

## Executive Summary

This document summarizes the calculations for verification of continued attainment of National Ambient Air Quality Standards in Washington’s Limited Maintenance Areas

## Maintenance Areas

Washington has ten maintenance areas for criteria pollutants. Maintenance areas demonstrate continued attainment of the NAAQS through a variety of ways. Some demonstrate NAAQS attainment through monitoring and some through EPA-approved alternate methods. These methods are summarized in Table 1.

**Table 1. Washington maintenance areas and methods of demonstrating NAAQS attainment**

Maintenance Area (Pollutant)	End of Maintenance Period	NAAQS Attainment Method
Seattle (PM <sub>10</sub> )	5/14/2021	Estimated PM <sub>10</sub> from Seattle-Duwamish PM <sub>2.5</sub> (530330057)
Kent (PM <sub>10</sub> )	5/14/2021	Estimated PM <sub>10</sub> from Kent-Central & James PM <sub>2.5</sub> (530332004)
Tacoma (PM <sub>10</sub> )	5/14/2021	Estimated PM <sub>10</sub> from Tacoma-Alexander nephelometer PM <sub>2.5</sub> (530530031)
Thurston County (PM <sub>10</sub> )	12/4/2020	Estimated PM <sub>10</sub> from Lacey-College St nephelometer PM <sub>2.5</sub> (530670013)
Walla Walla (PM <sub>10</sub> )	9/26/2025	Kennewick-Metaline PM <sub>10</sub> monitor (530050002) until 2017; Burbank-Maple St PM <sub>10</sub> monitor (530710006) as of January 1, 2018
Spokane (PM <sub>10</sub> )	8/30/2025	Spokane-Augusta PM <sub>10</sub> monitor (530630021)
Yakima (PM <sub>10</sub> )	3/10/2025	Yakima-4 <sup>th</sup> Ave S PM <sub>10</sub> monitor (530770009)
Tacoma (PM <sub>2.5</sub> )	3/12/2035	Tacoma-L St PM <sub>2.5</sub> 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

## Thurston County PM<sub>10</sub> Maintenance Area

As detailed in the 2nd PM<sub>10</sub> Maintenance Plan for Thurston County Washington, the Olympic Region Clean Air Agency (ORCAA) submitted the design value estimates for the Lacey-College Street nephelometer site (530670013). The 5-year PM<sub>10</sub> design value estimate for 2013-2017 was 45 µg/m<sup>3</sup>. The PM<sub>10</sub> design value estimate for 2015-2017 was 46 µg/m<sup>3</sup>.

Though these values are well below the Limited Maintenance Plan threshold of  $98 \mu\text{g}/\text{m}^3$  as specified in the Maintenance Plan, they included the wildfire smoke impacts during the summer of 2017. For the 2013-2017 time period, four of the top five maximum  $\text{NPM}_{10}$  values were from August 2017. Excluding these values (August 2-4, 8-9 and September 6, 2017) the 6th highest value was  $39 \mu\text{g}/\text{m}^3$ . For 2015-2017 the 3rd highest value was  $36 \mu\text{g}/\text{m}^3$ .

Ecology provided the daily 24-hour averages for the timeframe in question. The number of daily averages for the period was determined. The 5-year design value estimate was determined based on 1750 values and the 3-year design value estimate was based on 1021 values. The number of values was then compared to Table 6-1 contained in the  $\text{PM}_{10}$  SIP Development Guideline document. For 1750 values, the Table prescribes using the sixth highest value in the data set. For 1021 values, the Table prescribes the third highest value in the data set.

## **Kent, Seattle and Tacoma $\text{PM}_{10}$ Maintenance Areas**

Three- and five-year design values were calculated using the table look up method and the statistical fit method outlined in the LMP guidance document and the Kent, Seattle, and Tacoma  $\text{PM}_{10}$  Limited Maintenance Plan. A 3-year  $\text{PM}_{10}$  design value of  $150 \mu\text{g}/\text{m}^3$  or below demonstrates continued compliance with the  $\text{PM}_{10}$  NAAQS. A 5-year design value below  $98 \mu\text{g}/\text{m}^3$  is required to qualify for the LMP approach. Design values calculated using the table look up method fall within the range of uncertainty of the statistical fit method. Because they are the most conservative values, only the statistical fit values are presented here.

The  $\text{PM}_{2.5}$  FEM TEOM at James St and Central Ave (530332004) is used to assure continued compliance with the  $\text{PM}_{10}$  NAAQS and to confirm continued eligibility for the Limited Maintenance Plan approach. The 2017 estimated five year  $\text{PM}_{10}$  design value is  $68 \pm 12 \mu\text{g}/\text{m}^3$  and the three year design value is  $74 \pm 14 \mu\text{g}/\text{m}^3$ .

The  $\text{PM}_{2.5}$  FEM TEOM at Seattle-Duwamish (530330057) is used to assure continued compliance with the  $\text{PM}_{10}$  NAAQS and to confirm continued eligibility for the Limited Maintenance Plan approach. The 2017 estimated five year  $\text{PM}_{10}$  design value is  $73 \pm 12 \mu\text{g}/\text{m}^3$  and the three year design value is  $73 \pm 14 \mu\text{g}/\text{m}^3$ . In 2014 we did not have a complete year of data, based on Appendix B of the  $\text{PM}_{10}$  SIP Development Guide. The design values for Seattle-Duwamish were calculated using the guidelines for incomplete data outlined in Appendix B, page B-1, of the  $\text{PM}_{10}$  SIP Development Guide.

The  $\text{PM}_{2.5}$  Nephelometer at Tacoma – Alexander Ave (530530031) is used to assure continued compliance with the  $\text{PM}_{10}$  NAAQS and to confirm continued eligibility for the Limited Maintenance Plan approach. The 2017 estimated five year  $\text{PM}_{10}$  design value is  $71 \pm 19 \mu\text{g}/\text{m}^3$  and the three year design value is  $75 \pm 20 \mu\text{g}/\text{m}^3$ .

## **Spokane County $\text{PM}_{10}$ Maintenance Area**

The design values for the Spokane County Maintenance Area are based on FEM 24-hour  $\text{PM}_{10}$  monitoring data from the Spokane-Augusta monitoring site (530630021) in Spokane. The design values below are shown with and without the Ecology-flagged  $\text{PM}_{10}$  exceedance data. In

2017, the western United States and Canada experienced a severe wildfire season, resulting in significant wildfire smoke impacts that caused 4 PM<sub>10</sub> exceedances (September 4, 5, 6 and 7, 2017) in Spokane County. In 2013, eastern Washington experienced a haboob, a very strong dust storm, contributing to one PM<sub>10</sub> exceedance (September 15, 2013) in Spokane. Ecology flagged these exceedances in AQS as exceptional events.

A 5-year PM<sub>10</sub> design value below 98 µg/m<sup>3</sup>, excluding flagged values, demonstrates that the Spokane County Maintenance Area continues to qualify for the LMP approach.

**Table 2. Spokane County Maintenance Area LMP design values**

	<b>2013-2017 LMP Design Value (DV)</b>
<b>DV with all data</b>	168 µg/m <sup>3</sup>
<b>DV without flagged data</b>	79 µg/m <sup>3</sup>

A 3-year PM<sub>10</sub> design value at or below 1.0 demonstrates compliance with the PM<sub>10</sub> NAAQS. The design value is the number of annual 24-hour exceedances of 150 µg/m<sup>3</sup>, averaged over three years.

**Table 3. Spokane County Maintenance Area NAAQS design values**

	<b>2013-2017 NAAQS Design Value (DV)</b>
<b>DV with all data</b>	1.3
<b>DV without flagged data</b>	0.0

The 2017 wildfire smoke impacts generated four PM<sub>10</sub> exceedances, triggering the Spokane County PM<sub>10</sub> Maintenance Plan (PM<sub>10</sub> LMP) contingency measures. The contingency measures in the PM<sub>10</sub> LMP are for road dust, windblown dust and solid fuel burning devices. The contingency measures do not address wildfire air quality impacts; therefore they have not been implemented.

## **Spokane County CO Maintenance Area**

On July 14, 2016, Federal Register #81 FR 45417, the 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. § 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.

The 2015 limited maintenance plan included the most up-to-date emissions inventory data available, including 2015 MOVES modeling of onroad emissions. The total annual emissions of the three source categories for the maintenance area was 63,934 tons per year. The 2015 total is

well below the corresponding total of three emission categories from the 2002 emissions inventory which was 114,559 tons per year.

**Table 4. Spokane CO maintenance area total emissions (tons per year)**

<b>Year</b>	<b>Onroad</b>	<b>Nonroad</b>	<b>Residential Wood Combustion</b>	<b>Total</b>
<b>2002</b>	78,868	20,449	15,242	114,559
<b>2015</b>	47,262	9,458	7,214	63,934

Therefore, the Spokane CO maintenance area continues to qualify for the limited maintenance plan option and continued verification of attainment of the CO NAAQS. SRCAA and Ecology's next analysis will be with the 2017 triennial emissions inventory. Ecology anticipates the 2017 triennial emissions inventory data may be available in first quarter of 2019, allowing SRCAA and Ecology to provide analyses in next year's monitoring network report.

## Appendix. Maintenance Plan Correspondence from Local Air Agencies.

To: Mike Ragan, Ecology

From: Robert Moody, ORCAA

Re: PM10 Design Values for Lacey, Washington

Date: January 25, 2018

As detailed in the 2<sup>nd</sup> PM<sub>10</sub> Maintenance Plan for Thurston County Washington, ORCAA wishes to submit the design value estimates for the Lacey-College Street nephelometer site (53670013). The 5-year PM<sub>10</sub> design value estimate for 2013-2017 was 45 µg/m<sup>3</sup>. The PM<sub>10</sub> design value estimate for 2015-2017 was 46 µg/m<sup>3</sup>.

Though these values are well below the Limited Maintenance Plan threshold of 98 µg/m<sup>3</sup> as specified in the Maintenance Plan, they included the wildfire smoke impacts during the summer of 2017. For the 2013-2017 time period, four of the top five maximum NPM10 values were from August 2017. If you remove the summertime values (August 2-4, 8-9 and September 6, 2017) the 6<sup>th</sup> highest value would have been 39 µg/m<sup>3</sup>. For 2015-2017 the 3<sup>rd</sup> highest value would have been 36 µg/m<sup>3</sup>.

What follows is a brief description of the calculations for those design values. Ecology provided the daily 24-hour averages for the timeframe in question. The number of daily averages for the period was determined. The 5-year design value estimate was determined based on 1750 values and the 3-year design value estimate was based on 1021 values. The number of values was then compared to Table 6-1 contained in the PM10 SIP Development Guidance document. For 1750 values, the Table prescribes using the sixth highest value in the data set. For 1021 values, the Table prescribes the third highest value in the data set.

Date: March 16, 2018

To: Nancy Pritchett, Sean Lundblad

CC: Sara Conley

From: Kathy Strange

Subject: Design Values for Kent, Seattle, and Tacoma PM10 Maintenance Areas

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Dear Nancy and Sean,

Included in this memo are the five year and three year design values for the Kent, Seattle, and Tacoma PM10 Maintenance Areas. Three and five year design values were calculated using the table look up method and the statistical fit method outlined in the LMP guidance document and The Kent, Seattle, and Tacoma PM10 Limited Maintenance Plan. A 3-year PM<sub>10</sub> design value of 150 µg/m<sup>3</sup> or below demonstrates continued compliance with the PM<sub>10</sub> NAAQS. A 5-year design value below 98 µg/m<sup>3</sup> is required to qualify for the LMP approach. Design values calculated using the table look up method fall within the range of uncertainty of the statistical fit method. Because they are the most conservative values, only the statistical fit values are presented here.

The PM2.5 FEM TEOM at James St and Central Ave (530332004) is used to assure continued compliance with the PM10 NAAQS and to confirm continued eligibility for the Limited Maintenance Plan approach. The 2017 five year design value is 68±12µg/m<sup>3</sup> and the three year design value is 74±14 µg/m<sup>3</sup>.

The PM2.5 FEM TEOM at Seattle-Duwamish (530330057) is used to assure continued compliance with the PM10 NAAQS and to confirm continued eligibility for the Limited Maintenance Plan approach. The 2017 five year design value is 73±12 µg/m<sup>3</sup> and the three year design value is 73±14 µg/m<sup>3</sup>. In 2014 we did not have a complete year of data, based on Appendix B of the PM10 SIP Development Guide. The design values for Seattle-Duwamish were calculated using the guidelines for incomplete data outlined in Appendix B, page B-1, of the PM10 SIP Development Guide.

The PM2.5 Nephelometer at Tacoma – Alexander Ave (530530031) is used to assure continued compliance with the PM10 NAAQS and to confirm continued eligibility for the Limited Maintenance Plan approach. The 2017 five year design value is 71±19 µg/m<sup>3</sup> and the three year design value is 75±20 µg/m<sup>3</sup>.

Please let me know if you have any questions.

Thank you,

Kathy



Date: April 27, 2018  
 To: Jill Schulte  
 CC: Laurie Hulse-Moyer, Caroline Sun, Julie Oliver  
 From: Margee Chambers & Mark Rowe *Margee Chambers Mark Rowe*  
 Subject: Spokane County PM10 and CO Design Values for Air Monitoring Network Report

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**PM<sub>10</sub> Design Values**

Included in this memo are the 5-year and 3-year design values for the Spokane County Maintenance Area, in Spokane, Washington. The design values are based on FRM and FEM 24-hour PM<sub>10</sub> monitoring data from the Augusta Avenue site (530630021), in Spokane, Washington.

The design values below are shown with and without the Ecology i-flagged PM<sub>10</sub> exceedance data. In 2017, the western United States and Canada experienced a severe wildfire season, resulting in significant wildfire smoke impacts that caused in four PM<sub>10</sub> exceedances (September 4, 5, 6, and 7, 2017) in Spokane County, Washington. In 2013, eastern Washington experienced a haboob, a very strong dust storm, contributing to one PM<sub>10</sub> exceedance (September 15, 2013), in Spokane County, Washington.

A 5-year PM<sub>10</sub> design value below 98 µg/m<sup>3</sup> demonstrates that the Spokane County Maintenance Area continues to qualify for the LMP approach.

	2013-2017 LMP Design Value (DV)
DV with i-flagged data	168 µg/m <sup>3</sup>
DV without i-flagged data	79 µg/m <sup>3</sup>

A 3-year PM<sub>10</sub> design value at or below 1.0 demonstrates compliance with the PM<sub>10</sub> NAAQS. The design value is the number of 24-hour exceedances of 150 µg/m<sup>3</sup>, averaged over three years.

	2015-2017 NAAQS Design Value (DV)
DV with i-flagged data	1.3
DV without i-flagged data	0.0

The 2017 wildfire smoke impacts generated four PM<sub>10</sub> exceedances triggering the Spokane County PM<sub>10</sub> Maintenance Plan (PM<sub>10</sub> LMP) contingency measures. The contingency measures in the PM<sub>10</sub> LMP are for road dust, windblown dust and solid fuel burning devices. The contingency measures do not address wildfire air quality impacts; therefore they have not been implemented. SRCAA and Ecology are exploring options to remove the exceedance data when determining compliance with NAAQS and the limited maintenance plan.

**CO Design Values**

On July 14, 2016, Federal Register # 81 FR 45417, the EPA approved an alternate method of verification of attainment of the CO NAAQS and qualification for the limited maintenance plan option under 40 CFR 58.14(c). 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 predominate 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.

The 2015 limited maintenance plan included the most up to date emissions inventory data available, including 2015 MOVES modeling of onroad emissions. The total annual emissions of the three source categories for the maintenance area was 63,934 tons per year. This 2015 total is well below the corresponding total of three emission categories from the 2002 emissions inventory which was 114,559 tons per year.

	<b>Onroad</b>	<b>Nonroad</b>	<b>Residential wood combustion</b>	<b>Total</b>
<b>2002</b>	78,868 tons/yr	20,449 tons/yr	15,242 tons/yr	114,559 tons/yr
<b>2015</b>	47,262 tons/yr	9,458 tons/yr	7,214 tons/yr	63,934 tons/yr

Therefore, the Spokane CO maintenance area continues to qualify for the limited maintenance plan option and continued verification of attainment of the CO NAAQS. SRCAA and Ecology’s next analysis will be with the 2017 triennial emissions inventory. Ecology anticipates the 2017 triennial emissions inventory data may be available in first quarter of 2019, allowing SRCAA and Ecology to provide analyses in next year’s monitoring network report.



## Publication information

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