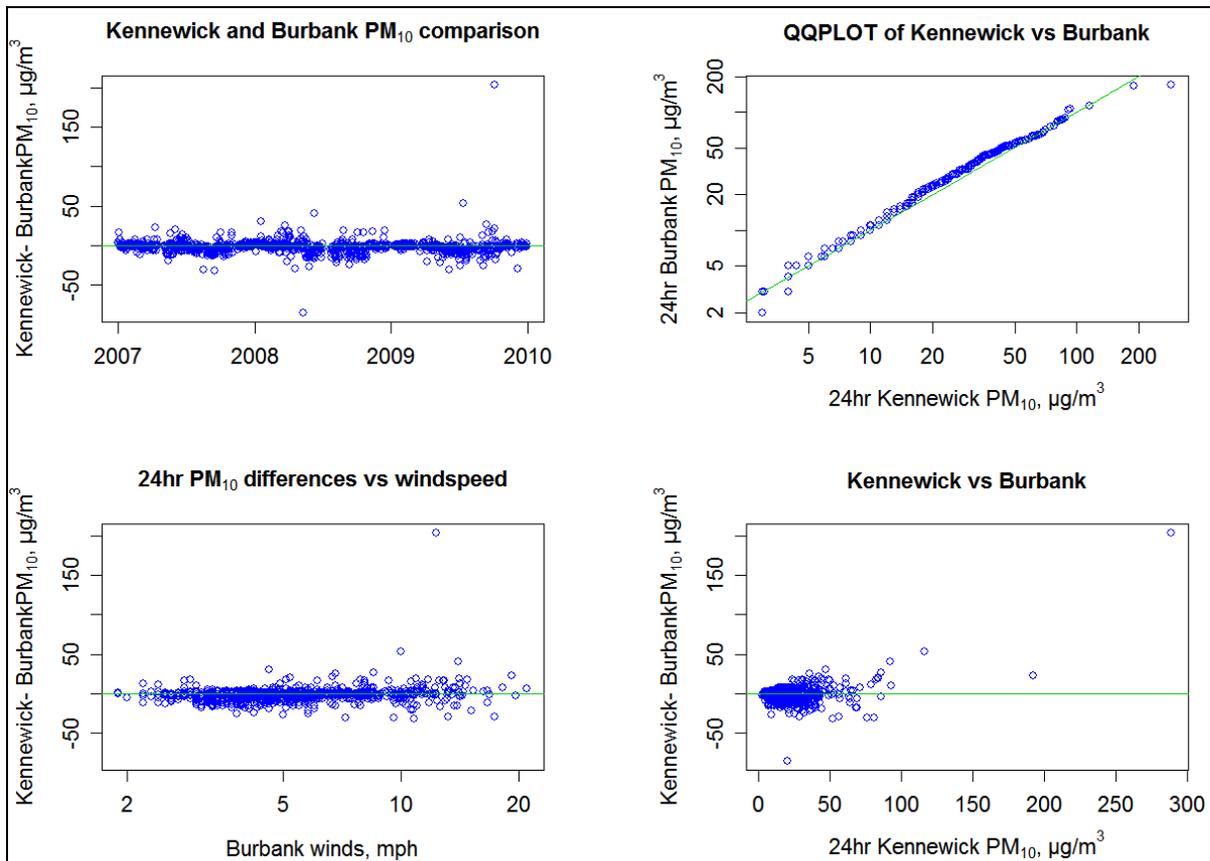
Recommendations/Proposed Modifications:

Ecology continues to recommend discontinuance of the Burbank PM₁₀ site. Through analysis in the 2010 Network Assessment, the Burbank PM₁₀ site was deemed to be redundant as described below. Ecology will work on a SIP amendment as requested by EPA to discontinue Burbank PM₁₀.

Burbank/Kennewick

Two potential duplicate continuous PM₁₀ monitors were identified- Kennewick and Burbank. These monitors are located at stations within the same airshed, are about 7 miles apart, and can likely serve as surrogates for each other. Burbank records slightly higher concentrations overall though Kennewick is sometimes higher during windblown dust events. Reading left to right (top to bottom) in Figure 2 below, the first graphic shows that with a few exceptions, there have been no pronounced differences between 24-hour concentrations at the two stations, since 2007. The second graphic is a quantile-quantile plot with a nearly straight line. This suggests that data at both sites for the past 3 years are distributed similarly, although Burbank often reads slightly higher concentrations than Kennewick. The third and fourth graphics show the difference in concentrations (Kennewick minus Burbank) as a function of wind speeds and Kennewick PM₁₀ concentrations, respectively.

With the exception of one event that impacted Kennewick and not Burbank, they do not appear to deviate on account of wind speeds, nor at some threshold PM₁₀ concentrations. Taken together, data shown suggest there is reason to believe that the continuous PM₁₀ TEOMs at Kennewick and Burbank consistently track each other quite closely. Since the lower readings at Kennewick are too small to be significant for operational purposes, these two TEOMs can be considered duplicates. As such Ecology believes that the Burbank station could be discontinued with no loss of important information.



Different Analyses Showing Redundant PM₁₀ Monitors at Burbank and Kennewick

PM₁₀

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

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 located in a commercial/residential area near downtown Yakima. The site is representative of the Yakima area which was 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" / 117 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 exceeded the standard for PM₁₀ in the past 3 years.

Burbank, Maple St – SLAMS – Continued recommendation for Discontinuance

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 located near 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, Augusta Ave. - SLAMS

AQS # 530630021

Address: 3104 E. Augusta Ave., Spokane

Monitoring objective: Population Exposure

Method code: 079/063

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

MSA: Spokane, WA

Comments

Augusta Ave. is a 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.

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

National Ambient Air Quality Standard (NAAQS):

- 3-year average of the 98th percentile 24-hour concentration not to exceed 35ug/m³ 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 forty sites, including one collocated site.

Table 7: Particulate Matter (PM_{2.5}, 88101, 88502)

AQS#	Site Name	Type	Sample Type	Sampling Frequency	DV(2011) Continuous	Action for 2011
530272002	Aberdeen Division St	SLAMS	Continuous	Continuous	12.3	Continue
530330037	Bellevue, Bellevue Way	SLAMS	Continuous	Continuous	12.1	Continue
530730015	Bellingham, Yew Street	SLAMS	Continuous	Continuous	15.5	Continue
530030004	Clarkston	SLAMS	Continuous	Continuous	21.9	Continue
530410004	Chehalis	SLAMS	Continuous	Continuous	*	Continue
530650004	Colville	SLAMS	Continuous	Continuous	25.3	Continue
530610020	Darrington, Fir St	SLAMS /SPMS	SEQ/Continuous	1/3	30.1	Continue
530130002	Dayton, W. Main	SLAMS	Continuous	Continuous	*	Continue
530370002	Ellensburg	SLAMS	Continuous	Continuous	22.7	Continue
530050002	Kennewick, Metaline Ave	SLAMS	Continuous	Continuous	18.5	Continue
530332004	Kent, James & Central	SPMS	Continuous	Continuous	20	Continue
530750005	LaCrosse, Hill St	SLAMS	Continuous	Continuous	10.9	Continue
530330024	Lake Forest Park, Ballinger Way	SLAMS	Continuous	Continuous	18.7	Continue
530150015	Longview, 30 th Ave	SLAMS	Continuous	Continuous	14.6	Continue
530610005	Lynnwood, 212 th	SPMS	Continuous	Continuous	20	Continue
530611007	Marysville, 7th Ave	SLAMS /SPMS	SEQ/Continuous	1/3	29	Continue
530450007	Shelton, W. Franklin	SLAMS	Continuous	Continuous	17.4	Continue
530351005	Meadowdale, Blackbird Dr	SPMS	Continuous	Continuous	25.5	Relocate
530210002	Mesa, Pepoit Way	SLAMS	Continuous	Continuous	15.4	Continue
530251002	Moses Lake, Balsam St	SLAMS	Continuous	Continuous	16.3	Continue
530570015	Mt. Vernon, S Second St	SLAMS	Continuous	Continuous	11	Continue
530330017	North Bend, North Bend Way	SLAMS	Continuous	Continuous	12.8	Continue
530670013	Lacey, College St	SLAMS	Continuous	Continuous	25.2	Continue
530090009	Port Angeles, W 14th St	SLAMS	Continuous	Continuous	17.5	Continue
530310003	Port Townsend, San Juan Ave	SLAMS	Continuous	Continuous	15.8	Continue
530750003	Pullman, Dexter Ave	SLAMS	Continuous	Continuous	12.1	Continue
530531018	Puyallup, 128 th St	SLAMS	Continuous	Continuous	22.3	Continue
530010003	Ritzville, Alder St	SLAMS	Continuous	Continuous	13.6	Continue
530750006	Rosalia, Josephine St	SLAMS	Continuous	Continuous	11.7	Continue
530330080	Seattle, Beacon Hill	NCore	SEQ/Continuous	1/3	16	Continue
530330057	Seattle, E Marginal Way	SPMS	Continuous	Continuous	24.3	Continue
530330048	Seattle, Olive St	SLAMS	Continuous	Continuous	14.9	Continue
530630021	Spokane, Augusta	SLAMS	SEQ/Continuous	1/6	24.5	Continue
530630021	Spokane, Augusta	Co-loc	SEQ	1/12	24.5	Continue
530630047	Spokane, Monroe Street	SLAMS	Continuous	Continuous	*	Continue

AQS#	Site Name	Type	Sample Type	Sampling Frequency	DV(2011) Continuous	Action for 2011
530530031	Tacoma, Alexander Ave	SLAMS	Continuous	Continuous	21	Continue
530530029	Tacoma, S L Street	SLAMS /SPMS	SEQ/Continuous	1/1	37.7	Continue
530110013	Vancouver, 4th Plain	SLAMS /SPMS	SEQ/Continuous	1/3	27.3	Continue
530710005	Walla Walla, 12 th St	SLAMS	Continuous	Continuous	19.3	Continue
530070006	Wenatchee	SLAMS	Continuous	Continuous	27.8	Continue
530770009	Yakima, S 4 th Ave	SLAMS /SPMS	SEQ/Continuous	1/3	37.1	Continue

Asterisk * denotes sites with less than 3 years data. Chehalis and Dayton are newer sites. Monitoring was temporarily discontinued for roof repairs at Spokane Monroe.

Note: Ecology uses the Washington Air Quality Advisory (WAQA) for reporting PM_{2.5} to inform and protect citizens of Washington. WAQA reporting is more protective of human health. Ecology's goal is to keep 24-hour concentrations below 20 ug/m³.

In addition, some monitors in areas of Washington are not intended to be solely NAAQS based. Certain monitors are used for protection of human health by calling burn bans during home heating season, making daily decisions for agricultural burning and health information- reporting PM_{2.5} values.

Additional Monitors: None

Recommendations/Modifications: The Marysville site has been relocated on the school grounds, see relocation detail in red below. Relocate Bremerton Meadowdale site to meet siting criteria. Continue all other sites as described.

PM_{2.5}

Aberdeen, Division St - SLAMS

AQS #530272002

Address: 359 North Division, Aberdeen

Sampling: Continuous

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 smoke related to home heating and mobile sources and is used for curtailment calls during the home heating season.

Bellevue, Bellevue Way - SLAMS

AQS #530330037

Address: 305 Bellevue Way, Bellevue

Sampling: Continuous

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. It is representative of mobile source and smoke impacts in the area and used for curtailment calls during the home heating season.

Bellingham, Yew Street - SLAMS

AQS #530730015

Address: 2420 Yew Street, Bellingham

Sampling: Continuous

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. It is impacted by smoke related to home heating in the Bellingham/Whatcom County area and used for curtailment calls during the home heating season.

Chehalis, Market Blvd – SLAMS

AQS # 530410004

Address: 350 N. Market, Chehalis

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

LAT/LONG: 046 66' 40"/122 96' 73"

UA: Not in an urban area

Comments

Chehalis is a neighborhood scale site established in late 2009. It is located in a mixed/residential area of Chehalis. It is impacted by smoke from home heating and used for curtailment calls during the home heating season.

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 and converted to PM_{2.5} in 2007, is located in a mixed/residential area of Clarkston.

Colville – SLAMS

AQS # 530650004

Address: 215 S. Oak Street, Colville

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 and converted to PM_{2.5} in 2009, is located in the commercial/residential area of Colville.

Darrington, Fir St – SLAMS/SPMS

AQS #530610020

Address: 1085 Fir St, Darrington

Sampling: FRM 1/3 & FEM continuous

Monitoring objective: Population Exposure

Method code: 118/181

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

MSA: Not in an urban area

Comments

Darrington is neighborhood scale residential site impacted by smoke from home heating. This site has an FRM and is suitable for comparison to the PM_{2.5} NAAQS.

Dayton, 206 W. Main - SLAMS

AQS # 530130002

Address: 206 W. Main, Dayton

Sampling: Continuous

Method code: 771

LAT/LONG: 046.3180"/ 117.9850

Monitoring objective: Population Exposure

UA: Not in an urban area

Comments

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

Ellensburg, Ruby St - SLAMS

AQS # 530370002

Method code: 771

Address: 201 North Ruby Street, Ellensburg

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

Sampling: Continuous

Monitoring objective: Population Exposure

MSA: Not in an urban area

Comments

Ellensburg is a neighborhood scale site established in 1995 as a PM₁₀ site and converted to PM_{2.5} in 2006. It is located in a residential area of Ellensburg impacted by smoke from home heating devices and used for curtailment calls during the home heating season.

Kennewick, Metaline Ave - SLAMS

AQS #530050002

Method code: 771

Address: 5929 W Metaline, Kennewick

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

Sampling: Continuous

Monitoring objective: Population Exposure

MSA: Richland, Kennewick, and Pasco, WA

Comments

Kennewick is neighborhood scale site. The site is impacted from smoke from home heating devices and agricultural sources and is geographically representative of the Tri-Cities area. Kennewick is used for curtailment calls during the home heating season.

Kent, James & Central – SPMS

AQS #530332004

Method code: 181

ADDRESS: 614 N Railroad, Kent

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

Sampling: FEM continuous

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Kent is neighborhood scale site in the South Puget Sound that is impacted from mobile sources, light industry, smoke from home heating devices. 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

Monitoring objective: Population Exposure

MSA: Olympia, WA

Comments

Lacey, College St is a neighborhood scale site impacted by smoke from home heating devices. The site is representative of the Olympia/Thurston County 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

Monitoring objective: Population Exposure

MSA: Not in an urban area

Comments

LaCrosse is neighborhood scale small-community monitor in Eastern Washington impacted by smoke from burning. LaCrosse is used for daily agricultural burn decisions and curtailment calls during the home heating season .It also provides 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

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Lake Forest Park is neighborhood scale site impacted by smoke from home heating devices and mobile sources from two adjacent arterials. It is used for curtailment calls during the home heating season.

Longview, 30th Ave - SLAMS

AQS #530150015

Method code: 771

Address: 1324 30th Ave, Longview

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

Sampling: Continuous

Monitoring objective: Population Exposure

MSA: Longview, WA

Comments

Longview is a neighborhood scale site impacted by smoke from home heating. It is representative of the Longview/Kelso area and is used for curtailment calls during the home heating season.

Lynnwood, 212th - SPMS

AQS #530610005

Method code: 181

Address: 6120 212th SW, Lynnwood

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

Sampling: FEM continuous

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Lynnwood is neighborhood scale site impacted by smoke during the home heating season. Lynnwood is representative of south Snohomish County.

Marysville, 7th Ave – SLAMS/SPMS*

AQS #530611007

Method code: 118/181

Address: 1605 7th ST, Marysville

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

Sampling: FRM 1/3 & FEM continuous

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Marysville is a neighborhood scale site impacted by smoke during the home heating season, mobile sources, and light industry. It is representative of the Marysville/North Snohomish County area. The site has an FEM & FRM and is suitable for comparison to the PM_{2.5} NAAQS.

***The new Marysville site is the result of an effort to satisfy both the Marysville School District and Marysville city (codes). The original location was located on a building scheduled for demolition, and therefore no longer viable as a long-term site. Daily PM values at this site have been very close to the NAAQS, therefore Ecology and the Puget Sound Clean Air Agency placed a high value retaining this site on school grounds.**

Meadowdale, Blackbird Dr - SPMS

AQS # 530351005

Address: 7252 Blackbird Dr NE, Bremerton
Sampling: Nephelometer & FEM continuous

Monitoring objective: Population Exposure

Method code: 771/181

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

MSA: Bremerton, WA

Comments

Meadowdale, Blackbird Dr is a middle-neighborhood scale residential site which currently does not meet EPA siting criteria. PSCAA plans to relocate Meadowdale in 2011. It provides air quality information to a population of 280,000 Kitsap residents.

Mesa, Pepoit Way - SLAMS

AQS #530210002

Address: 200 Pepoit Way, Mesa

Sampling: Continuous

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 impacted by agricultural sources and smoke from home heating. It is used for daily agricultural burn decisions and curtailment calls during the home heating season.

Moses Lake, Balsam St - SLAMS

AQS #530251002

Address: 412 S Balsam St, Moses Lake

Sampling: Continuous

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 impacted by agricultural sources and smoke from home heating sources. It is used for daily agricultural burn decisions and curtailment calls during the home heating season.

Mt. Vernon, S Second St - SLAMS

AQS #530570015

Address: 1600 South Second St, Mount Vernon

Sampling: Continuous

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 impacted by home heating devices. Mt. Vernon is used for curtailment calls during the home heating season.

North Bend, North Bend Way - SLAMS

AQS #530330017

Address: 42404 SE North Bend Way, North Bend

Sampling: Continuous

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 smoke from home heating devices. North Bend is used for curtailment calls during the home heating season. North Bend is collocated with ozone and meteorological equipment.

Port Angeles, W 14th St - SLAMS

AQS #530090009

Address: 1139 W 14th St., Port Angeles

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

MSA: Not in an MSA

Comments

Port Angeles is a neighborhood scale site adjacent to Olympic National Park, a Class 1 Area and impacted by smoke from home heating sources. Port Angeles is used for curtailment calls during the home heating season.

Port Townsend, San Juan Ave - SLAMS

AQS #530310003

Address: 3939 San Juan Avenue, Port Townsend

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

MSA: Not in an MSA

Comments

Port Townsend is neighborhood scale SLAMS site impacted by smoke from home heating devices. Port Townsend is used for curtailment calls during the home heating season. It is representative of the east Jefferson County area.

Pullman, Dexter Ave - SLAMS

AQS #530750003

Address: 240 SE Dexter, Pullman

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

MSA: Not in an MSA

Comments

Pullman is a neighborhood scale site is in Eastern Washington impacted by smoke from burning. Pullman is used for daily agricultural burn decisions and curtailment calls during the home heating season.

Puyallup, 128th St - SLAMS

AQS #530531018

Address: 9616 128th St E, Puyallup

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

MSA: Seattle-Bellevue-Everett, WA

Comments

Puyallup is a neighborhood scale site impacted by smoke from home heating devices in the Pierce County South Hill area.

Ritzville, Alder St - SLAMS

AQS #530010003

Address: 109 W Alder, Ritzville

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

UA: Not in an urban area

Comments

Ritzville is a neighborhood scale small-community located in Eastern Washington impacted by smoke from burning activities in the area. Ritzville is used for making daily agricultural burn decisions and curtailment calls during the home heating season.

Rosalia, Josephine St - SLAMS

AQS #530750006

Method code: 771

Address: 906 S Josephine Avenue, Rosalia

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

Sampling: Continuous

Monitoring objective: Population Exposure

UA: Not in an urban area

Comments

Rosalia is a neighborhood scale small-community site located in Eastern Washington impacted by smoke from burning in the area. Rosalia is used for making daily agricultural burning decisions and curtailment calls during the home heating season.

Seattle, Beacon Hill - NCore

AQS #530330080

Method code: 118/181

Address: 4103 Beacon Avenue S., Seattle

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

Sampling: FRM 1/3 & FEM continuous

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle, Beacon Hill is an urban scale NCore site. Seattle Beacon Hill is collocated with an FEM, FRM, meteorological equipment as well as toxics and speciation monitoring.

Seattle/Duwamish - SPMS

AQS #530330057

Method code: 181

Address: 4401 E Marginal Way S., Seattle

LAT/LONG: 047 56' 32" / 122 34' 05"

Sampling: FEM continuous

Monitoring objective: Population Exposure

MSA: Seattle-Bellevue-Everett, WA

Comments

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

Seattle, Olive St - SLAMS

AQS #530330048

Method code: 771

Address: 1624 Boren Avenue, Seattle

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

Sampling: Continuous

Monitoring objective: Population Exposure

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 effects of mobile source diesel emissions. This site is not suitable for comparison to the PM_{2.5} NAAQS.

Shelton, W. Franklin - SLAMS - Relocated

AQS #530450007

Method code: 771

Address: 122 W. Franklin, Shelton

LAT/LONG: 047 213' 55" / 123 100' 81"

Sampling: Continuous

Monitoring objective: Population Exposure

MSA: Not in an MSA

Comments

Shelton is a neighborhood scale site established in 2001 and relocated in April of 2011. Shelton is impacted by smoke from home heating devices and used for curtailment calls during the home heating season.

Spokane, Augusta - SLAMS

AQS #530630021

Address: 3104 E. Augusta Ave., Spokane

Sampling: FRM 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 Augusta Ave. is a neighborhood scale site impacted by smoke from home heating devices and light industrial sources. The site is equipped with an FRM and suitable for comparison to the PM_{2.5} NAAQS.

Spokane, Monroe Street - SLAMS

AQS #530630047

Address: N 4601 Monroe St., Spokane

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

MSA: Spokane, WA

Comments

Spokane, Monroe St. is a neighborhood scale site impacted by smoke from home heating devices and is representative of the area.

Tacoma, Alexander Ave - SLAMS

AQS #530530031

Address: 2301 Alexander Avenue, Tacoma

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 771

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

MSA: Seattle-Bellevue-Everett, WA

Comments

Tacoma, Alexander Ave is a neighborhood scale site impacted by smoke from home heating devices and industrial point sources on the Tacoma Tide flats. The site is representative of the NE Tacoma/Fife area.

Tacoma, S L St - SLAMS/SPMS

AQS #530530029

Address: 7802 South L St., Tacoma

Sampling: FRM 1/1 & FEM continuous

Monitoring objective: Population Exposure

Method code: 118/181

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

MSA: Seattle-Bellevue-Everett, WA

Comments

Tacoma, L Street is a neighborhood scale site impacted by smoke from home heating devices. The site is equipped with an FEM & FRM and suitable for comparison to the PM_{2.5} NAAQS.

Vancouver, 4th Plain – SLAMS/SPMS

AQS #530110013

Address: 8205 E 4th Plain Boulevard, Vancouver

Sampling: FRM 1/3 & continuous – FEM in 2011

Monitoring objective: Population Exposure

Method code: 118/771

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

MSA: Portland-Vancouver, OR-WA

Comments

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

Walla Walla, 12th St - SLAMS

AQS #530710005

Address: 200 S 12th, Walla-Walla

Sampling: Continuous

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 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 and converted to PM_{2.5} in 2006. It is located in a residential area of Wenatchee impacted by smoke from multiple sources including home heating devices and wildfires.

Yakima, S 4th Ave – SLAMS/SPMS

AQS #530770009

Address: 402 South 4th Avenue, Yakima

Sampling: FRM 1/3 & continuous - FEM in 2011

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 suitable for comparison to the PM_{2.5} NAAQS.

Other – Contracted Sites USFS

Table 8: Other Contracted Sites USFS

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
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

Other – Contracted Sites Tribal/EPA

Table 9: Other - Contracted Sites Tribal/EPA

AQS#	Site Name (Tribe)	Est.	Type	Scale	Sampling Type	Action for 2011
530090014	Neah Bay (Makah)	2008	SLAMS	Neighborhood	Continuous	Continue
530270008	Oakville (Chehalis)	2006	SLAMS	Neighborhood	Continuous	Continue
530470013	Omak (Colville)	2010	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	Discontinue
530650002	Wellpinit (Spokane)	2006	SLAMS	Neighborhood	Continuous	Continue
530770016	White Swan (Yakama)	2009	SLAMS	Neighborhood	Continuous	Continue

Additional Monitors:

Recommendations/Modifications: EPA Tribal Section has recommended and Ecology concurs in **Discontinuing the Usk site**. Continue all other contracted Tribal sites as listed. Ecology is discussing additional Tribal sites with EPA. If additional Tribal sites are added, they will be included in the 2012 network report.

Neah Bay, (Makah) - SLAMS

AQS#530090014

Address: 159 Waada View, Neah Bay

Sampling: Continuous PM_{2.5}

Method code: 771

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

Monitoring objective: Population Exposure

Oakville, (Chehalis) - SLAMS

AQS#530270008

Address: 252 Howanut Drive, Oakville

Sampling: Continuous PM_{2.5} & meteorology

Method code: 771

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

Monitoring objective: Population Exposure

Omak, Howanut Dr (Colville) - SLAMS

AQS#530470013

Address: 8th Ave & Omak/Okanogan Rd

Sampling: Continuous PM_{2.5} & meteorology

Method code: 771

LAT/LONG: 048. 39'99" / 119 518" 96"

Monitoring objective: Population Exposure

Puyallup, 66th Ave (Puyallup) - SLAMS

AQS#530530022

Address: 5722 66th Avenue E. Puyallup

Sampling: Continuous PM_{2.5}

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 PM_{2.5}

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

Method code: 771

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

Sampling: Continuous PM_{2.5} & meteorology

Monitoring objective: Population Exposure

Usk, LeClerc Rd N (Kalispel) – SLAMS - Discontinue

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 PM_{2.5}

Method code: 771

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

Monitoring objective: Population Exposure

White Swan (Yakama) - SLAMS

AQS#530770016

Address: 621 Signal Peak Rd, White Swan

Sampling: Continuous PM_{2.5} & meteorology

Method code: 771

LAT/LONG: 046.37'54"/120 72' 93:

Monitoring objective: Population Exposure

Other – Contracted Local Air Agencies

Table 10: Other - Contracted Local Air Agencies

AQS#	Site Name	Est.	Type	Scale	Sampling Type	DV(2011) Continuous	Action for 2011
530090013	Cheeka Peak	2006	Rural NCore	Regional	Continuous	6.5	Continue
530630021	Spokane Augusta	2010	SLAMS	Urban	Continuous	N/A	Continue

Additional Monitors: None

Recommendations/Modifications: Note: Ecology provides technical support for both Cheeka Peak and Spokane Augusta ozone. Technical support can include repair and calibration, quality assurance, telemetry and data management.

Cheeka Peak (ORCAA) NCore

Nephelometer, ozone, trace gas and meteorological support

AQS#530090013

Address: Cheeka Peak, Clallam County

Sampling: Continuous

Monitoring objective: Rural NCore

Method code: 771, 056,

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

MSA: Not in an MSA

Spokane, Augusta - SLAMS

AQS #530630021

Address: 3104 E. Augusta Ave., Spokane

Sampling: Continuous

Monitoring objective: Population Exposure

Method code: 056

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

MSA: Spokane, WA

Meteorological Monitoring

Table 11: Meteorological Monitoring

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
530170006	Burbank	11/05/02	WS, WD, Ta	Middle	Continuous	Relocate
530090013	Cheeka Peak	5/06	WS, WD, Ta	Regional	Continuous	Continue
530650004	Colville	3/11	WS, WD, Ta	Neighborhood	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
530630021	Spokane Augusta Ave.	3/09	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: A meteorological site at Colville has been established.

Recommendations/Modifications: Relocation of Burbank meteorology to the Kennewick site. Continue all other listed sites as described.

Burbank, Maple St – SLAMS – Relocation to Kennewick in 2011

AQS#530710006 Method code: 61101, 61102, 621101
 Address: 755 Maple Street, Burbank LAT/LONG: 046 12' 00" / 119 00' 30"
 Monitoring objective: Population Exposure MSA: Not in an urban area

Cheeka Peak, Rural NCore

AQS #530090013 Method code: 61101, 61102, 621101
 Address: Cheeka Peak LAT/LONG: 048 29' 78" / 124 62' 49"
 Monitoring objective: Special Studies MSA: Not in an MSA

Colville – SLAMS – NEW!

AQS # 530650004 Method code: 61101, 61102, 621101
 Address: 215 S. Oak Street LAT/LONG: 048 32' 41" / 122 54' 13"
 Monitoring objective: Population Exposure UA: Not in an urban area

Enumclaw, Mud Mountain Dam - SLAMS

AQS # 530330023 Method code: 61101, 61102, 621101
 Address: 30525 SE Mud Mountain Road, Enumclaw LAT/LONG: 047 08' 28" / 121 56' 09"
 Monitoring objective: Regional Transport MSA: Seattle-Bellevue-Everett, WA

North Bend, North Bend Way - SLAMS

AQS #530330017 Method code: 61101, 61102, 621101
 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

Seattle, Beacon Hill - NCore

AQS # 530330080 Method code: 61101, 61102, 621101
 Address: 4103 Beacon Avenue S., Seattle LAT/LONG: 047 34' 58" / 122 18' 30"
 Monitoring objective: Population Exposure MSA: Seattle-Bellevue-Everett, WA

Spokane, Augusta Ave. - SLAMS

AQS #530630021

Address: 3104 E. Augusta Ave., 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

Lead (Pb 11351)

Table 12: Pb Lead (11351)

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
530330080	Seattle, Beacon Hill	2010	NCore	Urban	1/6	Continue
TBD	Auburn Municipal	12/11	Special Studies	Urban	1/6	Document
TBD	Collocated	12/11	Special Studies	Urban	1/12	Document
TBD	Harvey Field	12/11	Special Studies	Urban	1/6	Document

Additional Monitors: Based on the EPA Proposed Rule signed December 23, 2009, Ecology established a Seattle area Pb population based monitor as required starting January 1, 2011 at the Seattle, Beacon Hill NCore site. Ecology anticipates establishing 2 source-based lead project airport site(s) in the fall of 2011. This is part of an EPA 12 month study at 15 airports in the United States. Washington airports are: Auburn Municipal Airport in Auburn and Harvey Field in Snohomish.

Recommendations/Modifications:

Seattle, Beacon Hill - NCore

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Population Exposure

Auburn Municipal – Special Studies

AQS #TBD

Address: 400 23rd St., Auburn

Monitoring objective: Special Studies

Method code: TBD

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

MSA: Seattle-Bellevue-Everett, WA

Method code: TBD

LAT/LONG: TBD

MSA: Seattle-Bellevue-Everett, WA

Harvey Field – Special Studies

AQS #TBD

Address: 9900 Airport Way, Snohomish

Monitoring objective: Special Studies

Method code: TBD

LAT/LONG: TBD

MSA: Seattle-Bellevue-Everett, WA

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. Multi-pollutant air monitoring benefits health assessments and emissions strategy development. Health studies with access to multi-pollutant data will be better positioned to identify 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 13: Trace Gas Monitoring

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
530330080	Seattle Beacon Hill	4/1997	NCore	Urban	Continuous	Continue
530090013	Cheeka Peak	5/2006	Rural NCore	Regional	Continuous	Continue

Additional Monitors: None

Recommendations/Modifications: Continue listed sites as described.

Seattle, Beacon Hill - NCore

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

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

Monitoring objective: Special Studies

MSA: Seattle-Bellevue-Everett, WA

Comments

Seattle Beacon Hill is an Urban scale site for trace level CO, SO₂, NO₂, PM_{2.5}, air toxics, speciation and other studies. Seattle Beacon Hill also measures chemical speciated particulate matter, volatile organic air toxics, carbonyls and semi-volatile (PAH) toxics. Data from this site supports Particulate Research Center activities.

Table 14: NCore Parameters Seattle Beacon Hill

Parameter	Parameter Code	Sampling/ Analysis Method	Sampling schedule	Spatial Scale	Instrument Type	Action for 2011
Ozone	44201	Continuous		Urban	API 440 E	Continue
SO ₂ trace	42401	Continuous		Urban	Thermo 42C	Continue
CO trace	42101	Continuous		Urban	API 300EU	Continue
NOy trace	42600	Continuous		Urban	Thermo 42C-Y	Continue
PM _{2.5} mass	88101	Manual	1/3	Urban	R&P 2025	Continue
PM _{2.5} Continuous	88502	Continuous		Urban	R&P FDMS TEOM	Continue
PM _{2.5} Speciation	88502	Continuous & Manual	1/3	Urban	Met One SSAS & URG 3000N Carbon , Sunset Labs OCEC	Continue
PM _{10-2.5}	86101	Manual	1/3	Urban	R&P 2025	Continue
PM _{10-2.5} Speciation			Not sampling		None	TBD
Wind speed & direction	61101/61102	Continuous		Urban	RM Young 05305	Continue
Ambient temperature	62101	Continuous		Urban	RM Young Platinum probe	Continue
Delta Temperature	62106	Continuous		Urban	RM Young	Continue
Ambient pressure	64101	Continuous		Urban	RM Young	Continue
Relative humidity	62201	Continuous		Urban	Rotronics	Continue

Cheeka Peak, Rural NCore

AQS #530090013

Address: Cheeka Peak

LAT/LONG: 048 29' 78"/124 62' 49"

Monitoring objective: Special Studies

MSA: Not in an MSA

Comments

Cheeka Peak is a Regional scale Rural NCore site in Clallam County. Cheeka Peak measures PM_{2.5}, ozone, trace level CO, SO₂, NO₂, PM_{2.5}, and meteorology.

Table 15: NCore Parameters Cheeka Peak

Parameter	Parameter Code	Sampling/ Analysis Method	Sampling schedule	Spatial Scale	Instrument Type	Action for 2011
Ozone	44201	Continuous	Continuous	Rural	API T400	Continue
SO ₂ trace	42401	Continuous	Continuous	Rural	API T100U	Continue
CO trace	42101	Continuous	Continuous	Rural	API 300EU	Continue
NO _y trace	42600	Continuous	Continuous	Rural	API T200U	Continue
PM _{2.5} mass	88101	Manual	IMPROVE	Rural	IMPROVE	Continue
PM _{2.5} Continuous	88502	Continuous	Continuous	Rural	Radiance Research M903 Nephelometer Correlated	Continue
Light Scatter	11203	Continuous	Continuous	Rural	“ “	Continue
Visibility	63101	Continuous	Continuous	Rural	“ “	Continue
PM _{2.5} Speciation	88502	Manual	IMPROVE	Rural	IMPROVE	Continue
PM _{10-2.5}			IMPROVE	Rural	IMPROVE	Continue
PM _{10-2.5} Speciation			IMPROVE	Rural	IMPROVE	Continue
Wind speed, direction & sigma	61101/61102 /61106	Continuous	Continuous	Rural	RM Young PSD Quality	Continue
Ambient temperature	62101	Continuous	Continuous	Rural	RM Young Platinum probe	Continue
Ambient pressure	64101	Continuous	Continuous	Rural	RM Young	Continue
Relative humidity	62201	Continuous	Continuous	Rural	Rotronics	Continue

Toxics

Toxics

Collocated National Air Toxics Trend Site (NATTS) - In addition to the STN and NCore Precursor Gas Monitoring Programs, 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 16: Toxics

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
530330080	Seattle Beacon Hill	4/1997	NCore	Urban	Manual	Continue

Additional Monitors: None

Recommendations/Modifications: Continue listed site as described.

Seattle, Beacon Hill - 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. It is currently the only designated urban scale NATTS located in the Pacific Northwest.

Speciation

Chemical Speciation Trends Network (CSN) - 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 17: Speciation

AQS#	Site Name	Est.	Type	Scale	Sampling Type	Action for 2011
530330080	Seattle Beacon Hill	4/1997	NCORE	Urban	1/3	Continue
530611007	Marysville	2009	SLAMS	Neighborhood	1/6	Continue
530530029	Tacoma L St	2008	SLAMS	Neighborhood	1/6	Continue
530110013	Vancouver	2002	SLAMS	Neighborhood	1/6	Continue
530770009	Yakima	2002	SLAMS	Neighborhood	1/6	Continue

Additional Monitors: Based on the 2010 Network Assessment, we are recommending a Chemical Speciation sampler be installed in the Columbia Basin.

Recommendations/Modifications: Marysville was relocated within school grounds. A description is below in red. Continue all other listed sites as described.

Seattle, Beacon Hill -NCORE

AQS #530330080

Address: 4103 Beacon Avenue S., Seattle

Monitoring objective: Population Exposure

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:

Marysville, 7th Ave – (PSCAA)

AQS #530611007

Address: 1605 7th ST, Marysville

Monitoring objective: Population Exposure

Method code:

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

MSA: Seattle-Bellevue-Everett, WA

The Marysville site is the result of an effort to satisfy both the Marysville school district and city of Marysville (codes) as we relocated the site. The original location was located on a school building scheduled to be demolished, and therefore no longer viable as a long-term site. As you know, daily PM values at this site have been very close to the NAAQS, and so we placed a high value on remaining on school grounds at this site.

Tacoma, L Street (PSCAA)

AQS #530530029

Address: 7802 South L St., Tacoma

Monitoring objective: Population Exposure

Method code:

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

MSA: Seattle-Bellevue-Everett, WA

Vancouver, 4th Plain (SWCAA)

AQS #530110013

Address: 8205 NE 4th Plain Boulevard, Vancouver

Monitoring objective: Population Exposure

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

References

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.