2022 Ambient Air Monitoring Network Plan

By

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For the

Air Quality Program

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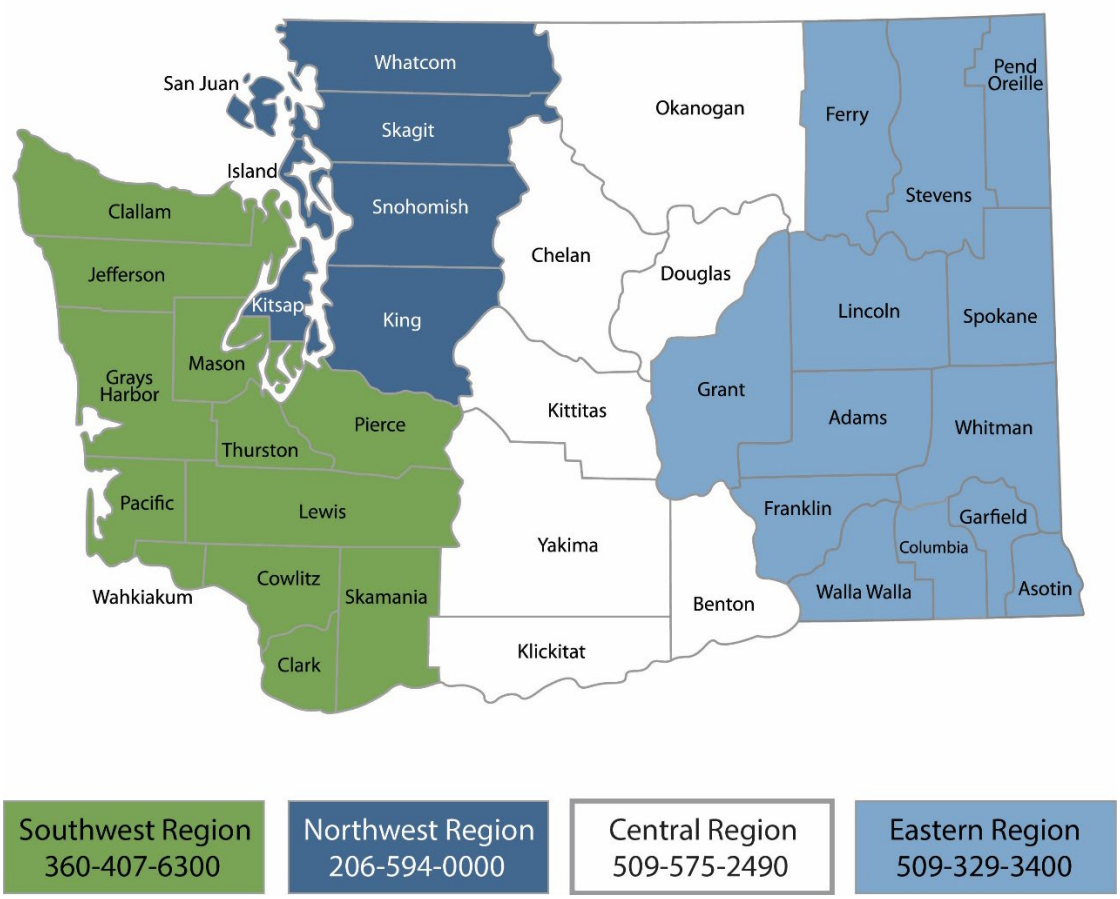
Department of Ecology's Regional Offices

Map of Counties Served



Southwest Region 360-407-6300 | Northwest Region 206-594-0000 | Central Region 509-575-2490 | Eastern Region 509-329-3400

Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	P.O. Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	P.O. Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 West Alder Street Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 North Monroe Spokane, WA 99205	509-329-3400
Headquarters	Statewide	P.O. Box 46700 Olympia, WA 98504	360-407-6000

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DEPARTMENT OF
ECOLOGY
State of Washington

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Acronyms

AQS	EPA's Air Quality System database
BAM	Beta Attenuation Monitor
BCAA	Benton County Clean Air Agency
CBSA	Core-Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CSA	Combined Statistical Area
CSN	Chemical Speciation Network
DV	Design Value
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
IMPROVE	Interagency Monitoring of Protected Visual Environments
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard
NATTS	National Air Toxics Trends Station
NCore	National Core
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NO_y	Total Reactive Oxides of Nitrogen
NWCAA	Northwest Clean Air Agency
O_3	Ozone
ORCAA	Olympic Region Clean Air Agency
Pb	Lead
$PM_{2.5}$	Particulate matter ≤ 2.5 micrometers in diameter
PM_{10}	Particulate matter ≤ 10 micrometer in diameter
$PM_{10-2.5}$	Particulate matter ≤10 microns and > 2.5 micrometers in diameter
ppb	parts per billion
ppm	parts per million
PAMS	Photochemical Assessment Monitoring Station
PQAO	Primary Quality Assurance Organization
PSCAA	Puget Sound Clean Air Agency
PSD	Prevention of Significant Deterioration
QA	Quality Assurance
QA	Quality Control
SLAMS	State and Local Air Monitoring Station
SO_2	Sulfur Dioxide
SPM	Special Purpose Monitor
SRCAA	Spokane Region Clean Air Agency
SWCAA	Southwest Clean Air Agency
STN	Speciation Trends Network
TSP	Total Suspended Particulate
$\mu g/m^3$	micrograms per cubic meter
VOC	Volatile Organic Compound
YRCAA	Yakima Region Clean Air Agency

Executive Summary

Purpose

In accordance with the requirements described in 40 C.F.R. Part 58.10, the Washington State Department of Ecology (Ecology) reviews its ambient air 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 2022 review. The annual review process includes:

- Documenting Ecology's ambient air quality monitoring needs, goals and priorities;
- Identifying modifications to Ecology's ambient air monitoring network since the previous annual network plan; and
- Identifying proposed modifications to the network in the upcoming 18 months.

Network modifications

Recent modifications

Ozone (44201)

Due to a planned construction project at the school where the Vancouver-Blairmont monitoring site (530110011) is located from 2020-2022, the site has been relocated to a temporary location on school property. It will again be relocated to a permanent location once construction is completed in summer 2022. As the original location, temporary location and future permanent location are all within 200 meters of each other on the same property, Ecology does not consider this a formal site relocation.

Ecology temporarily suspended ozone monitoring at the Yelm-Northern Pacific monitoring site (530670005) for the summer 2021 ozone season due to a planned construction project at the wastewater treatment facility where the site is located. Ecology was informed by the facility in January 2022 that due to delays in the construction project, the site will now be under construction until 2023 or 2024. During that time, the Olympic Region Clean Air Agency (ORCAA) plans to measure ozone at the nearby Lacey $PM_{2.5}$ monitoring site (530670013) as a temporary Special Purpose Monitor (SPM). Ecology plans to resume monitoring at Yelm when the site is once again available in 2023 or 2024. On April 13, 2022, Ecology requested a waiver for this relocation from the EPA Region 10 Administrator on a case-by-case basis per 40 C.F.R. Part 58.14(c): moving the monitor does not compromise data collection needed for implementation of National Ambient Air Quality Standards (NAAQS), and the requirements of Part 58 Appendix D continue to be met. EPA Region 10 approved this waiver request on May 5, 2022, and this approval is provided in Appendix B.

Ozone monitoring at the Issaquah-Lake Sammamish monitoring site (530330010), which was suspended during the summer 2021 ozone season, resumed on May 1, 2022.

Regulatory $PM_{2.5}$ (88101)

As of January 1, 2022, an FEM BAM 1020 $PM_{2.5}$ monitor was added to the Puget Sound Clean Air Agency's (PSCAA's) Tacoma-Alexander Ave site (530530031) as a SLAMS. The FEM replaces the non-regulatory nephelometer previously used for $PM_{2.5}$ reporting.

On February 11, 2022, the Bellingham-Pacific St site (530730019) operated by the Northwest Clean Air Agency was moved to a new location (48.759678, -122.456452) on the roof of the same property where it was previously located. This relocation was necessary due to a construction project to add a multi-level addition that would have served as an obstruction at the previous location. The new location is approximately 40 meters south of the old location. As the site address remains the same and the distance between the two locations is 40 meters, Ecology does not consider this a formal site relocation. The new location meets the probe and path monitoring path siting criteria in 40 C.F.R. Part 58 Appendix E.

Non-regulatory $PM_{2.5}$ (88502)

Nephelometer monitoring at PSCAA's Tacoma-Alexander Ave site (530530031) was discontinued as of December 31, 2021 and replaced with an FEM BAM 1020 SLAMS for $PM_{2.5}$ monitoring.

Nephelometer monitoring at the Yakama Nation's White Swan tribal monitoring site (530770016) ceased on August 31, 2021. In fall 2021, EPA Region 10 and the Yakama Nation informed Ecology that monitoring at White Swan would not resume and the site would instead be replaced with a tribal FEM BAM $PM_{2.5}$ monitoring site in Wapato funded by the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants.

PM_{10} (81102)

A continuous FEM PM_{10} monitor operated by the Spokane Regional Clean Air Agency (SRCAA) was added to the Cheney-Turnbull site (530630001) on October 1, 2021. This addition was requested in EPA's response to Ecology's 2019 Ambient Air Monitoring Network Plan.

Meteorological (61101/61102/61103/61104/62101)

Meteorological monitoring at the North Bend-North Bend Way site (530330017) is currently suspended. A large residential building was constructed within several meters of the meteorological tower, which no longer meets siting requirements for PSD meteorological monitoring. Ecology plans to relocate the tower to another location at the existing site, but this work has been delayed due the COVID-19 pandemic and competing monitoring priorities.

Due to a planned construction project on the property of the Vancouver-Blairmont monitoring site (530110011) from 2020-2022, the site was relocated to a temporary shelter without access to a meteorological tower in May 2020. Meteorological monitoring will resume in summer 2022.

Meteorological monitoring at the former Spokane-Augusta monitoring site (530630021) was discontinued on June 30, 2021, due to the discontinuation of $PM_{2.5}$ and PM_{10} monitoring in early 2021.

Photochemical Assessment Monitoring Stations (PAMS)

Monitoring for all PAMS parameters except hourly speciated VOCs began on or before June 1, 2021. Due to a number of delays in the installation of the automated gas chromatograph (AutoGC) and delays in required instrument service by the AutoGC vendor, hourly VOC monitoring began on August 26, 2021. Ecology continued monitoring hourly VOCs past the end of the PAMS season until September 22, 2021, to collect additional data and continue troubleshooting operational issues with the AutoGC. Ecology experienced additional operational challenges and instrument malfunctions at the start of the 2022 PAMS season and is currently working with the AutoGC vendor to resolve these issues. Ecology expects to resume monitoring hourly VOCs in July 2022.

Chemical Speciation Network (CSN)

With the passage of the Washington State 2018 supplemental operating budget (Engrossed Substitute Senate Bill 6032), Ecology was directed to use state funding to conduct a multiyear source apportionment study at the monitoring site closest to the Port of Tacoma. Ecology conducted $PM_{2.5}$ speciation monitoring at PSCAA's Tacoma-Alexander Ave (530530031) monitoring site from August 2018 through January 2022. Puget Sound Clean Air Agency conducted a parallel speciation study at the Seattle-Duwamish monitoring site (530330057) concurrently with the Tacoma study from August 2018 through June 2022. The temporary speciation studies were completed and sampling discontinued at Tacoma-Alexander on February 10, 2022 and at Seattle-Duwamish on June 30, 2022.

Planned modifications

Sulfur dioxide (42401)

Ecology proposes to discontinue the Malaga-Malaga Hwy monitoring site (530070012) on December 31, 2022. The Malaga-Malaga Hwy monitoring site was established in 2017 to meet the requirements of EPA's 2015 Data Requirements Rule, which directed states to evaluate levels of SO_2 in ambient air near sources emitting over 2,000 tons of SO_2 per year. Malaga has reported design values of less than 2% of the SO_2 NAAQS in each of the three years for which design values are available. The monitor meets the requirements for discontinuation described in 40 C.F.R. Part 51.1203(c)(3) and 40 C.F.R. Part 58.14(c)(1). More information is provided in the "Sulfur dioxide" section of this document.

Regulatory $PM_{2.5}$ (88101)

Ecology and the Yakima Regional Clean Air Agency (YRCAA) plan to replace the non-regulatory nephelometer used for $PM_{2.5}$ reporting at the Sunnyside-S 16th St SLAMS monitoring site (530770005) with an FEM BAM 1020. The equipment and installation costs for this replacement will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. The target date for this upgrade is January 1, 2023.

The Puget Sound Clean Air Agency plans to establish a regulatory $PM_{2.5}$ and meteorological monitoring site in SeaTac near the Seattle-Tacoma International Airport. The equipment and installation costs for this new monitoring site will be funded by EPA through the American

Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. PSCAA plans to identify a site location in summer 2022 and complete site installation by June 2024. Ecology and PSCAA will provide additional details on the site location, including an evaluation of 40 C.F.R. Part 58 Appendix E siting criteria, as they become available.

The Yakama Nation plans to establish a tribal regulatory $PM_{2.5}$ and meteorological monitoring site in Wapato. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. The installation of the Wapato site will take place in 2023-2024.

Non-regulatory $PM_{2.5}$ (88502)

The Benton Clean Air Agency (BCAA) plans to establish a new site for non-regulatory $PM_{2.5}$ AQI reporting in Prosser. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. BCAA plans to identify a site location in summer 2022, and the target date for the site to begin operating is January 1, 2023. Ecology and BCAA will provide additional details on the site location, including an evaluation of 40 C.F.R. Part 58 Appendix E siting criteria, as they become available.

Upon installation of the planned FEM BAM 1020 at the Sunnyside-S 16th St monitoring site (530770005) by January 2023, YRCAA plans to discontinue the non-regulatory nephelometer currently used for $PM_{2.5}$ reporting.

Meteorological (61101/61102/61103/61104/62101)

Ecology proposes to discontinue meteorological monitoring at the Malaga-Malaga Hwy monitoring site (530070012) on December 31, 2022, if discontinuation of the SO_2 monitor is approved.

The Yakama Nation plans to establish a tribal regulatory $PM_{2.5}$ and meteorological monitoring site in Wapato. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. The installation of the Wapato site will take place in 2023-2024.

Chemical Speciation Network (CSN)

Ecology plans to relocate CSN monitoring from the Seattle-10th & Weller (530330030) near-road site on July 31, 2022. Speciation data have been collected at Seattle-10th & Weller since 2014. The frequent site visits required for speciation monitoring are no longer tenable at Seattle-10th & Weller given the challenges to site access and safety that site operators experience. Source apportionment analysis results indicate that predictably, the dominant sources of $PM_{2.5}$ at the near-road site are on-road vehicles. Given the ongoing operational challenges at the site and the marginal value of additional data for source apportionment, Ecology determined that speciation monitors would provide greater value if relocated to central Washington. Ecology plans to relocate speciation monitoring to a site in central Washington and is currently working with EPA Region 10 to identify a suitable site.

Introduction

This document summarizes Ecology's annual review of the Washington Ambient Air Monitoring Network (Washington Network) in accordance with 40 C.F.R. Part 58.10.

EPA's ambient air quality surveillance regulations in 40 C.F.R. 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 C.F.R. Part 50 sets standards. SLAMS must meet the requirements of 40 C.F.R. 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 system and performance audits. States conform to Appendices D and E by conducting an annual network review of their air quality surveillance systems. This review is documented in an annual network plan that meets the following requirements:

- The plan describes any network modifications planned in the upcoming 18 months. Network modifications are subject to approval of the EPA Regional Administrator.
- For each existing and proposed monitoring site, the plan includes the following information:
    - The AQS site number
    - The represented MSA or other geographic area
    - The special scale, sampling method, and operating schedule for each monitor
- The plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA. The final plan includes and addresses comments received through the public notification process.

Background Information

Monitoring Objectives

The Washington Network was designed to meet the three monitoring objectives defined in 40 C.F.R. Part 58 Appendix D:

1. **Provide air pollution data to the public in a timely manner.** Ecology provides timely air quality data to the public in a variety of ways:
    - Near-real-time data are available on Ecology's monitoring website.
    - Near-real-time data are submitted to EPA's AirNow system for public display and reporting.
    - Ecology conducts public outreach and issues alerts and bulletins when air quality is compromised.
2. **Support compliance with National Ambient Air Quality Standards (NAAQS) and development of pollution control strategies.** Ambient air quality data are used to:
    - Determine compliance with the NAAQS
    - Determine the location of maximum pollutant concentrations
    - Track the progress of SIPs
    - Determine the effectiveness of air pollution control programs
    - Develop responsible and cost-effective emission control strategies
    - Assist with permitting work
3. **Support air pollution research.** Ecology and its partners use ambient air quality data to improve our understanding of air pollution and its consequences. Research applications of air quality include:
    - Improving air quality forecasting
    - Evaluating the effects of air pollution on public health
    - Informing dispersion models
    - Identifying air quality trends and emerging pollution issues
    - Analyzing pollution episodes

In order to meet these three objectives, 40 C.F.R. Part 58 Appendix D calls for the design of SLAMS networks to include several different types of monitors. These general types are sites that:

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 on visibility or vegetation (welfare impacts) in more rural and remote areas.

Appendix D of 40 C.F.R. Part 58 also provides guidance on spatial scales of representativeness for stations in a SLAMS network. Ideally, the station is located so that its sample represents the air quality across the scale that the station is intended to represent. Appendix D defines the following spatial scales:

1. **Microscale**: Area dimensions between several and 100 meters.
2. **Middle scale**: Areas between 100 and 500 meters, typically several city blocks.
3. **Neighborhood scale**: Areas between 0.5 and 4 kilometers with relatively uniform land use.
4. **Urban scale**: Areas with city-like dimensions between 4 and 50 kilometers. Urban and neighborhood scales can overlap considerably. Heterogeneous urban areas may not have a single representative site.
5. **Regional scale**: Areas from tens to hundreds of kilometers with relatively homogeneous geography and no large sources.
6. **National and global scales**: Scales representing the nation or globe as a whole.

Table 1 summarizes the appropriate spatial scales for each criteria pollutant and applicable site types.

Table 1. Summary of applicable spatial scales for criteria pollutants and monitoring objectives

Scale	SO_2	CO	O_3	NO_2	Pb	PM_{10}	$PM_{2.5}$	Site Types
Micro	✓	✓		✓	✓		✓	Highest concentration; source impact
Middle	✓	✓		✓	✓	✓	✓	Highest concentration; source impact
Neighborhood	✓	✓	✓	✓	✓	✓	✓	Highest concentration; population; source impact; general/background
Urban	✓		✓	✓			✓	Highest concentration; population; general/background; regional transport; welfare-related impacts

Scale	SO_2	CO	O_3	NO_2	Pb	PM_{10}	$PM_{2.5}$	Site Types
Regional	✓		✓				✓	General/background; regional transport; welfare-related impacts

Other ambient monitoring data needs

In addition to its network of criteria pollutant monitoring sites, Ecology also uses nephelometers throughout Washington to estimate $PM_{2.5}$ concentrations and inform the public of air quality conditions in communities where criteria pollutant monitoring is not required. Typically, nephelometer monitoring sites use site-specific $PM_{2.5}$ correlations developed from collocated Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor data. Lower concentration sites may use generalized regional correlations developed at sites with similar geographic and source characteristics. These sites are operated in accordance with 40 C.F.R. Part 58 Appendix A requirements for quality assurance and quality control. At nephelometer sites where $PM_{2.5}$ concentrations are consistently measured at or greater than 80 percent of the NAAQS, Ecology transitions to FEM monitoring.

On a limited basis, Ecology also supplements its network of fixed monitoring sites with portable low-cost $PM_{2.5}$ sensors for temporary reporting of air quality information. Typical applications of low-cost $PM_{2.5}$ sensors include temporary monitoring of smoke from wildland fires, responding to isolated or emergent events, monitoring to aid in smoke management decisions, and surveys or saturation studies of unmonitored areas. Portable low-cost $PM_{2.5}$ sensors are used primarily as a public information tool, and their data are not submitted to AQS. In summer 2022, Ecology plans to add $PM_{2.5}$ sensors to ozone monitoring sites that lack existing $PM_{2.5}$ monitors. These sensors will serve as an important public information tool during summer wildfire smoke events and will eliminate confusion around conflicting AQI information from ozone-only monitoring sites during periods of elevated $PM_{2.5}$.

Network Evaluation

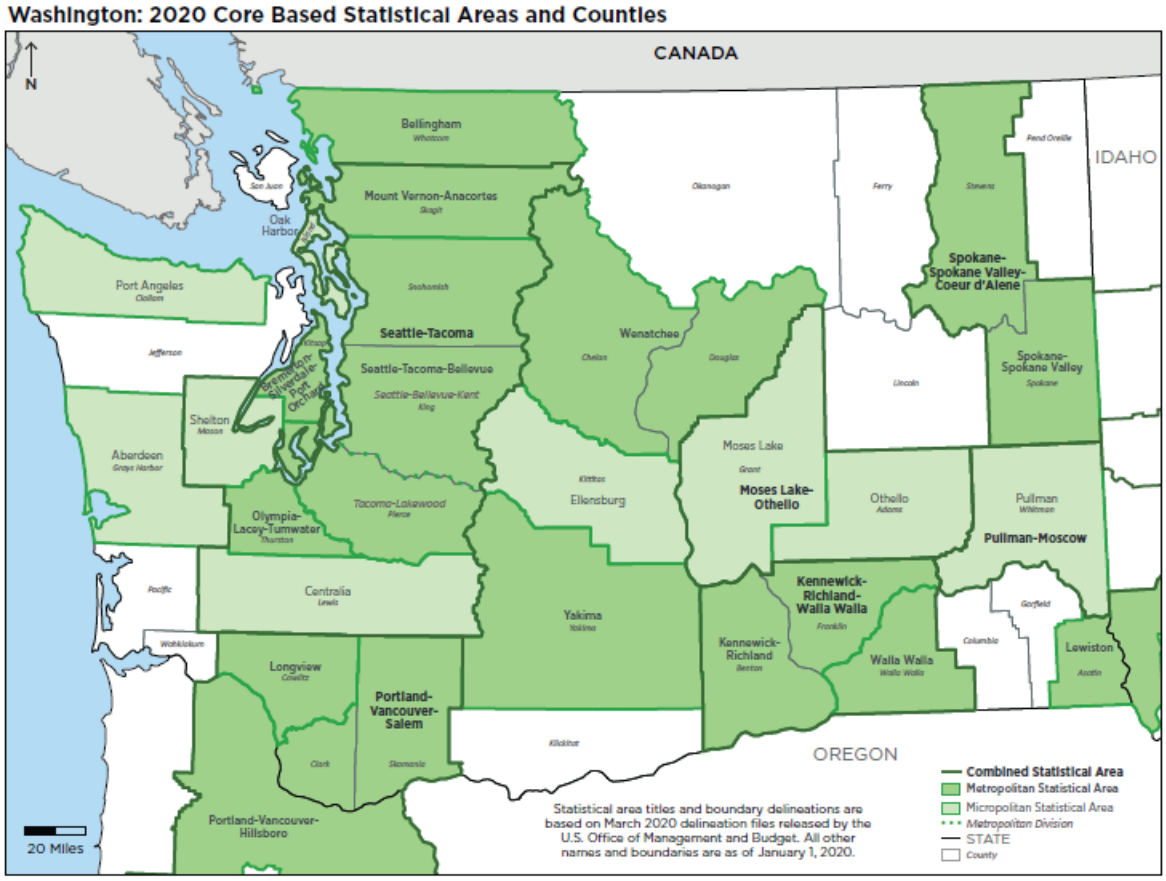
Ecology uses a variety of tools to evaluate how well its monitoring network is meeting these goals and objectives. These tools include:

- EPA minimum monitoring requirements in 40 C.F.R. Part 58 Appendix D
- Results of Ecology's most recent 5-year Ambient Air Quality Monitoring Network Assessment
- Analyses of historic monitoring data
- Census data on population density and demographics
- Dispersion and air quality forecast models
- Planning requirements, including SIPs and maintenance plans
- Jurisdictional boundaries
- Results of special monitoring studies

The suitability of individual monitoring sites is evaluated according to the probe and monitoring path siting criteria described in 40 C.F.R. Part 58 Appendix E.

Washington Core-Based Statistical Areas

The minimum monitoring requirements listed in 40 C.F.R. Part 58 Appendix D are based on the core-based statistical areas (CBSAs) defined by the U.S. Office of Management and Budget. Washington's CBSAs are shown in the map in Figure 1 (U.S. Census Bureau, 2020). The populations of CBSAs in Washington over 50,000 people are listed in Table 2.



U.S. Census Bureau, Population Division

Figure 1. Washington's Core-Based Statistical Areas (CBSAs), U.S. Census Bureau 2020

Table 2. Washington's CBSA populations over 50,000 (U.S. Census Bureau, 2021)

Core-Based Statistical Area	2021 Population
Seattle-Tacoma-Bellevue, WA	4,011,553
Portland-Vancouver-Hillsboro, OR-WA	2,511,612
Spokane-Spokane Valley, WA	593,466
Kennewick-Richland, WA	308,293
Olympia-Lacey-Tumwater, WA	297,977
Bremerton-Silverdale-Port Orchard, WA	274,314
Yakima, WA	256,035
Bellingham, WA	228,831
Mount Vernon-Anacortes, WA	130,696
Wenatchee, WA	123,342
Longview, WA	111,524
Moses Lake, WA	100,297
Oak Harbor, WA	87,432
Centralia, WA	84,398
Port Angeles, WA	78,209
Aberdeen, WA	76,841
Shelton, WA	67,615
Lewiston, ID-WA	64,851
Walla Walla, WA	62,682

Washington shares the Portland-Vancouver-Hillsboro, OR-WA CBSA with the state of Oregon. The minimum monitoring requirements for PM_{10}, $PM_{2.5}$ and ozone in this CBSA are met through a combination of monitors operated by Ecology and the Oregon Department of Environmental Quality (DEQ). Ecology and Oregon DEQ established a Memorandum of Understanding on May 20, 2019 to formalize this arrangement (Appendix F).

The Pullman, WA CBSA was previously included in Table 2 in the 2021 Annual Network Plan, but it was removed because the 2021 population estimate of 47,873 was below the 50,000 threshold.

Maintenance Areas

As of January 1, 2022, Washington had six maintenance areas for criteria pollutants. Maintenance areas demonstrate continued attainment of the NAAQS either through monitoring or through EPA-approved alternate methods. These methods are summarized in Table 3.

Table 3. Washington PM_{10} maintenance areas and methods of demonstrating NAAQS attainment

Maintenance Area (Pollutant)	End of Maintenance Period	Method of Demonstrating NAAQS Attainment
Wallula (PM_{10})**	9/26/2025	Burbank-Maple St PM_{10} monitor (530710006)
Spokane (PM_{10})	8/30/2025	Spokane-Augusta PM_{10} monitor (530630021) until March 2021; Spokane-E Broadway Ave PM_{10} monitor (530630017) as of April 2021
Yakima (PM_{10})	3/10/2025	Yakima-4th Ave S PM_{10} monitor (530770009)
Tacoma ($PM_{2.5}$)	3/12/2035	Tacoma-L St $PM_{2.5}$ monitor (530530029)
Yakima (CO)	12/31/2022	Modeled CO vehicle emissions
Spokane (CO)	8/30/2025	Modeled onroad, nonroad and residential wood combustion CO emissions

** The Wallula Maintenance Plan is a full maintenance plan, not a Limited Maintenance Plan. The compliance status of the Wallula Maintenance Area is determined by design value at the Burbank-Maple St monitoring site as listed in Table 27. Outside of exceedances due to extreme wildfire smoke events, the Burbank-Maple St is in compliance with the PM_{10} standard.

Washington has maintenance areas that fall within the jurisdiction of local air agencies. In accordance with the maintenance plans, the Spokane Regional Clean Air Agency submitted design values to Ecology for the maintenance areas in their jurisdiction. These design values and their underlying calculations can be found in the document “Verification of Continued Attainment in Limited Maintenance Areas (2022)” submitted concurrently with this plan.

Monitoring Network Design

As of July 1, 2022, Ecology and its partners operate 72 monitoring sites as part of the Washington Network. These sites are shown on the map in Figure 2, and the parameters monitored are summarized in Table 4. Any changes to detailed site information since submission of the 2021 Ambient Air Monitoring Network Plan are described in Appendix E. All monitoring sites described in this plan are operated under the Ecology Primary Quality Assurance Organization (PQAO). Other monitoring sites, such as IMPROVE sites, are operated in Washington as part of separate PQAOs, but those networks are outside the scope of this document.

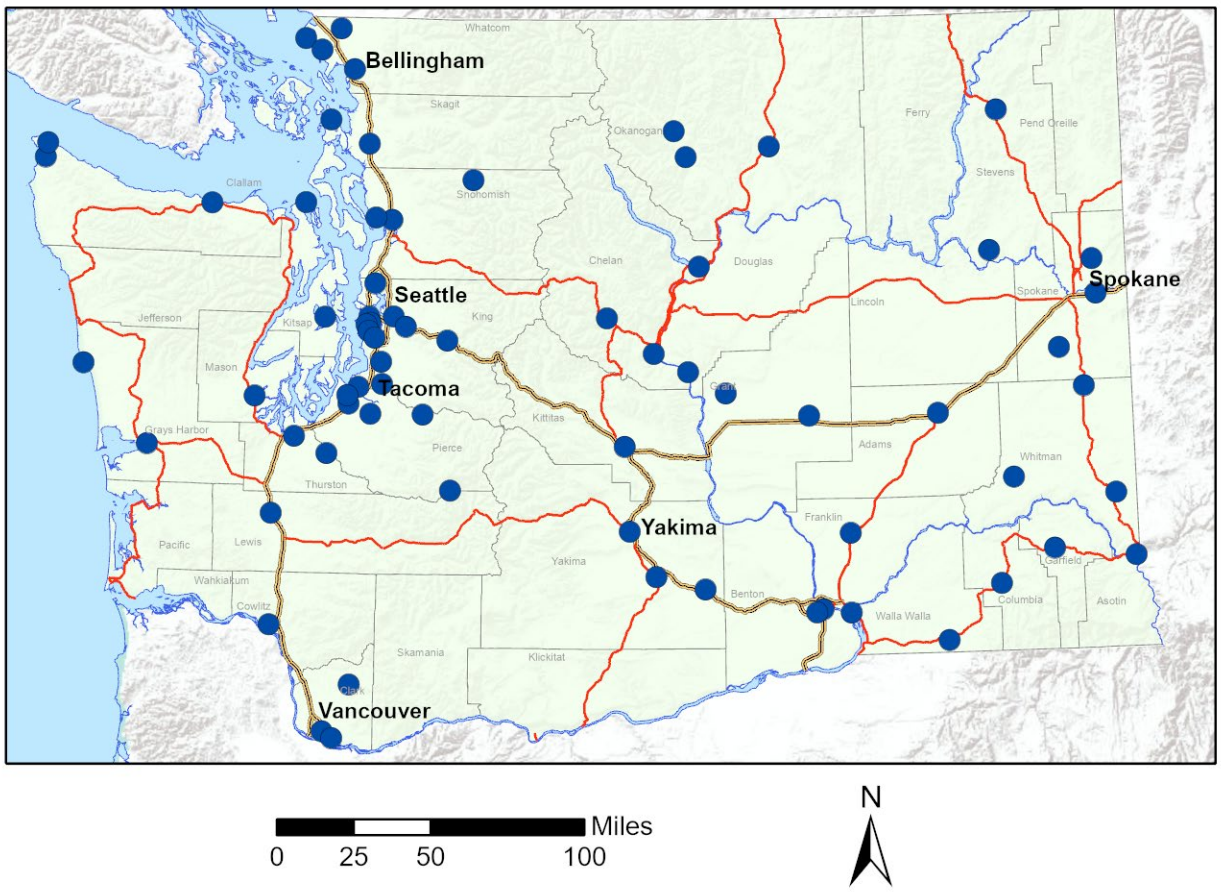


Figure 2. Map of all Washington Network monitoring sites.

Table 4. Summary of parameters monitored at Washington Network monitoring sites

CBSA	Site	AQS ID	CO	NO_2	O_3	SO_2	$PM_{2.5}$ (FRM/FEM)	$PM_{2.5}$ (Non-FRM/FEM)	PM_{10}	Meteor-ological	CSN
Aberdeen, WA	Aberdeen-Division St	530272002						x			
Aberdeen, WA	Taholah-Quinault Tribe	530270011						x			
Bellingham, WA	Bellingham-Pacific St	530730019					x				

CBSA	Site	AQS ID	CO	NO_2	O_3	SO_2	$PM_{2.5}$ (FRM/FEM)	$PM_{2.5}$ (Non-FRM/FEM)	PM_{10}	Meteor-ological	CSN
Bellingham, WA	Custer-Loomis	530730005			x						
Bellingham, WA	Ferndale-Kickerville Road	530730013				x					
Bellingham, WA	Ferndale-Mountain View Rd	530730017				x				x	
Bremerton-Silverdale-Port Orchard, WA	Bremerton-Spruce Ave	530350007					x				
Centralia, WA	Chehalis-Market Blvd	530410004						x			
Ellensburg, WA	Ellensburg-Ruby St	530370002					x	x			
Kennewick-Richland, WA	Kennewick-Metaline	530050002						x	x	x	
Kennewick-Richland, WA	Kennewick-S Clodfelter Rd	530050003			x						
Kennewick-Richland, WA	Mesa-Pepiot Way	530210002						x			
Lewiston, ID-WA	Clarkston-13th St	530030004						x			
Longview, WA	Longview-30th Ave	530150015						x			
Moses Lake, WA	Moses Lake-Balsam St	530251002						x			
Moses Lake, WA	Quincy-3rd Ave NE	530251003						x		x	
Mount Vernon-Anacortes, WA	Anacortes-202 O Ave	530570011			x	x	x				
Mount Vernon-Anacortes, WA	Mt Vernon-S Second St	530570015						x			
None	Dayton-W Main St	530130002						x			
None	Newport-Calispel	530510008						x			
None	Omak-Colville Tribe	530470013					x			x	
None	Pomeroy-Pataha St	530230001						x			
None	Port Townsend-San Juan Ave	530310003						x			
None	Twisp-Ewell St	530470016						x			
None	Winthrop-Chewuch Rd	530470010						x			
Olympia-Lacey-Tumwater, WA	Lacey-College St	530670013						x			
Olympia-Lacey-Tumwater, WA	Yelm-Northern Pacific	530670005									
Othello, WA	Ritzville-Alder St	530010003						x			
Port Angeles, WA	Cheeka Peak	530090013	x	x	x	x		x		x	
Port Angeles, WA	Neah Bay-Makah Tribe	530090015						x			
Port Angeles, WA	Port Angeles-E 5th St	530090017						x			
Portland-Vancouver-Hillsboro, OR-WA	Vancouver NE 84th Ave	530110024					x				
Portland-Vancouver-Hillsboro, OR-WA	Vancouver-Blairmont Dr	530110011			x						
Portland-Vancouver-Hillsboro, OR-WA	Yacolt-Yacolt Rd	530110022						x			
Pullman, WA	LaCrosse-Hill St	530750005						x			
Pullman, WA	Pullman-Dexter SE	530750003						x			
Pullman, WA	Rosalia-Josephine St	530750006						x			
Seattle-Tacoma-Bellevue, WA	Auburn-29th St	530330047						x			
Seattle-Tacoma-Bellevue, WA	Bellevue-SE 12th St	530330031						x			
Seattle-Tacoma-Bellevue, WA	Darrington-Fir St	530610020					x				
Seattle-Tacoma-Bellevue, WA	Enumclaw-Mud Mtn.	530330023			x					x	
Seattle-Tacoma-Bellevue, WA	Issaquah-Lake Sammamish	530330010									

CBSA	Site	AQS ID	CO	NO_2	O_3	SO_2	$PM_{2.5}$ (FRM/FEM)	$PM_{2.5}$ (Non-FRM/FEM)	PM_{10}	Meteor-ological	CSN
Seattle-Tacoma-Bellevue, WA	Kent-Central & James	530332004					x				
Seattle-Tacoma-Bellevue, WA	Lake Forest Park	530330024						x			
Seattle-Tacoma-Bellevue, WA	Marysville-7th Ave	530611007					x				
Seattle-Tacoma-Bellevue, WA	Mt Rainier-Jackson Visitors Ctr	530530012			x						
Seattle-Tacoma-Bellevue, WA	North Bend-North Bend Way	530330017			x			x			
Seattle-Tacoma-Bellevue, WA	Seattle-10th & Weller	530330030	x	x			x			x	x
Seattle-Tacoma-Bellevue, WA	Seattle-Beacon Hill	530330080	x	x	x	x	x			x	x
Seattle-Tacoma-Bellevue, WA	Seattle-Duwamish	530330057					x				
Seattle-Tacoma-Bellevue, WA	Seattle-South Park	530331011						x			
Seattle-Tacoma-Bellevue, WA	Tacoma-L Street	530530029					x				x
Seattle-Tacoma-Bellevue, WA	Tacoma-Alexander Ave	530530031					x				
Seattle-Tacoma-Bellevue, WA	Tacoma-S 36th St	530530024		x			x			x	
Seattle-Tacoma-Bellevue, WA	Tukwila Allentown	530330069					x				
Seattle-Tacoma-Bellevue, WA	Tulalip-Totem Beach Rd	530610021						x			
Shelton, WA	Shelton-W Franklin	530450007						x			
Spokane-Spokane Valley, WA	Cheney-Turnbull	530630001			x				x		
Spokane-Spokane Valley, WA	Colville-E 1st St	530650005					x		x	x	
Spokane-Spokane Valley, WA	Spokane-E Broadway Ave	530630017					x		x		
Spokane-Spokane Valley, WA	Spokane-Greenbluff	530630046			x						
Spokane-Spokane Valley, WA	Spokane-Monroe St	530630047						x			
Spokane-Spokane Valley, WA	Wellpinit-Spokane Tribe	530650002						x			
Walla Walla, WA	Burbank-Maple St	530710006							x	x	
Walla Walla, WA	Walla Walla-12th St	530710005						x			
Wenatchee, WA	Chelan-Woodin Ave	530070007						x			
Wenatchee, WA	Leavenworth-Evans St	530070010						x			
Wenatchee, WA	Malaga-Malaga Hwy	530070012				x				x	
Wenatchee, WA	Wenatchee-Fifth St	530070011						x		x	
Yakima, WA	Sunnyside-S 16th St	530770005						x			
Yakima, WA	Toppenish-Yakama Tribe	530770015					x			x	
Yakima, WA	Yakima-4th Ave	530770009					x		x		x

Carbon monoxide (CO, 42101)

There are three CO monitoring sites in the Washington Network. All Washington Network CO monitoring sites collect data under method code 593 (Teledyne API 300 EU). The monitoring objective of the Cheeka Peak and Beacon Hill CO monitors is general/background, and the monitoring objective of the Seattle-10th & Weller CO monitor is source-oriented.

Table 5. Washington Network CO monitoring sites

AQS ID	Site Name	CBSA	Established	Type	Scale	POC
530090013	Cheeka Peak	Port Angeles, WA	05/2006	SLAMS, NCore	Regional	2
530330030	Seattle-10th & Weller	Seattle-Tacoma-Bellevue, WA	04/2014	SLAMS, Near-road	Microscale	1
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	03/2007	SLAMS, NCore	Urban	1

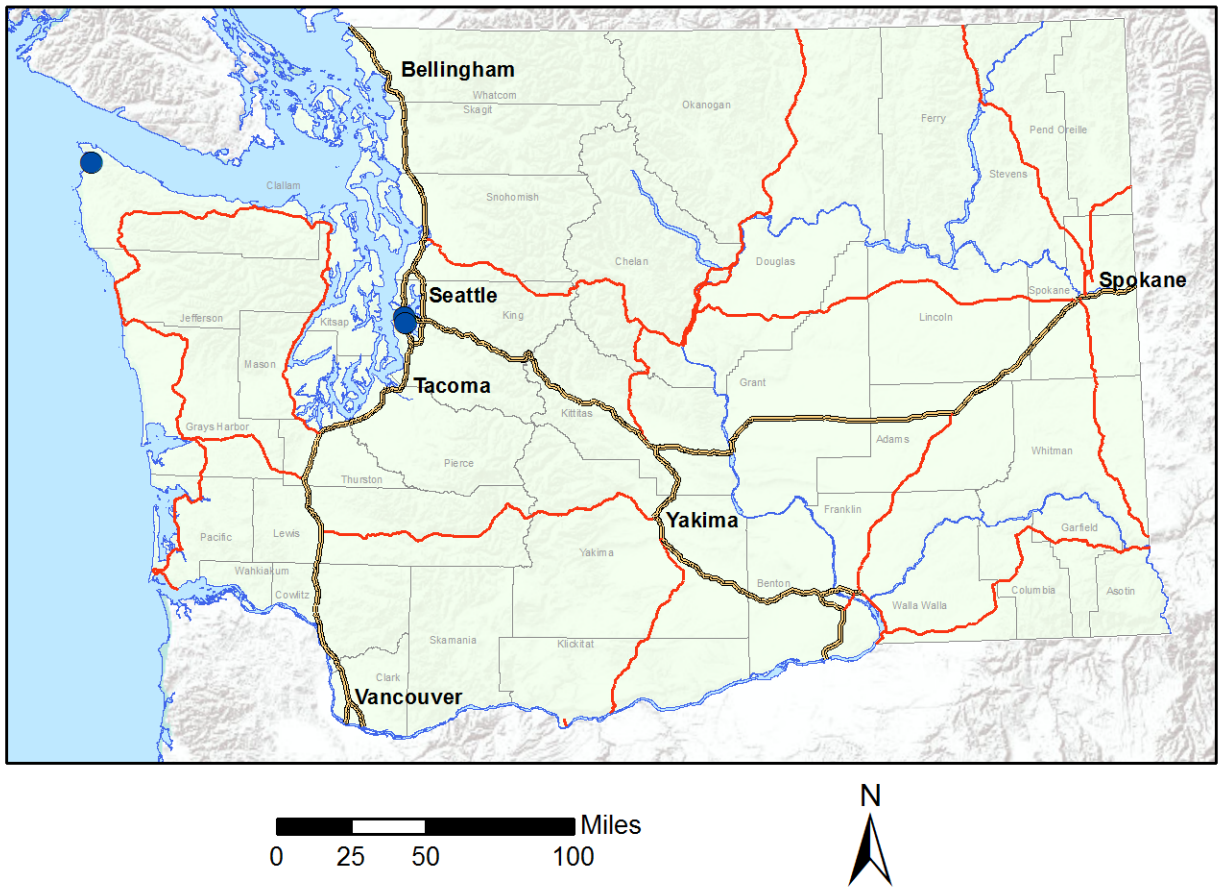


Figure 3. Map of Washington Network CO monitoring sites

Minimum monitoring requirements

Ecology is required to operate a CO monitor collocated with one required near-road NO_2 monitor in CBSAs with a population of 1,000,000 or more. In the Seattle-Tacoma-Bellevue CBSA, this requirement is met at the Seattle-10th & Weller near-road monitoring site (530330030).

Recent modifications: None.

Recommended/proposed modifications: None.

Nitrogen dioxide (NO_2, 42602/42612)

There are three NO_2 (42602) monitoring sites in the Washington Network and two sites that monitor trace NO_y-NO (42612). Seattle-Beacon Hill monitors both area-wide NO_2 and trace NO_y-NO. The monitoring objective of the trace NO_y-NO monitors is general/background. The monitoring objective of the Seattle-Beacon Hill NO_2 monitor is population exposure, and the monitoring objective of the near-road NO_2 monitors is source-oriented.

Table 6. Washington Network NO_2 and Trace NO_y-NO monitoring sites

AQS ID	Site Name	CBSA	NO_2	Trace NO_y-NO	Est.	Type	Scale	Method (POC)
530090013	Cheeka Peak	Port Angeles, WA		✓	01/2011	SLAMS, NCore	Regional	Teledyne API 200 EU (699) (POC 2)
530330030	Seattle-10th & Weller	Seattle-Tacoma-Bellevue, WA	✓		04/2014	SLAMS, Near-road	Microscale	Teledyne API 200 EU (599) (POC 1)
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	✓	✓	08/2013	SLAMS, NCore	Urban	NO_2: Teledyne API T500U (212) (POC 1); Trace NO_y-NO: Teledyne API T200U (599) (POC 2)
530530024	Tacoma-S 36th	Seattle-Tacoma-Bellevue, WA	✓		01/2016	SLAMS, Near-road	Microscale	Teledyne API 200 EU (599) (POC 1)

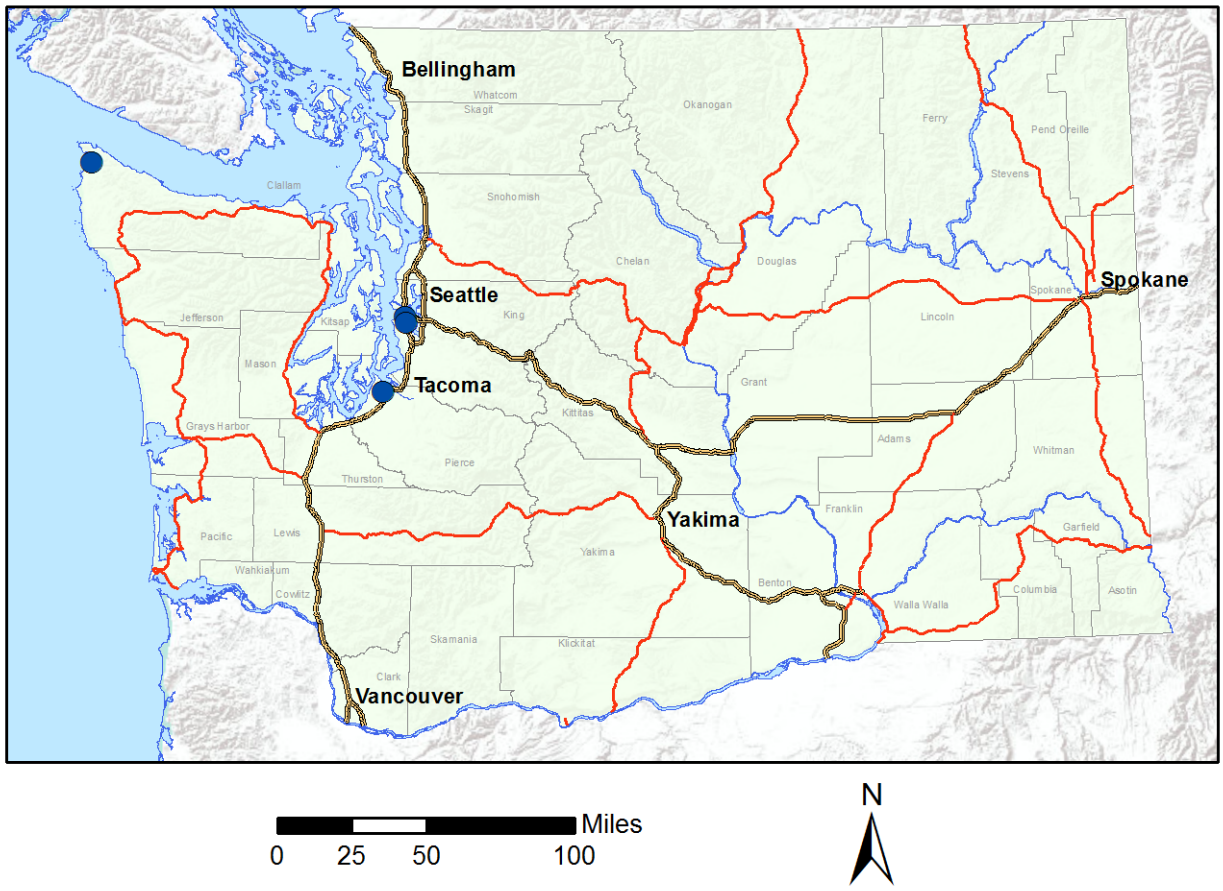


Figure 4. Map of Washington Network NO_2 and Trace NO_y-NO monitoring sites

Minimum monitoring requirements

Ecology is required to monitor both near-road and area-wide NO_2 in each CBSA with a population of 1,000,000 or greater. In CBSAs with a population of 2,500,000 or more, two near-road NO_2 monitoring sites are required. Ecology fulfills the near-road monitoring requirements at the Seattle-10th & Weller (530330030) and Tacoma-S 36th St (530530024) near-road sites. Seattle-Beacon Hill (530330080) fulfills the requirement for area-wide NO_2 monitoring.

The Portland-Vancouver-Hillsboro, OR-WA CBSA surpassed 2.5 million people in 2020, which triggers the requirement for a second near-road NO_2 site. Ecology will work with the Oregon Department of Environmental Quality (Oregon DEQ) to identify a suitable location for a second near-road site in this CBSA. Previous siting evaluations ruled out the I-5 corridor between Portland and Vancouver for near-road monitoring due to the absence of a suitable flat area.

Recent modifications: None.

Recommended/proposed modifications: Ecology will work with Oregon DEQ to identify a suitable location for a second near-road site in the Portland-Vancouver-Hillsboro, OR-WA CBSA.

Ozone (O_3, 44201)

There are 13 ozone monitoring sites in the Washington Network. All Washington Network ozone sites collect data under method code 087 (UV Absorbance) using Teledyne API 400 analyzers and all report data using POC 1. The monitoring objective of most ozone monitors is population exposure; exceptions are two monitors for general/background (Cheeka Peak and Mt Rainier-Jackson Visitors Ctr) and two monitors for regional transport (Custer-Loomis and Enumclaw-Mud Mtn).

Table 7. Washington Network ozone monitoring sites

AQS ID	Site Name	CBSA	Established	Type	Scale
530570011	Anacortes-202 O Ave	Mount Vernon-Anacortes, WA	05/2012	SLAMS	Neighborhood
530090013	Cheeka Peak	Port Angeles, WA	05/2006	SLAMS, NCore	Regional
530630001	Cheney-Turnbull	Spokane-Spokane Valley, WA	05/1999	SLAMS	Urban
530730005	Custer-Loomis	Bellingham, WA	04/1989	SLAMS	Regional
530330023	Enumclaw-Mud Mtn	Seattle-Tacoma-Bellevue, WA	07/1998	SLAMS	Urban
530330010	Issaquah-Lake Sammamish	Seattle-Tacoma-Bellevue, WA	12/1975	SLAMS	Urban
530050003	Kennewick-S Clodfelter Rd	Kennewick-Richland, WA	06/2015	SLAMS	Urban
530670013	Lacey-College St	Olympia-Lacey-Tumwater, WA	05/2022	SPM	Urban
530530012	Mt Rainier-Jackson Visitors Ctr	Seattle-Tacoma-Bellevue, WA	07/1998	SLAMS	Regional
530330017	North Bend-North Bend Way	Seattle-Tacoma-Bellevue, WA	06/1998	SLAMS	Neighborhood
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	03/2007	SLAMS, NCore	Urban
530630046	Spokane-Greenbluff	Spokane-Spokane Valley, WA	04/1990	SLAMS	Urban
530110011	Vancouver-Blairmont	Portland-Vancouver-Hillsboro, OR-WA	05/1988	SLAMS	Urban

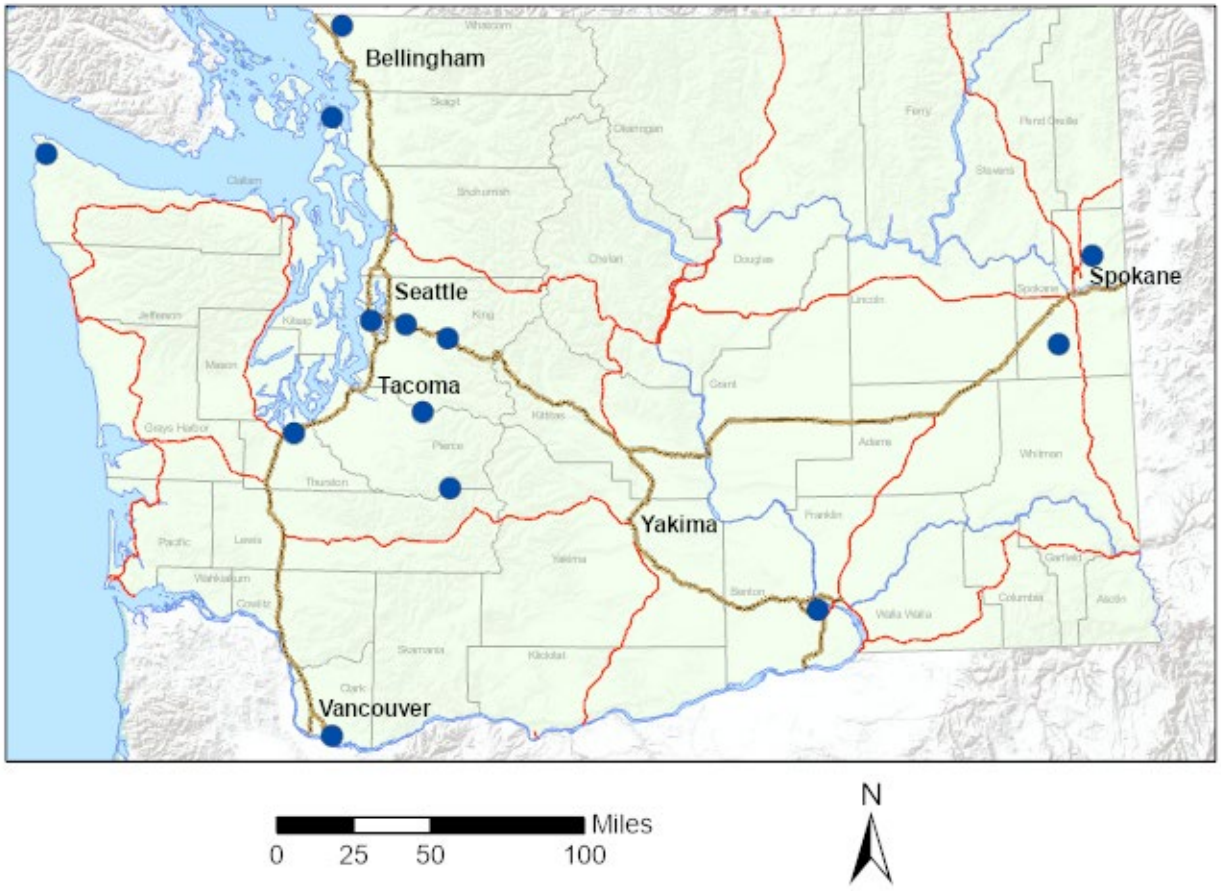


Figure 5. Map of Washington Network ozone monitoring sites

Minimum monitoring requirements

The Washington Network meets the minimum monitoring requirements for ozone defined in 40 C.F.R. Part 58 Appendix D. In each CBSA, the number of existing ozone monitors meets or exceeds the number of required monitors, as summarized in Table 8. The design values listed are the maximum valid design value of all sites within the CBSA. For a full list of design values at all ozone sites in the Washington Network, see Appendix A.

Table 8. EPA minimum monitoring requirements for ozone

CBSA	2021 Population Estimate	Highest Monitoring Site	2021 Design Value (ppm)	Number of Required Monitors	Number of Existing Monitors
Seattle-Tacoma-Bellevue, WA	4,011,553	Enumclaw-Mud Mtn	0.064	3	5
Portland-Vancouver-Hillsboro, OR-WA**	2,511,612	Portland-Carus	0.065	2	6
Spokane-Spokane Valley, WA	593,466	Spokane-Greenbluff	0.060	2	2

CBSA	2021 Population Estimate	Highest Monitoring Site	2021 Design Value (ppm)	Number of Required Monitors	Number of Existing Monitors
Kennewick-Richland, WA	308,293	Kennewick-S Clodfelter	0.063	1	1
Olympia-Lacey-Tumwater, WA	297,977	Yelm-Northern Pacific	NA (2020 DV of 0.054*)	0	1
Bellingham, WA	228,831	Custer-Loomis	0.048*	0	1
Mount Vernon-Anacortes, WA	130,696	Anacortes-202 O Ave	0.042*	0	1
Port Angeles, WA	78,209	Cheeka Peak	0.052*	0	1

* Design values are estimated from incomplete data

** Washington shares the Portland-Vancouver-Hillsboro CBSA with the state of Oregon. The minimum monitoring requirements for ozone in this CBSA are met through a combination of monitors operated by Ecology and Oregon DEQ. Ecology and Oregon DEQ established a Memorandum of Understanding on May 20, 2019 to formalize this arrangement (Appendix F).

Recent modifications: Due to a planned construction project at the school where the Vancouver-Blairmont monitoring site (530110011) is located from 2020-2022, the site has been relocated to a temporary location on school property. It will again be relocated to a permanent location once construction is completed in summer 2022. As the original location, temporary location and future permanent location are all within 200 meters of each other on the same property, Ecology does not consider this a formal site relocation.

Ecology temporarily suspended ozone monitoring at the Yelm-Northern Pacific monitoring site (530670005) for the summer 2021 ozone season due to a planned construction project at the wastewater treatment facility where the site is located. Ecology was informed by the facility in January 2022 that due to delays in the construction project, the site will now be under construction until 2023 or 2024. During that time, ORCAA plans to measure ozone at the nearby Lacey $PM_{2.5}$ monitoring site (530670013) as a temporary SPM. Ecology plans to resume monitoring at Yelm when the site is once again available in 2023 or 2024. On April 13, 2022, Ecology requested a waiver for this relocation from the EPA Region 10 Administrator on a case-by-case basis per 40 C.F.R. Part 58.14(c): moving the monitor does not compromise data collection needed for implementation of National Ambient Air Quality Standards (NAAQS), and the requirements of Part 58 Appendix D continue to be met. EPA Region 10 approved this waiver request on May 5, 2022, and this approval is provided in Appendix B.

Ozone monitoring at the Issaquah-Lake Sammamish monitoring site (530330010), which was suspended during the summer 2021 ozone season, resumed on May 1, 2022.

Recommended/proposed modifications: None.

Sulfur dioxide (SO_2, 42401)

There are six SO_2 monitoring sites in the Washington Network. All report data using POC 2. Three have a monitoring objective of source-oriented (Ferndale-Kickerville Rd, Ferndale-Mountain View Rd, and Malaga-Malaga Hwy), two of general/background (Cheeka Peak and Seattle-Beacon Hill), and one of population exposure (Anacortes-202 O Ave).

Table 9. Washington Network SO_2 monitoring sites

AQS ID	Site Name	CBSA	Established	Type	Scale	Method
530570011	Anacortes-202 O Ave	Mount Vernon-Anacortes, WA	01/2013	SLAMS	Neighborhood	TAPI 100 EU (600)
530090013	Cheeka Peak	Port Angeles, WA	05/2006	SLAMS, NCore	Regional	TAPI 100 EU (600)
530730013	Ferndale-Kickerville Rd	Bellingham, WA	01/2017	SLAMS	Microscale	TAPI 100 (077)
530730017	Ferndale-Mountain View Rd	Bellingham, WA	01/2017	SLAMS	Microscale	TAPI 100 (077)
530070012	Malaga-Malaga Hwy	Wenatchee, WA	01/2017	SLAMS	Microscale	TAPI 100 (077)
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	03/2007	SLAMS, NCore	Urban	TAPI 100 EU (600)

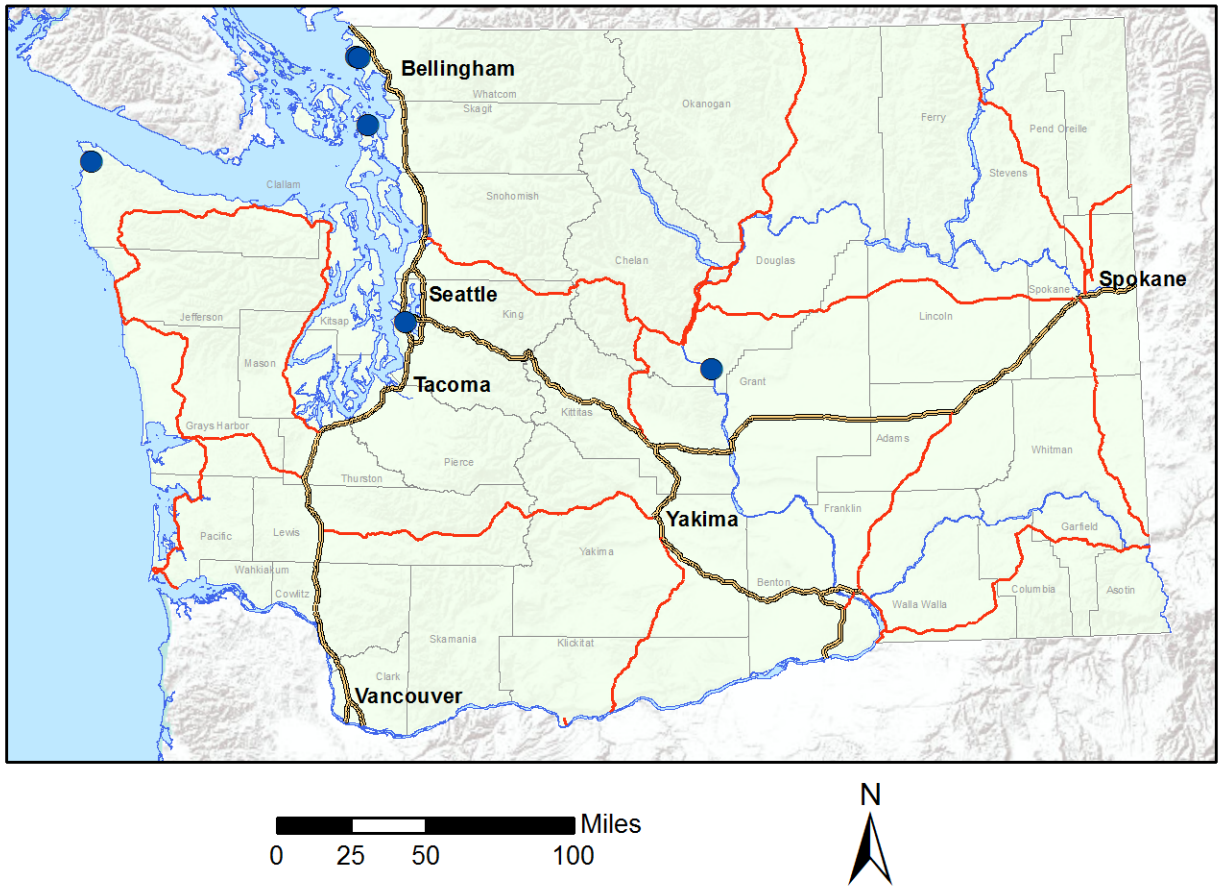


Figure 6. Map of Washington Network SO_2 monitoring sites

Minimum monitoring requirements

The Seattle-Beacon Hill NCore site (530330080) is used to satisfy the minimum monitoring requirement for the Seattle-Tacoma-Bellevue, WA CBSA, which is the only CBSA in Washington with required SO_2 monitoring based on the Population Weighted Emissions Index.

Recent modifications: None.

Recommended/proposed modifications: Ecology proposes to discontinue the Malaga-Malaga Hwy monitoring site (530070012) on December 31, 2022. The Malaga-Malaga Hwy monitoring site was established in 2017 to meet the requirements of EPA's 2015 Data Requirements Rule, which directed states to evaluate levels of SO_2 in ambient air near sources emitting over 2,000 tons of SO_2 per year. Operations at the Alcoa Wenatchee Works aluminum smelter, the facility associated with the Malaga-Malaga Hwy monitoring site, have been curtailed the entire time

the monitoring site has been operational. In December 2021, Alcoa announced the permanent closure of the Wenatchee Works smelter[2].

Design values are available for years 2019-2021, and in each year the design value was 1 ppb:

Table 10. Malaga-Malaga Hwy SO_2 design values, 2019-2021

Year	Design Value (ppb)
2019	1
2020	1
2021	1

The monitor meets the requirements for discontinuation described in 40 C.F.R. Part 51.1203(c)(3):

> "Any SO_2 monitor identified by an air agency in its approved Annual Monitoring Network Plan as having the purpose of meeting the requirements of this paragraph (c) that: Is not located in an area designated as nonattainment as the 2010 SO_2 NAAQS is not also being used to satisfy other ambient SO_2 minimum monitoring requirements listed in 40 CFR part 58, appendix D, section 4.4; and is not otherwise required as part of a SIP, permit, attainment plan or maintenance plan, may be eligible for shut down upon EPA approval if it produces a design value no greater than 50 percent of the 2010 SO_2 NAAQS from data collected in either its first or second 3-year period of operation."

The Malaga-Malaga Hwy SO_2 monitor is located in Chelan County, which is designated Attainment/Unclassifiable for SO_2 (86 FR 16055). It is not used to meet SO_2 minimum monitoring requirements in 40 CFR Part 58 Appendix D, section 4.4, and it is not otherwise required as part of a SIP, permit, attainment or maintenance plan. Upon EPA approval of the discontinuation of the Malaga-Malaga Hwy SO_2 monitor, it will no longer be a part of the Agreed Order #13522, signed August 2016, in which Ecology required the facility to operate the monitoring site. The agreed order is conditional on the monitoring site being a part of the Washington Network. If this discontinuation request is approved by EPA, the agreed order will be void and Ecology will have no requirement for the facility to maintain the monitoring site.

The Malaga-Malaga Hwy SO_2 design value has been below 50 percent of the 2010 SO_2 NAAQS of 75 ppb in each of the three years for which design values are available.

The monitor also meets the requirements for discontinuation described in 40 C.F.R. Part 58.14(c)(1):

[2] https://news.alcoa.com/press-releases/press-release-details/2021/Alcoa-Announces-Closure-of-Wenatchee-Smelter-in-Washington-State/default.aspx

> "Any $PM_{2.5}$, O_3, CO, PM_{10}, SO_2, Pb, or NO_2 SLAMS monitor which has shown attainment during the previous five years, that has a probability of less than 10 percent of exceeding 80 percent of the applicable NAAQS during the next three years based on the levels, trends, and variability observed in the past, and which is not specifically required by an attainment plan or maintenance plan. In a nonattainment or maintenance area, if the most recent attainment or maintenance plan adopted by the State and approved by EPA contains a contingency measure to be triggered by an air quality concentration and the monitor to be discontinued is the only SLAMS monitor operating in the nonattainment or maintenance area, the monitor may not be discontinued."

The Malaga-Malaga Hwy SO_2 monitor has shown attainment since it was established in 2017. The monitor is not required by any attainment plan or maintenance plan. The probability of exceeding 80 percent of the SO_2 NAAQS is less than 10 percent, according to the calculation method described in EPA's 2007 Ambient Air Monitoring Network Assessment Guidance:

Equation 1. Probability of NAAQS exceedance (U.S. EPA 2007)

$$\bar{X} + \frac{t * s}{\sqrt{n}} < 0.8 * NAAQS$$

Where:

X is the average design value (1 ppb)
t is the student's t-value for 2 degrees of freedom at the 90% confidence level (1.886)
s is the standard deviation of the design values (0 ppb)
n is the number of design values (3)

With the values from the Malaga-Malaga Hwy SO_2 monitor, the left side of Equation 1 is 1 ppb, which is less than 80% of the 75 ppb NAAQS for SO_2.

Particulate matter 2.5 ($PM_{2.5}$, 88101/88502)

FRM/FEM $PM_{2.5}$ (88101)

There are 20 sites in the Washington Network that monitor $PM_{2.5}$ with FRM or Class III FEM monitors. Most have a monitoring objective of population exposure; exceptions are the near-road monitors (source-oriented and highest concentration) and Seattle-Beacon Hill (general/background).

Table 11. Washington Network $PM_{2.5}$ monitoring sites

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method (POC)
530570011	Anacortes-202 O Ave	Mount Vernon-Anacortes, WA	10/2011	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530730019	Bellingham-Pacific St	Bellingham, WA	01/2018	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method (POC)
530350007	Bremerton-Spruce Ave	Bremerton-Silverdale-Port Orchard, WA	05/2012	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530650005	Colville- E 1st St	Spokane-Spokane Valley, WA	11/2019	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530610020	Darrington-Fir St	Seattle-Tacoma-Bellevue, WA	12/2010	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530370002	Ellensburg-Ruby St	Ellensburg, WA	10/2007	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530332004	Kent-Central & James	Seattle-Tacoma-Bellevue, WA	12/2010	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530611007	Marysville-7th Ave	Seattle-Tacoma-Bellevue, WA	02/2010	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530470013	Omak-Colville Tribe	None	10/2010	Tribal	Neighborhood	Met One BAM 1020 (170) (POC 5)
530330030	Seattle-10th & Weller	Seattle-Tacoma-Bellevue, WA	06/2014	SLAMS, Near-road	Microscale	Met One BAM 1020 (170) (POC 5)
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	02/2010	SLAMS, NCore	Urban	Met One BAM 1020 (Primary) (170) (POC 5); R&P 2025 (Collocated) (145) (POC 1)
530330057	Seattle-Duwamish	Seattle-Tacoma-Bellevue, WA	12/2009	SLAMS	Neighborhood	R&P 2025 (Primary and Collocated) (145) (POC 1 and 2); Met One BAM 1020 (170) (POC 5)
530630017	Spokane-E Broadway Ave	Spokane-Spokane Valley, WA	01/2021	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530530031	Tacoma-Alexander Ave	Seattle-Tacoma-Bellevue, WA	01/2022	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530530029	Tacoma- L Street	Seattle-Tacoma-Bellevue, WA	01/2010	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530530024	Tacoma-S 36th St	Seattle-Tacoma-Bellevue, WA	01/2016	SLAMS, Near-road	Microscale	Met One BAM 1020 (170) (Primary and Collocated) (POC 5 and 6)
530770015	Toppenish-Yakama Tribe	Yakima, WA	08/2008	Tribal	Neighborhood	Met One BAM 1020 (170) (POC 5)
530330069	Tukwila Allentown	Seattle-Tacoma-Bellevue, WA	04/2021	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method (POC)
530110024	Vancouver NE 84th Ave	Portland-Vancouver-Hillsboro, OR-WA	12/2014	SLAMS	Neighborhood	Met One BAM 1020 (170) (POC 5)
530770009	Yakima-4th Ave	Yakima, WA	05/2011	SLAMS	Neighborhood	Met One BAM 1020 (Primary) (170) (POC 5); R&P 2025 (Collocated) (145) (POC 1)

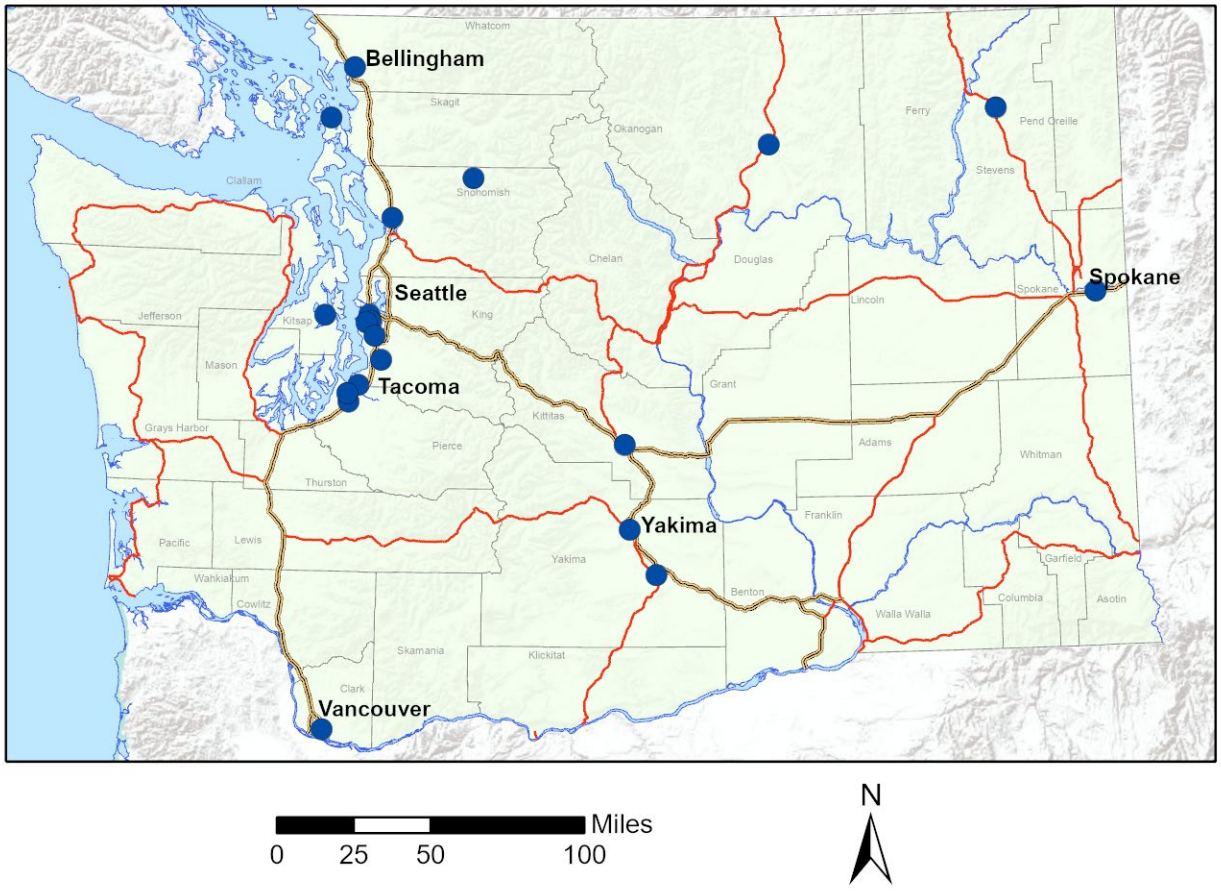


Figure 7. Map of Washington Network $PM_{2.5}$ monitoring sites

Minimum monitoring requirements

Minimum monitoring requirements for $PM_{2.5}$ are defined in 40 C.F.R. Part 58 Appendix D. Table 12 below summarizes the number of required and existing monitors in each of Washington's CBSAs where monitoring is conducted. The design values listed are the maximum valid design value of all sites within the CBSA. The Washington Network is currently meeting the minimum monitoring requirements in all CBSAs.

For a full list of design values at all Washington Network $PM_{2.5}$ monitoring sites, see Appendix A.

Table 12. EPA minimum monitoring requirements for FRM/FEM $PM_{2.5}$

CBSA	2021 Population Estimate	Highest Monitoring Site	2021 Design Value (µg/m^3)	Number of Required Monitors	Number of Existing Monitors
Seattle-Tacoma-Bellevue, WA	4,011,553	Darrington-Fir St/Marysville-7th Ave (tied)	32	3	10
Portland-Vancouver-Hillsboro, OR-WA**	2,511,612	Vancouver-NE 84th Ave	63	3	4
Spokane-Spokane Valley, WA	593,466	Colville-E 1st St	51	2	2
Bremerton-Silverdale, WA	274,314	Bremerton-Spruce Ave	22	0	1
Yakima, WA	256,035	Yakima-4th Ave	69	1	2
Bellingham, WA	228,831	Bellingham-Pacific St	22	0	1
Mount Vernon-Anacortes, WA	130,696	Anacortes-202 O Ave	12*	0	1
Ellensburg, WA	45,499	Ellensburg-Ruby St	31	0	1

*Design value was estimated from incomplete data.

** Washington shares the Portland-Vancouver-Hillsboro CBSA with the state of Oregon. The minimum monitoring requirements for $PM_{2.5}$ in this CBSA are met through a combination of monitors operated by Ecology and the Oregon DEQ. Ecology and Oregon DEQ established a Memorandum of Understanding on May 20, 2019 to formalize this arrangement (Appendix F).

Collocation requirements

The monitoring sites listed in Table 13 are used to fulfill the collocation requirements described in 40 C.F.R. Part 58 Appendix A.

Table 13. $PM_{2.5}$ collocation requirements

Method Code	# Primary Monitors	# Required Collocated Monitors	# Active Collocated Monitors	Site
145	1	1	1	Seattle-Duwamish (530330057)
170	19	3	3	Tacoma-S 36th (530530024); Seattle-Beacon Hill (530330080) Yakima-4th Ave S (530770009)

Recent modifications: As of January 1, 2022, an FEM BAM 1020 $PM_{2.5}$ was added to the Puget Sound Clean Air Agency's (PSCAA's) Tacoma-Alexander Ave site (530530031) as a SLAMS. The FEM replaces the non-regulatory nephelometer previously used for $PM_{2.5}$ reporting.

On February 11, 2022, the Bellingham-Pacific St site (530730019) operated by the Northwest Clean Air Agency (NWCAA) was moved to a new location (48.759678, -122.456452) on the roof of the same property where it was previously located. This relocation was necessary due to a construction project to add a multi-level addition that would have served as an obstruction at the previous location. The new location is approximately 40 meters south of the old location. As the site address remains the same and the distance between the two locations is 40 meters, Ecology does not consider this a formal site relocation. The new location meets the probe and path monitoring path siting criteria in 40 C.F.R. Part 58 Appendix E.

Recommended/proposed modifications: Ecology and the Yakima Regional Clean Air Agency (YRCAA) plan to replace the non-regulatory nephelometer used for $PM_{2.5}$ reporting at the Sunnyside-S 16th St SLAMS monitoring site (530770005) with an FEM BAM 1020. The equipment and installation costs for this replacement will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. The target date for this upgrade is January 1, 2023.

The Puget Sound Clean Air Agency plans to establish a regulatory $PM_{2.5}$ and meteorological monitoring site in SeaTac near the Seattle-Tacoma International Airport. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. PSCAA plans to identify a site location in summer 2022 and complete site installation by June 2024. Ecology and PSCAA will provide additional details on the site location, including an evaluation of 40 C.F.R. Part 58 Appendix E siting criteria, as they become available.

The Yakama Nation plans to establish a tribal regulatory $PM_{2.5}$ and meteorological monitoring site in Wapato. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. The installation of the Wapato site will take place in 2023-2024.

Non-regulatory $PM_{2.5}$ (88502)

Ecology and its partners operate 40 monitoring sites with correlated nephelometers to report estimated $PM_{2.5}$ concentrations to the public. All report data using POC 4. Most have a monitoring objective of population exposure; exceptions are five sites for general/background (Cheeka Peak, Chelan-Woodin Ave, Leavenworth-Evans St, Twisp-Ewell St, and Winthrop-Chewuch Rd) and one for regional transport (Moses Lake-Balsam St).

Table 14. Washington Network nephelometer monitoring sites

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method
530272002	Aberdeen-Division St	Aberdeen, WA	08/2002	SLAMS	Neighborhood	Radiance Research M903 (771)

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method
530330047	Auburn-29th St	Seattle-Tacoma-Bellevue, WA	03/2021	SPM	Neighborhood	Ecotech M9003 (812)
530330031	Bellevue-SE 12th St	Seattle-Tacoma-Bellevue, WA	12/2016	SLAMS	Neighborhood	Radiance Research M903 (771)
530090013	Cheeka Peak	Port Angeles, WA	05/2006	SLAMS, NCore	Regional	Radiance Research M903 (771)
530410004	Chehalis-Market Blvd	Centralia, WA	12/2009	SLAMS	Neighborhood	Radiance Research M903 (771)
530070007	Chelan-Woodin Ave	Wenatchee, WA	12/2002	SPM	Neighborhood	Radiance Research M903 (771)
530030004	Clarkston-13th St	Lewiston, ID-WA	03/2007	SLAMS	Neighborhood	Radiance Research M903 (771)
530130002	Dayton-W Main St	None	02/2009	SLAMS	Neighborhood	Radiance Research M903 (771)
530050002	Kennewick-Metaline	Kennewick-Richland, WA	08/2004	SLAMS	Neighborhood	Radiance Research M903 (771)
530670013	Lacey-College St	Olympia-Lacey-Tumwater, WA	09/1990	SLAMS	Neighborhood	Radiance Research M903 (771)
530750005	LaCrosse-Hill St	Pullman, WA	10/2002	SLAMS	Neighborhood	Radiance Research M903 (771)
530330024	Lake Forest Park	Seattle-Tacoma-Bellevue, WA	10/2003	SLAMS	Neighborhood	Ecotech M9003 (812)
530070010	Leavenworth-Evans St	Wenatchee, WA	07/2005	SPM	Neighborhood	Radiance Research M903 (771)
530150015	Longview-30th Ave	Longview, WA	03/2003	SLAMS	Neighborhood	Radiance Research M903 (771)
530210002	Mesa-Pepiot Way	Kennewick-Richland, WA	01/2003	SLAMS	Neighborhood	Radiance Research M903 (771)
530251002	Moses Lake-Balsam St	Moses Lake, WA	01/2004	SLAMS	Neighborhood	Radiance Research M903 (771)
530570015	Mt Vernon-S Second St	Mount Vernon-Anacortes, WA	07/2005	SLAMS	Neighborhood	Radiance Research M903 (771)
530090015	Neah Bay-Makah Tribe	Port Angeles, WA	02/2010	Tribal	Neighborhood	Radiance Research M903 (771)
530510008	Newport-Calispel (Temporary)	None	12/2020	SPM	Neighborhood	Radiance Research M903 (771)

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method
530330017	North Bend-North Bend Way	Seattle-Tacoma-Bellevue, WA	03/2003	SLAMS	Neighborhood	Radiance Research M903 (771)
530230001	Pomeroy-Pataha St	None	05/2017	SLAMS	Neighborhood	Radiance Research M903 (771)
530090017	Port Angeles- E 5th St	Port Angeles, WA	04/2015	SLAMS	Neighborhood	Radiance Research M903 (771)
530310003	Port Townsend-San Juan Ave	None	10/2002	SLAMS	Neighborhood	Radiance Research M903 (771)
530750003	Pullman-Dexter SE	Pullman, WA	10/2002	SLAMS	Neighborhood	Radiance Research M903 (771)
530251003	Quincy-3rd Ave NE	Moses Lake, WA	06/2017	SPM	Neighborhood	Radiance Research M903 (771)
530010003	Ritzville-Alder St	Othello, WA	03/2001	SLAMS	Neighborhood	Radiance Research M903 (771)
530750006	Rosalia-Josephine St	Pullman, WA	10/2002	SLAMS	Neighborhood	Radiance Research M903 (771)
530331011	Seattle-South Park	Seattle-Tacoma-Bellevue, WA	10/2003	SLAMS	Microscale	Ecotech M9003 (812)
530450007	Shelton-W Franklin	Shelton, WA	04/2011	SLAMS	Neighborhood	Radiance Research M903 (771)
530630047	Spokane-Monroe St	Spokane-Spokane Valley, WA	05/2004	SLAMS	Neighborhood	Radiance Research M903 (771)
530770005	Sunnyside-S 16th St	Yakima, WA	09/2015	SLAMS	Neighborhood	Radiance Research M903 (771)
530270011	Taholah-Quinault Tribe	Aberdeen, WA	04/2004	Tribal	Neighborhood	Radiance Research M903 (771)
530610021	Tulalip-Totem Beach Rd	Seattle-Tacoma-Bellevue, WA	10/2019	Tribal	Neighborhood	Radiance Research M903 (771)
530470016	Twisp-Ewell St	None	06/2020	SPM	Neighborhood	Radiance Research M903 (771)
530710005	Walla Walla-12th St	Walla Walla, WA	10/2002	SLAMS	Neighborhood	Radiance Research M903 (771)
530650002	Wellpinit-Spokane Tribe	Spokane-Spokane Valley, WA	10/2008	Tribal	Neighborhood	Radiance Research M903 (771)
530070011	Wenatchee-Fifth St	Wenatchee, WA	11/2012	SLAMS	Neighborhood	Radiance Research M903 (771)

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method
530470010	Winthrop-Chewuch Rd	None	11/2003	SPM	Neighborhood	Radiance Research M903 (771)
530110022	Yacolt-Yacolt Rd	Portland-Vancouver-Hillsboro, OR-WA	07/2003	SLAMS	Neighborhood	Radiance Research M903 (771)

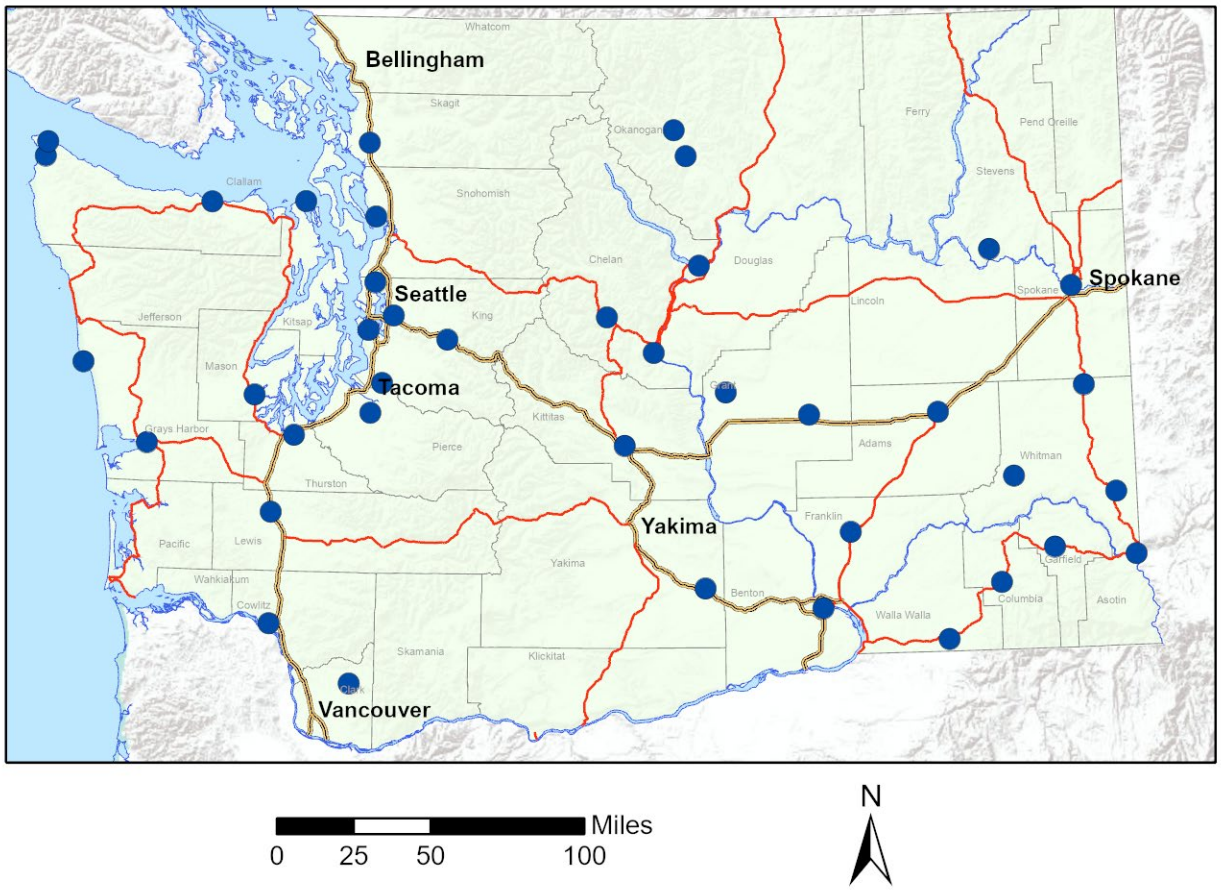


Figure 8. Map of Washington Network nephelometer monitoring sites

Regional background/transport requirements

Appendix D (4.7.3) of 40 C.F.R. Part 58 requires each state to operate at least one $PM_{2.5}$ monitoring site for regional background and one for regional transport. The Cheeka Peak NCore site serves as Washington's regional background site, and the Moses Lake SLAMS is designated as a regional transport site.

Recent modifications: Nephelometer monitoring at PSCAA's Tacoma-Alexander Ave site (530530031) was discontinued as of December 31, 2021 and replaced with an FEM BAM 1020 as a SLAMS for $PM_{2.5}$ monitoring.

Nephelometer monitoring at the Yakama Nation's White Swan tribal monitoring site (530770016) ceased on August 31, 2021. In fall 2021, EPA Region 10 and the Yakama Nation informed Ecology that monitoring at White Swan would not resume and the site would instead be replaced with a tribal FEM BAM $PM_{2.5}$ monitoring site in Wapato funded by the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants.

Recommended/proposed modifications: The Benton Clean Air Agency (BCAA) plans to establish a new site for non-regulatory $PM_{2.5}$ AQI reporting in Prosser. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. BCAA plans to identify a site location in summer 2022, and the target date for the site to begin operating is January 1, 2023. Ecology and BCAA will provide additional details on the site location, including an evaluation of 40 C.F.R. Part 58 Appendix E siting criteria, as they become available.

Upon installation of the planned FEM BAM 1020 at the Sunnyside-S 16th St monitoring site (530770005) by January 2023, YRCAA plans to discontinue the non-regulatory nephelometer currently used for $PM_{2.5}$ reporting.

Particulate matter 10 (PM_{10}, 81102)

There are seven PM_{10} monitoring sites in the Washington Network. All have a monitoring objective of population exposure with the exception of Seattle-Beacon Hill, which has a monitoring objective of general/background.

Table 15. Washington Network PM_{10} monitoring sites

AQS ID	Site Name	CBSA	Est.	Type	Scale	Method (POC)
530710006	Burbank-Maple St	Walla Walla, WA	08/2017	SLAMS	Neighborhood	BAM 1020 (122) (POC 3)
530630001	Cheney-Turnbull	Spokane-Spokane Valley, WA	10/2021	SLAMS	Urban	BAM 1020 (122) (POC 3)
530650005	Colville-E 1st St	Spokane-Spokane Valley, WA	10/2015	SLAMS	Neighborhood	BAM 1020 (122) (POC 3)
530050002	Kennewick-Metaline	Kennewick-Richland, WA	10/1994	SLAMS	Neighborhood	BAM 1020 (122) (POC 3)
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	03/2003	SLAMS, NCore	Urban	R&P 2025 (127) (POC 2)
530630017	Spokane-E Broadway Ave	Spokane-Spokane Valley, WA	03/2021	SLAMS	Neighborhood	BAM 1020 (122) (POC 3)
530770009	Yakima-4th Ave S	Yakima, WA	04/2000	SLAMS	Neighborhood	BAM 1020 (122) (POC 3)

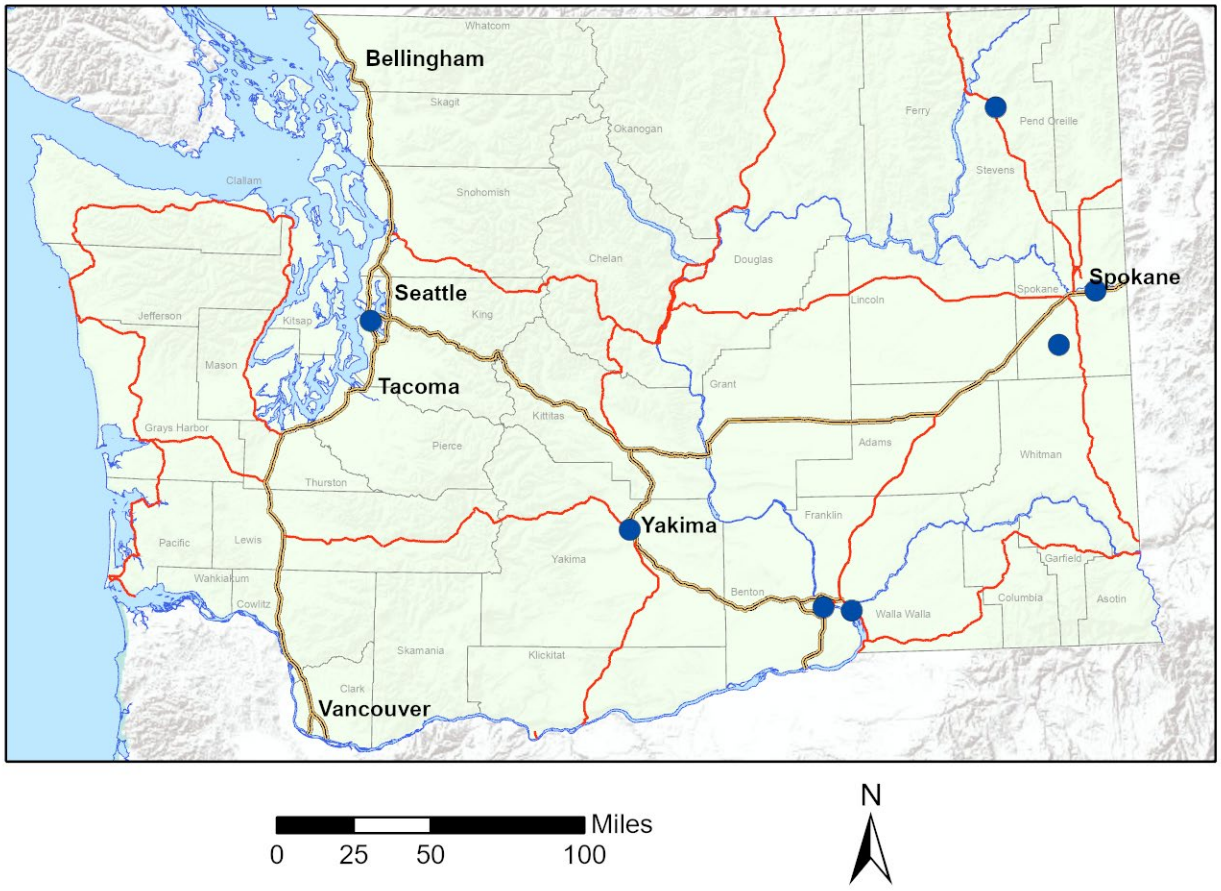


Figure 9. Map of Washington Network PM_{10} monitoring sites

The Washington Network is currently not meeting the PM_{10} minimum monitoring requirements defined in 40 C.F.R. Part 58 Appendix D in four metropolitan areas, as summarized in Table 16, and EPA Region 10 has approved waivers for the unmet monitoring requirements.

Table 16. EPA minimum monitoring requirements for PM_{10}

Core-Based Statistical Area	2021 Population Estimate	Maximum 24-hour concentration in µg/m^3 (2019-2021)	Number of Required Monitors	Number of Existing Monitors
Seattle-Tacoma-Bellevue, WA	4,011,553	46	2	1
Portland-Vancouver-Hillsboro, OR-WA	2,511,612	37	2	4
Spokane-Spokane Valley, WA	593,466	440	4	2
Kennewick-Richland, WA	308,293	1012	3	1
Yakima, WA	256,035	399	3	1

On April 2, 2019, Ecology submitted to EPA Region 10 a request for a waiver for the unmet minimum monitoring requirements in the Seattle-Tacoma-Bellevue, Spokane-Spokane Valley, Kennewick-Richland and Yakima CBSAs. EPA issued Ecology a waiver for the unmet monitoring requirements in the Yakima and Kennewick-Richland CBSAs on April 18, 2019. These waivers are provided in Appendix B. In a letter dated February 7, 2020 (Appendix C), EPA Region 10 also approved Ecology's request for a monitoring waiver for the unmet PM_{10} monitoring requirement in the Seattle-Tacoma-Bellevue CBSA and one of the two unmet PM_{10} monitoring requirements in the Spokane-Spokane Valley CBSA. In order to meet the remaining requirement for a third PM_{10} monitor in the Spokane-Spokane Valley CBSA, EPA requested that data from the PM_{10} monitor that SRCAA operates at Cheney-Turnbull (530630001) be submitted to AQS. The Cheney-Turnbull PM_{10} monitor was added to the Washington Network on October 1, 2021.

Recent modifications: A continuous FEM PM_{10} monitor operated by the Spokane Regional Clean Air Agency (SRCAA) was added to the Cheney-Turnbull site (530630001) on October 1, 2021. This addition was requested in EPA's response to Ecology's 2019 Ambient Air Monitoring Network Plan.

Recommended/proposed modifications: None.

Meteorological monitoring (61101/61102/61103/61104/62101)

There are 16 meteorological monitoring sites in the Washington Network. All Washington Network meteorological monitoring sites collect scalar and vector wind speed and direction using RM Young or Vaisala sonic anemometers (method codes 062 and 060, respectively) and ambient temperature under method code 040 (electronic or machine average). All Washington Network meteorological sites follow EPA's monitoring guidelines for prevention of significant deterioration (PSD).

Table 17. Washington Network meteorological monitoring sites

AQS ID	Site Name	Established	Type	Scale
530710006	Burbank-Maple St	03/2018	SLAMS	Urban
530090013	Cheeka Peak	08/2007	SLAMS, NCore	Urban
530650005	Colville-E 1st St	05/2016	SLAMS	Urban
530330023	Enumclaw-Mud Mtn.	02/2004	SLAMS	Urban
530730017	Ferndale-Mountain View Rd	01/2017	SLAMS	Urban
530050002	Kennewick-Metaline	08/2012	SLAMS	Urban
530070012	Malaga-Malaga Hwy	01/2017	SLAMS	Urban
530330017	North Bend-North Bend Way*	01/2000	SLAMS	Urban
530470013	Omak-Colville Tribe	10/2010	Tribal	Urban
530251003	Quincy-3rd Ave NE	06/2017	SPM	Urban
530330030	Seattle-10th & Weller	04/2014	SLAMS, Near-road	Urban
530330080	Seattle-Beacon Hill	01/1991	SLAMS, NCore	Urban

AQS ID	Site Name	Established	Type	Scale
530530024	Tacoma-S 36th St	02/2016	SLAMS, Near-road	Urban
530770015	Toppenish-Yakama Tribe	06/2009	Tribal	Urban
530110011	Vancouver-Blairmont Dr*	12/2007	SLAMS	Urban
530070011	Wenatchee-Fifth St	11/2012	SLAMS	Urban

*Meteorological monitoring at North Bend-North Bend Way and Vancouver-Blairmont Dr are temporarily suspended.

Meteorological monitoring at the North Bend-North Bend Way site (530330017) is currently suspended. A large residential building was constructed within several meters of the meteorological tower, which no longer meets siting requirements for PSD meteorological monitoring. Ecology plans to relocate the tower to another location at the existing site, but this work has been delayed due the COVID-19 pandemic and competing monitoring priorities.

Due to a planned construction project on the property of the Vancouver-Blairmont monitoring site (530110011) from 2020-2022, the site was relocated to a temporary shelter without access to a meteorological tower in May 2020. Meteorological monitoring will resume in summer 2022.

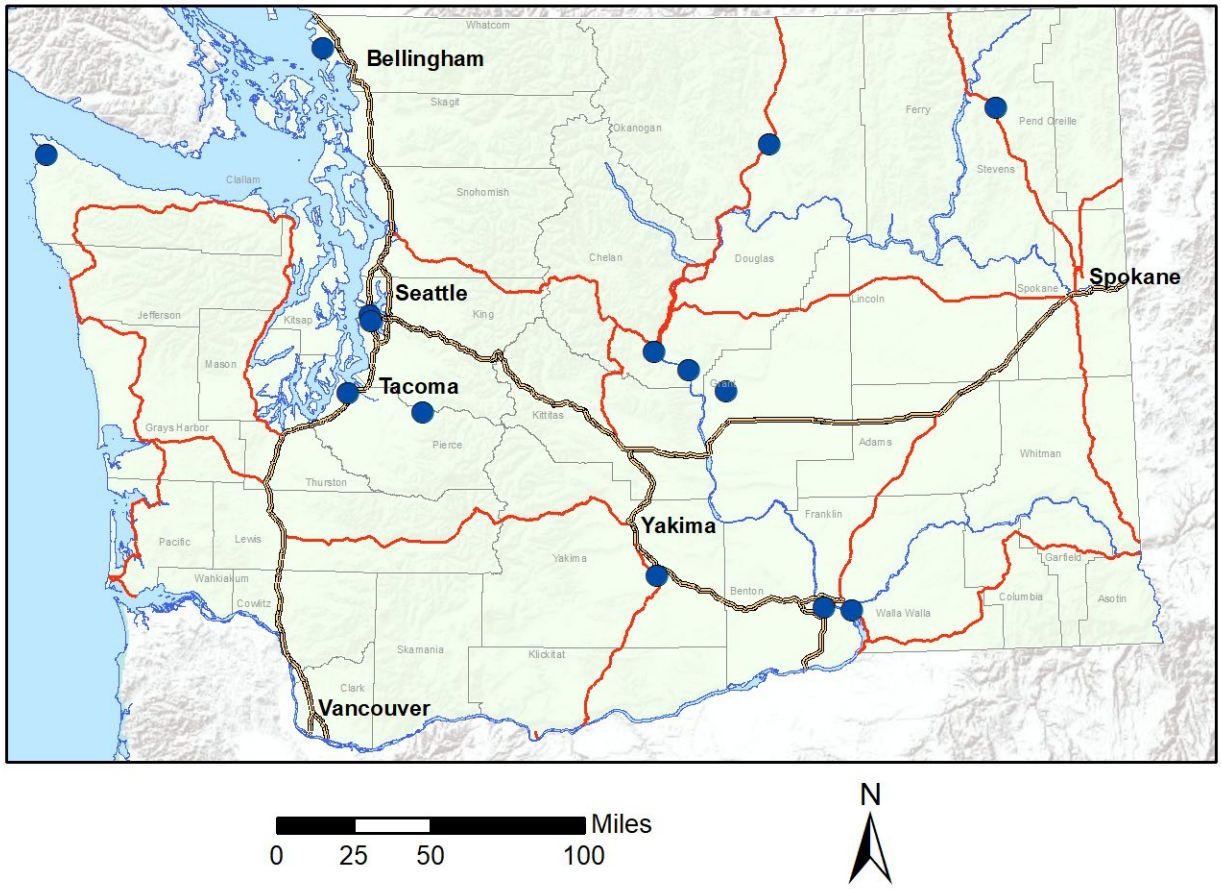


Figure 10. Map of active Washington Network meteorological monitoring sites

Recent modifications: Meteorological monitoring at the former Spokane-Augusta monitoring site (530630021) was discontinued on June 30, 2021, due to the discontinuation of $PM_{2.5}$ and PM_{10} monitoring in early 2021.

Recommended/proposed modifications: The North Bend and Vancouver-Blairmont meteorological monitoring sites will resume monitoring when the issues described above are resolved.

Ecology proposes to discontinue meteorological monitoring at the Malaga-Malaga Hwy monitoring site (530070012) on December 31, 2022, if discontinuation of the SO_2 monitor is approved.

The Yakama Nation plans to establish a tribal regulatory $PM_{2.5}$ and meteorological monitoring site in Wapato. The equipment and installation costs for this new monitoring site will be funded by EPA through the American Rescue Plan direct awards for enhanced air monitoring for criteria pollutants. The installation of the Wapato site will take place in 2023-2024.

Lead (Pb)

Ecology reports Pb in PM_{10} concentrations as part of the National Air Toxics Trends Station (NATTS) monitoring at Seattle-Beacon Hill (530330080). At the request of EPA, Ecology ceased reporting to parameter code 85129 and began reporting to parameter code 85128 (POC 6) as of January 1, 2019. The monitor has an objective of population exposure.

As described in 40 C.F.R. Part 58, Appendix D (4.5), source-oriented lead monitoring is required in the vicinity of sources that emit 0.5 tons per year or more of lead. According to the 2017 National Emissions Inventory, Washington's only source above this threshold is Ardagh Glass in Seattle. Ecology modeled the impact of this facility on ambient air and demonstrated that it would not contribute to a maximum Pb concentration in ambient air above 50 percent of the NAAQS. On April 18, 2019, EPA issued Ecology a waiver for lead monitoring at Ardagh Glass based on the modeling results. This waiver is provided in Appendix B.

Recommended/proposed modifications: None.

Chemical Speciation Network (CSN)

Ecology and its partners operate 4 speciation monitoring sites as part of the national Chemical Speciation Network. Four of these sites are ongoing, including one Speciation Trends Network (STN) site and three supplemental CSN sites. Monitoring objectives, methods and POCs vary by site and parameter.

Table 18. Washington Network Chemical Speciation Network monitoring sites

AQS ID	Site Name	CBSA	Established	Type	Scale
530330030	Seattle-10th & Weller	Seattle-Tacoma-Bellevue, WA	11/2014	Supplemental CSN	Microscale
530330080	Seattle-Beacon Hill	Seattle-Tacoma-Bellevue, WA	02/2000	Speciation Trends Network (STN)	Urban
530530029	Tacoma-L St	Seattle-Tacoma-Bellevue, WA	01/2006	Supplemental CSN	Neighborhood
530770009	Yakima-4th Ave S	Yakima, WA	11/2007	Supplemental CSN	Neighborhood

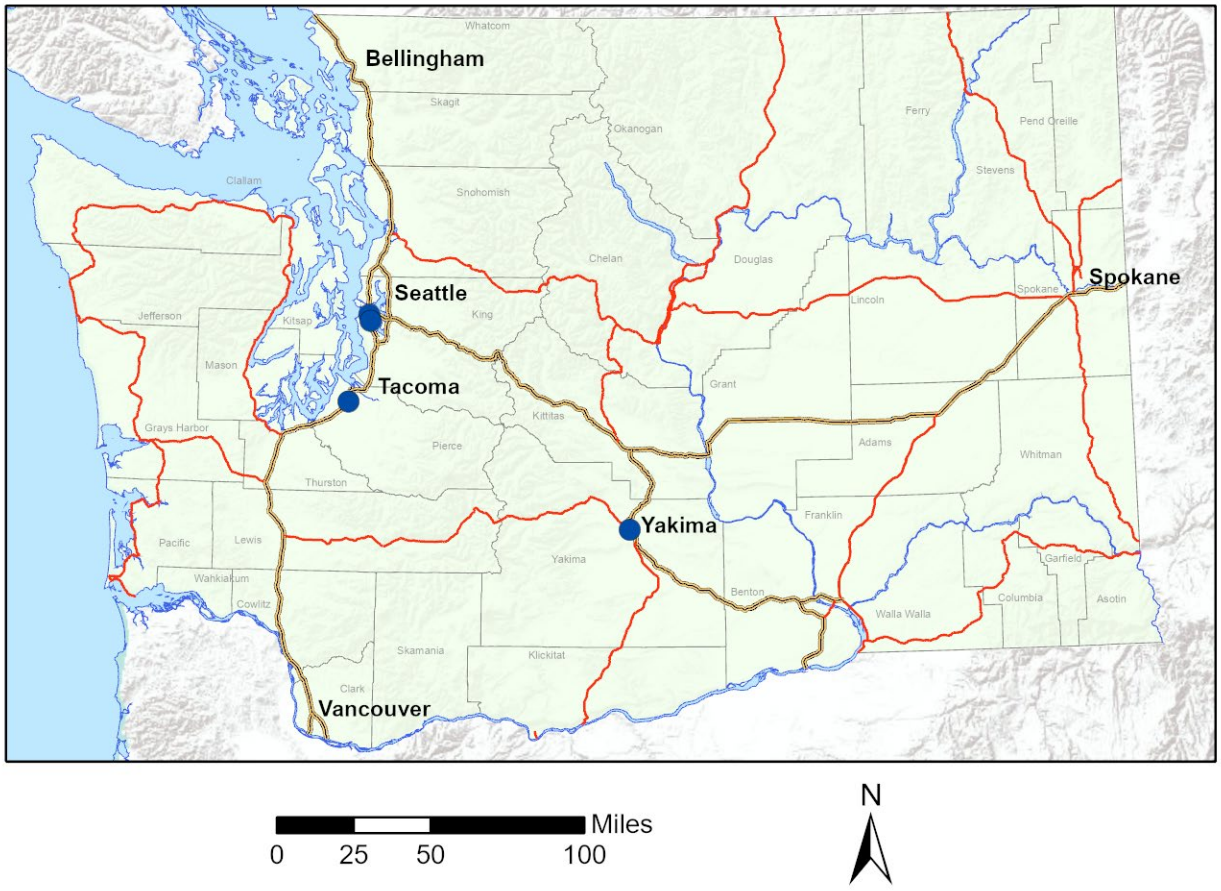


Figure 11. Map of Washington Chemical Speciation Network monitoring sites

Each speciation site samples the following parameters:

Table 19. Chemical Speciation Network monitoring parameters

Code	Parameter	Code	Parameter	Code	Parameter	Code	Parameter
88102	Antimony	88126	Iron	88167	Zinc	88370	OC CSN Rev Unadjusted
88103	Arsenic	88128	Lead	88168	Strontium	88374	OC1 CSN Rev Unadjusted
88104	Aluminum	88131	Indium	88169	Sulfur	88375	OC2 CSN Rev Unadjusted
88107	Barium	88132	Manganese	88176	Rubidium	88376	OC3 CSN Rev Unadjusted
88109	Bromine	88136	Nickel	88180	Potassium	88377	OC4 CSN Rev Unadjusted
88110	Cadmium	88140	Magnesium	88184	Sodium	88378	OP CSN Rev Unadjusted
88111	Calcium	88152	Phosphorus	88185	Zirconium	88380	EC CSN Rev Unadjusted
88112	Chromium	88154	Selenium	88301	Ammonium Ion	88383	EC1 CSN Rev Unadjusted
88113	Cobalt	88160	Tin	88302	Sodium Ion	88384	EC2 CSN Rev Unadjusted
88114	Copper	88161	Titanium	88303	Potassium Ion	88385	EC3 CSN Rev Unadjusted
88115	Chlorine	88164	Vanadium	88306	Total Nitrate	88388	OP CSN Rev Unadjusted
88117	Cerium	88165	Silicon	88355	OC CSN Rev Unadjusted	88403	Sulfate
88118	Cesium	88166	Silver	88357	EC CSN Rev Unadjusted	88502	$PM_{2.5}$ Speciation Mass

Recent modifications: With the passage of the Washington State 2018 supplemental operating budget (Engrossed Substitute Senate Bill 6032), Ecology was directed to use state funding to conduct a multiyear source apportionment study at the monitoring site closest to the Port of Tacoma. Ecology conducted $PM_{2.5}$ speciation monitoring at PSCAA's Tacoma-Alexander Ave (530530031) monitoring site from August 2018 through January 2022. Puget Sound Clean Air Agency conducted a parallel speciation study at the Seattle-Duwamish monitoring site (530330057) concurrently with the Tacoma study from August 2018 through June 2022. The temporary speciation studies were completed and sampling discontinued at Tacoma-Alexander on February 10, 2022 and at Seattle-Duwamish on June 30, 2022.

Recommended/proposed modifications: Ecology plans to relocate CSN monitoring from the Seattle-10th & Weller (530330030) near-road site on July 31, 2022. Speciation data have been collected at Seattle-10th & Weller since 2014. The frequent site visits required for speciation monitoring are no longer tenable at Seattle-10th & Weller given the challenges to site access and safety that site operators experience. Source apportionment analysis results (Friedman 2020) indicate that predictably, the dominant sources of $PM_{2.5}$ at the near-road site are on-road vehicles. Given the ongoing operational challenges at the site and the marginal value of additional data for source apportionment, Ecology determined that speciation monitors would provide greater value if relocated to central Washington. Ecology plans to relocate speciation monitoring to a site in central Washington and is currently working with EPA Region 10 to identify a suitable site.

National Core (NCore)

There are two NCore sites in the Washington Network: Seattle-Beacon Hill (530330080) is an urban NCore site in the Seattle-Tacoma-Bellevue, WA CBSA, and Cheeka Peak (530090013) is a rural NCore site in the Port Angeles, WA CBSA. The parameters monitored at each site are summarized in Table 20. The Olympic Region Clean Air Agency (ORCAA) is funded directly by EPA for operation of the Cheeka Peak NCore site. Per ORCAA's arrangement with EPA, the site does not include FRM/FEM $PM_{2.5}$, $PM_{10-2.5}$ or NO_2 monitoring.

Table 20. NCore parameters monitored at Cheeka Peak and Seattle-Beacon Hill

Parameter	Cheeka Peak	Seattle-Beacon Hill
Trace CO (42101)	✓	✓
Trace NO_y (42600)	✓	✓
Area-wide NO_2 (42602)		✓
Ozone (44201)	✓	✓
Trace SO_2 (42401)	✓	✓
Filter-based PM_{10} (81102)		✓
Filter-based $PM_{2.5}$ (88101)		✓
Continuous FEM $PM_{2.5}$ (88101)		✓
Nephelometer $PM_{2.5}$ (88502)	✓	
Meteorological (61101/61102/61103/61104/62101/64101/62201)	✓	✓

Parameter	Cheeka Peak	Seattle-Beacon Hill
$PM_{2.5}$ speciation		✓
$PM_{10-2.5}$ (86101)		✓

Recommended/proposed modifications: None.

National Air Toxics Trends Station (NATTS)

Seattle-Beacon Hill (530330080) is a National Air Toxics Trends Station (NATTS) as well as a CSN, NCore and SLAMS site.

Recommended/proposed modifications: None.

Photochemical Assessment Monitoring Station (PAMS)

On January 8, 2020, EPA published a final rule in the federal register extending the start date for new required Photochemical Assessment Monitoring Stations (PAMS) from June 1, 2019, to June 1, 2021. Ecology is required to conduct PAMS measurements at the Seattle-Beacon Hill NCore site (530330080), as PAMS measurements are required at each NCore site in a core-based statistical area (CBSA) with population 1,000,000 or more (40 C.F.R. Part 58 Appendix D), which applies to the Seattle-Tacoma-Bellevue, WA CBSA.

The following PAMS parameters are monitored at Seattle-Beacon Hill:

- Hourly averaged VOCs (pending equipment repairs in July 2022)
- Three 8-hour averaged carbonyl samples per day on a 1/3 schedule
- Hourly averaged O_3
- Hourly averaged NO, true nitrogen dioxide (NO_2), and total reactive nitrogen (NO_y)
- Hourly averaged ambient temperature
- Hourly vector-averaged wind direction
- Hourly vector-averaged wind speed
- Hourly average atmospheric pressure
- Hourly averaged relative humidity
- Hourly precipitation
- Hourly averaged mixing height

Monitoring for all PAMS parameters except hourly speciated VOCs began by June 1, 2021. Due to a number of delays in the installation of the automated gas chromatograph (AutoGC) and delays in required instrument service by the AutoGC vendor, hourly VOC monitoring began on August 26, 2021. Ecology continued monitoring hourly VOCs past the end of the PAMS season until September 22, 2021, to collect additional data and continue troubleshooting operational issues with the AutoGC. Ecology experienced additional operational challenges and instrument

malfunctions at the start of the 2022 PAMS season and is currently working with the AutoGC vendor to resolve these issues. Ecology expects to resume monitoring hourly VOCs in July 2022.

In November 2020, EPA approved a waiver request to collect the required solar and ultraviolet radiation parameters at the Seattle-Duwamish site (530330057) as an alternative location due to the lack of suitable space for those measurements at Seattle-Beacon Hill. This waiver is included in Appendix B. Monitoring for these parameters at Seattle-Duwamish also began by June 1, 2021.

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U.S. EPA. "Ambient Air Monitoring Network Assessment Guidance." https://www.epa.gov/sites/default/files/2020-01/documents/network-assessment-guidance.pdf (February 2007).

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Appendices

Appendix A. Criteria Pollutant Design Values

Tables 21-27 show criteria pollutant design values for all sites in the Washington Network.

Table 21. Carbon monoxide (CO) 2021 design values

Site	AQS ID	2021 Exceedances
Cheeka Peak	530090013	0
Seattle 10th & Weller	530330030	0
Seattle Beacon Hill	530330080	0

Table 22. Nitrogen dioxide (NO_2) 2021 design values (ppb)

Site	AQS ID	2019 98th Percentile	2020 98th Percentile	2021 98th Percentile	2021 Design Value
Seattle 10th & Weller	530330030	57.2	56.8	48.6	54
Seattle Beacon Hill	530330080	42.8	39.4	41.6	41
Tacoma S 36th	530530024	40.3	39.8	37.7	39

Table 23. Ozone (O_3) 2021 design values (ppm)

Site	AQS ID	2019 4th Highest D8M*	2020 4th Highest D8M	2021 4th Highest D8M	2021 Design Value
Anacortes 202 Avenue	530570011	0.040	NA	0.042	0.041
Cheeka Peak	530090013	0.051	0.049	[0.057]	[0.052]
Cheney Turnbull	530630001	0.054	0.054	0.068	0.058
Custer Loomis	530730005	0.044	0.050	0.052	[0.048]
Enumclaw Mud Mtn	530330023	0.055	0.059	0.078	0.064
Issaquah Lake Sammamish	530330010	0.052	0.060	NA	[0.056]
Kennewick S Clodfelter	530050003	0.061	0.061	0.068	0.063
Mt Rainier Jackson Visitors Ctr	530530012	0.056	0.060	0.058	0.058
North Bend North Bend Way	530330017	0.053	0.051	0.055	0.053
Seattle Beacon Hill	530330080	0.046	0.052	0.052	0.050
Spokane Greenbluff	530630046	0.057	0.055	0.069	0.060
Vancouver Blairmont Dr	530110011	0.058	[0.054]	0.057	[0.056]
Yelm Northern Pacific	530670005	0.052	0.057	NA	[0.054]

*D8M is the daily maximum 8-hour average concentration.

Design values in brackets do not meet minimum data completeness requirements.

Table 24. Sulfur dioxide (SO_2) 2021 design values (ppb)

Site	AQS ID	2019 99th Percentile	2020 99th Percentile	2021 99th Percentile	2021 Design Value
Anacortes 202 Ave	530570011	3.4	NA	[3.5]	[3]
Cheeka Peak	530090013	0.7	0.6	0.4	1
Ferndale-Kickerville Rd	530730013	69.6	59.2	2.4	44
Ferndale-Mountain View Rd	530730017	104.5	62.0	2.6	56
Malaga-Malaga Hwy	530070012	1.0	1.7	1.4	1
Seattle-Beacon Hill	530330080	5.5	4.1	2.5	4

Design values in brackets do not meet minimum data completeness requirements.

Table 25. $PM_{2.5}$ 2021 24-hour design values and pseudo-design values ($\mu g/m^3$)

Design values from FRM and FEM monitoring sites are shaded. Pseudo-design values from nephelometer sites are estimates only and cannot be used to determine compliance with the NAAQS. DVs in brackets are estimated from fewer than three years of available data. In years with one or more quarters less than 50% complete, 98th percentiles are not reported.

Site	AQS ID	98th Percentile 2019	98th Percentile 2020	98th Percentile 2021	24-Hour Design Value 2021
Aberdeen Division St	530272002	NA	27.3	8.8	[18]
Anacortes 202 O Avenue	530570011	12.0	NA	NA	[12]
Bellevue SE 12th St	530330031	9.4	68.0	6.3	28
Bellingham Pacific St	53073001	12.2	42.4	11.9	22
Bremerton Spruce Ave	530350007	11.6	41.2	11.8	22
Cheeka Peak	530090013	5.2	48.6	4.7	20
Chehalis Market Blvd	530410004	13.7	12.7	11.5	13
Chelan Woodin Ave	530070007	12.4	99.1	19.3	44
Clarkston 13th St	530030004	22.8	117.5	51.3	64
Colville E 1st St	530650005	24.3	65.7	60.5	50
Darrington Fir St	530610020	22.8	51.2	21.8	32
Dayton W Main St	530130002	15.4	79.2	36.3	44
Ellensburg Ruby St	530370002	18.8	50.3	22.8	31
Kennewick Metaline	530050002	18.6	76.5	28.6	41
Kent Central & James	530332004	17.8	42.2	17.6	26
Lacey College St	530670013	18.1	33.2	11.5	21
LaCrosse Hill St	530750005	11.8	48.3	41.0	34
Lake Forest Park	530330024	18.1	52.7	15.8	29
Leavenworth Evans St	530070010	19.6	57.4	20.2	32
Longview 30th Ave	530150015	16.7	63.9	11.1	31
Marysville 7th Ave	530611007	27.7	47.2	22.1	32
Mesa Pepiot Way	530210002	16.0	90.3	15.4	41
Moses Lake Balsam St	530251002	14.7	50.9	28.5	31
Mt Vernon S Second St	530570015	7.6	NA	NA	[8]
Neah Bay Makah Tribe	530090015	NA	19.5	9.6	[15]
North Bend North Bend Way	530330017	12.2	45.9	10.5	23
Omak Colville Tribe	530470013	21.3	83.1	62.4	56

Site	AQS ID	98th Percentile 2019	98th Percentile 2020	98th Percentile 2021	24-Hour Design Value 2021
Pomeroy Pataha St	530230001	12.6	74.9	34.2	41
Port Angeles E 5th St	530090017	14.6	30.4	13.2	19
Port Townsend San Juan Ave	530310003	10.1	44.6	7.9	21
Pullman Dexter SE	530750003	8.2	17.3	40.0	22
Quincy 3rd Ave NE	530251003	12.8	66.7	20.1	33
Ritzville Alder St	530010003	11.6	81.3	27.2	40
Rosalia Josephine St	530750006	12.0	20.1	32.8	22
Seattle 10th & Weller	530330030	16.5	60.5	14.7	31
Seattle Beacon Hill	530330080	11.9	53.0	11.8	26
Seattle Duwamish	530330057	20.2	46.3	16.2	28
Seattle South Park	530331011	16.3	19.1	15.4	17
Shelton W Franklin	530450007	14.5	52.0	11.8	26
Spokane*	530630021	25.1	31.0	32.8	30
Spokane Monroe St	530630047	23.3	23.7	31.5	26
Sunnyside S 16th St	530770005	31.3	118.1	42.3	64
Tacoma Alexander Ave	530530031	15.3	35.4	16.2	22
Tacoma L Street	530530029	27.5	36.8	21.4	29
Tacoma S 36th St	530530024	19.2	40.5	17.2	26
Taholah Quinault Tribe	530270011	NA	44.4	11.3	[28]
Toppenish Yakama Tribe	530770015	34.4	90.0	65.1	63
Tukwila Allentown	530330069	16.6	56.5	17.7	30
Tulalip Totem Beach Rd	530610021	NA	29.5	8.0	[19]
Twisp*	530470016	20.7	51.3	99.8	57
Vancouver NE 84th Ave	530110024	24.9	147.4	16.4	63
Walla Walla 12th St	530710005	16.5	100.1	28.1	48
Wellpinit Spokane Tribe	530650002	15.1	42.4	59.4	39
Wenatchee Fifth St	530070011	18.6	92.7	17.7	43
Winthrop Chewuch Rd	530470010	15.7	56.9	163.3	79
Yacolt Yacolt Rd	530110022	17.4	17.3	13.0	16
Yakima 4th Ave	530770009	31.8	104.6	69.4	69

*****Data from the Spokane-Augusta Ave and Spokane-E Broadway Ave monitoring sites and data from the Twisp-Glover Ave and Twisp-Ewell St monitoring sites were combined to calculate estimated design values for informational purposes only.

Design values in brackets do not meet minimum data completeness requirements.

Table 26. $PM_{2.5}$ 2021 annual design values and pseudo-design values

Design values from FRM and FEM monitoring sites are shaded. Pseudo-design values from nephelometer sites are estimates only and cannot be used to determine compliance with the NAAQS. DVs in brackets are estimated from fewer than three years of available data. In years with one or more quarters less than 50% complete, annual means are not reported.

Site	AQS ID	Annual Mean 2019	Annual Mean 2020	Annual Mean 2021	Annual Design Value 2021
Aberdeen Division St	530272002	NA	7.16	4.33	[5.7]
Anacortes 202 O Avenue	530570011	5.49	NA	NA	[5.5]

Site	AQS ID	Annual Mean 2019	Annual Mean 2020	Annual Mean 2021	Annual Design Value 2021
Bellevue SE 12th St	530330031	3.79	6.17	2.80	4.3
Bellingham Pacific St	53073001	4.55	5.55	4.03	4.7
Bremerton Spruce Ave	530350007	4.86	7.64	5.21	5.9
Cheeka Peak	530090013	2.00	4.88	1.77	2.9
Chehalis Market Blvd	530410004	5.86	5.06	4.73	5.2
Chelan Woodin Ave	530070007	4.80	9.70	4.80	6.4
Clarkston 13th St	530030004	8.01	10.84	10.25	9.7
Colville E 1st St	530650005	8.36	14.57	11.41	11.4
Darrington Fir St	530610020	5.95	7.25	5.57	6.3
Dayton W Main St	530130002	5.20	7.30	6.99	6.5
Ellensburg Ruby St	530370002	6.99	9.29	6.28	7.5
Kennewick Metaline	530050002	6.40	8.55	5.77	6.9
Kent Central & James	530332004	5.87	8.57	7.08	7.2
Lacey College St	530670013	6.18	7.23	4.12	5.8
LaCrosse Hill St	530750005	4.44	6.02	6.04	5.5
Lake Forest Park	530330024	7.11	8.13	5.46	6.9
Leavenworth Evans St	530070010	6.65	7.67	6.90	7.1
Longview 30th Ave	530150015	5.47	7.60	4.16	5.7
Marysville 7th Ave	530611007	8.52	10.57	7.01	8.7
Mesa Pepiot Way	530210002	4.82	7.47	4.89	5.7
Moses Lake Balsam St	530251002	5.55	7.38	6.70	6.5
Mt Vernon S Second St	530570015	2.76	NA	NA	[2.8]
Neah Bay Makah Tribe	530090015	NA	5.36	3.61	[4.5]
North Bend North Bend Way	530330017	3.55	5.52	3.14	4.1
Omak Colville Tribe	530470013	7.36	15.04	14.88	12.4
Pomeroy Pataha St	530230001	4.76	6.74	6.85	6.1
Port Angeles E 5th St	530090017	6.75	9.03	5.96	7.2
Port Townsend San Juan Ave	530310003	5.14	7.02	4.01	5.4
Pullman Dexter SE	530750003	3.25	4.59	6.09	4.6
Quincy 3rd Ave NE	530251003	4.19	6.61	4.79	5.2
Ritzville Alder St	530010003	4.00	6.39	5.51	5.3
Rosalia Josephine St	530750006	4.76	6.16	6.26	5.7
Seattle 10th & Weller	530330030	7.37	9.49	6.53	7.8
Seattle Beacon Hill	530330080	5.21	6.21	4.36	5.3
Seattle Duwamish	530330057	8.27	10.13	6.64	8.3
Seattle South Park	530331011	8.43	9.03	7.37	8.3
Shelton W Franklin	530450007	5.94	9.10	4.56	6.5
Spokane*	530630021	7.54	10.28	8.99	8.9
Spokane Monroe St	530630047	7.07	10.40	7.70	8.4
Sunnyside S 16th St	530770005	10.77	15.21	10.93	12.3
Tacoma Alexander Ave	530530031	6.78	7.46	5.48	6.6
Tacoma L Street	530530029	8.11	9.41	6.10	7.9
Tacoma S 36th St	530530024	7.15	9.12	6.64	7.6
Taholah Quinault Tribe	530270011	NA	6.62	4.65	[5.6]
Toppenish Yakama Tribe	530770015	9.80	14.12	11.53	11.8
Tukwila Allentown	530330069	7.28	9.69	6.33	7.8
Tulalip Totem Beach Rd	530610021	NA	3.13	2.17	[2.6]
Twisp*	530470016	7.73	8.70	11.68	9.4
Vancouver NE 84th Ave	530110024	7.04	13.91	5.66	8.9

Site	AQS ID	Annual Mean 2019	Annual Mean 2020	Annual Mean 2021	Annual Design Value 2021
Walla Walla 12th St	530710005	6.21	9.05	5.63	7.0
Wellpinit Spokane Tribe	530650002	5.19	6.41	7.32	6.3
Wenatchee Fifth St	530070011	6.72	10.62	6.07	7.8
Winthrop Chewuch Rd	530470010	6.07	7.80	14.02	9.3
Yacolt Yacolt Rd	530110022	5.01	8.01	4.34	5.8
Yakima 4th Ave	530770009	9.24	12.30	10.99	10.8

*****Data from the Spokane-Augusta Ave and Spokane-E Broadway Ave monitoring sites and data from the Twisp-Glover Ave and Twisp-Ewell St monitoring sites were combined to calculate estimated design values for informational purposes only.

Design values in brackets do not meet minimum data completeness requirements.

Table 27. PM_{10} 2021 design values

Site	AQS ID	2019 Expected Exceedances	2020 Expected Exceedances	2021 Expected Exceedances	3-Year Estimated Exceedances
Burbank Maple St	530710006	0	9.5	1.1	3.5
Colville E 1st St	530650005	0	4.3	1	1.8
Kennewick Metaline	530050002	0	12.5	2.1	4.9
Seattle Beacon Hill	530330080	0	0	0	0
Spokane*	530630021	0	6	0	2
Yakima 4th Ave S	530770009	0	8.2	1	3.1

*****Data from the Spokane-Augusta Ave and Spokane-E Broadway Ave monitoring sites were combined to calculate estimated design values for informational purposes only.

Appendix B. Monitoring Waivers

Lead (Pb)

In 2014, EPA approved the use of lead in PM_{10} measurements as a surrogate for lead in TSP at Seattle-Beacon Hill (530330080). Ecology met this requirement through lead analysis of low-vol PM_{10} filters analyzed through the NATTS program. In 2016, EPA discontinued the requirement for lead monitoring at NCore sites. Ecology continues to report measurements of lead in PM_{10} at Seattle-Beacon Hill as a NATTS parameter. In 2017, at the request of EPA Region 10, Ecology redesignated the Seattle-Beacon Hill lead monitor a "NAAQS-exclusion" type monitor. At the further request of EPA, Ecology ceased reporting to parameter code 85129 and began reporting to parameter code 85128 as of January 1, 2019. It is no longer used to demonstrate compliance with the NAAQS.

On April 18, 2019, EPA issued Ecology a waiver for the source-oriented lead monitoring requirement at Ardagh Glass in Seattle. That waiver is provided below.

2019 Ardagh Glass Pb Waiver Approval

The U.S. Environmental Protection Agency has completed our review of your supporting information for waiving ambient air lead monitoring for the Ardagh Glass facility in Seattle, Washington (EIS ID: 4985311). Based on the information you provided in Attachment E of your correspondence and the available data in AQS, Region 10 agrees that the ambient air lead monitoring for this facility based on the results of the AERMOD dispersion modeling conducted by your staff meet the regulatory requirements for waiving ambient air lead monitoring for this facility.

According to 40 CFR Part 58, Appendix D §4.5(a)(ii), the Regional Administrator may waive the requirement for lead source monitoring if the state can demonstrate that the source will not contribute to a maximum lead concentration in ambient air in excess of 50 percent of the NAAQS. The modeling approach and protocol for the Ardagh Glass facility conducted by the Department of Ecology was consistent with the EPA's guidance and modeling requirements found in 40 CFR Part 51, Appendix W. The results of this modeling demonstrate that the maximum ambient air 3-month rolling average lead concentration at the facility does not exceed 50 percent of the lead NAAQS.

Monitoring regulations require that this waiver must be renewed every five years. As such, this waiver will be due for renewal in calendar year 2023 if the NEI emission estimates for this facility continue to be above 0.5 tons/year. The EPA reserves the right to rescind this waiver should a future need arise (e.g., increased production or emissions at the facility, monitoring regulation changes, or revisions to the NAAQS).

Enclosure 3

Yakima CO

In 2006, EPA approved the discontinuation of the Yakima CO monitor based on the low concentrations measured at the monitor and predicted reductions in onroad mobile source emissions in Yakima. Below is the approval letter from EPA approving discontinuation of the monitor.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

MAR 0 3 2006

Reply to
Attn Of: OAWT-107

Mr. Mike Ragan
Air Monitoring Coordinator
Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Re: Approval of the Washington 2006 Ambient Monitoring Network

Dear Mr. Ragan:

We have evaluated the Washington 2005 Ambient Air Monitoring Network Assessment and Ecology's proposed monitoring network for 2006. As you know, in December 2005 EPA proposed a lower 24-hour PM2.5 monitoring standard of 35 ug/m3, and a new 24-hour PMcoarse standard of 70 ug/m3 to replace the current PM10 standard. The implementation of these new standards will have a significant effect on the future number and locations of PM monitors in the State's monitoring network. This should be a major consideration in your 2006 annual monitoring network assessment. In order to ensure continued PM2.5 monitoring at sites required by population (40 CRF Part 58), and at sites reporting values near or above the proposed PM2.5 standard, Region 10 developed a list of monitoring priorities for a "core" PM2.5 monitoring network (Attachment 1). In response to these monitoring priorities, Ecology has proposed to discontinue PM2.5 FRM monitors at the following sites:

	Monitoring Site	AIRS#
1.	Moose Lodge – Vancouver	530110013
2.	Benton County – Kennewick	530050002
3.	Monroe Street - Spokane	530630047

The PM2.5 design values for these sites, based on monitoring data collected over the past 3 years, are below the current PM2.5 and proposed PM2.5 standards. Therefore, I approve the discontinuation of these PM2.5 FRM monitors. Ecology is authorized to operate all PM2.5 "core" monitors for 2006 including:

1. PM2.5 FRMs (or FEMs, if approved) at the Beacon Hill, Duwamish (primary and co-located), Crown Zellerbach (primary and co-located), and Tacoma/L Street sites.
2. PM2.5 speciation monitors located at the following sites:
    a. Beacon Hill
    b. Spokane
    c. Duwamish
    d. Tacoma

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e. Lake Forest Park

3. Pre-cursor gas monitors operated at the Beacon Hill site

Operation of any additional PM2.5 monitors, in addition to the PM2.5 "core" network, are authorized as funding permits. Ecology is authorized to operate all ozone, SO2, NOx, other CO, and PM10 monitors identified in the 2005 Washington Ambient Air Monitoring Network Review.

The Yakama Regional Clean Air Authority has requested permission to discontinue operations of its CO monitor at the Tattoo Parlor site in Yakama. The rationale for discontinuing this monitor is that CO 8-hour design values at this site have decreased from a value of 5.1 ppm in 1998-1999, to a value of 3.5 ppm in 2002-2003. In addition, EPA's MOBILE6.2 model predicts that on-road mobile source emissions of CO in Yakama will decrease by 12.4% compared to the 1999 mobile source emissions. This should ensure that the 8-hour CO design values remain substantially below the CO standard of 9 ppm. Therefore, I approve the discontinuation of this CO monitor.

If you have any questions about our approval of the WA monitoring network, please contact Keith Rose at (206) 553-1949.

Sincerely,

Mahbubul Islam

Mahbubul Islam, Manager
State and Tribal Program Unit
Office of Air, Waste and Toxics

cc: William Puckett, OEA

Spokane CO

On July 14, 2016, Federal Register #81 FR 45417, EPA approved an alternate method of verification of attainment of the CO NAAQS in Spokane and qualification for the limited maintenance plan option under 40 C.F.R. Part 58.14(c) in the Spokane Maintenance Area. Under this alternative, EPA considers the limited maintenance plan criteria met and continued verification of attainment of the CO NAAQS if the total of the three predominant CO emission source categories calculated as part of the triennial emissions inventory (onroad mobile, nonroad, and residential wood combustion) remain below the corresponding total of the 2002 emission inventory source categories approved at the time the Spokane area was redesignated to attainment. SRCAA and Ecology will compare future year 2017, 2020 and 2023 triennial emission analysis results to the baseline 2002.

PM_{10}

In the summers of 2017 and 2018, Washington experienced extended smoke events from regional wildfires in the Pacific Northwest. These smoke events caused repeated exceedances of the PM_{10} standard in Yakima and Kennewick, which triggered additional monitoring requirements as detailed in 40 C.F.R. Part 58 Appendix D, Table D-4. In addition, Kennewick routinely experiences high wind dust events that cause exceedances of the PM_{10} standard. Due to the regional and exceptional nature of these events, EPA issued Ecology waivers for the unmet PM_{10} monitoring requirements in the Yakima and Kennewick-Richland CBSAs on April 18, 2019. In its February 7, 2020 response to Ecology's 2019 Annual Network Plan, EPA approved Ecology's waiver request for the remaining unmet monitoring requirement in the Seattle-Tacoma-Bellevue and one of the unmet monitoring requirements in the Spokane-Spokane Valley CBSA. The waivers and Annual Network Plan response are provided below.

Yakima PM10 Waiver Approval

The U.S. Environmental Protection Agency has completed our review of your supporting information for waiving additional PM_{10} monitoring in the Yakima MSAs. Based on the information you provided in Attachment C of your correspondence and the available data in AQS, Region 10 agrees that the high concentration PM_{10} air quality episodes were broad scale events driven by wildfires. As such, Region 10 also concurs that the existing PM_{10} monitor in the Yakima MSA (AQS ID: 53-077-0009) is adequate for characterizing the PM_{10} air quality trends and spatial geographical patterns in this MSA. Per 40 CFR Part 58, Appendix D §4.6(a), Region 10 waives the minimum PM_{10} network size specified by Table D-4 of 40 CFR Part 58, Appendix D for the Yakima MSA and allows the Department of Ecology to use the existing PM_{10} monitor (AQS ID: 53-077-0009) for meeting minimum regulatory monitoring requirements for this MSA.

This monitoring waiver is effective for five years and may need to be renewed in calendar year 2023 to keep the minimum monitoring requirements set at a single PM_{10} monitor. The EPA reserves the right to reinstate the additional PM_{10} monitoring requirements in the MSA sooner than five years should a future need arise (e.g., changes in air quality due to local sources, monitoring regulation changes, or revisions to the NAAQS).

Enclosure 1

2019 Kennewick PM10 Waiver Approval

The U.S. Environmental Protection Agency has completed our review of your supporting information for waiving additional PM_{10} monitoring in the Kennewick-Richland MSAs. Based on the information you provided in Attachment B of your correspondence and the available data in AQS, Region 10 agrees that the high concentration PM_{10} air quality episodes were broad scale events driven by high winds and wildfires. As such, Region 10 also concurs that the existing PM_{10} monitor in the Kennewick-Richland MSA (AQS ID: 53-005-0002) is adequate for characterizing the PM_{10} air quality trends and spatial geographical patterns in this MSA. Per 40 CFR Part 58, Appendix D §4.6(a), Region 10 waives the minimum PM_{10} network size specified by Table D-4 of 40 CFR Part 58, Appendix D for the Kennewick-Richland MSA and allows the Department of Ecology to use the existing PM_{10} monitor (AQS ID: 53-005-0002) for meeting minimum regulatory monitoring requirements for this MSA.

This monitoring waiver is effective for five years and may need to be renewed in calendar year 2023 to keep the minimum monitoring requirements set at a single PM_{10} monitor. The EPA reserves the right to reinstate the additional PM_{10} monitoring requirements in the MSA sooner than five years should a future need arise (e.g., changes in air quality due to local sources, monitoring regulation changes, or revisions to the NAAQS).

Enclosure 2

PAMS Solar and Ultraviolet Radiation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3123

AIR & RADIATION
DIVISION

November 3, 2020

Ms. Jill Schulte
Ambient Air Monitoring Coordinator
Department of Ecology
State of Washington
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Schulte:

This letter is in response to your October 7, 2020, correspondence requesting a waiver to collect solar radiation measurements for the Seattle Photochemical Assessment Monitoring Station (PAMS) at an alternative location. In this correspondence you explained that the Seattle-Beacon Hill station (AQS ID: 53-033-0080), where the remainder of the PAMS sampling will be located, is unacceptable for solar radiation measurements. This is due to the shadow cast on the monitoring site for part of the day by a nearby driving range net. Your proposed solution is to locate the radiometer and pyranometer instruments at the Seattle-Duwamish monitoring station (AQS ID: 53-033-0057) instead. You explained that this alternative siting is appropriate because of the proximity of the stations (1.55 miles) and the lack of obstructions at the Seattle-Duwamish station.

My staff completed the review of the information you provided and consulted the EPA's Office of Air Quality Planning and Standards regarding this request. We agree that siting the PAMS solar radiation instrumentation at the Seattle-Duwamish station is an acceptable solution. Per 40 CFR Part 58, Appendix D, Section 5(c) the EPA can grant a waiver to allow the collection of required PAMS measurements at an alternative location if the alternative location will provide representative and useful data. In this instance, we conclude that those standards will be met at the alternative location.

Region 10 approves the alternative siting of the PAMS solar radiation measurements at the Seattle-Duwamish station (AQS ID: 53-033-0057), instead of the Seattle-Beacon Hill station (AQS ID: 53-033-0080). Please reference and attach this waiver in future Annual Network Plan reports, and address whether this alternative location continues to be appropriate in future five-year network assessments. We also request that you continue to keep my staff informed of any other developments with the PAMS monitoring. If you have any questions regarding this waiver, please contact me at (206) 553-0985 or Sarah Waldo at (206) 553-1504.

Sincerely,

DEBRA SUZUKI Digitally signed by DEBRA SUZUKI Date: 2020.11.03 11:30:16 -08'00'

Debra Suzuki, Manager
Air Planning, State/Tribal Coordination Branch

Thurston County Ozone

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3144

AIR & RADIATION DIVISION

May 5, 2022

Ms. Kathy Taylor
Air Quality Program Manager
Department of Ecology
State of Washington
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Taylor:

This letter is in response to your April 12, 2022, correspondence requesting a waiver to temporarily relocate the Washington Department of Ecology's (Ecology) Thurston County ozone (O3) State and Local Air Monitoring Station (SLAMS). Ecology must suspend operation at the current site (Yelm, AQS ID: 53-067-0005) for the next 1-2 years due to a construction and renovation project. Ecology proposes temporarily discontinuing the Yelm O3 monitoring site and relocating the monitor to Lacey (AQS ID: 53-067-0013) beginning May 1, 2022. Ecology expects to resume monitoring at the Yelm site when it becomes available again in 2023 or 2024. By this letter, Region 10 approves Ecology's request for temporary discontinuation and relocation of the Yelm O3 monitor to Lacey.

According to 40 CFR § 58.14(c), EPA may approve requests for site discontinuation on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of the National Ambient Air Quality Standards (NAAQS) and the minimum monitoring requirements for O3 continue to be met. My staff reviewed the information you provided on the historical O3 design values at Yelm and the minimum monitoring requirements for the Olympia-Lacey-Tumwater MSA. The 2020 DV for Yelm was <80% of the O3 NAAQS (0.057 ppm), and no O3 monitoring sites are required in the MSA per the 40 CFR Part 58, Appendix D requirements. Furthermore, relocation will prevent any interruption in Air Quality Index (AQI) reporting and health messaging for Thurston County as the two sites are both representative of urban-scale ozone conditions and are influenced by the same O3 precursors and meteorology. This is supported by the results of parallel O3 monitoring at Yelm and Lacey, which showed similar O3 levels and patterns. Based on all this information, we agree that temporary relocation of O3 to Lacey is an acceptable solution.

Please reference and attach this approval in future Annual Network Plans. We also request that you continue to keep my staff informed of the status of the construction and renovation project at the Yelm site. If you have any questions regarding this approval, please contact me at (206) 553-0985 or Sarah Waldo at (206) 553-1504.

Sincerely,

Suzuki, Debra
Digitally signed by Suzuki, Debra
Date: 2022.05.05 14:13:08 -07'00'

Debra Suzuki, Manager
Air Planning and State/Tribal Coordination Branch

Appendix C. EPA Response to 2019 Annual Network Plan

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3123

AIR & RADIATION DIVISION

FEB - 7 2020

Ms. Jill Schulte
Ambient Air Monitoring Coordinator
Department of Ecology
State of Washington
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Schulte:

The U.S. Environmental Protection Agency, Region 10 evaluated the Washington Department of Ecology's 2019 Annual Monitoring Network Plan (ANP) dated June 25, 2019. This approval letter documents Region 10's findings from the review of this ANP. Based on our review of the ANP, we did not identify any monitoring deficiencies for Washington State's ambient air monitoring network other than the PM_{10} network size that was previously identified by Ecology in the ANP. The ANP's description of modifications for the Washington State network was helpful in our review and is appreciated.

On April 2, 2019, Ecology requested a waiver from the minimum PM_{10} network size requirements for the following MSAs: Seattle-Tacoma-Bellevue, Spokane-Spokane Valley, Kennewick-Richland, and Yakima. On April 18, 2019, Region 10 approved Ecology's waiver request with the exception of the PM_{10} monitoring for the Seattle-Tacoma-Bellevue and Spokane-Spokane Valley MSAs. For these MSAs, EPA delayed its decision pending further review as these requests presented unique issues for consideration.

We have completed our assessment of the information Ecology provided on April 2, 2019. For the Seattle-Tacoma-Bellevue MSA, we agree with Ecology's conclusions from the April 2, 2019, correspondence to our office regarding the limited benefit of operating additional PM_{10} monitors in this MSA. As such, pursuant to 40 CFR Part 58, Appendix D §4.6(a), EPA approves your waiver request to limit the required PM_{10} SLAMS monitoring for the Seattle-Tacoma-Bellevue MSA to the single station located at the Beacon Hill NCore station. The EPA accepts your assertion that PM_{10} monitoring at Seattle-Beacon Hill is sufficient to characterize emissions across the MSA and concludes that expanding the size of the network at this time would provide limited additional information that is disproportionate to the costs associated with a network expansion.

While the EPA has flexibility to adjust the minimum monitoring requirements for MSAs in Region 10, the monitoring regulations do not provide provisions to waive the data reporting requirements of 40 CFR §§ 58.16 and 58.20. We understand that some local air agencies in Washington State operate more FRM/FEM monitors than are reported to AQS. The data from these additional monitoring stations are reported to the public through Washington's AQI webpage services and also submitted by Ecology to the EPA's AIRNow AQI system. However, in addition to these two data reporting systems, ambient air quality measurements obtained from FRM and FEM monitors are required to be submitted to AQS. As such, we request that all data from FRM and FEM monitors in the Washington State network be

uploaded to AQS going forward. Accordingly, data from the FEM PM_{10} monitor at Turnbull National Wildlife Refuge in the Spokane-Spokane Valley MSA should be reported to AQS.

For the Spokane-Spokane Valley MSA, in addition to reporting all FRM/FEM data to AQS, we also request that the FEM PM_{10} monitor at Turnbull National Wildlife Refuge in this MSA be designated as SLAMS. As such the monitor will count toward the minimum monitoring requirements for this MSA. The designation of the Turnbull PM_{10} monitor as a SLAMS for the Spokane-Spokane Valley MSA will bring the total number of SLAMS PM_{10} stations to three. Ecology has requested a waiver from the requirement to maintain a minimum of four SLAMS PM_{10} network monitoring stations in the Spokane-Spokane Valley MSA. To address your concerns expressed in your waiver request that expanding the PM_{10} network beyond the size of the existing network would adversely impact the statewide $PM_{2.5}$ network, EPA through this network approval letter waives the requirement to operate the fourth PM_{10} station in the Spokane-Spokane Valley MSA.

This PM_{10} network size waiver for reducing the monitoring requirements in the Seattle-Tacoma-Bellevue MSA to one station and the Spokane-Spokane Valley MSA to three stations is in effect for five years from the date of this correspondence. We ask that you reference this waiver approval in future ANPs. We also ask that Ecology evaluate whether additional PM_{10} monitors continue to provide limited air quality value relative to their operational costs for these MSAs during the network assessment and future Annual Network Plan submittals to our office. Additionally, changes to the air quality concentrations in the Spokane-Spokane Valley MSA may warrant reducing or modifying this network in the future.

The EPA appreciates Ecology's establishment of a MOU with the Oregon Department of Environmental Quality for jointly meeting the criteria pollutant monitoring requirements for the Portland-Vancouver-Hillsboro OR-WA MSA. Through this network approval letter, as provided by 40 CFR Part 58, Appendix D §2(e), Region 10 allows the minimum network size requirements for this MSA to be satisfied jointly by Ecology and the Oregon Department of Environmental Quality. The EPA requests that Ecology and the Oregon Department of Environmental Quality review and reaffirm this MOU periodically and renew the request from Region 10 to waive full monitoring requirements by Ecology for this MSA every five years.

Region 10 approves the State of Washington's 2019 ANP. Region 10 appreciates the timeliness and detail provided in the ANP. Please notify us when Ecology has determined the location for the second $PM_{2.5}$ SLAMS for the Spokane MSA and notify Region 10 when the supplemental Chemical Speciation Network (CSN) sampling at the 10th and Weller (53-033-0030) and/or L-Street (53-053-0029) stations ceases or is relocated. Since these monitoring stations are supplemental CSN stations and not members of the national Speciation Trends Network (STN), these approvals can be made by our Regional Office. If you have any questions about our approval of the ANP, please contact me or Doug Jager at (206) 553-2961.

Sincerely,

Debra M Suzuki

Debra Suzuki, Manager
Air Planning, State/Tribal Coordination Branch

Appendix D. Special Purpose Monitors (SPMs) Statements of Purpose

Ecology is required to include a statement of purpose for each SPM in the annual monitoring network plan according to 40 C.F.R. Part 58.20. Table 1 below contains the statements of purpose for each SPM in the Washington Network.

Table 28. Statements of purpose for Special Purpose Monitors (SPMs)

Site	AQS ID	Parameter	Statement of Purpose
Auburn-29th St SE	530330047	$PM_{2.5}$ AQI (88502)	The Auburn SPM nephelometer site was established to report neighborhood-scale $PM_{2.5}$ conditions in the Auburn area. The site operates as a non-regulatory SPM site because a line of evergreen trees approximately 8 meters from the site prevents the site from meeting probe and path siting criteria for SLAMS $PM_{2.5}$ monitoring.
Chelan-Woodin Ave	530070007	$PM_{2.5}$ AQI (88502)	The Chelan monitoring site was previously operated by the U.S. Forest Service as a non-EPA federal monitor to inform smoke management decisions. Ecology temporarily took over operational responsibility for the site as a SPM on October 1, 2018.
Lacey-College St	530670013	Ozone (44201)	The Lacey ozone SPM was established in May 2022 to temporarily provide ozone data and AQI information in Thurston County while the permanent Yelm ozone monitoring site (530670005) is under construction until 2023 or 2024.
Leavenworth-Evans St	530070010	$PM_{2.5}$ AQI (88502)	The Leavenworth monitoring site was previously operated by the U.S. Forest Service as a non-EPA federal monitor to inform smoke management decisions. Ecology temporarily took over operational responsibility for the site as a SPM on October 1, 2018.
Quincy-3rd Ave NE	530251003	$PM_{2.5}$ AQI (88502)	The Quincy-3rd Ave NE SPM site exists to provide meteorological and non-FEM $PM_{2.5}$ data in a previously unmonitored community and to support a health risk assessment of diesel emissions in the Quincy area published in 2020.

Site	AQS ID	Parameter	Statement of Purpose
Twisp-Ewell St	530470016	$PM_{2.5}$ AQI (88502)	The previous Twisp monitoring site was operated by the U.S. Forest Service as a non-EPA federal monitor to inform smoke management decisions. Ecology temporarily took over operational responsibility for monitoring at the previous Twisp-Glover site on October 1, 2018 and relocated the site to Twisp-Ewell St in 2020.
Winthrop-Chewuch Rd	530470010	$PM_{2.5}$ AQI (88502)	The Winthrop monitoring site was previously operated by the U.S. Forest Service as a non-EPA federal monitor to inform smoke management decisions. Ecology temporarily took over operational responsibility for the site as a SPM on October 1, 2018.

Appendix E. Changes to Site and Monitor Information

Appendix E contains the details of any changes to site and monitor information used to demonstrate compliance with the probe and monitoring path siting criteria described in 40 C.F.R. Part 58 Appendix E. For full tables of site and monitor metadata, see Ecology's 2021 Ambient Air Monitoring Network Plan at https://apps.ecology.wa.gov/publications/SummaryPages/2102013.html.

Changes to the tables in Appendix E since the 2021 Ambient Air Monitoring Network Plan are noted with bold text.

Bellingham-Pacific St	**Site Information**	
	AQS ID	530730019
	Street Address	2221 Pacific Street
	Zip Code	98229
	Latitude	**48.759678**
	Longitude	**-122.456452**
	Date Site Established	20180102
	MSA/CBSA/CSA Represented	Bellingham
	County	Skagit
	Distance from roadway (m)	**20**
	Traffic count (AADT)	2399
	Ground cover	Roof
$PM_{2.5}$ (88101, POC 5)	Sampling/Analysis Method	Met One BAM 1020 (170)
	Parameter Begin Date	20180102
	Monitor Objective	Population Exposure
	Measurement Scale	Neighborhood
	Monitor type	SLAMS
	Collecting agency	Northwest Clean Air Agency
	Analytical lab	N/A
	Reporting agency	Washington State Department of Ecology (1136)
	Monitoring start date	20180101
	Sampling frequency	Continuous
	Sampling season	Year-round
	Probe height (m)	6
	Distance from supporting structure (m)	1
	Distance from obstruction on roof (m)	**60**
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	N/A
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Changes in next 18 months?	No
	Suitable for NAAQS comparison?	Yes

Bellingham-Pacific St	Site Information	
	Does monitor meet quality assurance requirements for monitors used in NAAQS evaluations described in 40 C.F.R. Part 58 Appendix A?	Yes
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	Yes

Summary of changes: The site latitude, longitude, distance from roadway, and distance from obstruction on roof were updated due to the relocation of the monitor to a different part of the roof away from a multi-story building addition.

Cheney-Turnbull	Site Information	
	AQS ID	530630001
	Street Address	S 26010 Smith Road (Turnbull Slough National Wildlife Refuge)
	Zip Code	99004
	Latitude	47.41645
	Longitude	-117.52997
	Date Site Established	19710701
	MSA/CBSA/CSA Represented	Spokane-Spokane Valley
	County	Spokane
	Distance from roadway (m)	1900
	Traffic count (AADT)	992
	Ground cover	Grass, dirt
PM_{10} (81102, POC 5)	Sampling/Analysis Method	**Met One BAM 1020 (122)**
	Parameter Begin Date	**20211001**
	Monitor Objective	**General/Background**
	Measurement Scale	**Urban Scale**
	Monitor type	**SLAMS**
	Collecting agency	**Spokane Regional Clean Air Agency**
	Analytical lab	**N/A**
	Reporting agency	**Washington State Department of Ecology (1136)**
	Sampling frequency	**Continuous**
	Sampling season	**Year-round**
	Probe height (m)	**2**
	Distance from supporting structure (m)	**N/A**
	Distance from obstruction on roof (m)	**N/A**
	Distance from obstruction not on roof (m)	**70**
	Distance from trees (m)	**100**
	Distance from furnace or incinerator flue (m)	**N/A**
	Unrestricted airflow (deg)	**360**
	Changes in next 18 months?	**No**
	Suitable for NAAQS comparison?	**Yes**
	Does monitor meet quality assurance requirements for monitors used in NAAQS evaluations described in 40 C.F.R. Part 58 Appendix A?	**Yes**
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	**Yes**

Summary of changes: All probe and path monitor siting criteria were added for the PM_{10} monitor added to the site on October 1, 2021.

Issaquah-Lake Sammamish	Site Information	
	AQS ID	530330010
	Street Address	2000 NW Sammamish Rd
	Zip Code	98027
	Latitude	47.5525
	Longitude	-122.064722
	Date Site Established	19751201
	MSA/CBSA/CSA Represented	Seattle-Tacoma-Bellevue
	MSA/CBSA/CSA Represented	Seattle-Tacoma-Bellevue
	County	King
	Distance from roadway (m)	65
	Traffic count (AADT)	10901
	Ground cover	Gravel, grass
Ozone (44201, POC 1)*	Sampling/Analysis Method	UV Absorption (087)
	Parameter Begin Date	19810101
	Monitor Objective	Population Exposure
	Measurement Scale	Urban Scale
	Monitor type	SLAMS
	Collecting agency	Washington State Department of Ecology (1136)
	Analytical lab	N/A
	Reporting agency	Washington State Department of Ecology (1136)
	Sampling frequency	Continuous
	Sampling season	May-Sept
	Probe height (m)	3
	Distance from supporting structure (m)	1
	Distance from obstruction on roof (m)	N/A
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	N/A
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Probe material	Teflon
	Residence time (sec)	2.8
	Changes in next 18 months?	**No**
	Suitable for NAAQS comparison?	Yes
	Does monitor meet quality assurance requirements for monitors used in NAAQS evaluations described in 40 C.F.R. Part 58 Appendix A?	Yes
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	Yes

Summary of changes: Ozone monitoring was suspended for the 2021 ozone season and resumed on May 1, 2022.

Lacey-College St	Site Information	
	AQS ID	530670013
	Street Address	1900 College St Se (Mountain View Elementary School)
	Zip Code	98503
	Latitude	47.029396
	Longitude	-122.821548
	Date Site Established	19840401
	MSA/CBSA/CSA Represented	Olympia-Tumwater
	County	Thurston
	Distance from roadway (m)	65
	Traffic count (AADT)	21346
	Ground cover	Grass
Ozone (44201, POC 1)	Sampling/Analysis Method	**UV Absorption (087)**
	Parameter Begin Date	**20220501**
	Monitor Objective	**Population Exposure**
	Measurement Scale	**Urban**
	Monitor type	**SPM**
	Collecting agency	**Olympic Region Clean Air Agency (0815)**
	Analytical lab	**N/A**
	Reporting agency	**Washington State Department of Ecology (1136)**
	Sampling frequency	**Continuous**
	Sampling season	**May-Sept**
	Probe height (m)	**5**
	Distance from supporting structure (m)	**2**
	Distance from obstruction on roof (m)	**N/A**
	Distance from obstruction not on roof (m)	**11**
	Distance from trees (m)	**62**
	Distance from furnace or incinerator flue (m)	**N/A**
	Unrestricted airflow (deg)	**360**
	Probe material	**Teflon**
	Residence time (s)	**6.5**
	Changes in next 18 months?	**Yes. Monitor will be discontinued in 2023 or 2024 when ozone monitoring at Yelm resumes.**
	Suitable for NAAQS comparison?	**No**
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	**Yes**

Summary of changes: All probe and path monitor siting criteria were added for the temporary ozone SPM added to the site on May 1, 2022.

Malaga-Malaga Hwy	Site Information	
	AQS ID	530070012
	Street Address	8100 Malaga Alcoa Highway
	Zip Code	98831
	Latitude	47.33444
	Longitude	-120.095544
	Date Site Established	20170101
	MSA/CBSA/CSA Represented	Wenatchee
	County	Chelan
	Distance from roadway (m)	910
	Traffic count (AADT)	8800
	Ground cover	Grass, gravel
Sulfur Dioxide (42401, POC 2)	Sampling/Analysis Method	TAPI 100 (077)
	Parameter Begin Date	20170101
	Monitor Objective	Source Oriented
	Measurement Scale	Microscale
	Monitor type	SLAMS
	Collecting agency	Intalco
	Analytical lab	N/A
	Reporting agency	Washington State Department of Ecology (1136)
	Sampling frequency	Continuous
	Sampling season	Year-round
	Probe height (m)	3
	Distance from supporting structure (m)	1
	Distance from obstruction on roof (m)	N/A
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	N/A
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Probe material	Teflon
	Residence time (sec)	15
	Changes in next 18 months?	**Yes. Ecology proposes to discontinue the site on December 31, 2022.**
	Suitable for NAAQS comparison?	Yes
	Does monitor meet quality assurance requirements for monitors used in NAAQS evaluations described in 40 C.F.R. Part 58 Appendix A?	Yes
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	Yes

Summary of changes: Ecology proposes to discontinue the Malaga monitoring site on December 31, 2022.

Sunnyside-S 16th	**Site Information**	
	AQS ID	530770005
	Street Address	810 16th St (Harrison Middle School)
	Zip Code	98944
	Latitude	46.31932
	Longitude	-119.999677
	Date Site Established	19980821
	MSA/CBSA/CSA Represented	Yakima
	County	Yakima
	Distance from roadway (m)	1450
	Traffic count (AADT)	3900
	Ground cover	Roof
Non-compliance $PM_{2.5}$ (88502, POC 4)	Sampling/Analysis Method	Radiance Research M903 Nephelometer (771)
	Parameter Begin Date	20150915
	Monitor Objective	Population Exposure
	Measurement Scale	Neighborhood
	Monitor type	SLAMS
	Collecting agency	Yakima Region Clean Air Agency
	Analytical lab	N/A
	Reporting agency	Washington State Department of Ecology (1136)
	Sampling frequency	Continuous
	Sampling season	Year-round
	Probe height (m)	2
	Distance from supporting structure (m)	1
	Distance from obstruction on roof (m)	N/A
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	N/A
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Changes in next 18 months?	**Yes. The nephelometer will be replaced with an FEM BAM 1020 by January 1, 2023.**
	Suitable for NAAQS comparison?	No
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	Yes

Summary of changes: The Yakima Regional Clean Air Agency and Ecology plan to replace the nephelometer with an FEM BAM 1020 by January 1, 2023.

Tacoma-Alexander Ave	Site Information	
	AQS ID	530530031
	Street Address	2301 Alexander Ave, Tacoma, WA
	Zip Code	98421
	Latitude	47.2656
	Longitude	-122.3858
	Date Site Established	19870101
	MSA/CBSA/CSA Represented	Seattle-Tacoma-Bellevue
	County	Pierce
	Distance from roadway (m)	65
	Traffic count (AADT)	638
	Ground cover	Grass, gravel
$PM_{2.5}$ (88101, POC 5)	Sampling/Analysis Method	**Met One BAM 1020 (170)**
	Parameter Begin Date	**20220101**
	Monitor Objective	**Population Exposure**
	Measurement Scale	**Neighborhood**
	Monitor type	**SLAMS**
	Collecting agency	**Puget Sound Clean Air Agency**
	Analytical lab	**N/A**
	Reporting agency	**Washington State Department of Ecology (1136)**
	Sampling frequency	**Continuous**
	Sampling season	**Year-round**
	Probe height (m)	**3**
	Distance from supporting structure (m)	**N/A**
	Distance from obstruction on roof (m)	**N/A**
	Distance from obstruction not on roof (m)	**N/A**
	Distance from trees (m)	**300**
	Distance from furnace or incinerator flue (m)	**N/A**
	Unrestricted airflow (deg)	**360**
	Changes in next 18 months?	**No**
	Suitable for NAAQS comparison?	**No**
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	**Yes**

Summary of changes: All probe and path monitor siting criteria were added for the $PM_{2.5}$ SLAMS FEM BAM added to the site on January 1, 2022.

Vancouver-Blairmont	Site Information	
	AQS ID	530110011
	Street Address	1500 SE Blairmont Dr (Mountain View High School)
	Zip Code	98683
	Latitude	**45.6135097**
	Longitude	**-122.5199118**
	Date Site Established	19880501
	MSA/CBSA/CSA Represented	Portland-Vancouver-Hillsboro
	County	Clark
	Distance from roadway (m)	**400**
	Traffic count (AADT)	8939
	Ground cover	Grass, asphalt
Meteorological*	Sampling/Analysis Method	Vaisala WMT700 Ultrasonic Sensor (060)
	Parameter Begin Date	20071220
	Monitor Objective	Population Exposure
	Measurement Scale	Urban Scale
	Monitor type	SLAMS
	Collecting agency	Washington State Department of Ecology (1136)
	Analytical lab	N/A
	Reporting agency	Washington State Department of Ecology (1136)
	Sampling frequency	Continuous
	Sampling season	Year-round
	Probe height (m)	10
	Distance from supporting structure (m)	N/A
	Distance from obstruction on roof (m)	N/A
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	N/A
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Changes in next 18 months?	**Yes. Meteorological monitoring was temporarily suspended for a construction project in 2020 and will resume in summer 2022.**
	Suitable for NAAQS comparison?	N/A
Ozone (44201, POC 1)	Sampling/Analysis Method	UV Absorption (087)
	Parameter Begin Date	19880501
	Monitor Objective	Population Exposure
	Measurement Scale	Urban Scale
	Monitor type	SLAMS
	Collecting agency	Washington State Department of Ecology (1136)
	Analytical lab	N/A

Vancouver-Blairmont	Site Information	
	Reporting agency	Washington State Department of Ecology (1136)
	Sampling frequency	Continuous
	Sampling season	May-Sept
	Probe height (m)	4
	Distance from supporting structure (m)	0.5
	Distance from obstruction on roof (m)	N/A
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	**20**
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Probe material	Teflon
	Residence time (sec)	15
	Changes in next 18 months?	No
	Suitable for NAAQS comparison?	Yes
	Does monitor meet quality assurance requirements for monitors used in NAAQS evaluations described in 40 C.F.R. Part 58 Appendix A?	Yes
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	Yes

Summary of changes: The Vancouver-Blairmont ozone monitoring site was temporarily relocated in 2020 due to a construction and renovation project. Meteorological monitoring was also suspended at that time. In June 2022, the site was moved to its new permanent location. The latitude, longitude, distance from roadway, and distance from trees were updated.

Yelm-Northern Pacific	Site Information	
	AQS ID	530670005
	Street Address	931 Northern Pacific Road
	Zip Code	98597
	Latitude	46.952562
	Longitude	-122.59527
	Date Site Established	20060501
	MSA/CBSA/CSA Represented	Olympia-Lacey-Tumwater
	County	Thurston
	Distance from roadway (m)	1250
	Traffic count (AADT)	14000
	Ground cover	Gravel, grass
Ozone (44201, POC 1)*	Sampling/Analysis Method	UV Absorption (087)
	Parameter Begin Date	20060501
	Monitor Objective	Population Exposure
	Measurement Scale	Urban Scale
	Monitor type	SLAMS
	Collecting agency	Washington State Department of Ecology (1136)
	Analytical lab	N/A
	Reporting agency	Washington State Department of Ecology (1136)
	Sampling frequency	Continuous
	Sampling season	May-Sept
	Probe height (m)	3
	Distance from supporting structure (m)	0.7
	Distance from obstruction on roof (m)	N/A
	Distance from obstruction not on roof (m)	N/A
	Distance from trees (m)	50
	Distance from furnace or incinerator flue (m)	N/A
	Unrestricted airflow (deg)	360
	Probe material	Teflon
	Residence time (sec)	4.4
	Changes in next 18 months?	**Yes. Ozone monitoring is temporarily suspended until 2023 or 2024.**
	Suitable for NAAQS comparison?	Yes
	Does monitor meet quality assurance requirements for monitors used in NAAQS evaluations described in 40 C.F.R. Part 58 Appendix A?	Yes
	Does monitor meet probe and path siting criteria described in 40 C.F.R. Part 58 Appendix E?	Yes

Summary of changes: The Yelm-Pacific ozone monitoring site is temporarily suspended until 2023 or 2024 due to a construction project at the site. The temporary ozone SPM at the Lacey-College St site provides ozone data and AQI information in Thurston County during this suspension.

Appendix F. Interstate Memorandum of Understanding

Memorandum of Understanding
Between
Oregon Department of Environmental Quality
And
Washington Department of Ecology

I. PURPOSE

This Memorandum of Understanding (MOU) is entered into by and between the Oregon Department of Environmental Quality Air Quality Program, hereinafter referred to as ODEQ, and the Washington Department of Ecology Air Quality Program, hereinafter referred to as WDOE.

The purpose of this MOU is to agree in principle to cooperate with shared resources to collectively meet the United States Environmental Protection Agency (US EPA) minimum monitoring requirements for criteria air pollutants in the Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area (MSA).

II. STATEMENT OF MUTUAL BENEFITS AND INTEREST

The Portland-Vancouver-Hillsboro, OR-WA MSA consists of Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon and Clark and Skamania Counties in Washington. The network design criteria for ambient air quality monitoring described in 40 C.F.R § 58 Appendix D require that in areas where metropolitan statistical areas (MSAs) cross jurisdictional boundaries, "full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator." This MOU establishes an agreement that ODEQ and WDOE cooperatively meet the minimum monitoring requirements in the Portland-Vancouver-Hillsboro, OR-WA MSA.

The Portland-Vancouver-Hillsboro, OR-WA MSA had an estimated population of 2,478,810 as of July 1, 2018. Based on 40 C.F.R § 58 Appendix D, the following minimum monitoring requirements for criteria pollutants apply to an MSA of this population size:

Pollutant	**Minimum Number of Required Monitors**
Ozone (O_3)	2
Carbon Monoxide (CO)	2
Nitrogen Dioxide (NO_2)	2*
Sulfur Dioxide (SO_2)	1
Particulate Matter ≤10µm (PM_{10})	2
Fine Particulate Matter ($PM_{2.5}$)	3

* An additional NO_2 monitor will be required if the population of the MSA grows above 2,500,000 people.

As of January 1, 2019, the minimum monitoring requirements were met or exceeded in the Portland-Vancouver-Hillsboro, OR-WA MSA for each of the criteria pollutants listed above.

III. GENERAL ROLES

ODEQ and WDOE formally agree to collectively provide adequate criteria pollutant monitoring as required by 40 C.F.R § 58 Appendix D. Each agency shall inform the other agency at its earliest convenience via telephone or email of any monitoring changes within the Portland-Vancouver-Hillsboro, OR-WA MSA that impact the minimum monitoring requirements. In the event that new minimum monitoring requirements are imposed after the execution of this MOU, ODEQ and WDOE agree to consult and jointly determine how to meet the new requirements.

IV. IT IS MUTUALLY AGREED AND UNDERSTOOD BY AND BETWEEN THE SAID PARTIES THAT:

A. This instrument is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between the parties to this instrument will be handled in accordance with applicable laws, regulations, and procedures, including those for government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties, and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority.

B. This instrument in no way restricts ODEQ or WDOE from participating in similar activities with other public or private agencies, organizations, and individuals.

C. Pursuant to Section 22, Title 41, United States Code, no Member of, or Delegate to, Congress shall be admitted to any share or part of this instrument, or any benefits that may arise therefrom.

D. Nothing in this MOU shall be construed as obligating either party to expend funds or to make any contract or other obligation for the future payment of money in excess of appropriations authorized by law and administratively allocated for this purpose.

E. Modifications within the scope of this instrument shall be made by mutual consent of the parties, by the issuance of a written modification, signed and dated by both parties.

F. Either party(s), in writing, may terminate the MOU in whole, or in part, at any time before the date of expiration provided that written notice is sent to the other party at least 120 calendar days prior to the termination date.

G. This MOU shall be effective upon execution by both parties and shall remain in effect for a period of 5 years unless otherwise modified. This agreement can be extended if mutually agreed to by both parties.

H. The principal contacts for this instrument are:

Oregon Department of Environmental Quality
Anthony Barnack, Ambient Monitoring Coordinator
7202 NE Evergreen Parkway, Suite 150
Hillsboro, OR 97124-6166
(503)693-5708

Washington Department of Ecology
Jill Schulte, Air Monitoring Coordinator
PO Box 47600
Olympia, WA 98504-7600
(360) 407-6877

In Witness whereof, the parties hereto have executed this MOU as of the last date written below:

5/13/19
Date Tom Roick
Air Quality Monitoring Manager
Oregon Department of Environmental Quality

5/20/19
Date Kathy Taylor
Deputy Program Manager
Air Quality Program
Washington Department of Ecology

Appendix G. Public Comment Period

The draft 2022 Ambient Air Monitoring Network Plan was posted for public comment from May 20 – June 19, 2021, on Ecology's webpage. No comments were received.

COMMENT PERIOD

Draft Annual Air Quality Monitoring Network Plan

Air quality monitoring network

May 20, 2022 - June 19, 2022, 11:59 p.m.

Ecology's draft annual air quality monitoring network plan is available for review.

This report describes:

- Washington's air quality monitoring network, including air monitoring stations.
- Recent and planned changes to the network.
- How Ecology will operate its air monitoring stations in the next year.

Ecology reviews its air quality monitoring network every year to make sure that it collects adequate, representative, and useful air quality data. We use this data to make science-based policy decisions.

Documents for review:

- Draft 2022 Annual Air Quality Network Plan
- 2022 Verification of Continued Attainment in Limited Maintenance Areas

Background

Ecology, EPA, tribes, and local clean air agencies maintain a network of air monitoring stations to measure air pollution in the state. Using continuous monitoring data, we can let you know when air pollution reaches unhealthy levels. Based on this information, people can adjust their daily activities to minimize unhealthy effects.

Comment online

Use our online comment form

Comment by mail

Jill Schulte
Washington Department of Ecology
Air Quality Program
P.O. Box 47600
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Questions

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360-790-6538