

Oregon Air Quality Annual Report: 2018

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.



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Department of
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Glossary of Air Quality Terms used in this report:

AQI –	Air Quality Index – standardized EPA method of reporting air quality
BScat –	Beta Scattering - a light scattering unit used for visibility
CO –	Carbon monoxide – An odorless, colorless gaseous pollutant
CO ₂ –	Carbon dioxide – Primary greenhouse gas
CO ₂ e -	Carbon dioxide equivalent – Way to compare other GHG to CO ₂
FF -	Forest Fire or Wildfire
GHG –	Greenhouse Gas
HAPs –	Hazardous Air Pollutant as defined in Title III of the Clean Air Act
MMTCO ₂ e -	Million metric tons of carbon dioxide equivalent
NAAQS –	National Ambient Air Quality Standards – federal air quality standards
NO –	Nitrogen oxide
NO ₂ –	Nitrogen dioxide - a reddish-brown gaseous pollutant.
NO _x –	Nitrogen oxides – reddish brown gaseous pollutant - mainly NO and NO ₂
O ₃ –	Ozone – a gaseous pollutant and a component of smog at ground level
PM _{2.5} –	Particulate Matter 2.5 micrometers in diameter and smaller
PM ₁₀ -	Particulate Matter 10 micrometers in diameter and smaller
ppm –	Parts per million - air pollutant concentration.
ppb –	Parts per billion - air pollutant concentration.
SO ₂ –	Sulfur dioxide - a colorless, pungent gaseous pollutant.
SO ₂ –	Sulfur oxides - mainly SO ₂
USG –	Unhealthy for Sensitive Groups – an AQI air quality category
µg/m ³ –	Microgram per meters cubed - air pollutant concentration
VOC –	Volatile Organic Compounds
WAQR –	Wildfire Air Quality Rating - wildfire smoke health internet page
Standard Exceedance –	Occur when the NAAQS is surpassed.
Standard Violation –	The NAAQS provides a cushion which allows for a few exceedances every year. (e.g. the ozone NAAQS is compared to the 4 th highest day of the year. So a city can have three exceedances without a violation.)
Non-Attainment -	An area is non-attainment if its three year average violates the NAAQS and EPA formally declares it non-attainment.

Air Quality Annual Report

DEQ's Mission Statement

The Department of Environmental Quality's (DEQ) mission is to be a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

Each year DEQ updates the annual report including the most recent year. The air pollutants of greatest concern in Oregon are:

- Fine particulate matter (mostly from combustion sources) known as **PM2.5** (2.5 micrometers and smaller diameter)
- **Air Toxics** - pollutants that cause or may cause cancer or other serious health effects.
- Ground-level **ozone**, a component of smog
- **Greenhouse gas** (GHG) emissions and global climate change are also concerns in Oregon. Oregon state agencies track GHG emissions from a wide variety of products, services, utilities, and fuel providers. These emissions data are available on DEQ's web site under Air Quality/AQ Programs / Greenhouse Gas Reporting Home. <http://www.oregon.gov/DEQ/AQ/Pages/Greenhouse-Gas-Inventory-Report>

There is much more information about climate change on the Oregon Global Warming Commission's web page <http://www.keeporegoncool.org/>

Oregon's 2018 Ambient Air Quality in Summary:

- **PM2.5** was greatly elevated in 2018 due to widespread wildfire smoke in August and September. The winter time levels were about average.
- **Air toxics** Some of the air toxics such as benzene and acetaldehyde, remain near or above the ambient benchmarks concentrations. Air toxics in the wildfire smoke were greatly elevated in impacted areas. *Health benchmarks are concentration levels at which, if exposed over a lifetime, an individual's risk of getting cancer is increased by one in a million, or non-cancer health effects could occur.*
- The **ozone** (smog) levels violated the National Ambient Air Quality Standard in most of the communities impacted by wildfire smoke because of ozone precursors in the smoke such as nitrogen dioxide and volatile organic compounds.
- **Carbon monoxide, nitrogen dioxide, sulfur dioxide and PM10** are far below the criteria pollutant federal health standard. These pollutants have been trending mostly downward for most locations over the last ten years.

Air Quality Index

The Air Quality Index (AQI) is a health index which converts concentrations into health levels. The AQI is updated hourly on EPA, DEQ, and Lane Regional Air Protection Agency (LRAPA)'s websites. The AQI uses index numbers, health levels, and colors to communicate impacts to health (Table 1).

Table 1 Air Quality Index Health Category Descriptors.

Air Quality	AQI	Health Advisory
Good	0-50	No health impacts expected .
Moderate	51-100	Unusually sensitive people should consider reducing prolonged or heavy outdoor exertion.
Unhealthy for Sensitive Groups	101-150	People with heart disease, respiratory disease (such as asthma), older adults, and children should reduce prolonged or heavy exertion. Active healthy adults should also limit prolong outdoor exertion.
Unhealthy	151-200	People with heart disease, respiratory disease (such as asthma), older adults, and children should avoid prolonged or heavy outdoor exertion. Everyone else should reduce prolonged or heavy outdoor exertion.
Very Unhealthy (Alert)	201-300	People with heart disease, respiratory disease (such as asthma), older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.

How the AQI is computed

The AQI is computed hourly for PM2.5 and ozone. EPA provides all states with the AQI equation for national uniformity. DEQ and Lane County Regional Air Protection Authority (LRAPA) report the AQI for various cities in Oregon.

Table 2. Air Quality Index Ranges and Episode Stages.

Air Quality Rating	Air Quality Index (AQI)	PM _{2.5} 24-hour Average (µg/m ³)	Ozone 8-hour Average (ppm)
GOOD	0 - 50	0.0 - 12.0	0.000 - 0.054
MODERATE	51 - 100	12.1 - 35.4	0.055 - 0.070
UNHEALTHY FOR SENSITIVE GROUPS	101 - 150	35.5 - 55.4	0.071 - 0.085
UNHEALTHY	151 - 200	55.5 - 150.4	0.086 - 0.105
VERY UNHEALTHY	201 - 300	150.5 - 250.4	0.106 - 0.200
HAZARDOUS	>300	>250.5	>0.200

2018 Oregon Air Quality Index by City

The AQI provides a review of the health levels over the past year. The Figures below display the AQI health levels over the past year for all the areas where DEQ and LRAPA monitor air quality. **Note: A summary of all the AQI days are shown in Appendix G.**

Table 3. Figure Key for 2018 Air Quality Index.

Figure	City or Area	Figure	City or Area	Figure	City or Area
1	Albany	14	Grants Pass	27	Roseburg
2	Applegate Valley	15	Hermiston	28	Salem
3	Ashland	16	Hillsboro	29	Sauvie Island
4	Baker City	17	John Day	30	Shady Cove
5	Beaverton	18	Klamath Falls	31	Silverton
6	Bend	19	La Grande	32	Sisters
7	Burns	20	Lakeview	33	Springfield
8	Cave Junction	21	Madras	34	Sweet Home
9	Corvallis	22	Medford	35	The Dalles
10	Cottage Grove	23	Oakridge	36	Tualatin at I-5
11	Cove	24	Pendleton	37	Mt. Hood Wilderness
12	Enterprise	25	Portland		
13	Eugene/Springfield	26	Prineville		

2018 Albany Air Quality Index

Based on PM2.5

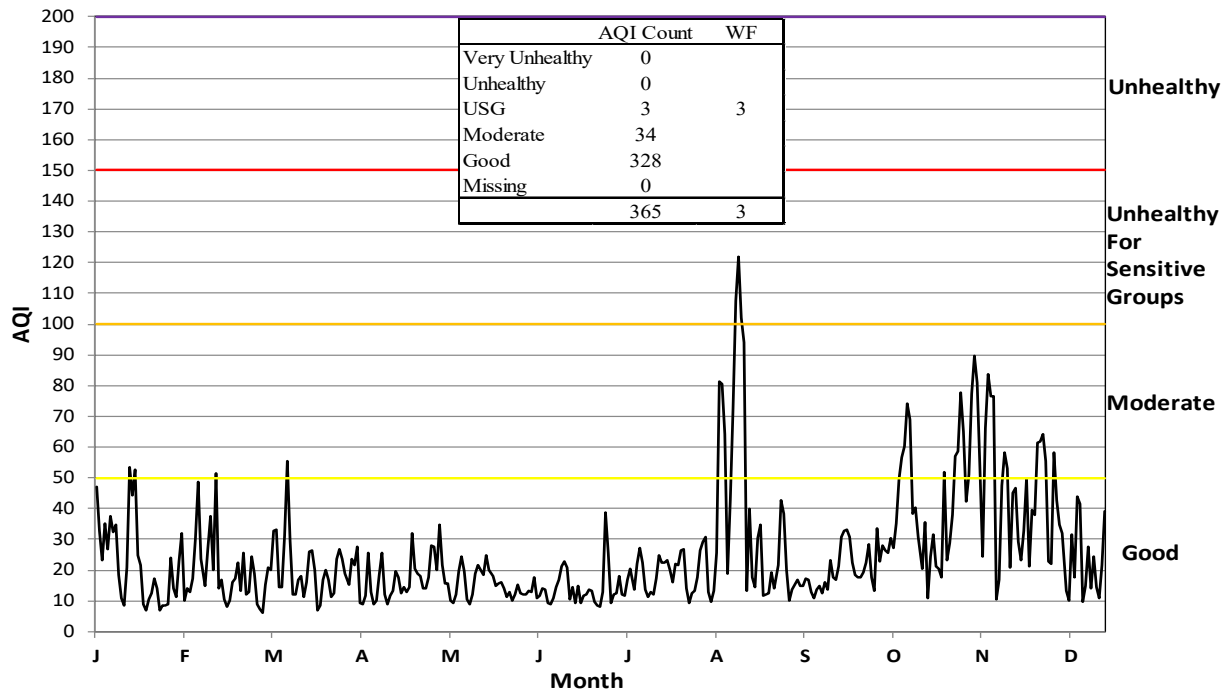


Figure 1. 2018 Albany Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Applegate Valley Air Quality Index Based on PM2.5

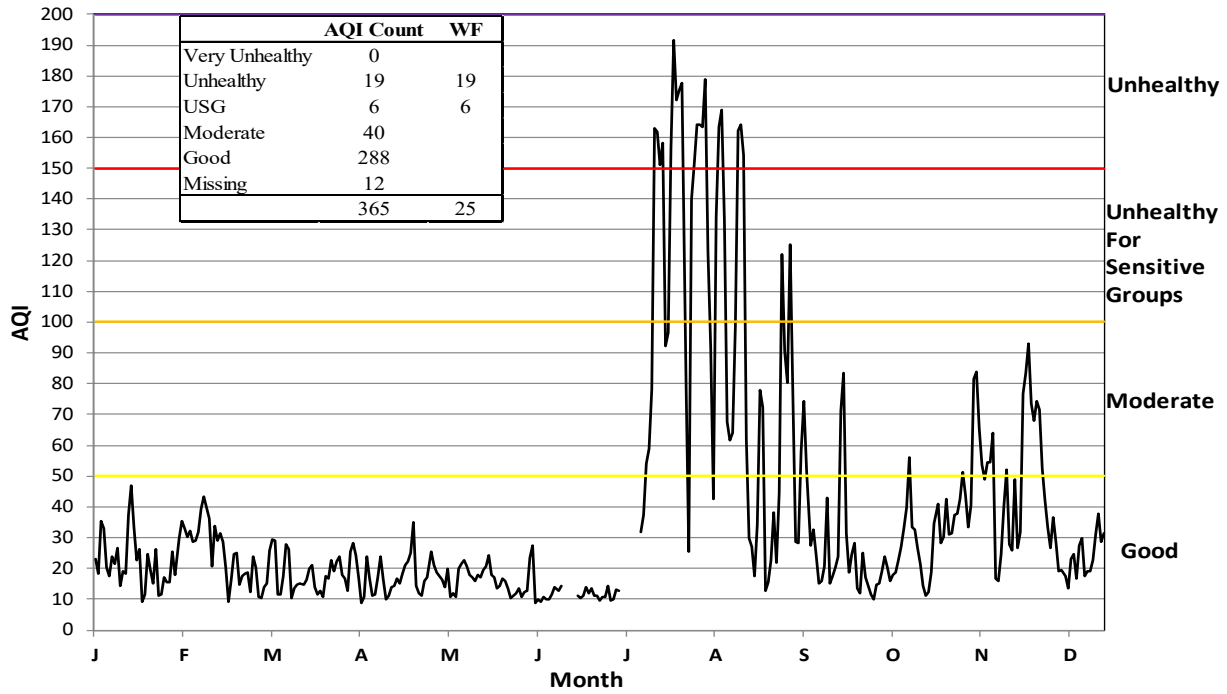


Figure 2. 2018 Applegate Valley Air Quality Summary.

2018 Ashland Air Quality Index Based on PM2.5

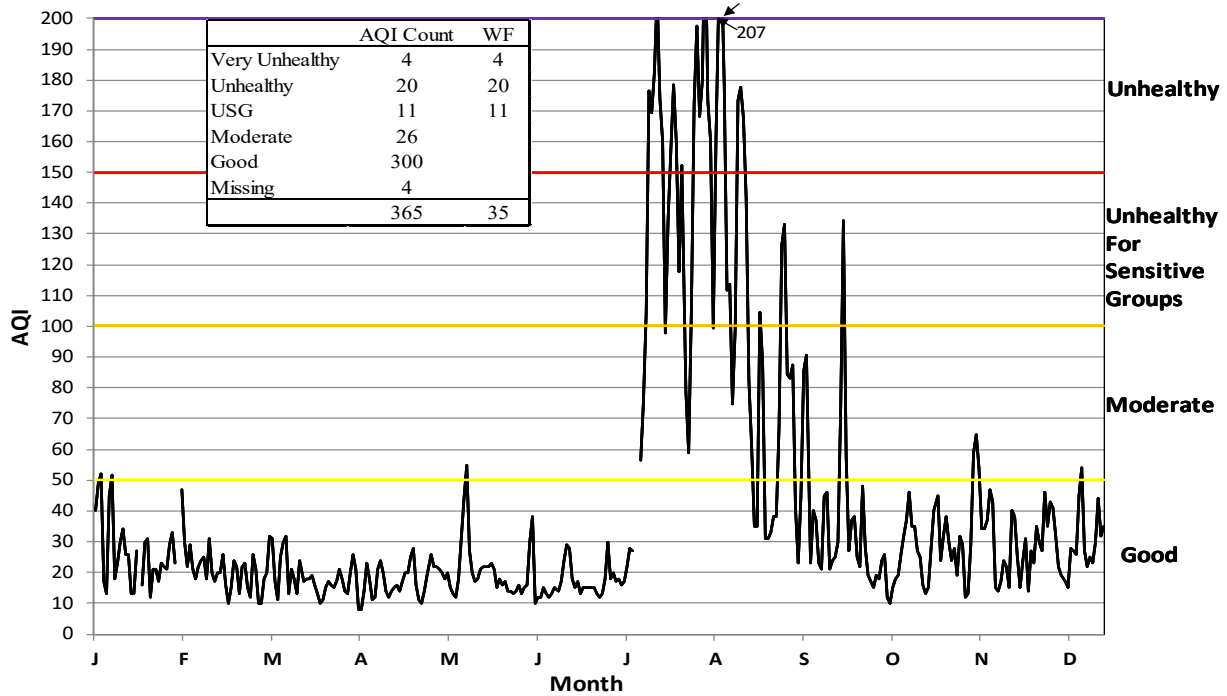


Figure 3. 2018 Ashland Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

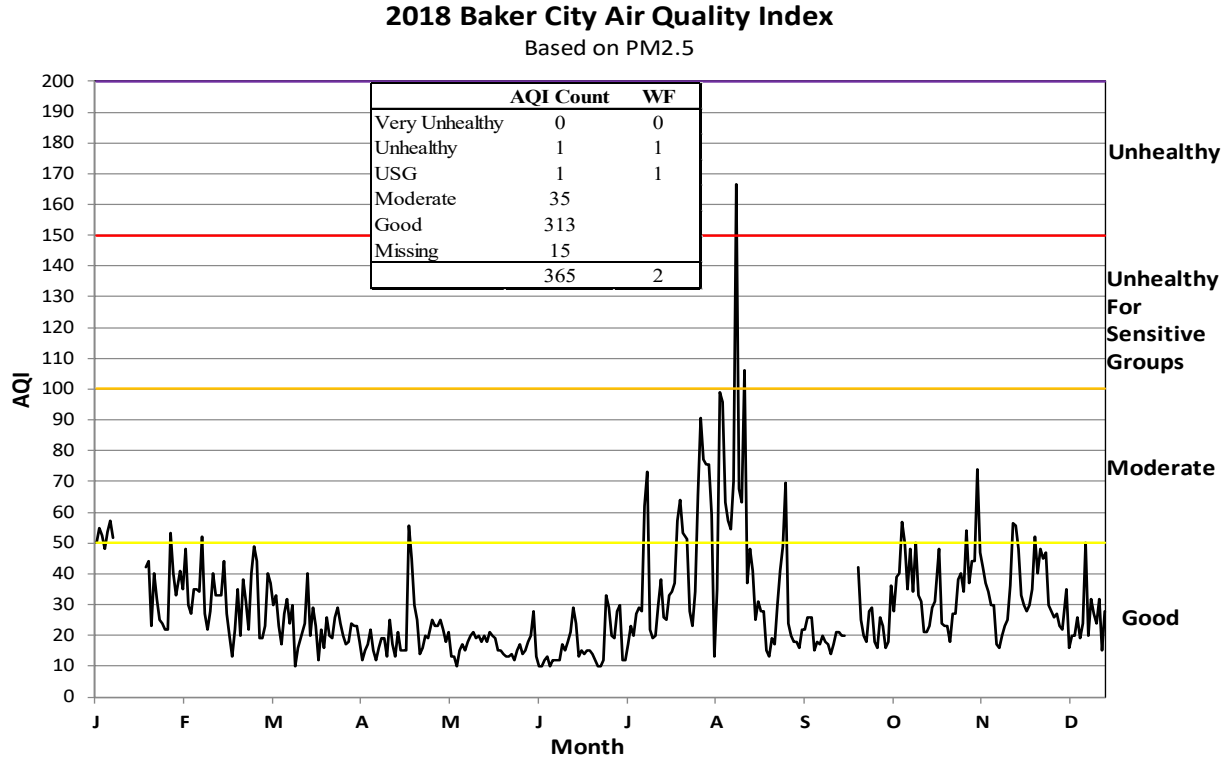


Figure 4. 2018 Baker City Air Quality Index Summary.

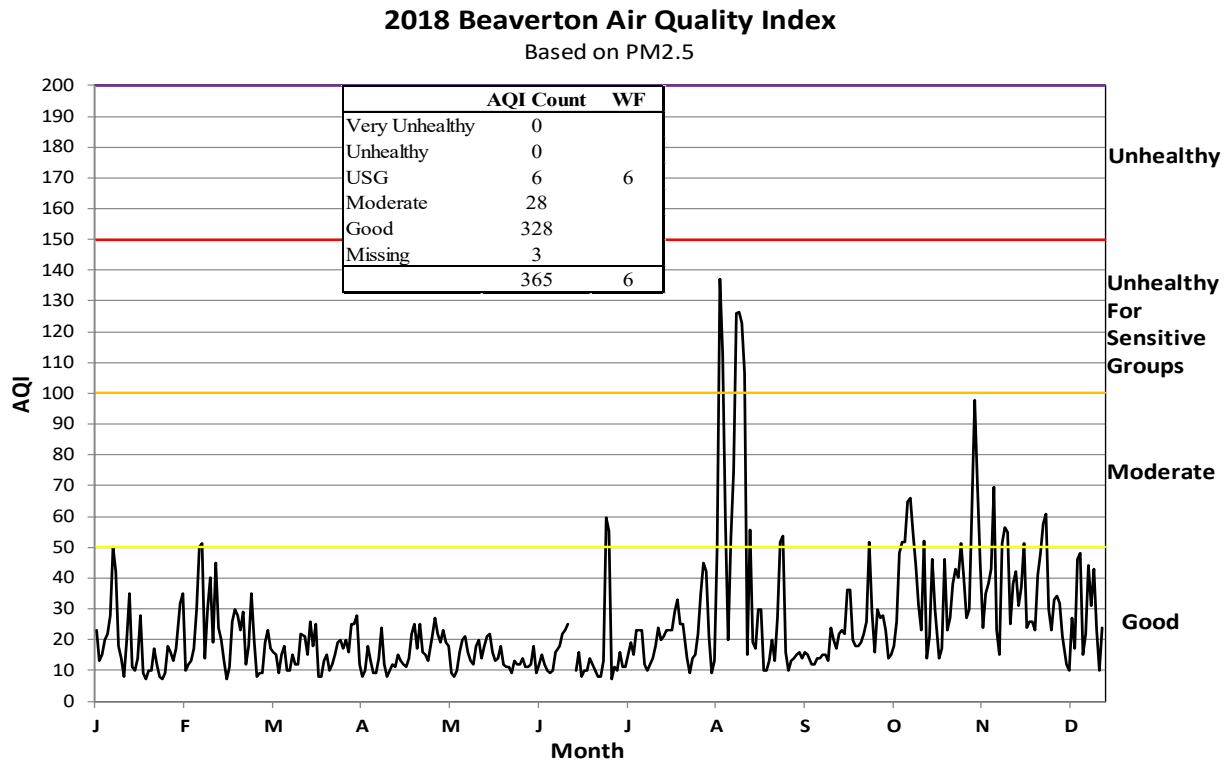


Figure 5. 2018 Beaverton Air Quality Index Summary.

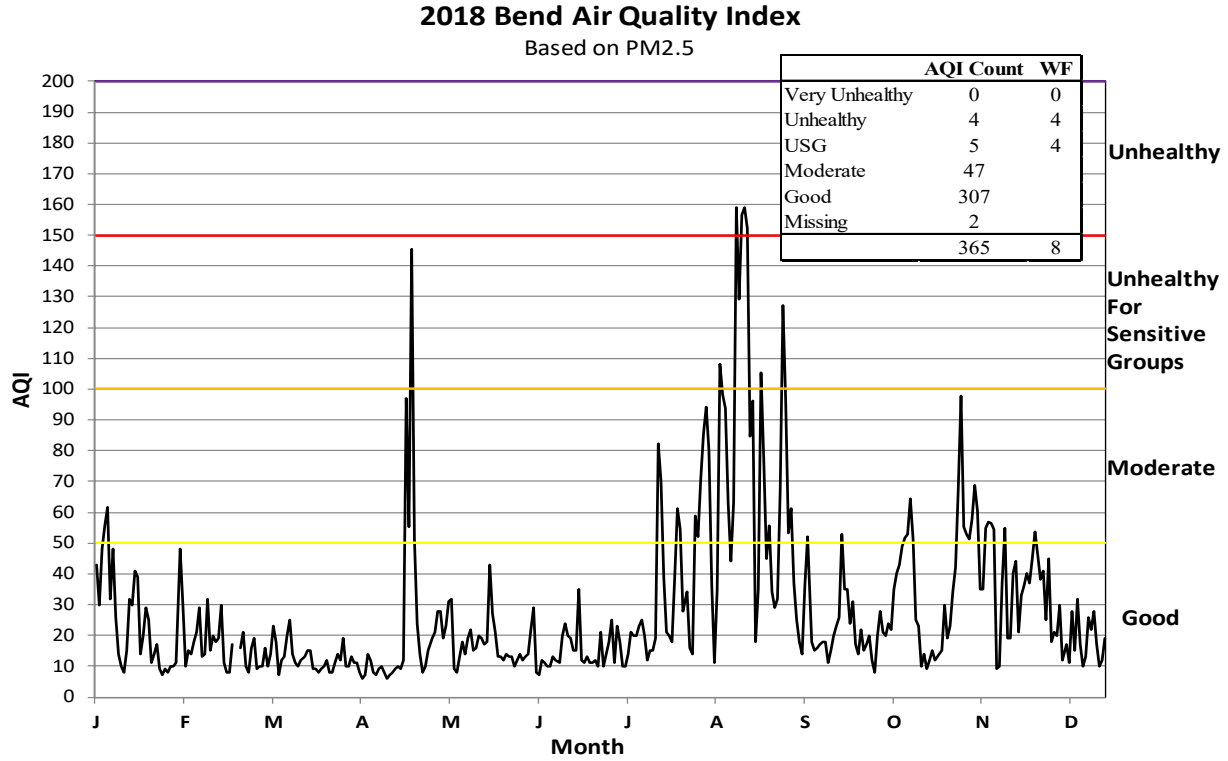


Figure 6. 2018 Bend Air Quality Index Summary.

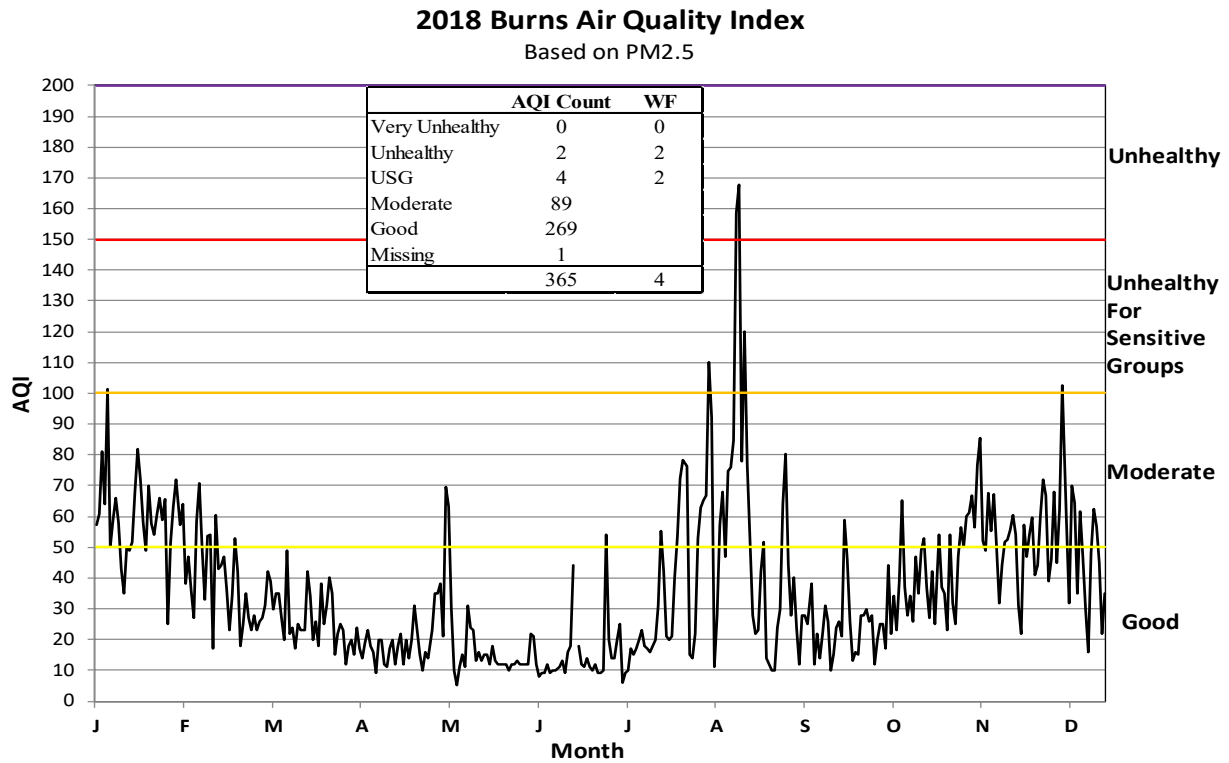


Figure 7. 2018 Burns/Hines Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

2018 Cave Junction Air Quality Index

Based on PM2.5

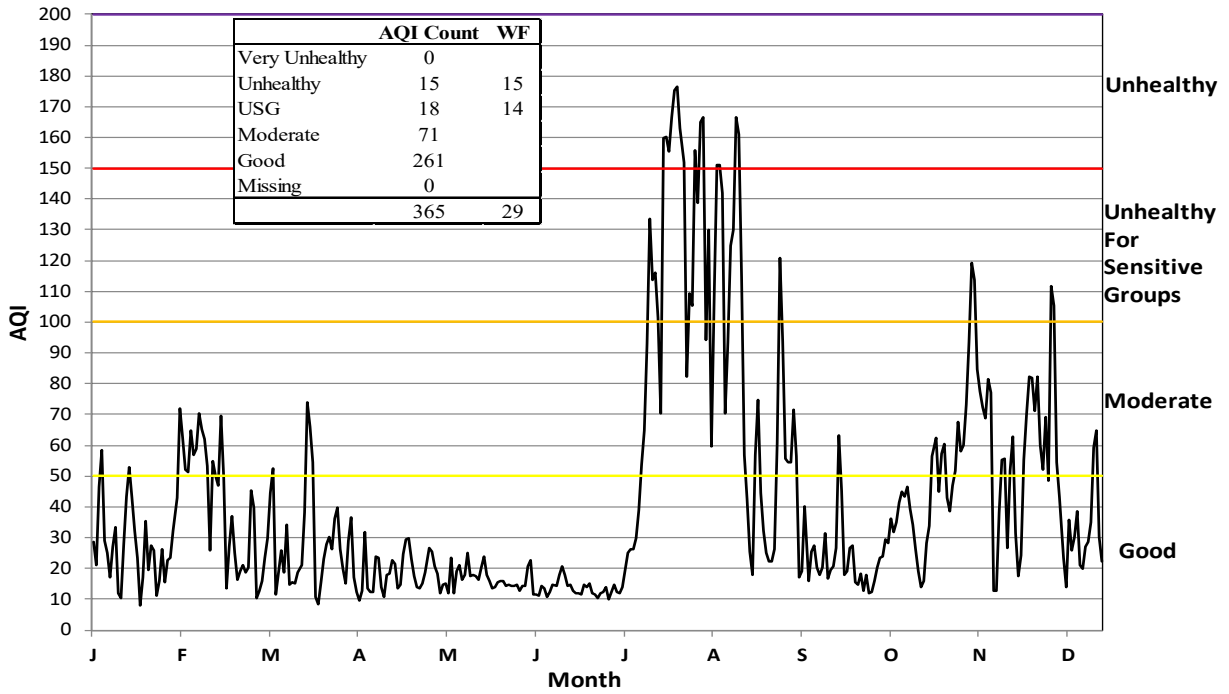


Figure 8. 2018 Cave Junction Air Quality Index Summary.

2018 Corvallis Air Quality Index

Based on PM2.5

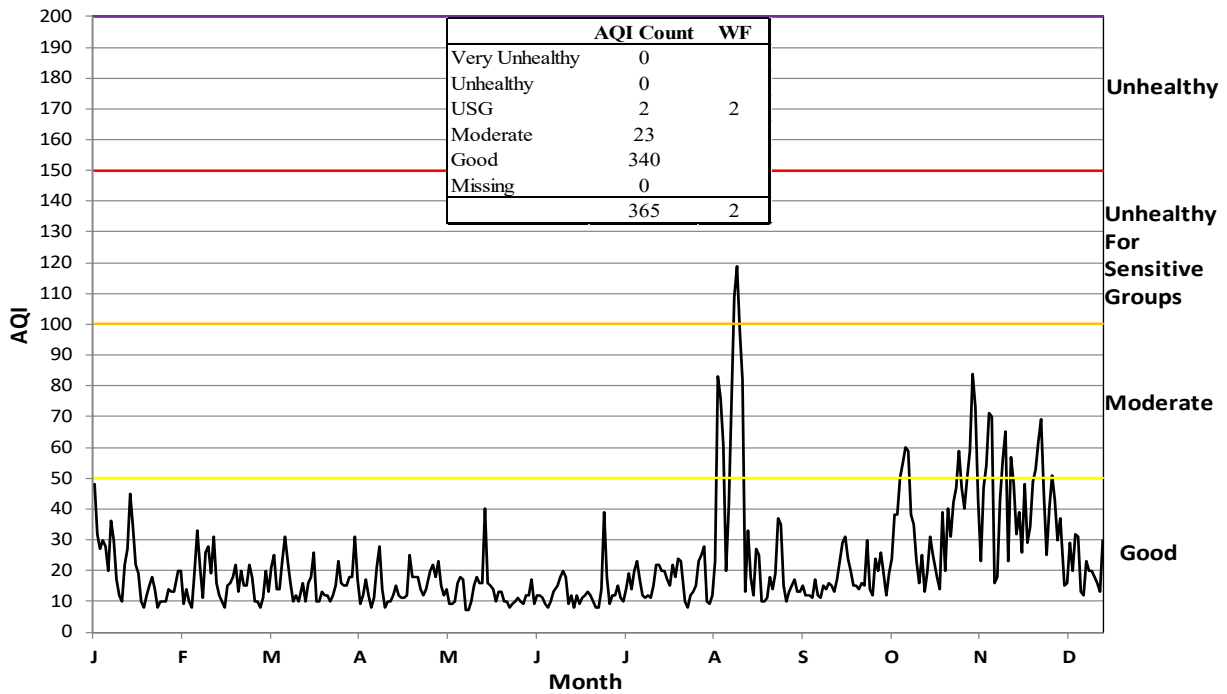


Figure 9. 2018 Corvallis Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Cottage Grove Air Quality Index

Based on PM2.5

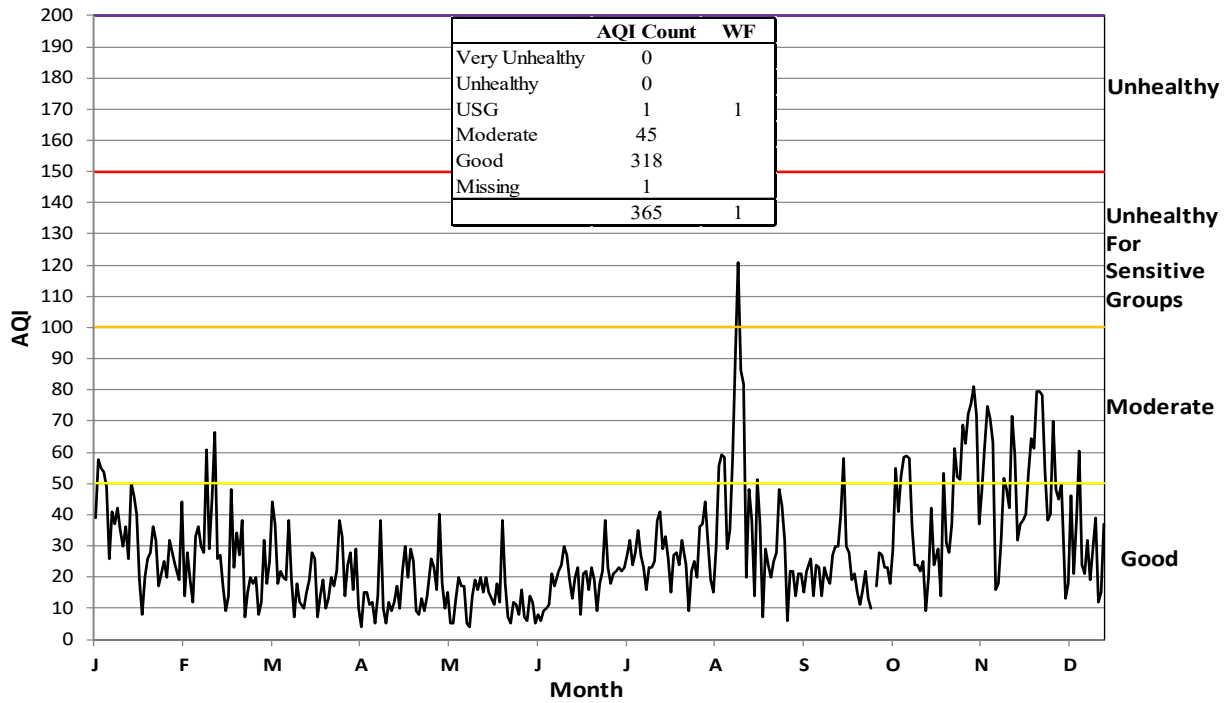


Figure 10. 2018 Cottage Grove Air Quality Index Summary.

2018 Cove Air Quality Index

Based on PM2.5

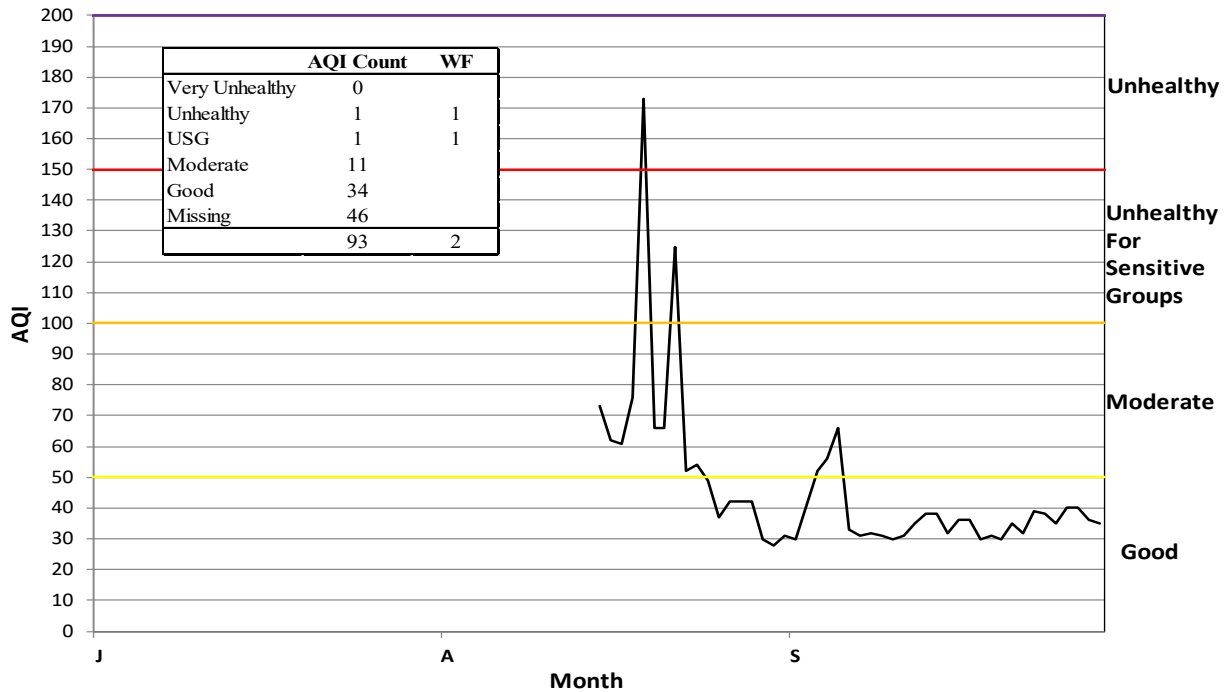


Figure 11. 2018 Cove Air Quality Index Summary

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Enterprise Air Quality Index

Based on PM2.5

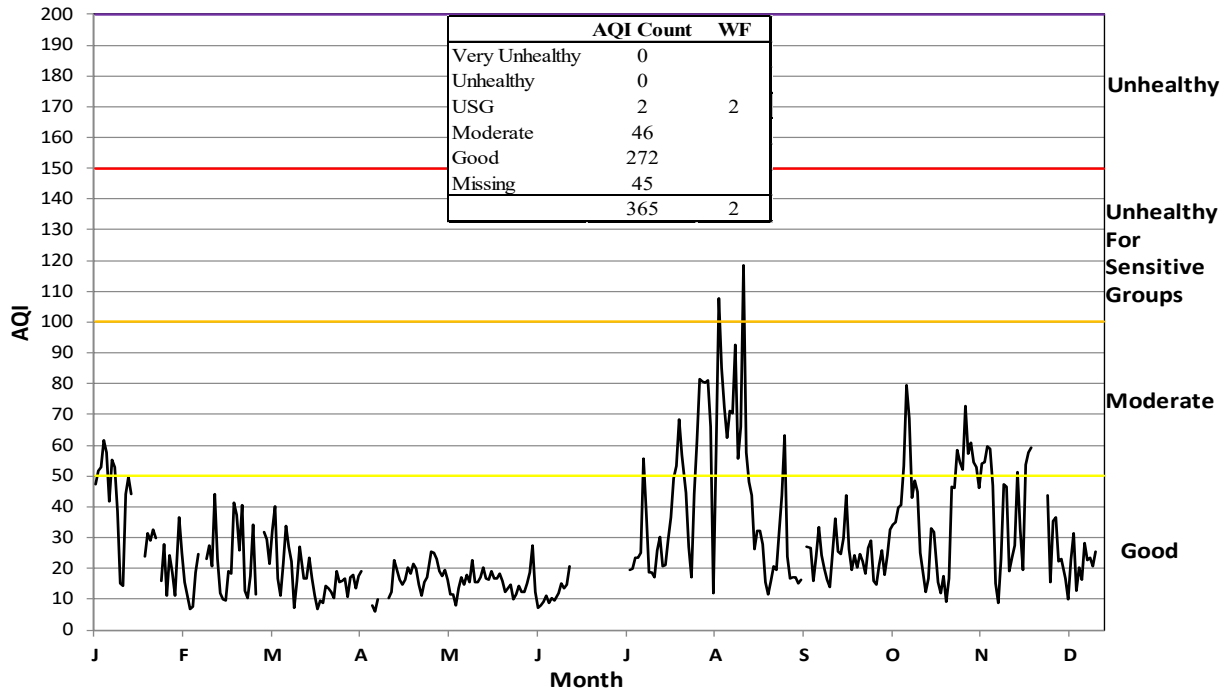


Figure 12. 2018 Enterprise Air Quality Index Summary.

2018 Eugene-Springfield Air Quality Index

Based on PM2.5 and Ozone

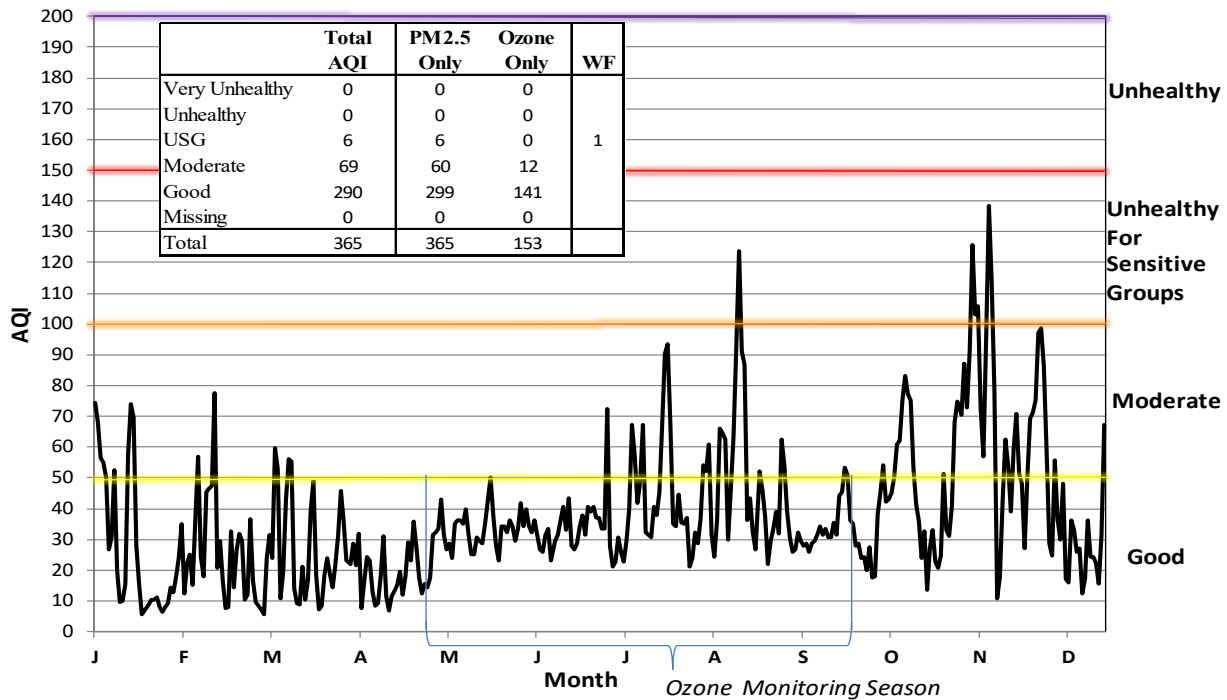


Figure 13. 2018 Eugene/Springfield Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Grants Pass Air Quality Index

Based on PM2.5

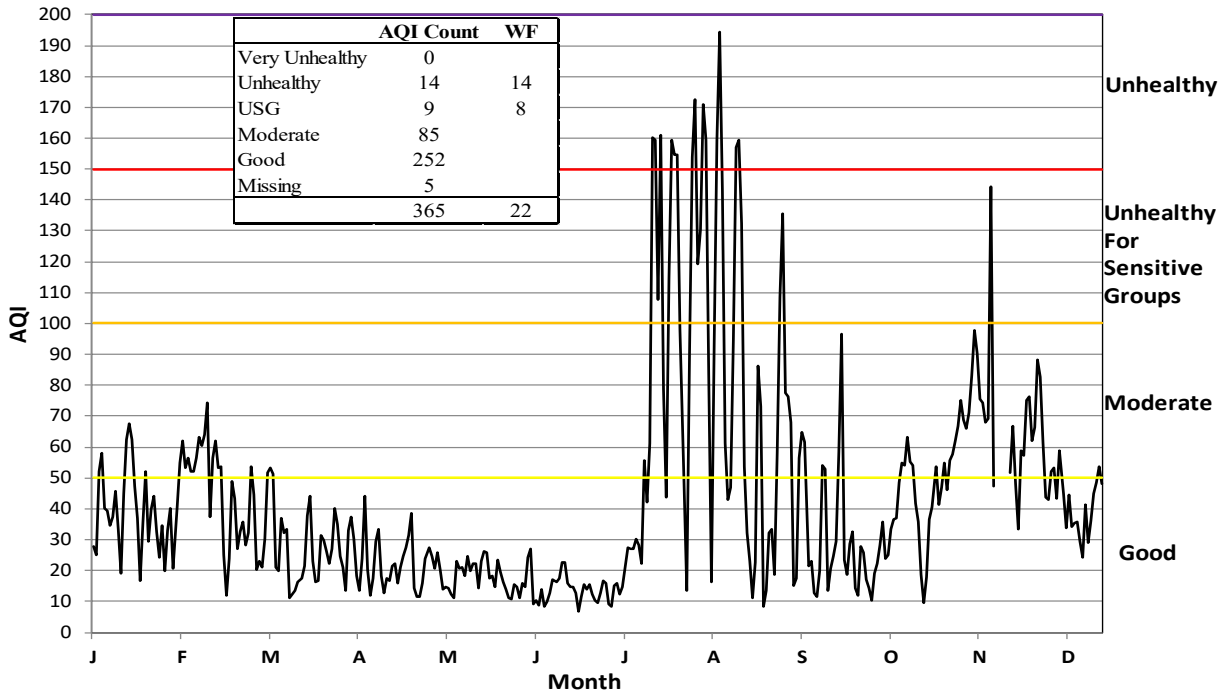


Figure 14. 2018 Grants Pass Air Quality Index Summary.

2018 Hermiston Summer Air Quality Index

Based on Ozone

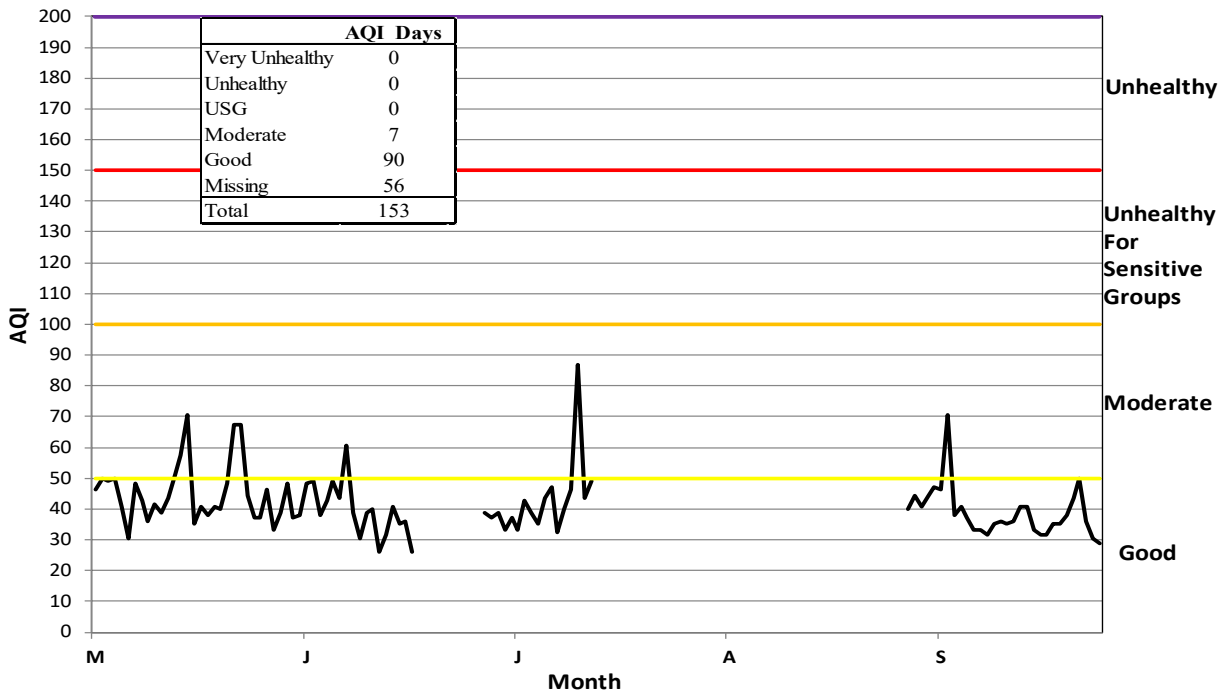


Figure 15. 2018 Hermiston Summer Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Hillsboro Air Quality Index

Based on PM2.5

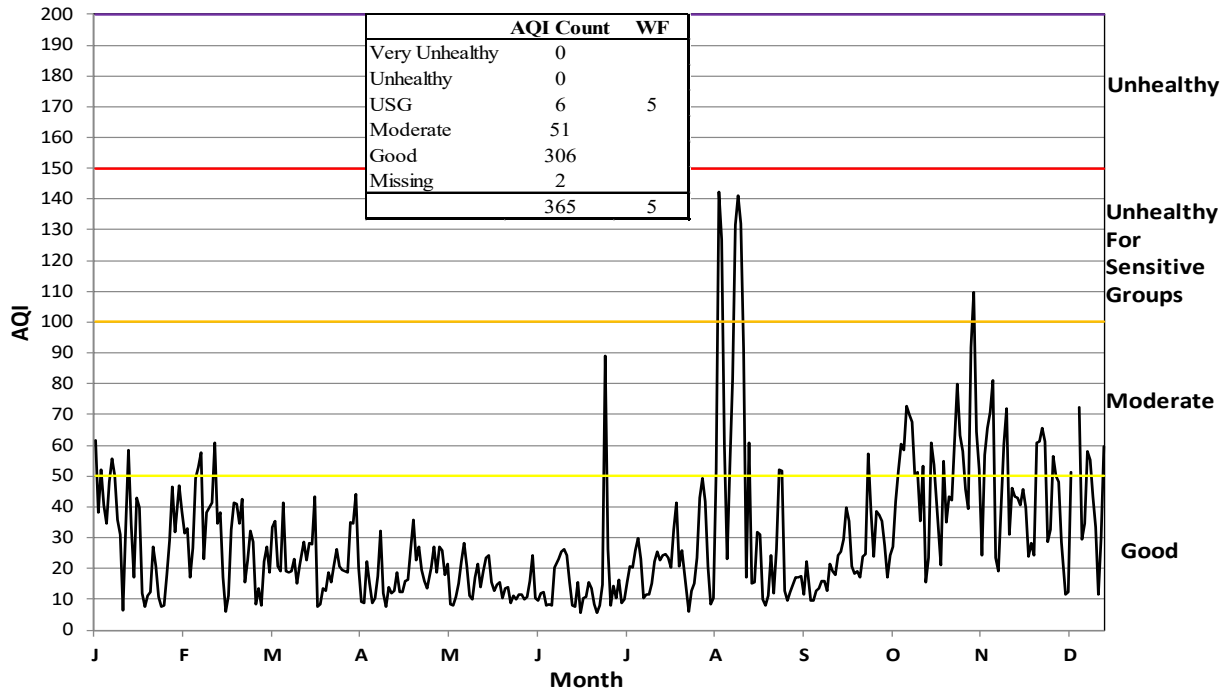


Figure 16. 2018 Hillsboro Air Quality Index Summary.

2018 John Day Air Quality Index

Based on PM2.5

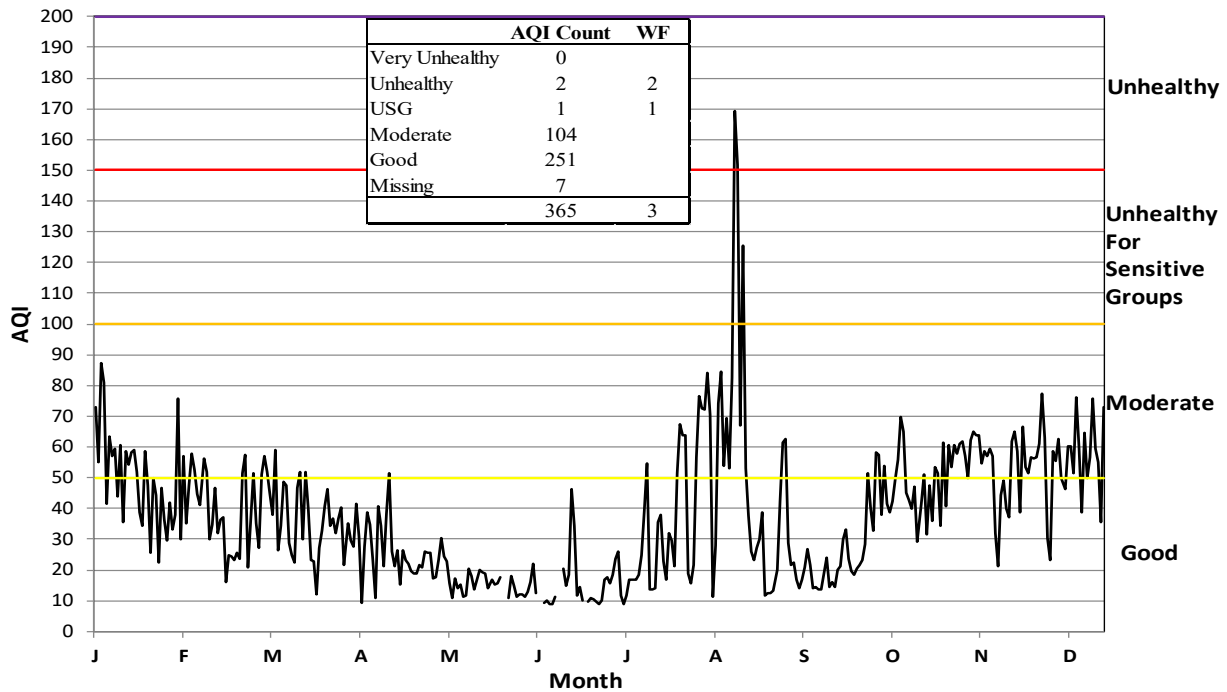


Figure 17. 2018 John Day Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

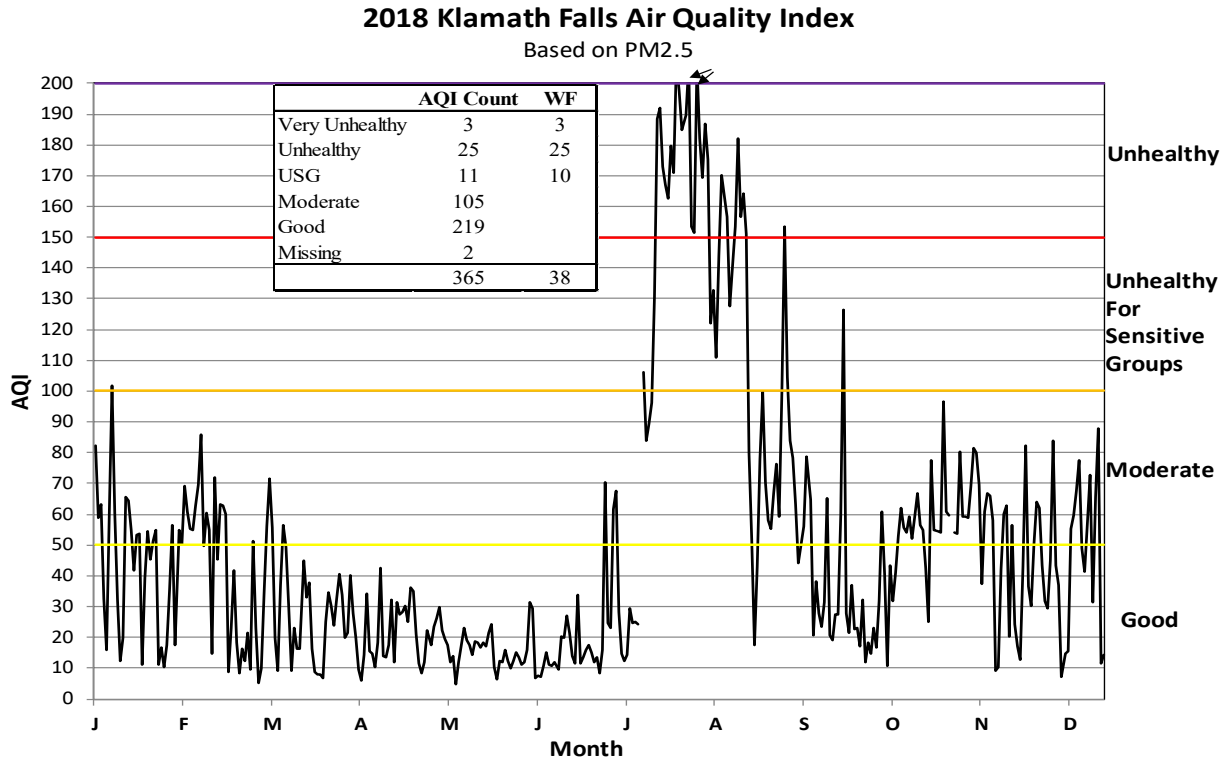


Figure 18. 2018 Klamath Falls Air Quality Index Summary.

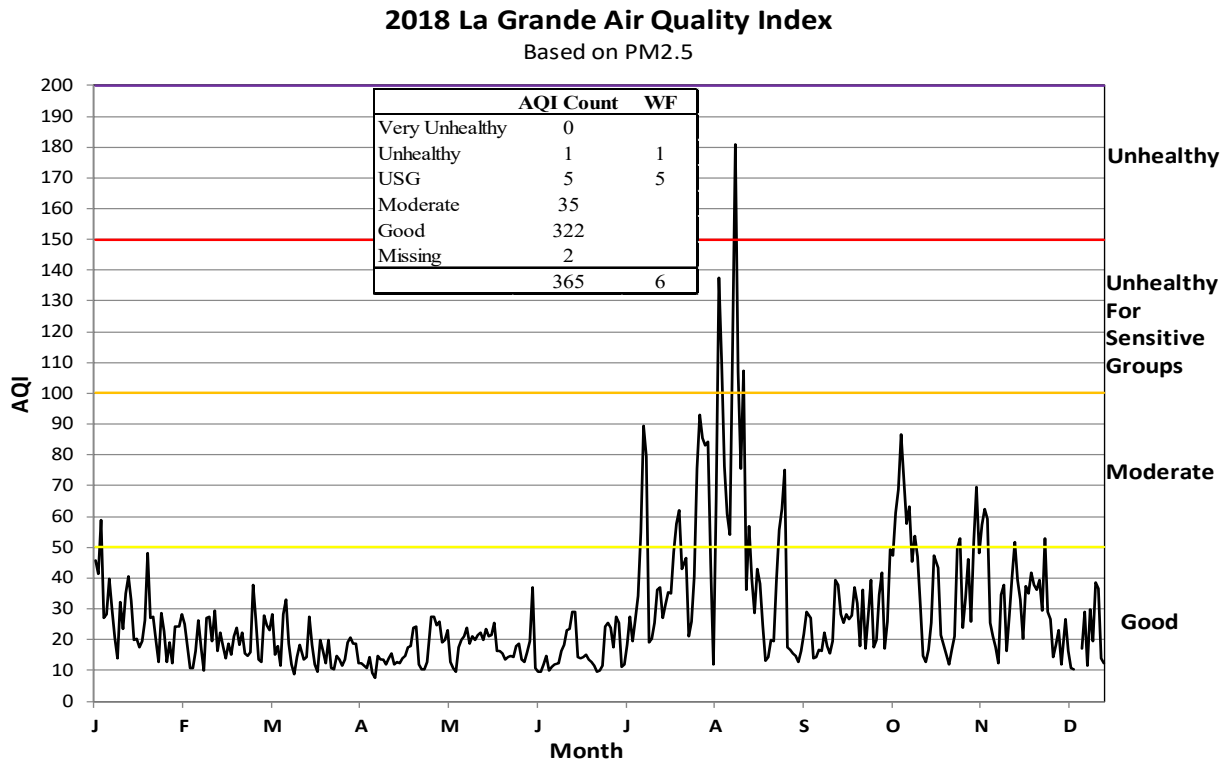


Figure 19. 2018 La Grande Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

2018 Lakeview Air Quality Index Based on PM2.5

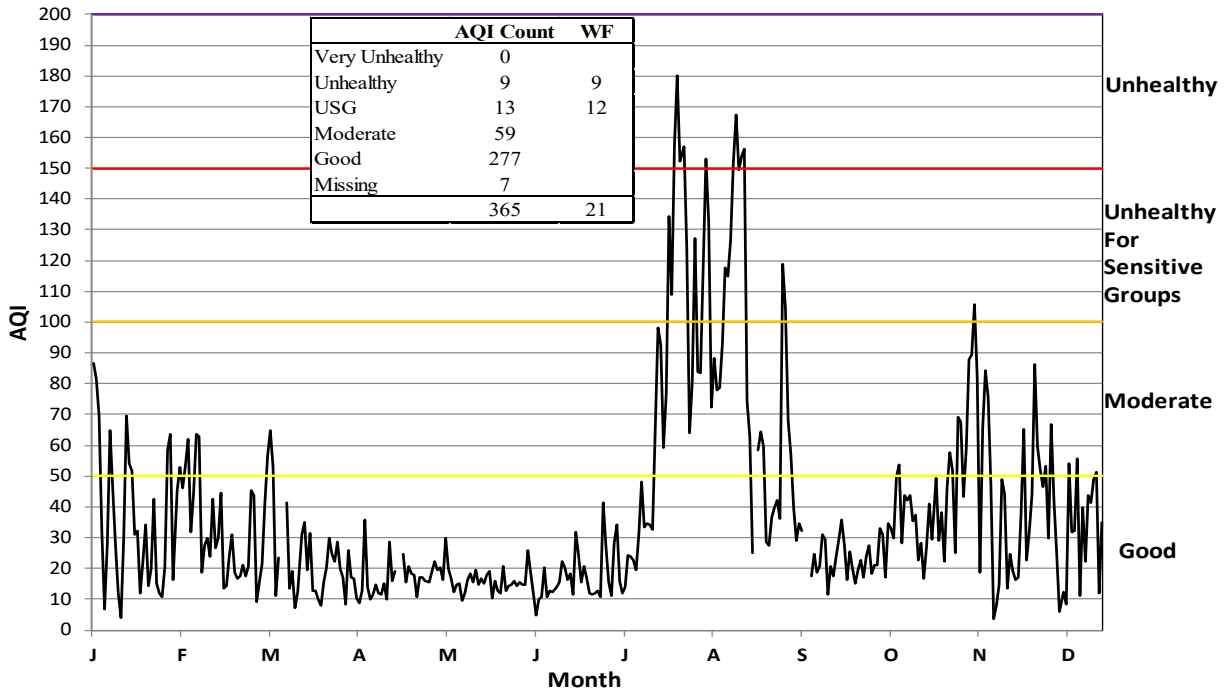


Figure 20. 2018 Lakeview Air Quality Index Summary.

2018 Madras Air Quality Index Based on PM2.5

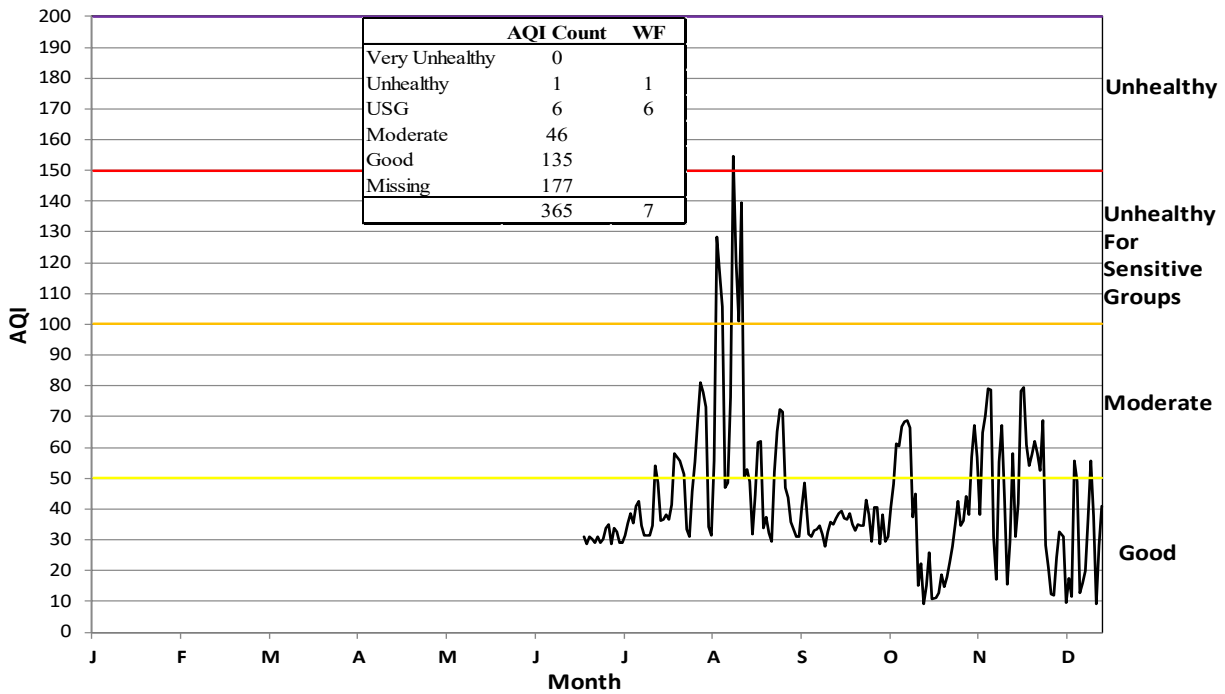


Figure 21. 2018 Madras Summer Air Quality Index Summary.

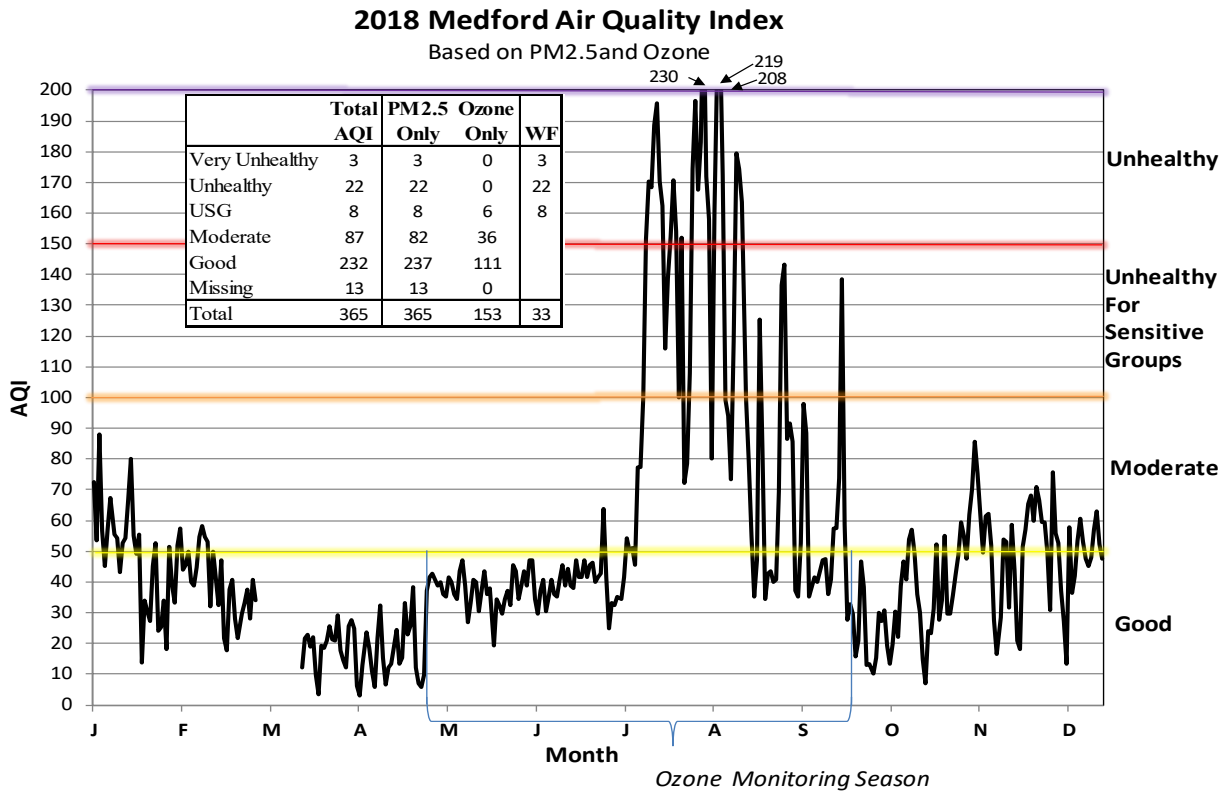


Figure 22. 2018 Medford Air Quality Index Summary.

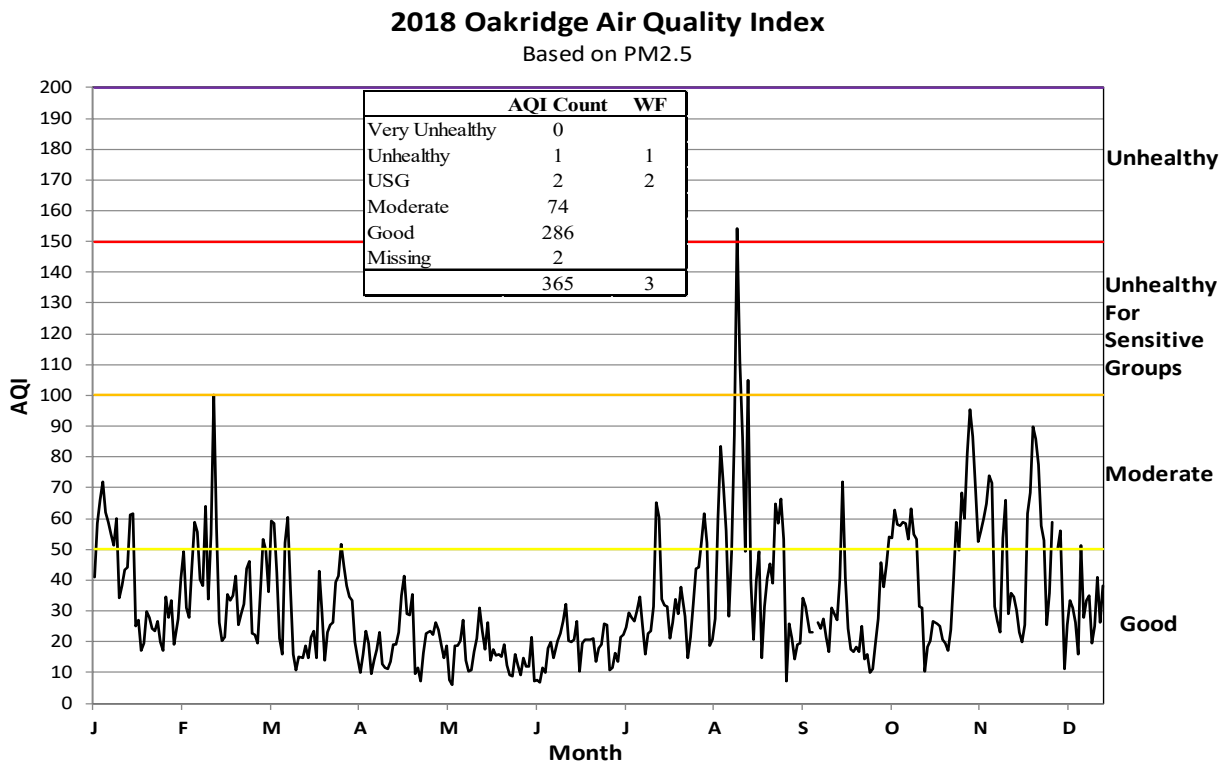


Figure 23. 2018 Oakridge Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

2018 Pendleton Air Quality Index

Based on PM2.5

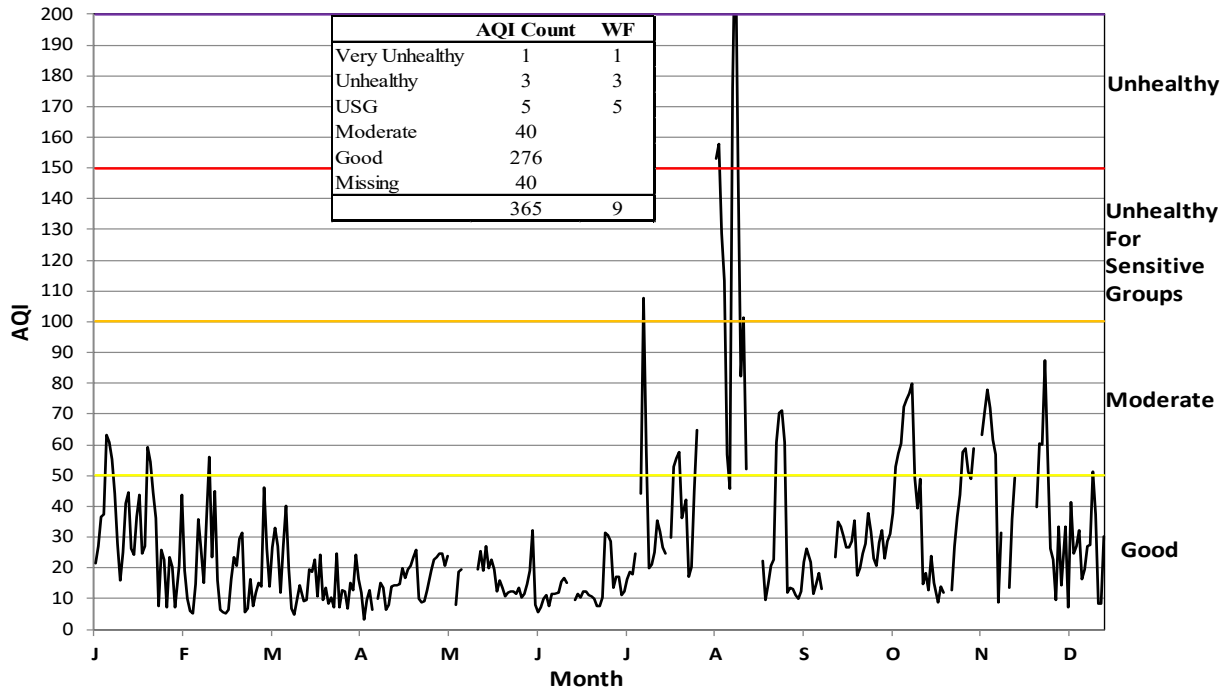


Figure 24. 2018 Pendleton Air Quality Index Summary.

2018 Portland Air Quality Index

Based on PM2.5, Ozone, Carbon Monoxide, Nitrogen Dioxide, and Sulfur Dioxide

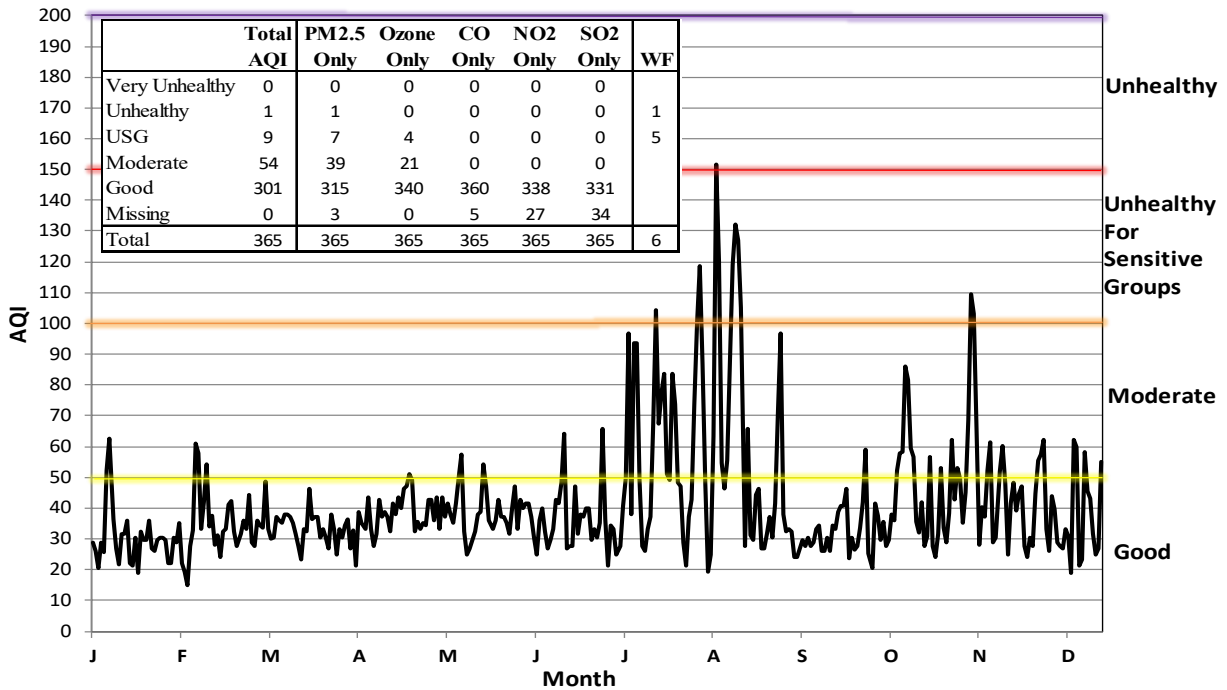


Figure 25. 2018 Portland Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Prineville Air Quality Index

Based on PM2.5

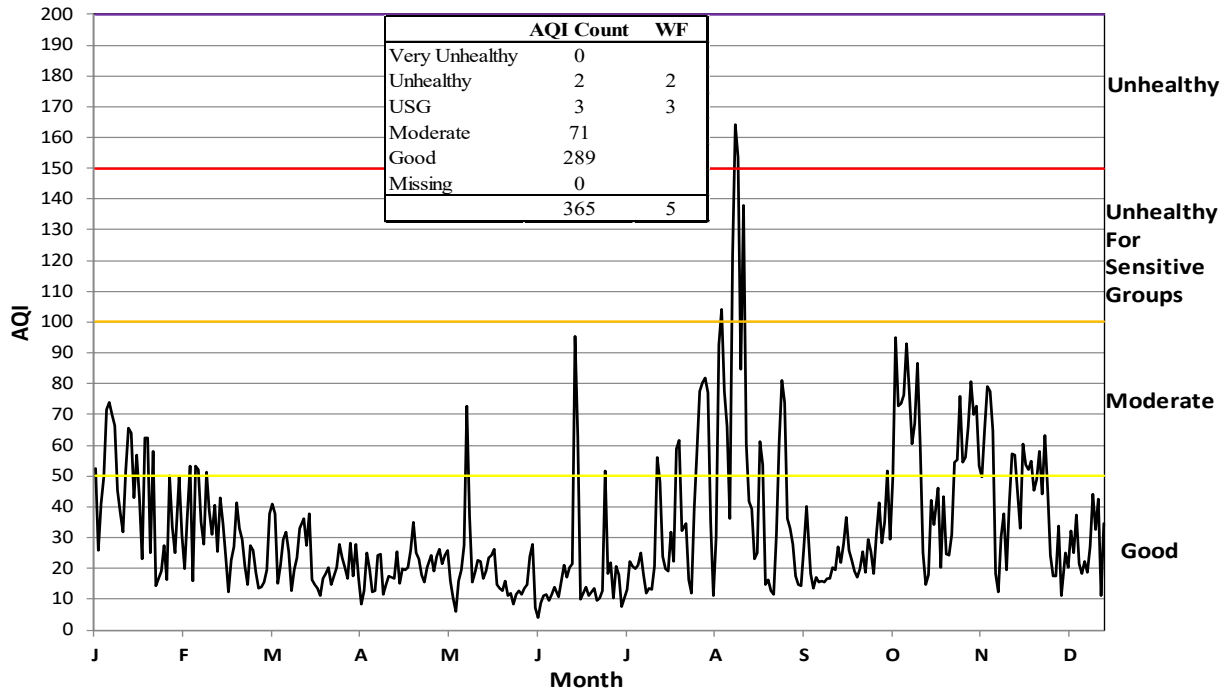


Figure 26. 2018 Prineville Air Quality Index Summary.

2018 Roseburg Air Quality Index

Based on PM2.5

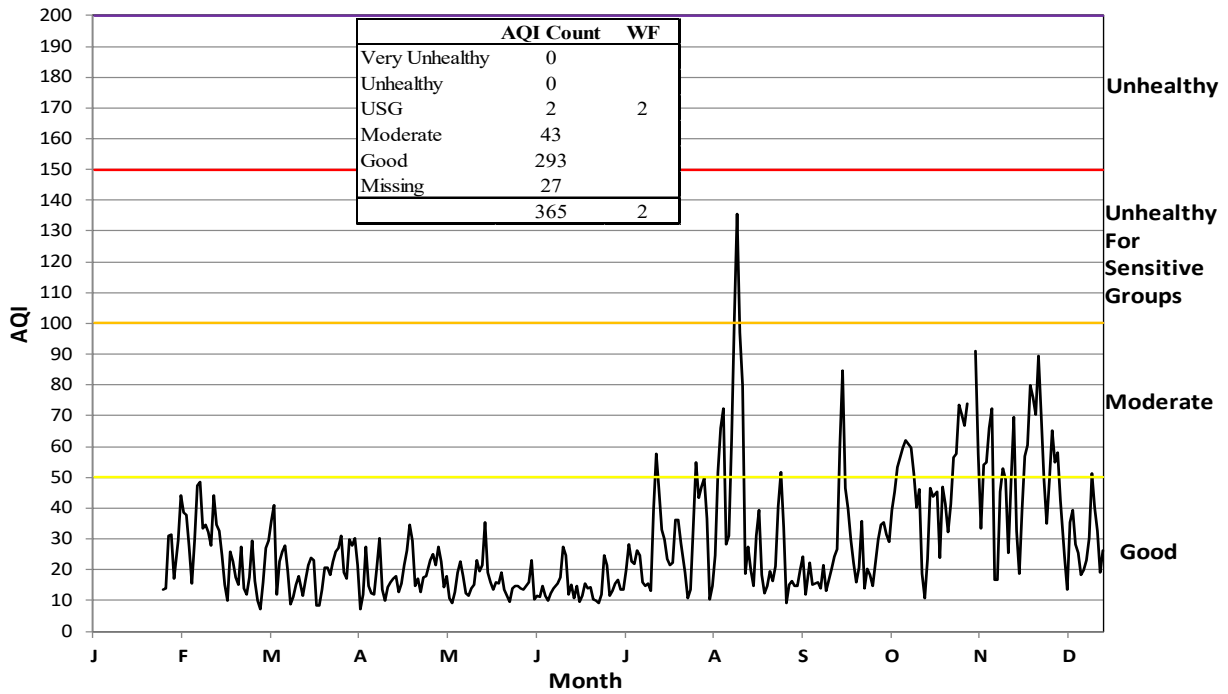


Figure 27. 2018 Roseburg Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Salem Air Quality Index
Based on PM2.5 and Ozone

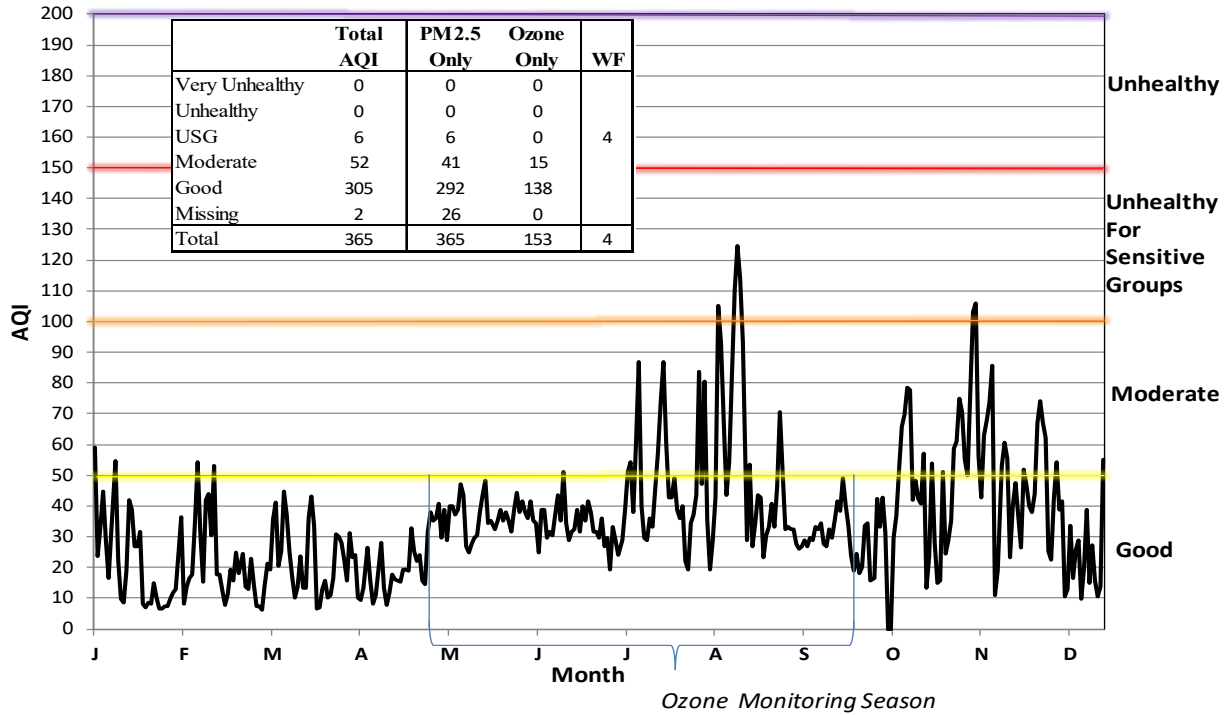


Figure 28. 2018 Salem Air Quality Index Summary.

2018 Sauvie Island Air Quality Index
Based on PM2.5

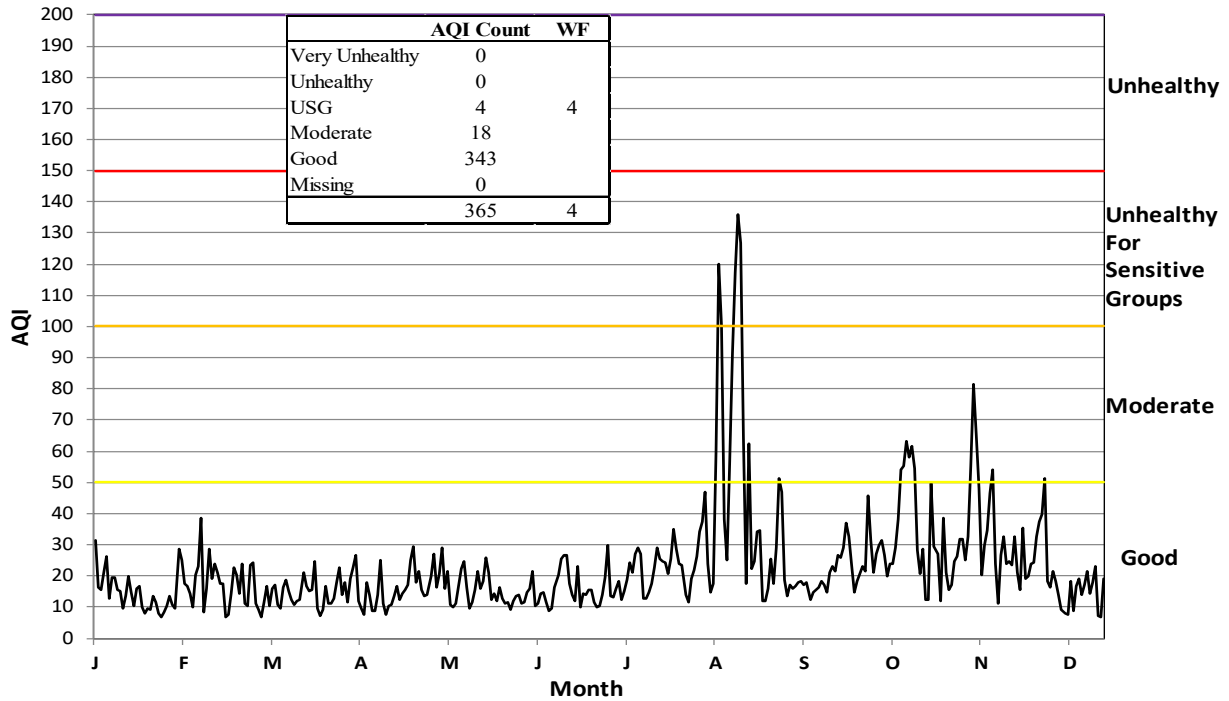


Figure 29. 2018 Sauvie Island Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

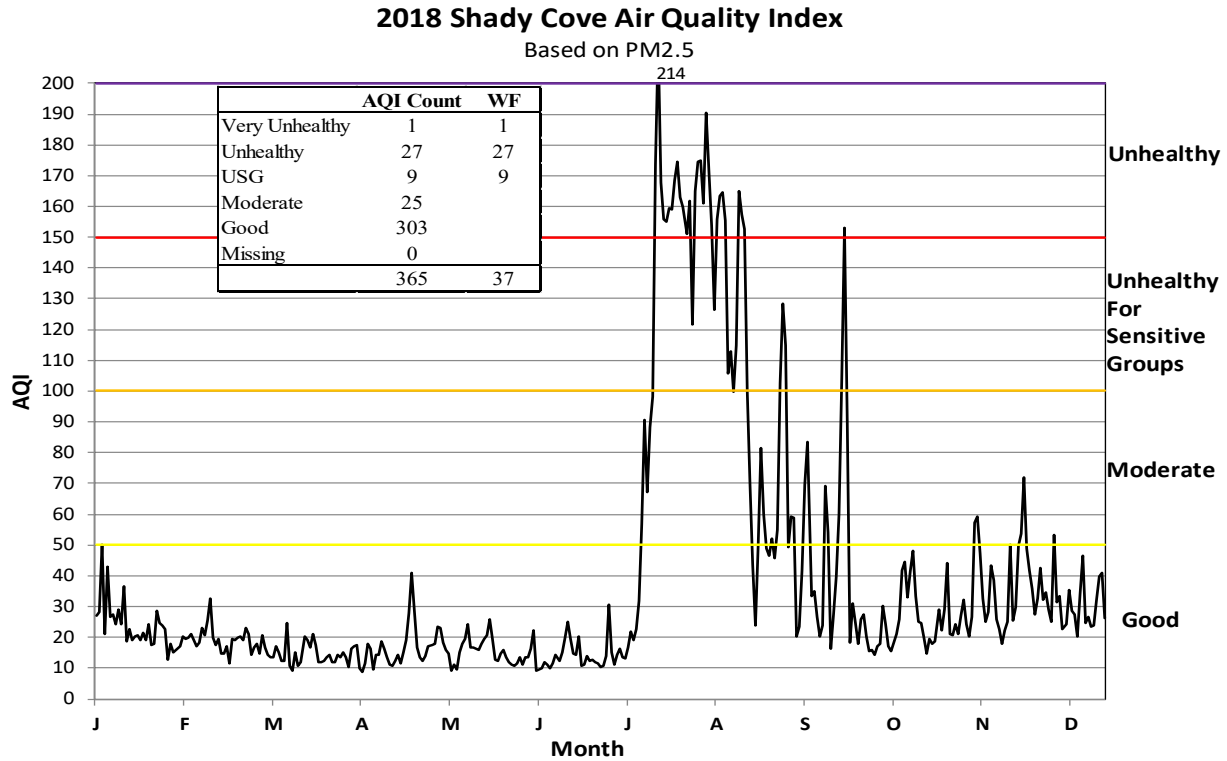


Figure 30. 2018 Shady Cove Air Quality Index Summary.

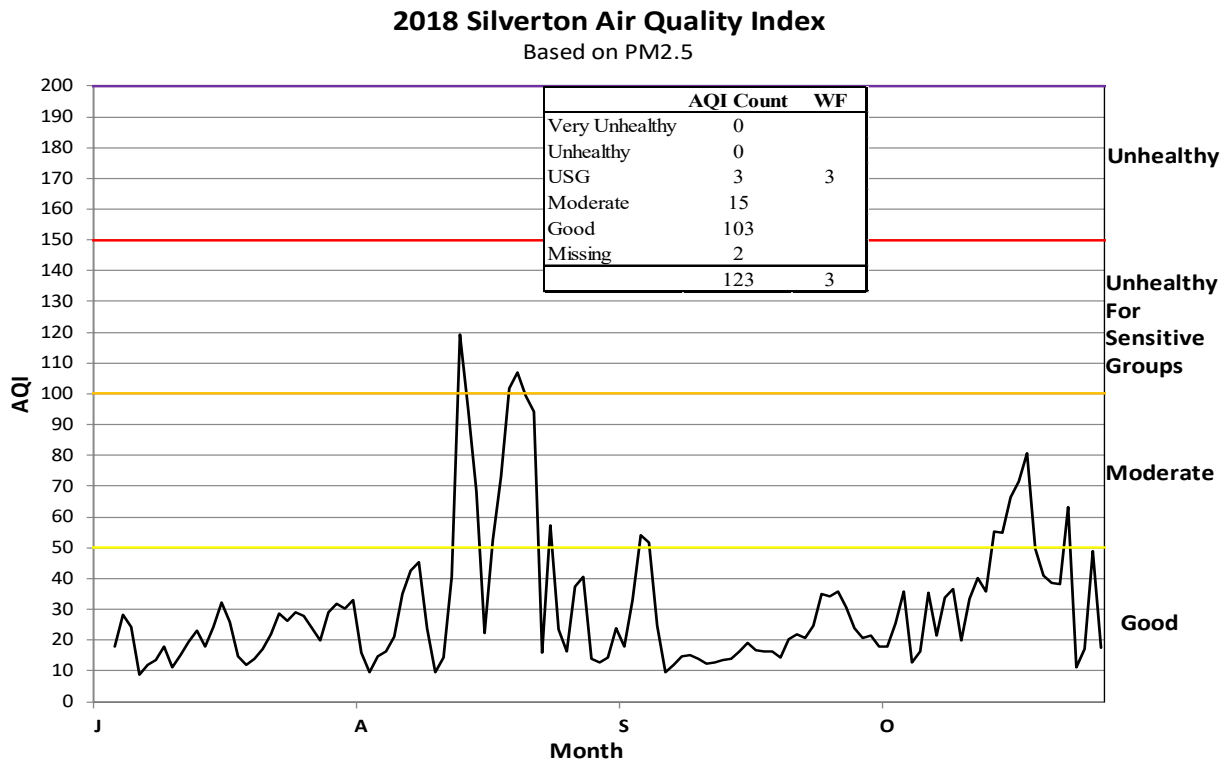


Figure 31. 2018 Silverton Summer Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

2018 Sisters Air Quality Index Based on PM2.5

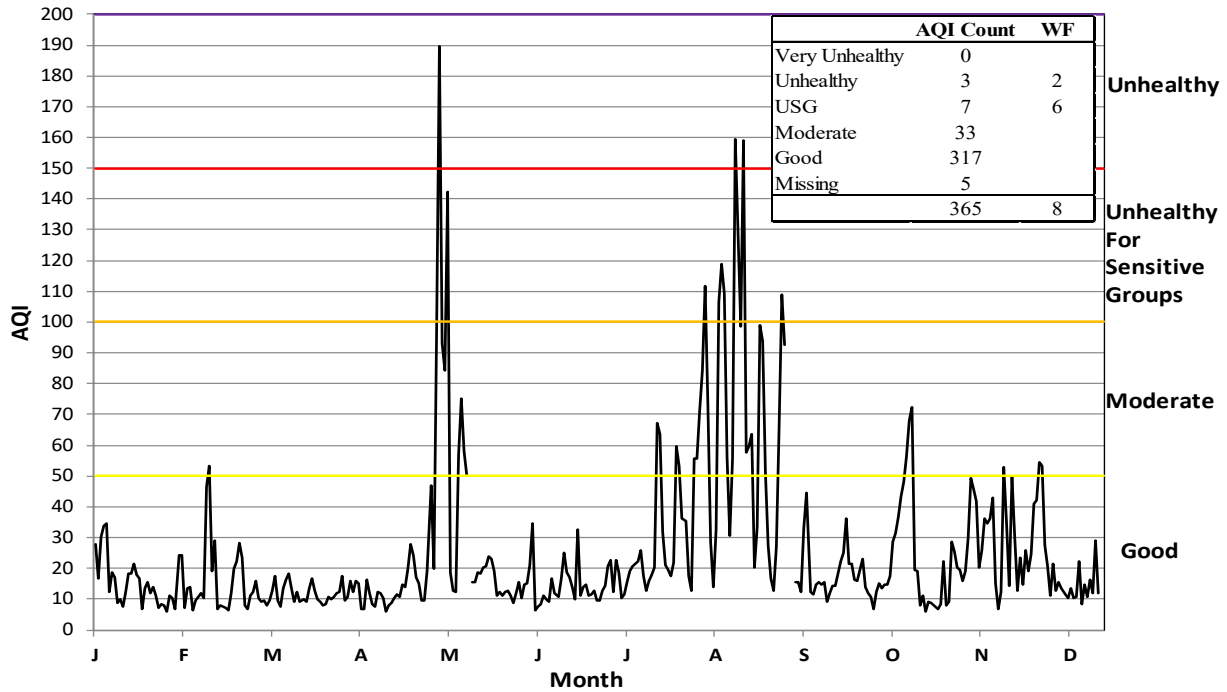


Figure 32. 2018 Sisters Air Quality Index Summary.

2018 Springfield Air Quality Index Based on PM2.5

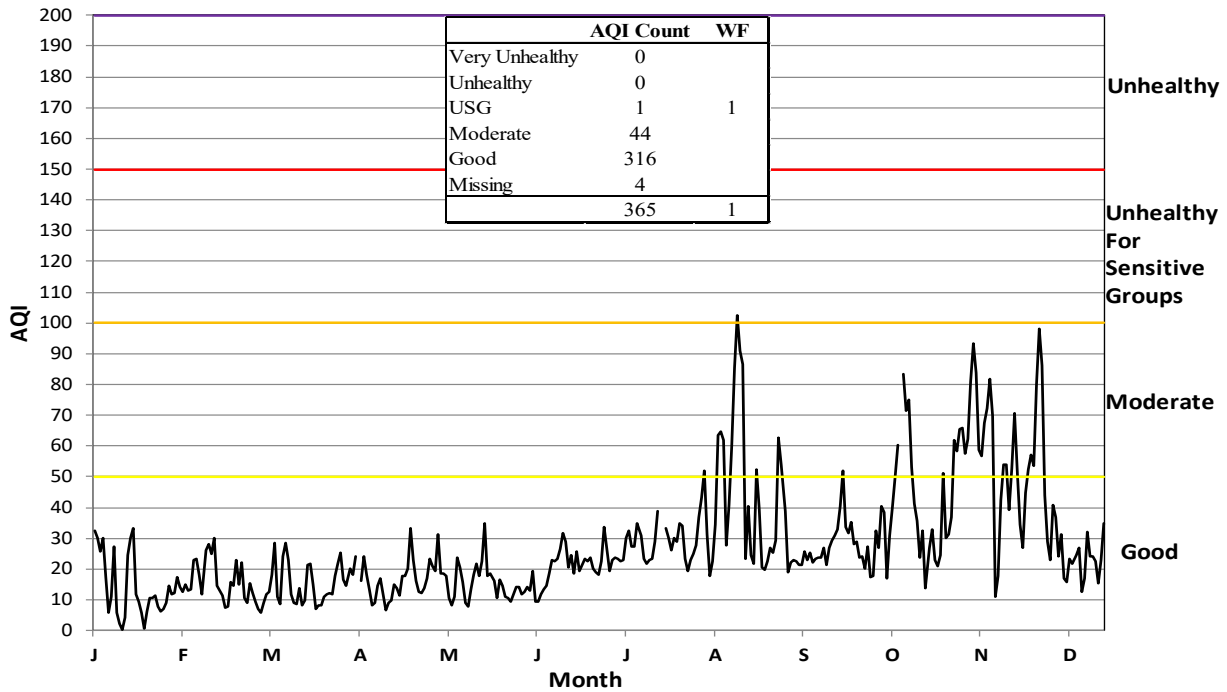


Figure 33. 2018 Springfield Air Quality Index Summary

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

2018 Sweet Home Air Quality Index Based on PM2.5

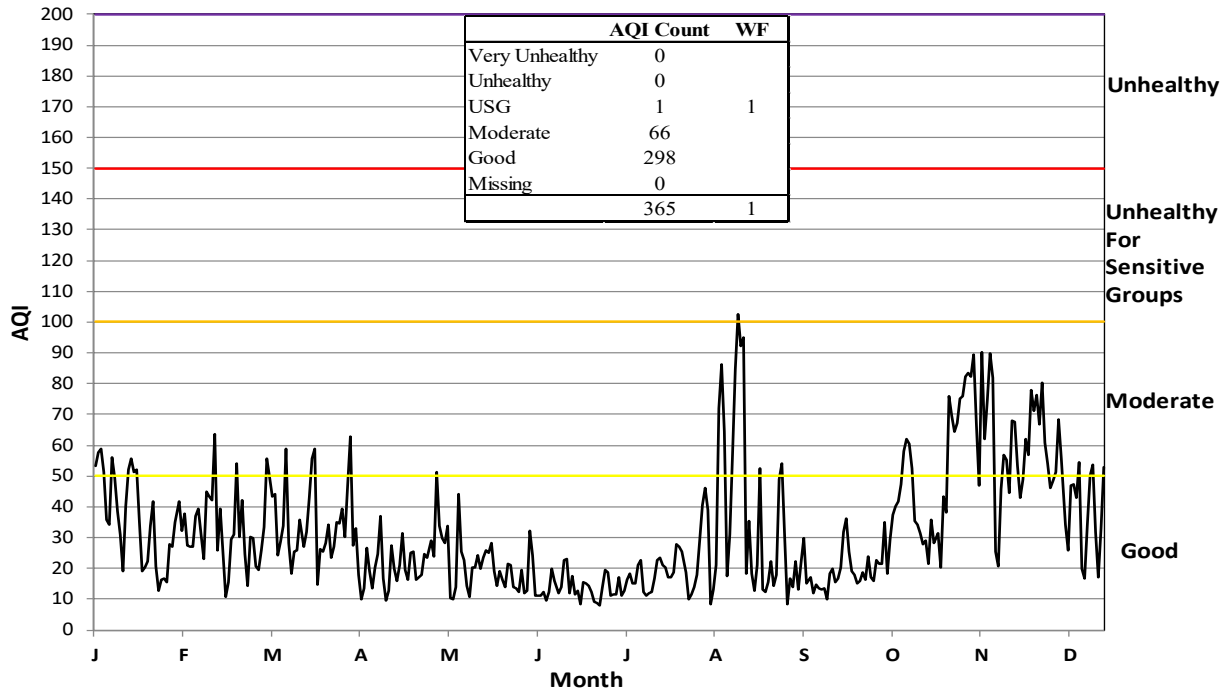


Figure 34. 2018 Sweet Home Air Quality Index Summary.

2018 The Dalles Air Quality Index Based on PM2.5

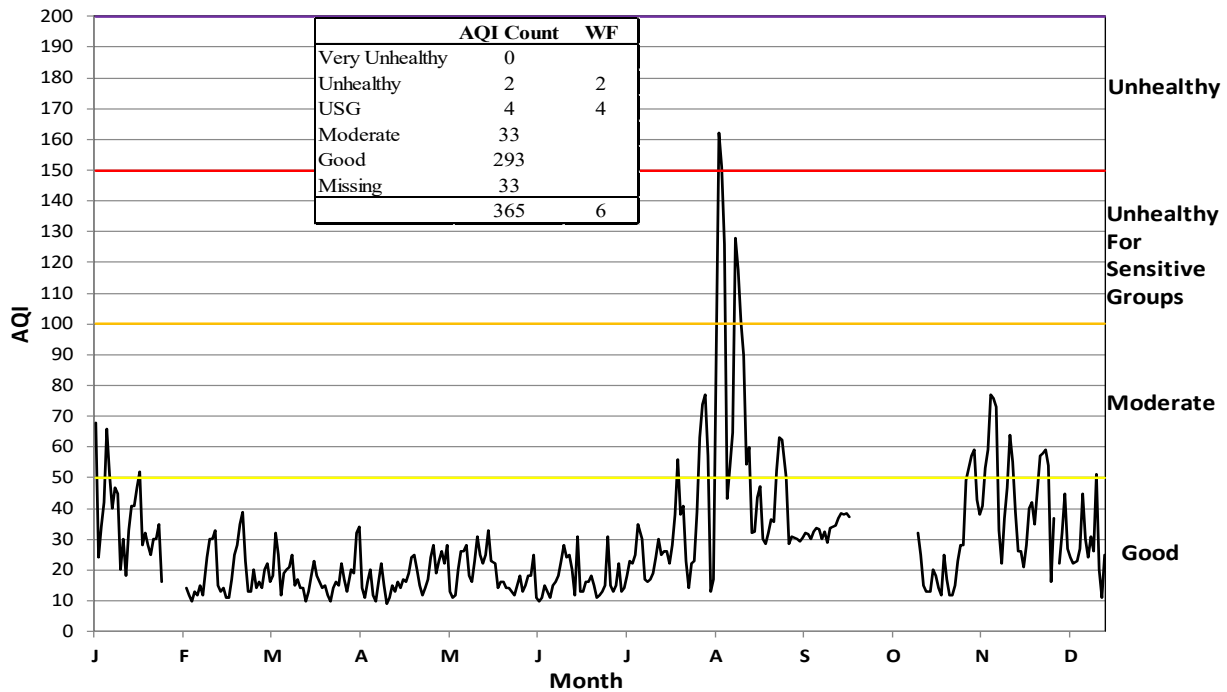


Figure 35. 2018 The Dalles Air Quality Index Summary.

WF = Wildfire Smoke Impact
USG = Unhealthy for Sensitive Groups

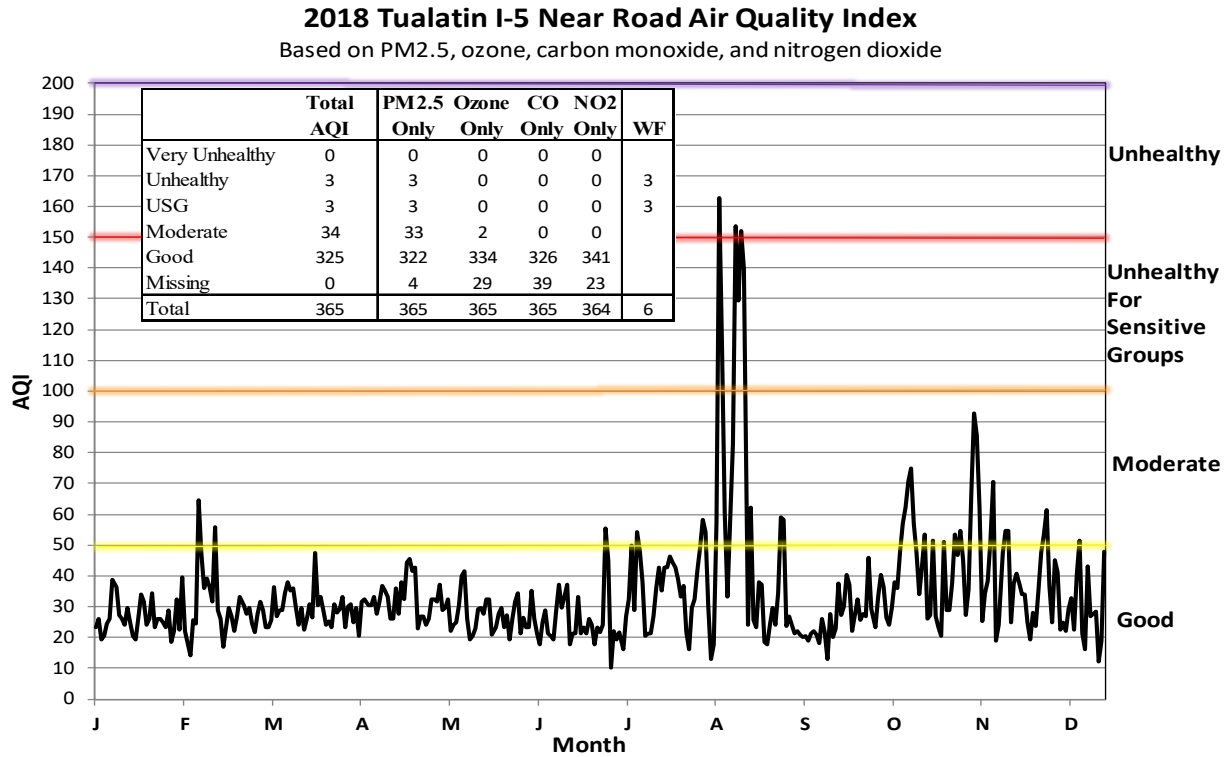


Figure 36. 2018 Tualatin Interstate-5 Near-Road Air Quality Index Summary

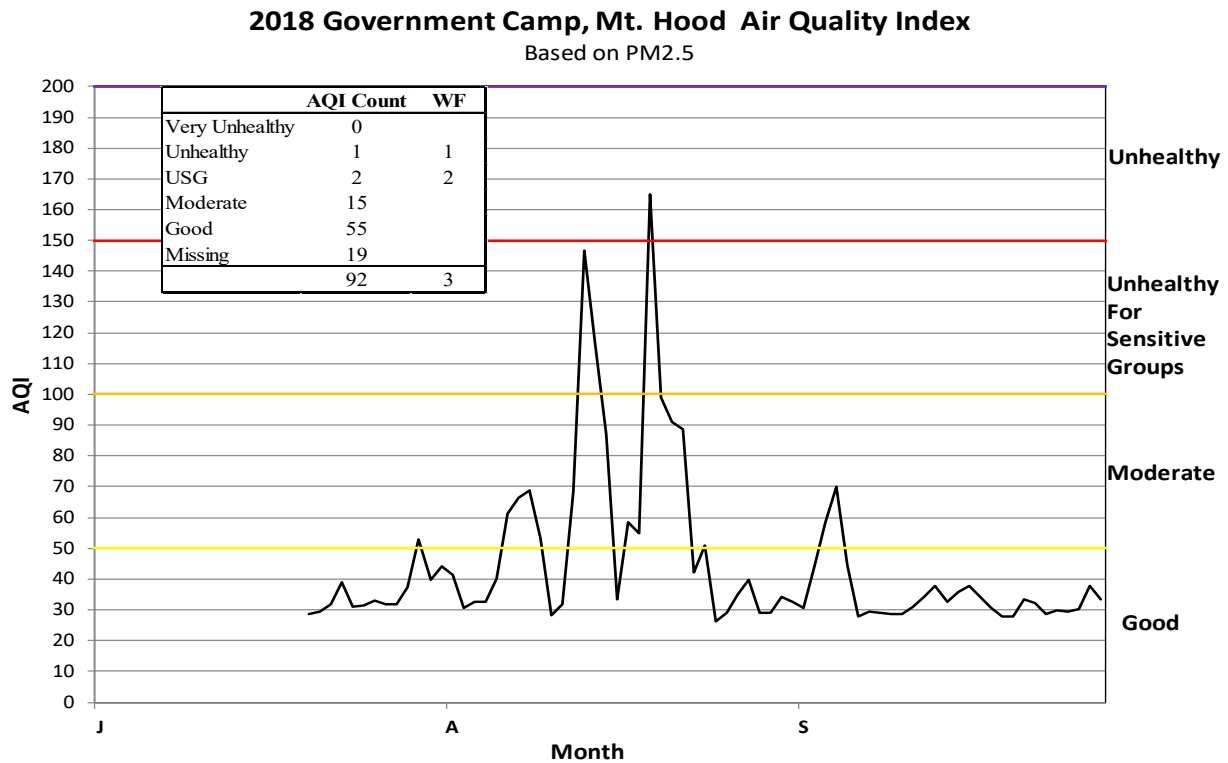


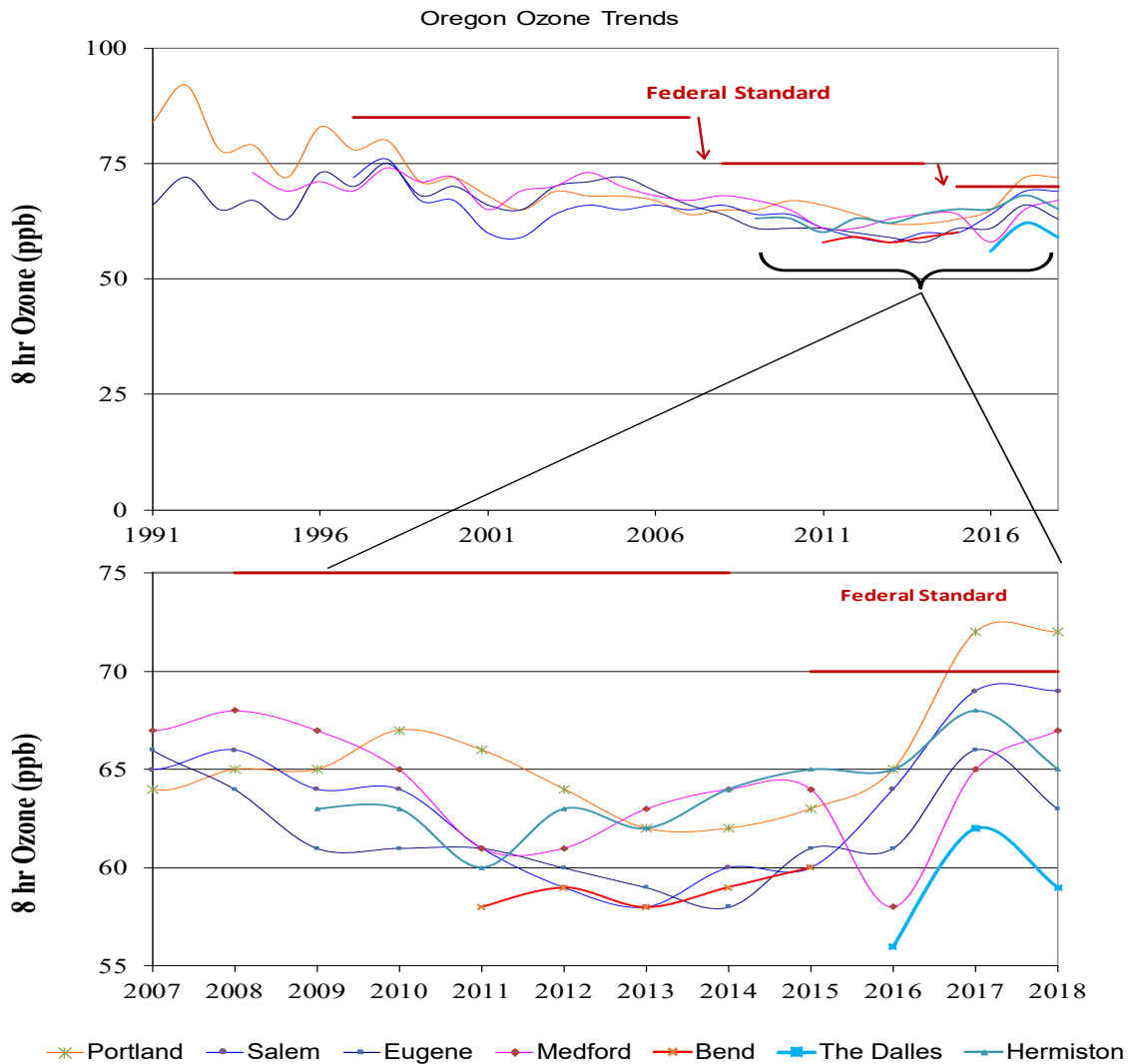
Figure 37. 2018 Mt. Hood Summer Air Quality Index Summary.

WF = Wildfire Smoke Impact
 USG = Unhealthy for Sensitive Groups

Air Quality Trends

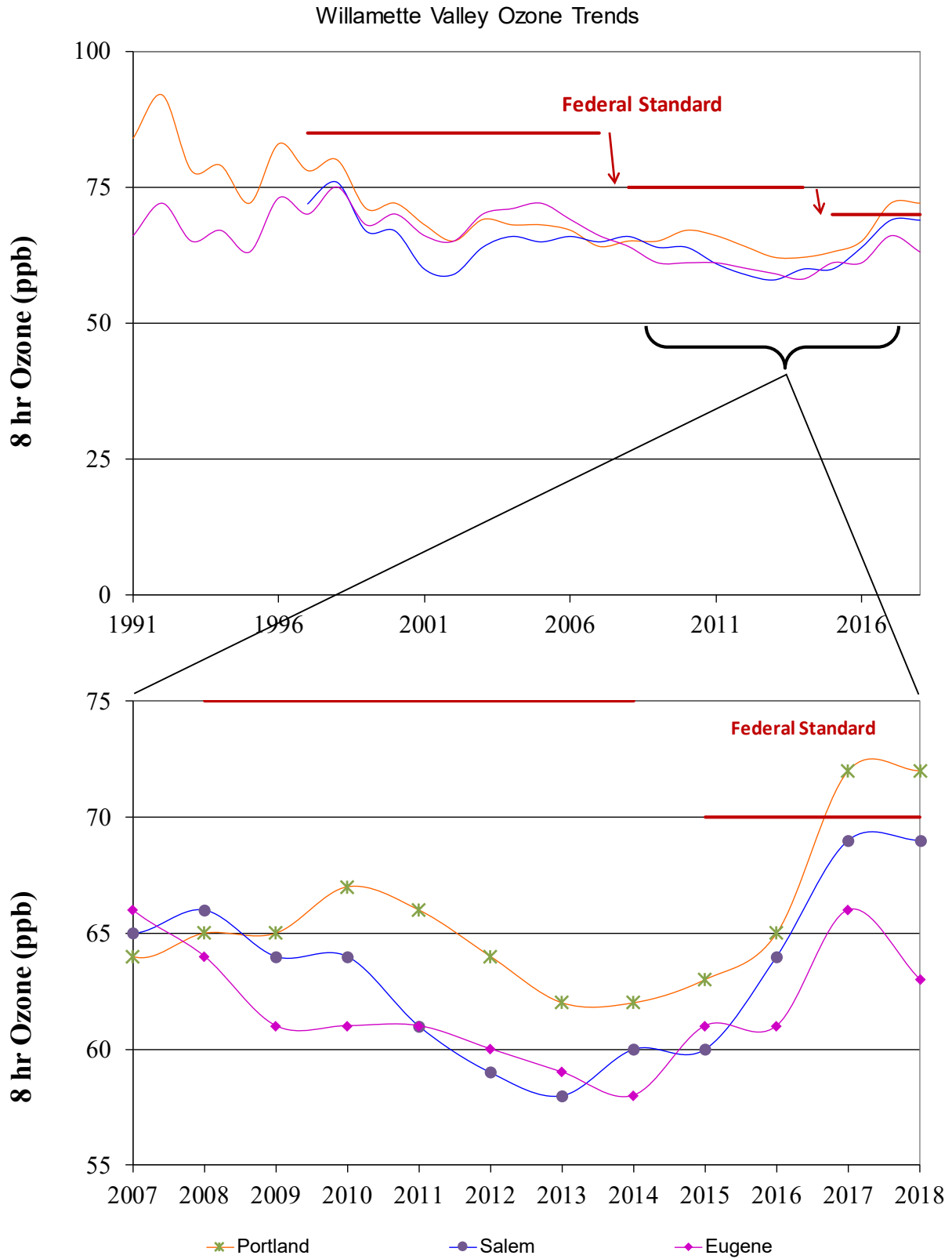
Ozone Trends

Ozone is a secondary pollutant formed when there are elevated levels of nitrogen dioxide and volatile organic compounds that undergo chemical reactions in high temperatures, and sunlight. In Oregon, elevated ozone occurs in the summer and can be formed by human-caused pollution from fossil fuel combustion and also by naturally caused pollution from wildfire smoke, which contains NO₂ and VOCs. In 2018, most of the state experienced elevated ozone because the wildfire smoke introduced natural precursors on top of the human-caused emissions. With global warming we expect more fires in the Northwest and higher temperature days; this will result in more elevated ozone days. The graphs below show the air quality trends compared to the National Ambient Air Quality Standard (NAAQS). Data with wildfire contributions are included because it is very difficult to determine if the ozone would have exceeded the NAAQS without the smoke from wildfires.



Three year average of the 4th highest daily maximum 8 hour average

Figure 38. Oregon ozone trend.
For more detail, see the charts by region below.



Three year average of the 4th highest daily maximum 8 hour average

Figure 39. Willamette Valley ozone trends

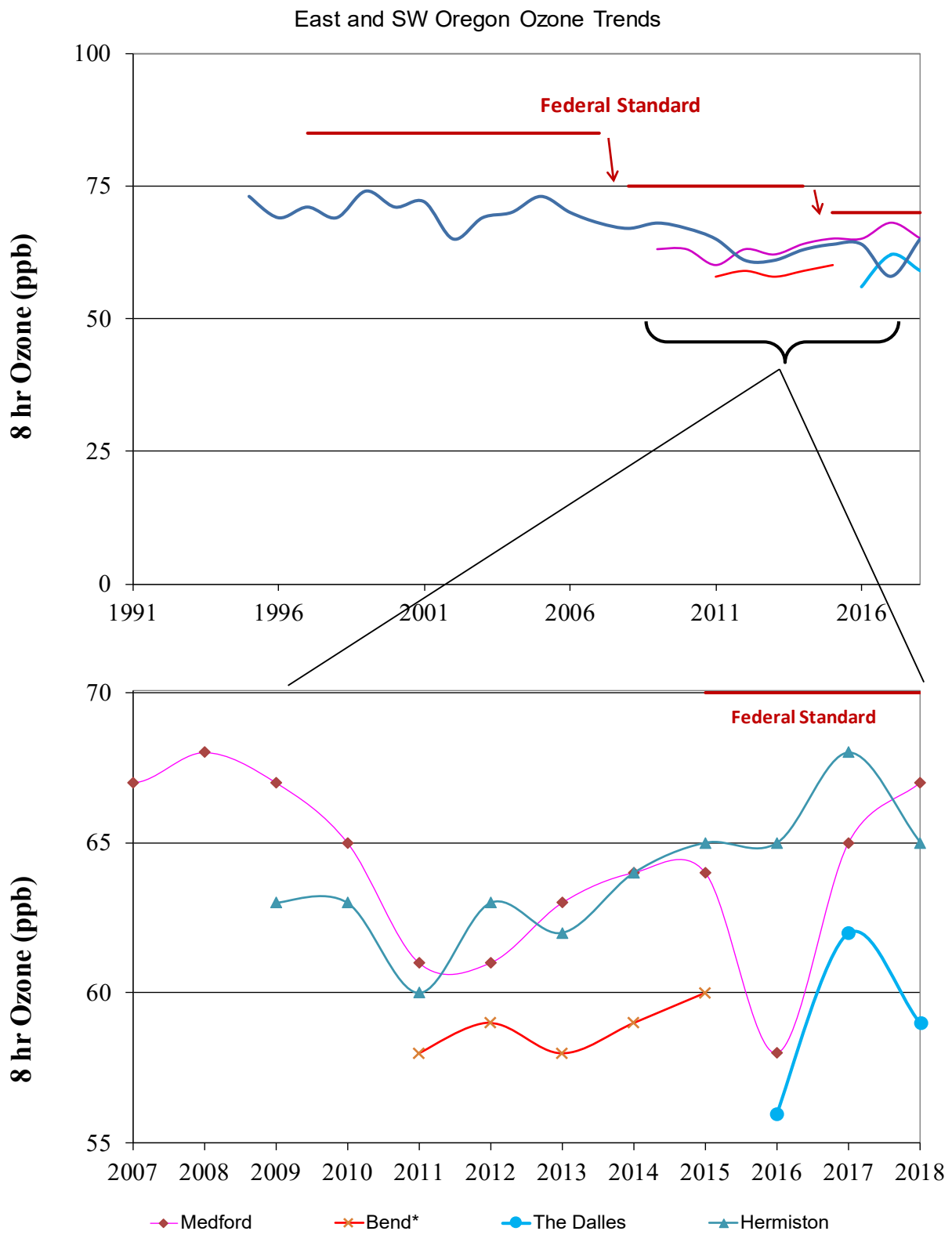


Figure 40. Southwest and Eastern Oregon ozone trends

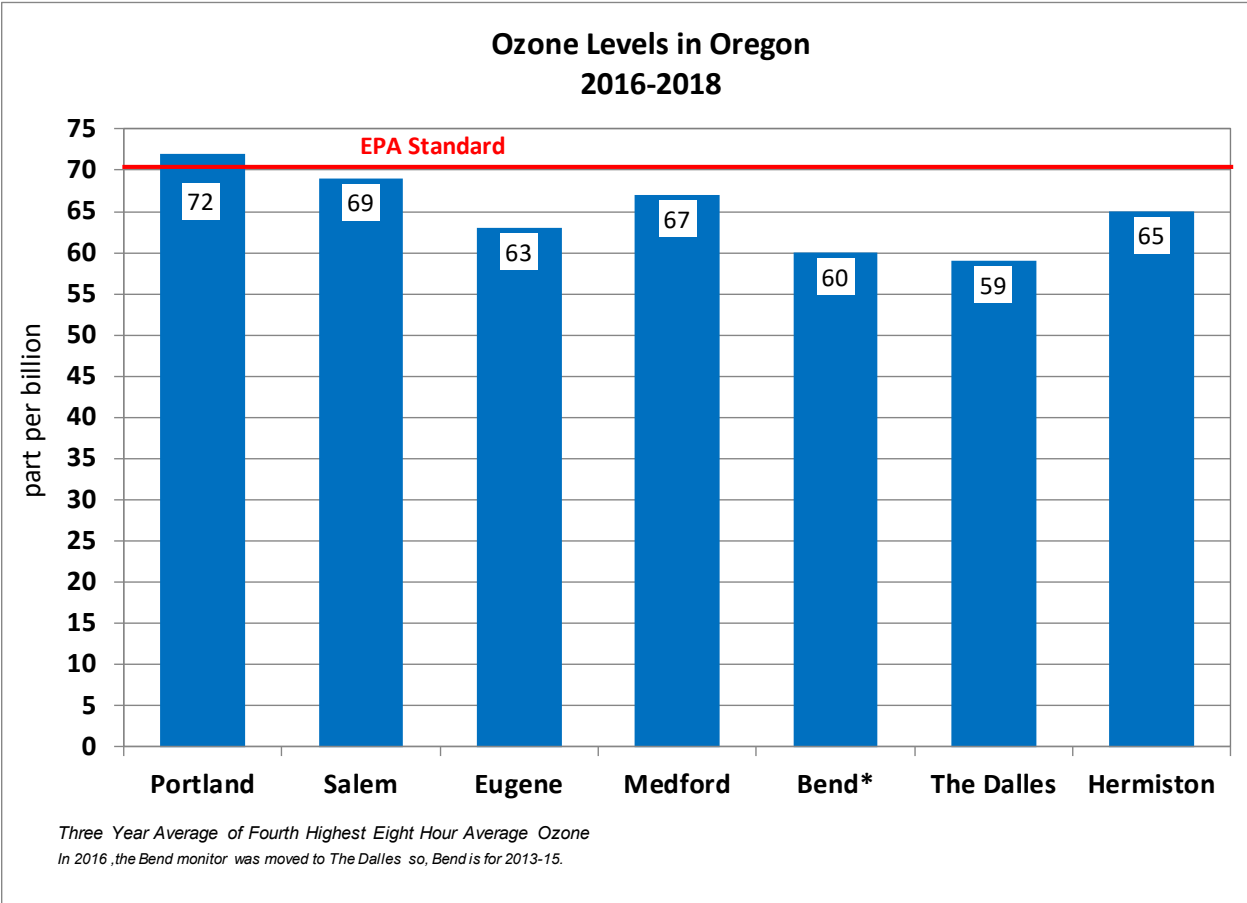


Figure 41. Oregon cities 2016-2018 Ozone Levels

Note that the wildfire smoke in 2017 and 2018 contributed to the elevated ozone levels most likely caused Portland to violate the NAAQS although since high ozone occurs in the summer months precisely when wildfire smoke impacts occur, it is very difficult to determine what the ozone level would have been but for the wildfire smoke.

PM2.5 Trends

The charts below show the trends for the 98th percentile and annual average PM2.5. The 98th Percentile is used for comparison to the daily standard. Wildfire data was separated for daily standard comparison.

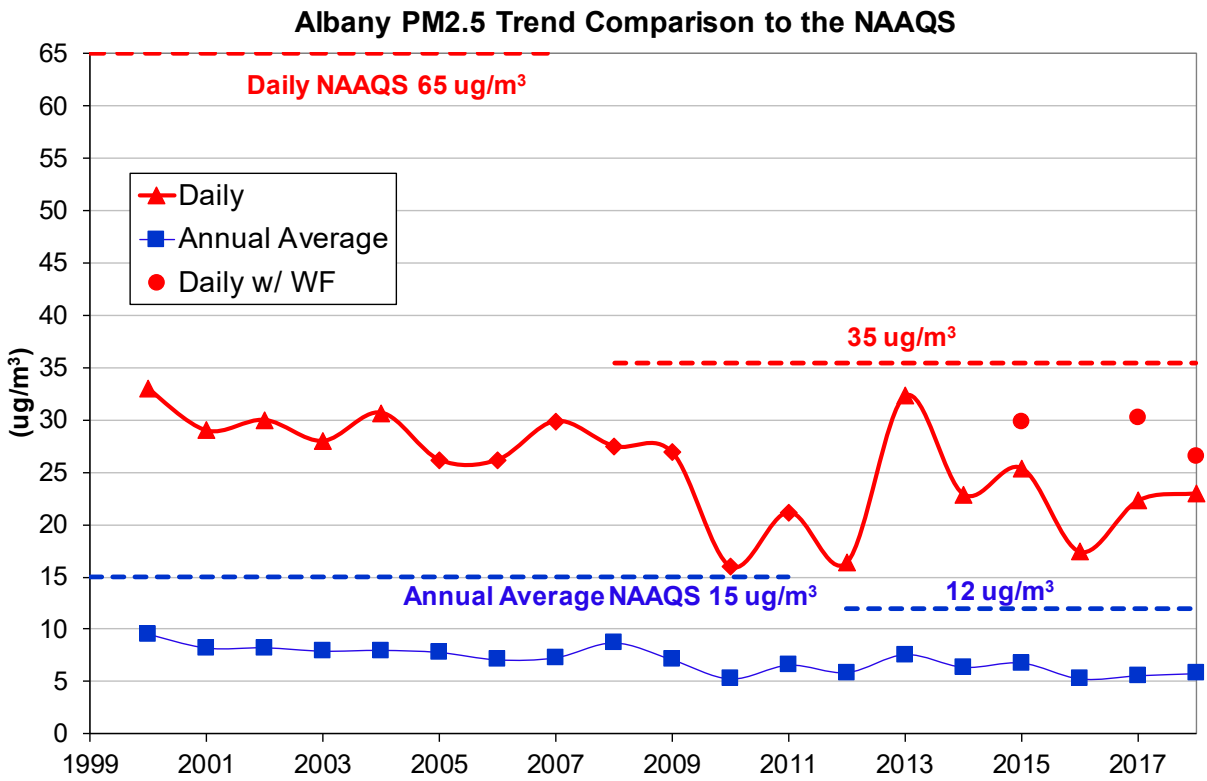


Figure 42. Albany PM2.5 trends

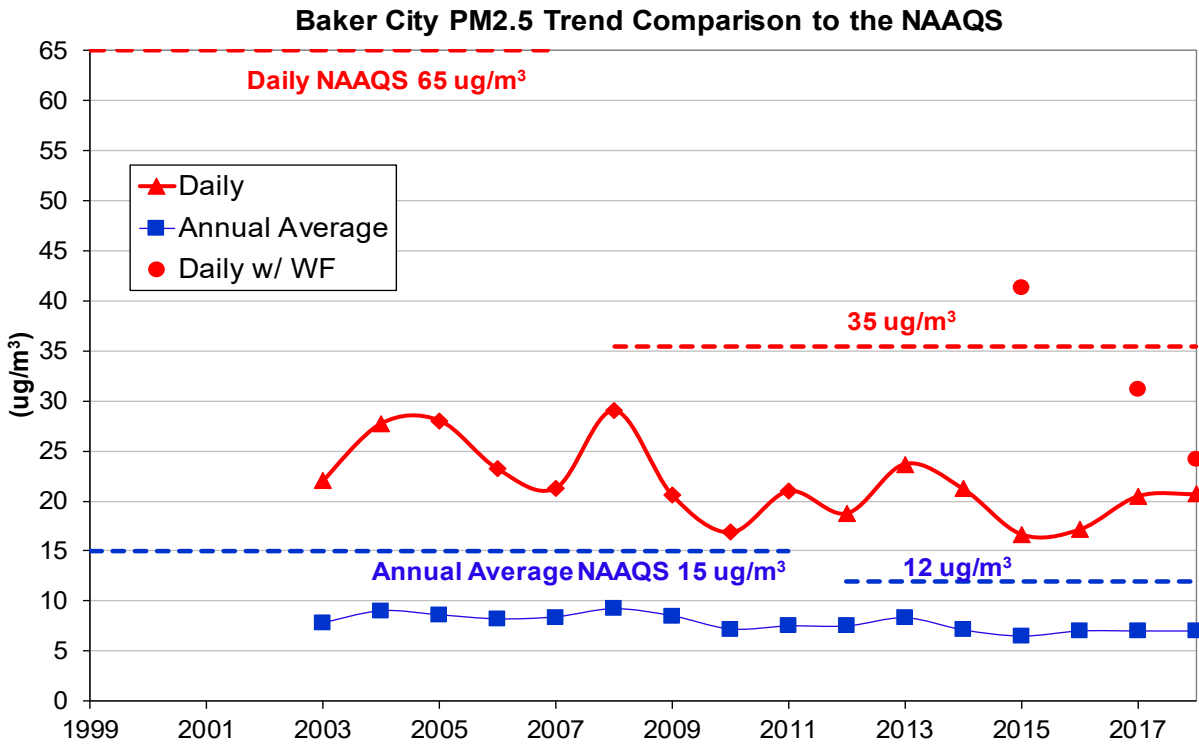


Figure 43. Baker City PM2.5 trends

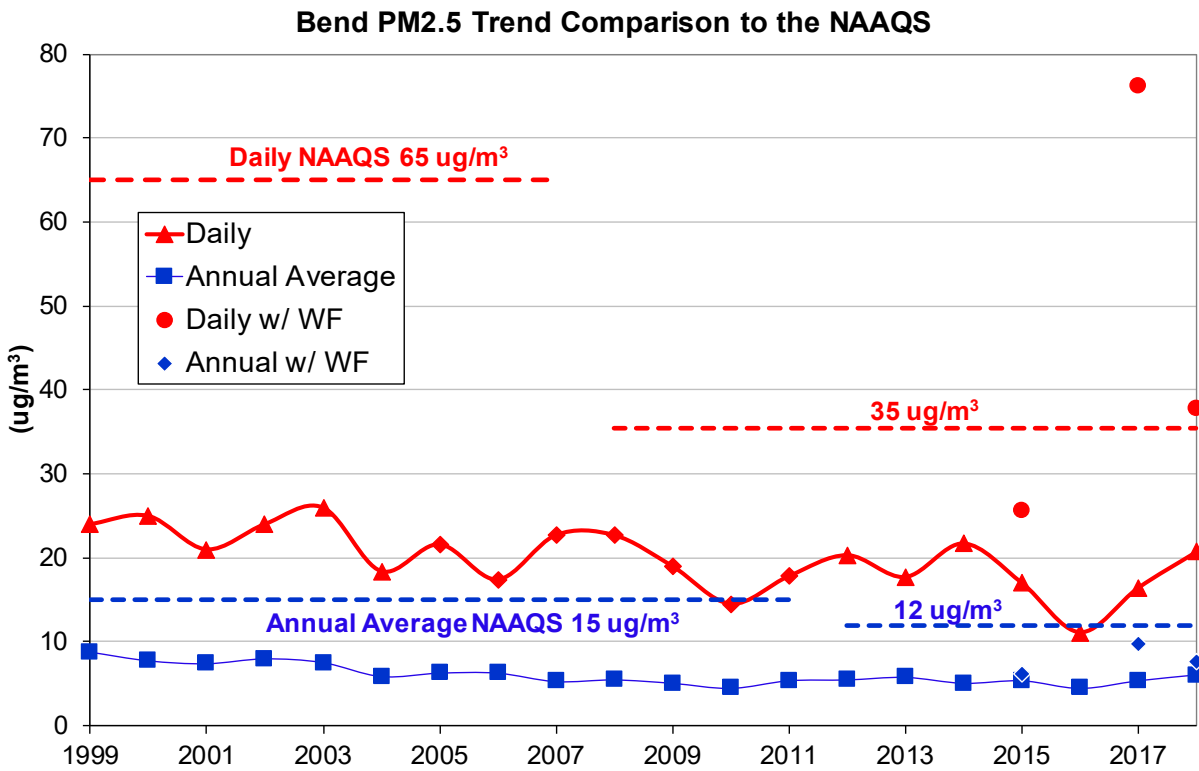


Figure 44. Bend PM2.5 trends

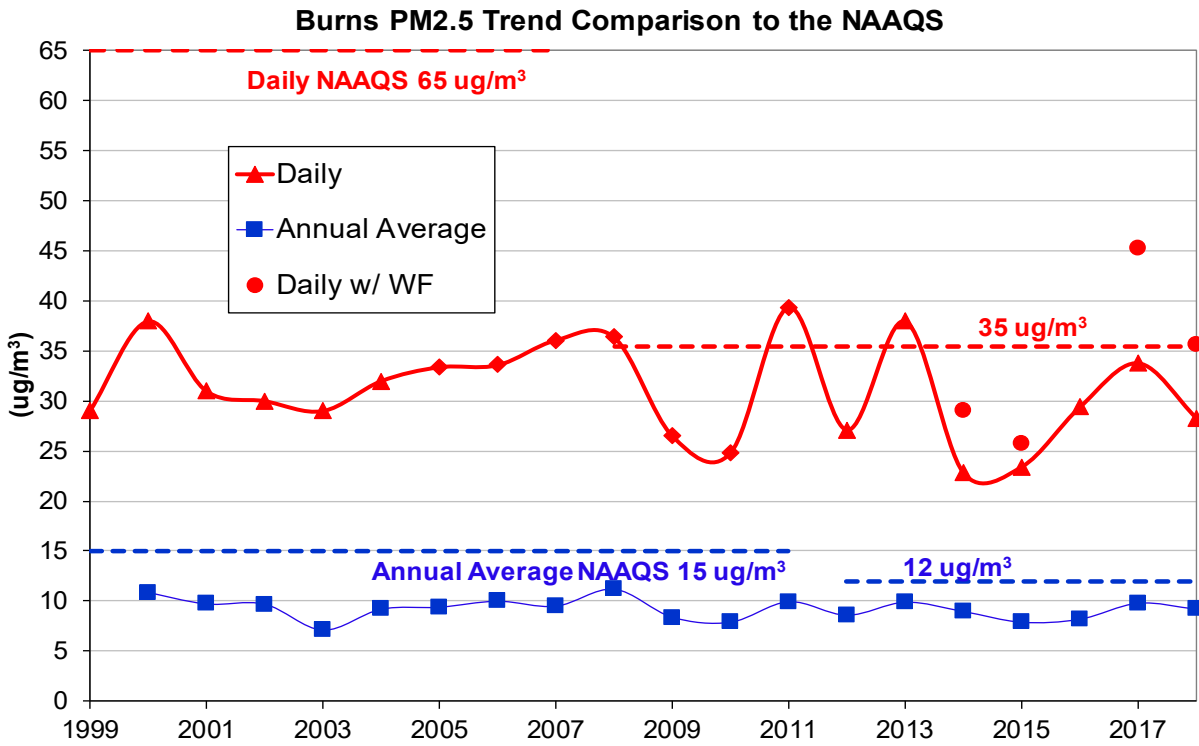


Figure 45. Burns PM2.5 trend.

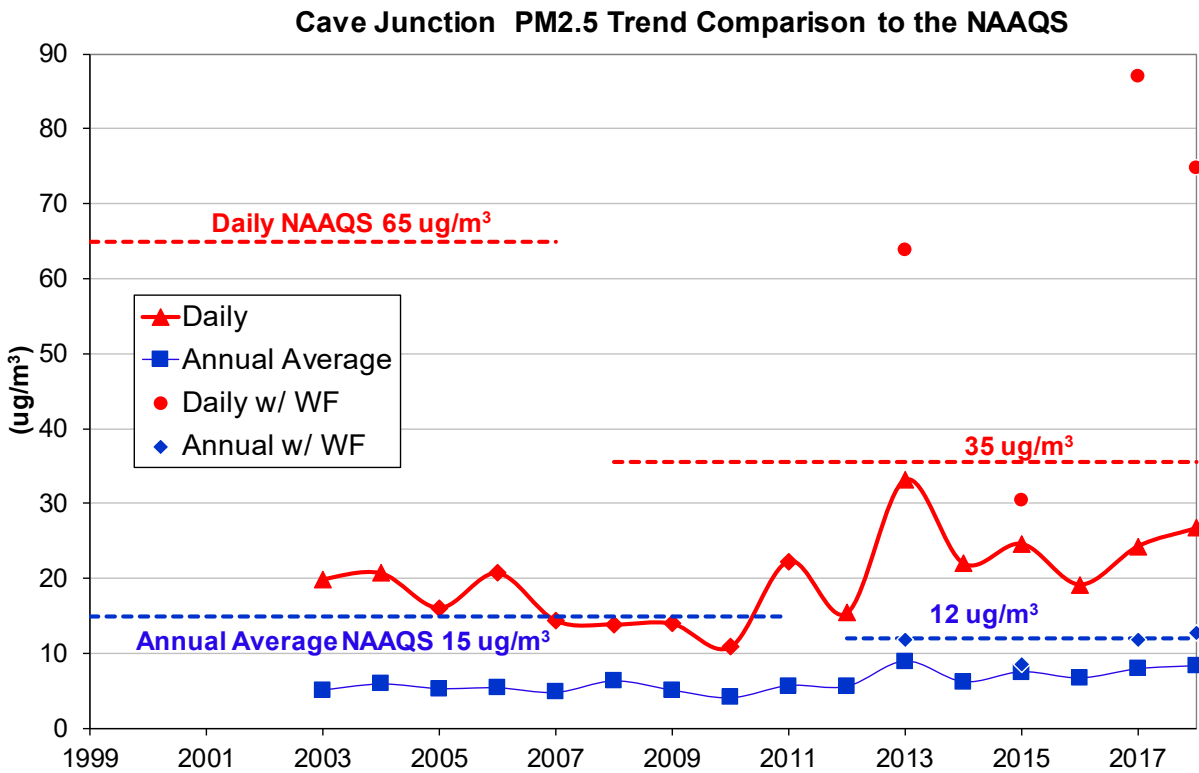


Figure 46. Cave Junction PM2.5 trend.

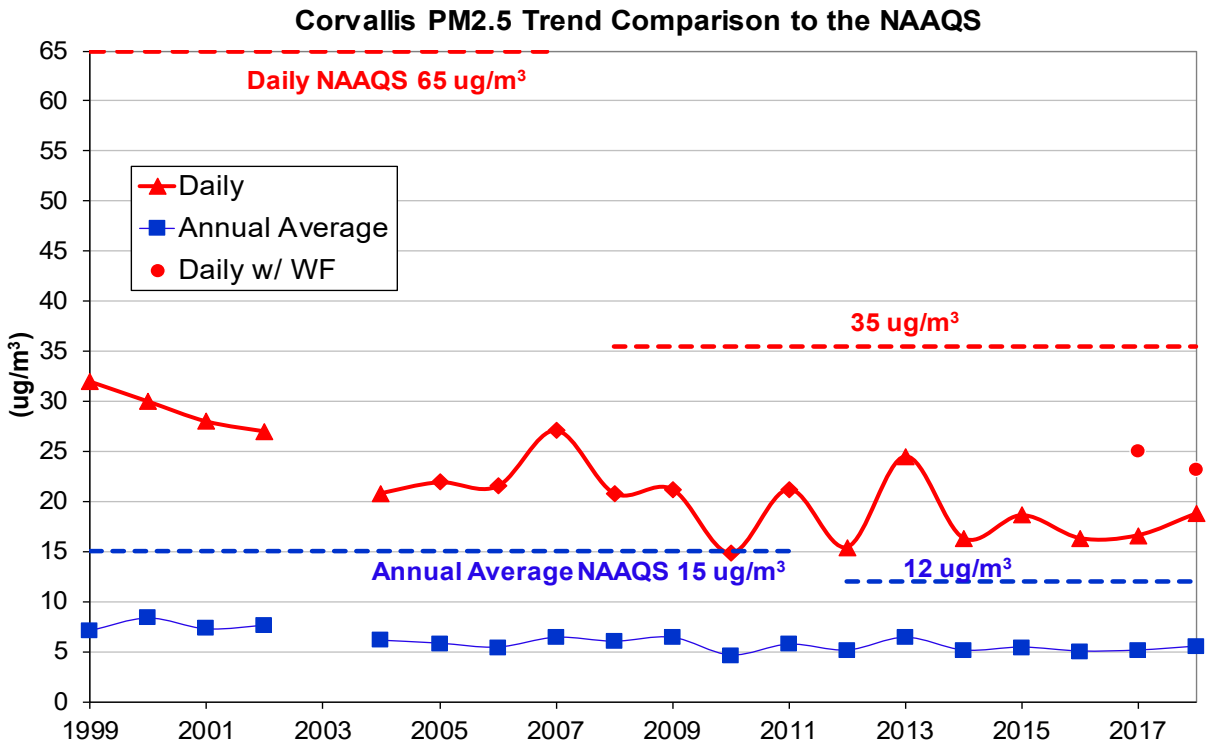


Figure 47. Corvallis PM2.5 trend.

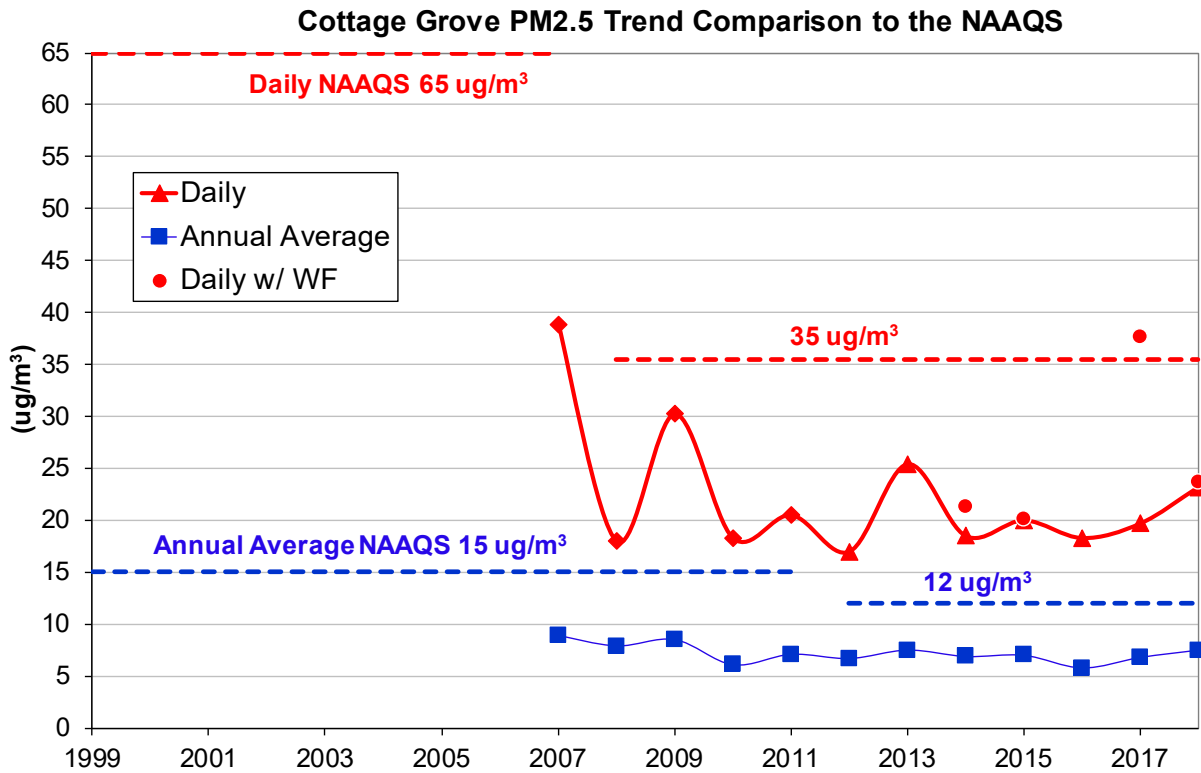


Figure 48. Cottage Grove PM2.5 trends.

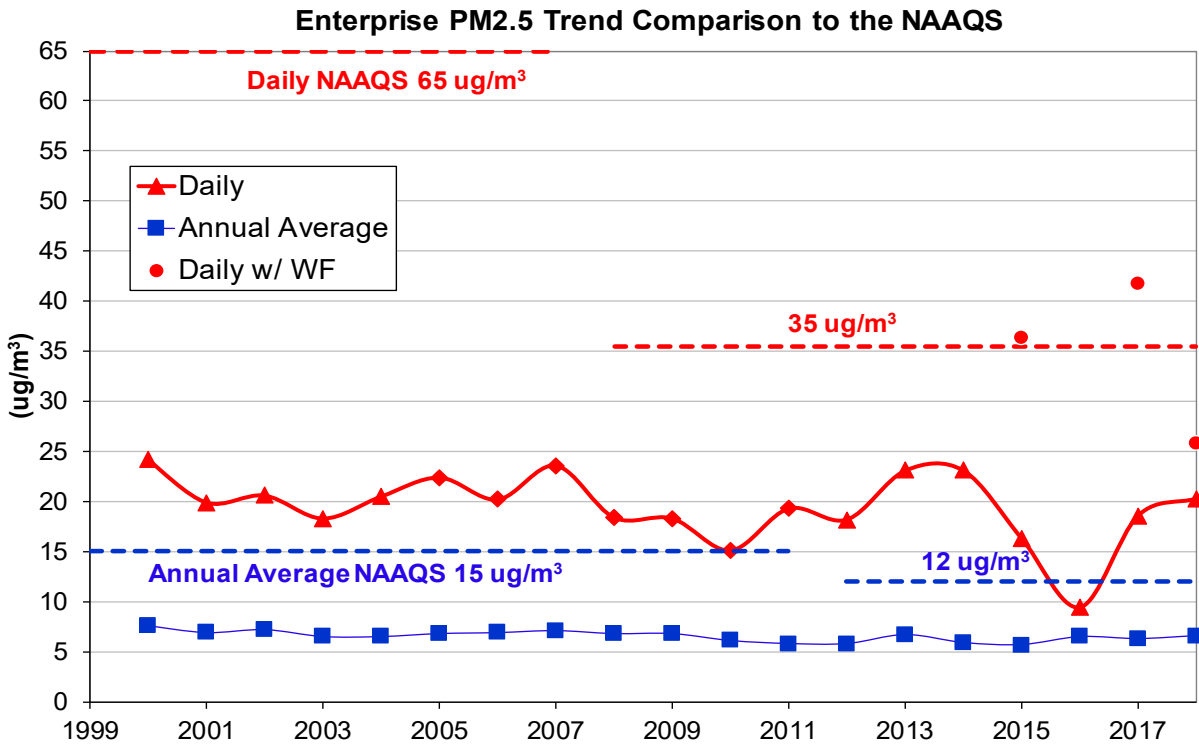


Figure 49. Enterprise PM2.5 trends.

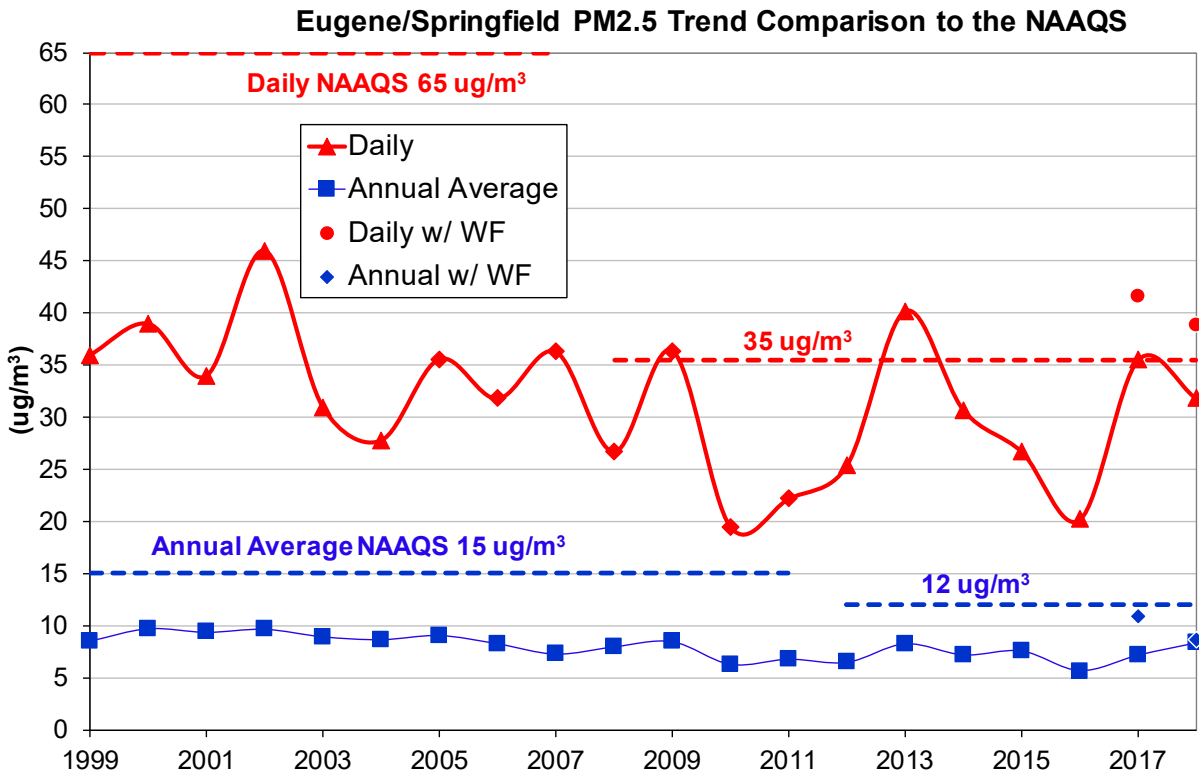


Figure 50. Eugene/Springfield PM2.5 trends.

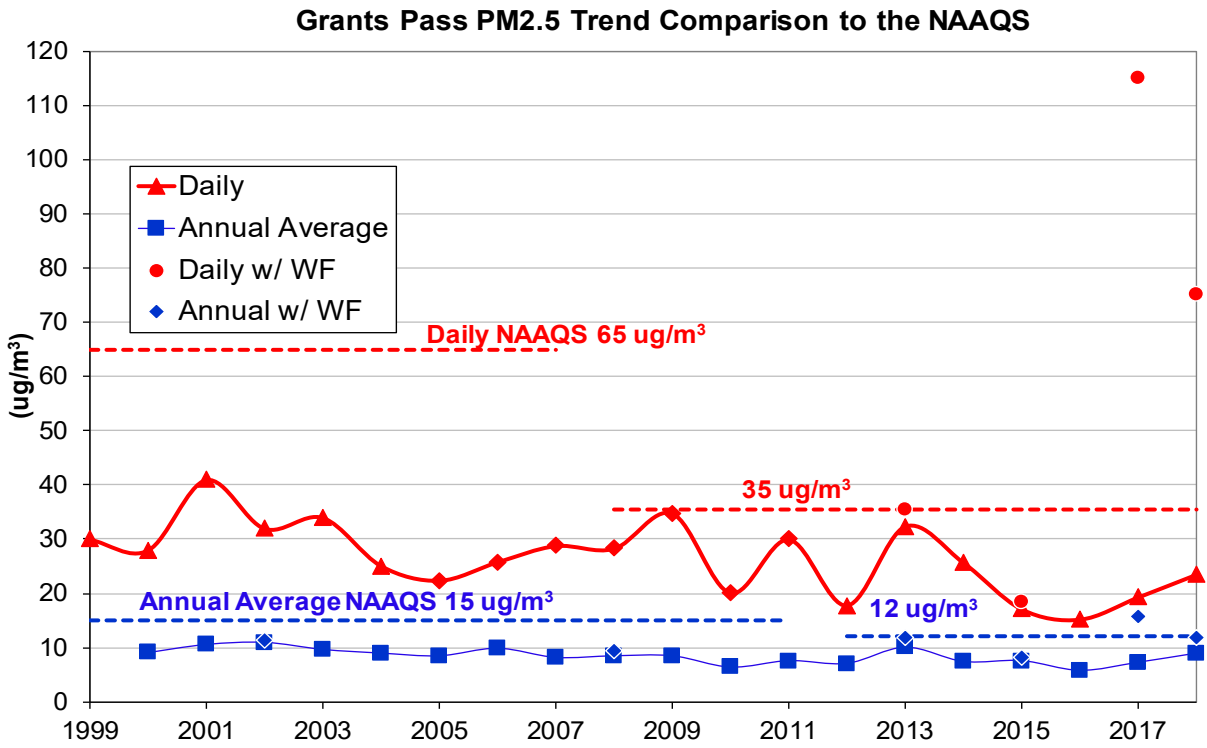


Figure 51. Grants Pass PM2.5 trends.

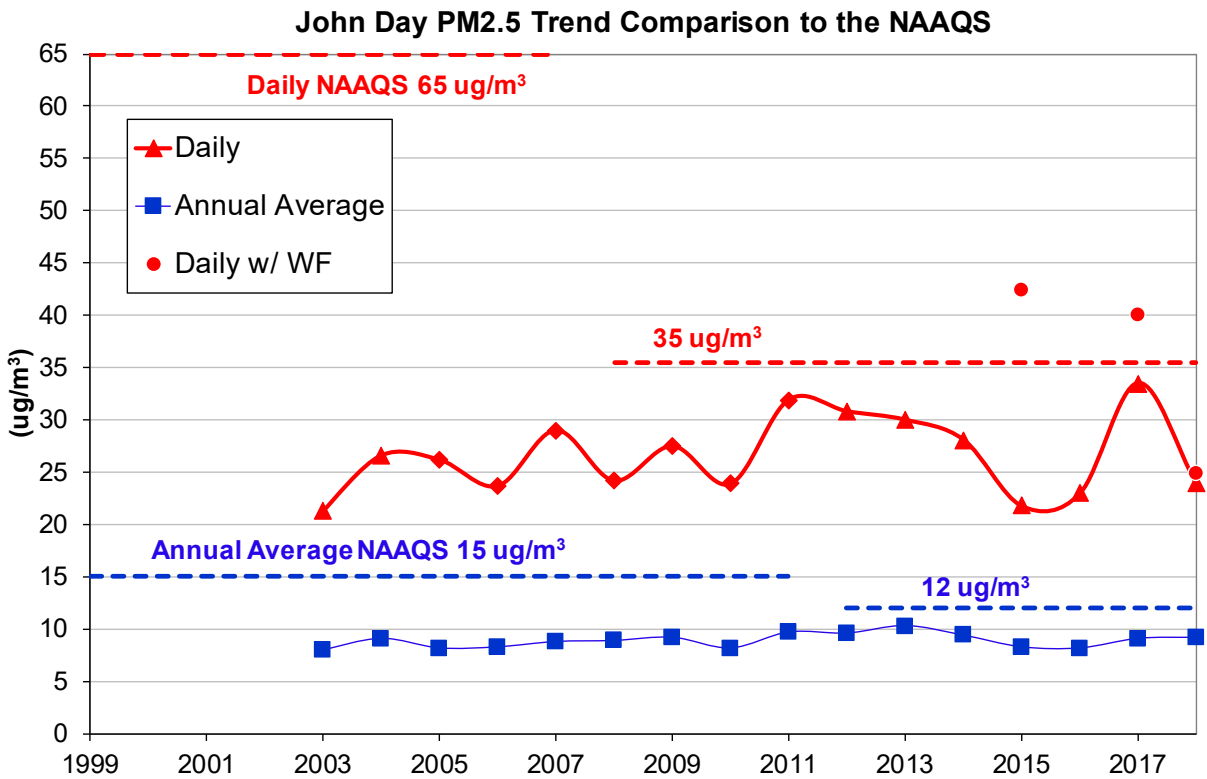


Figure 52. John Day PM2.5 trends.

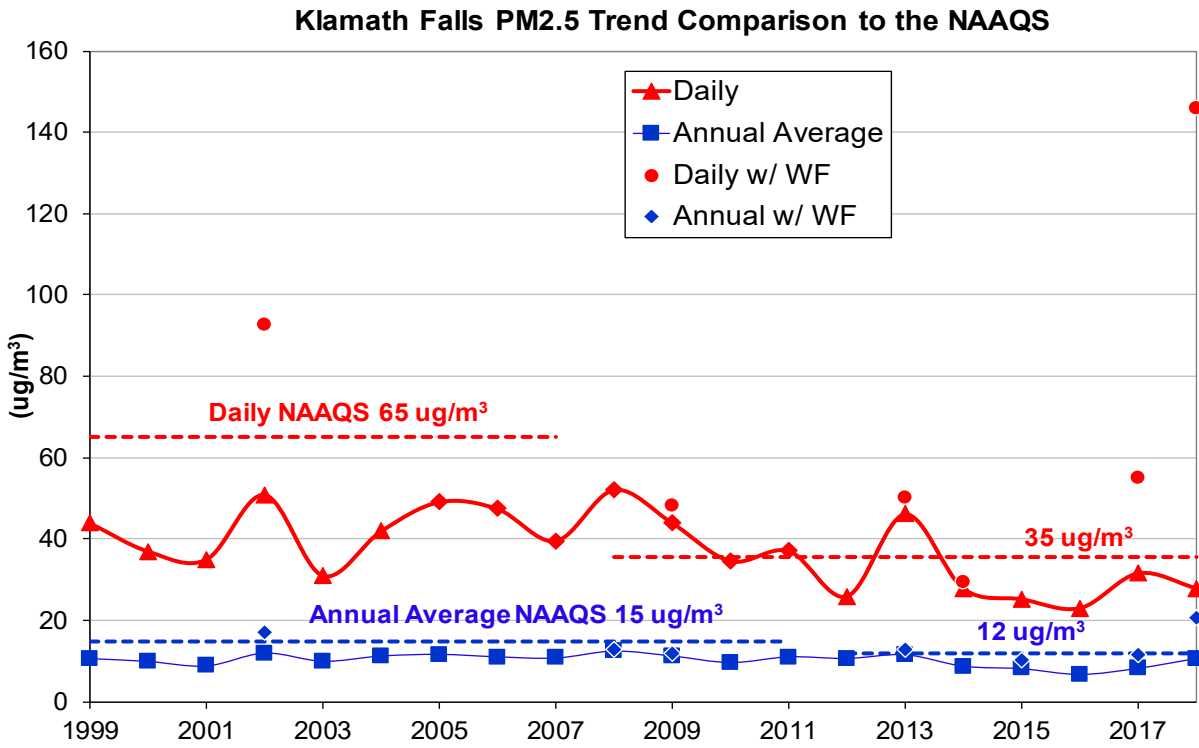


Figure 53. Klamath Falls PM2.5 trends.

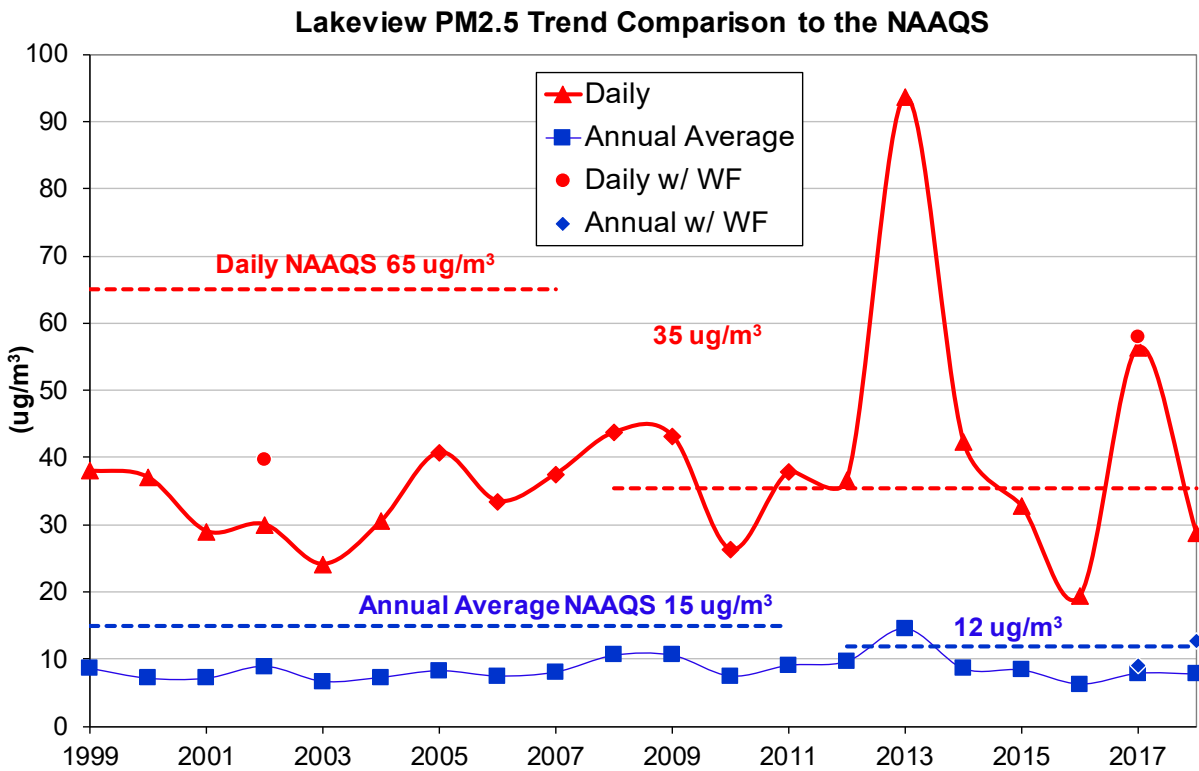


Figure 54. Lakeview PM2.5 trends.

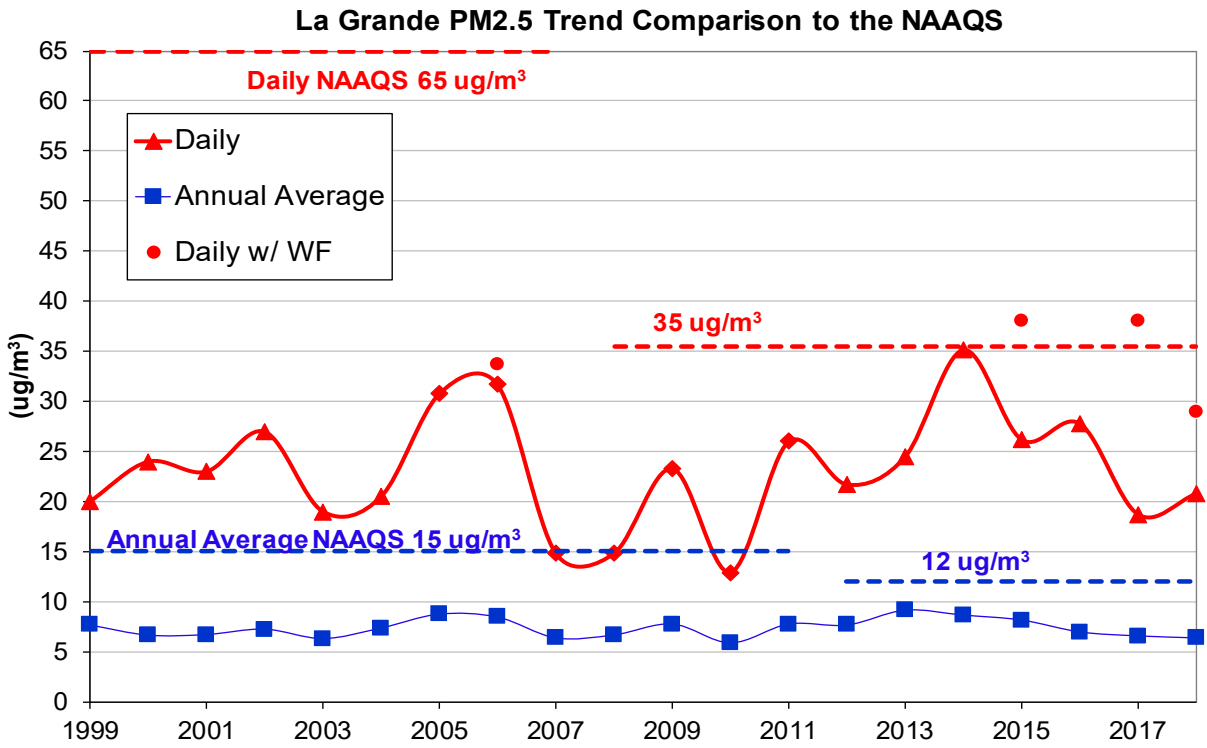


Figure 55. La Grande PM2.5 trends.

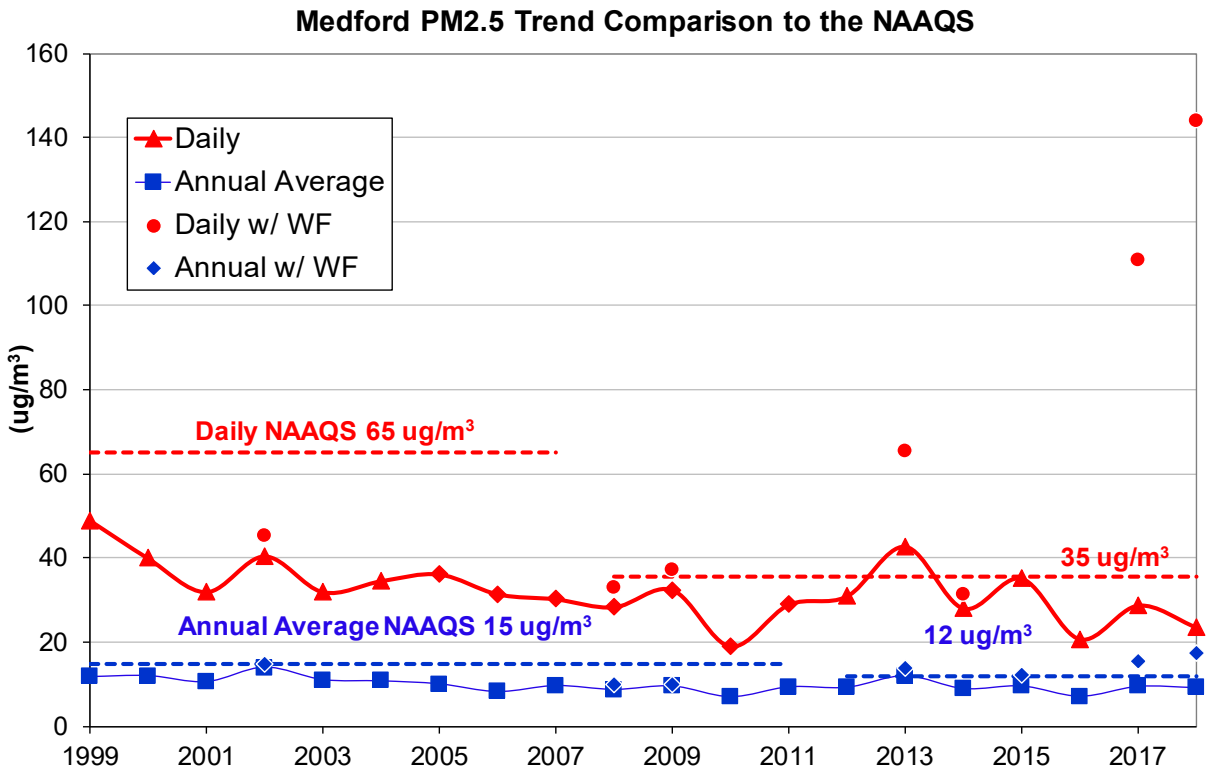


Figure 56. Medford PM2.5 trends.

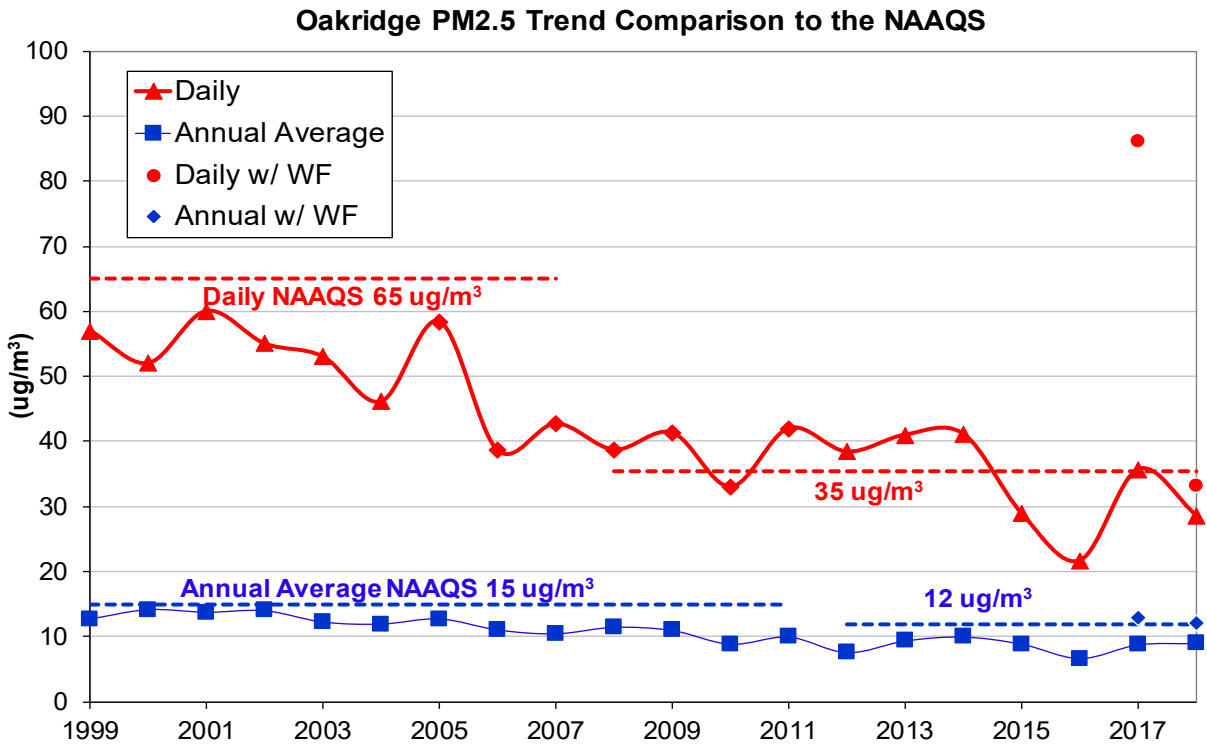


Figure 57. Oakridge PM2.5 trends.

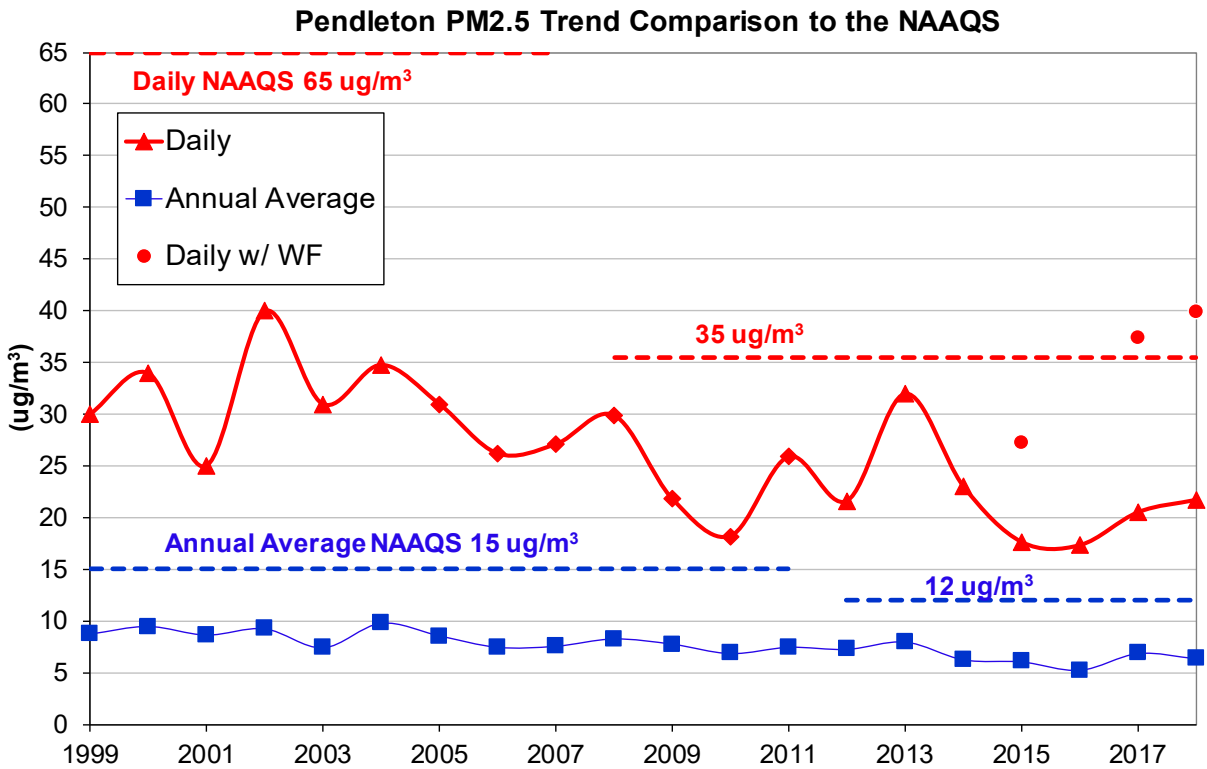


Figure 58. Pendleton PM2.5 trends.

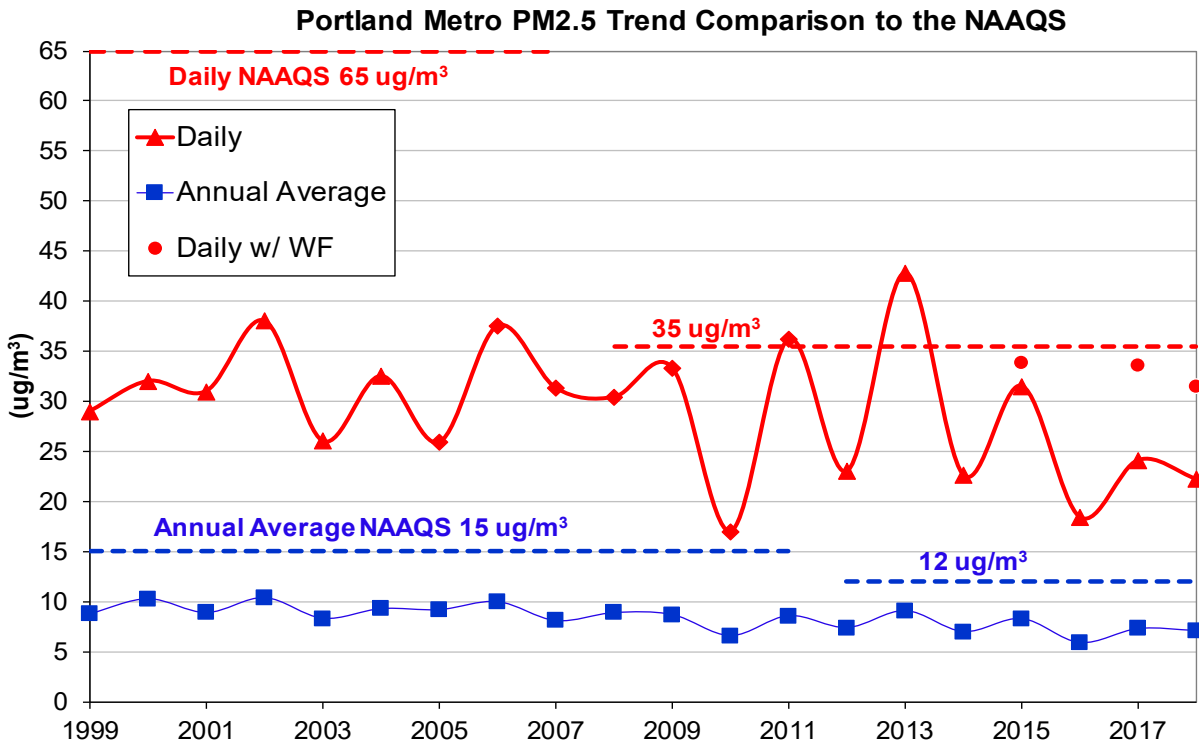


Figure 59. Portland Metro PM2.5 trends.

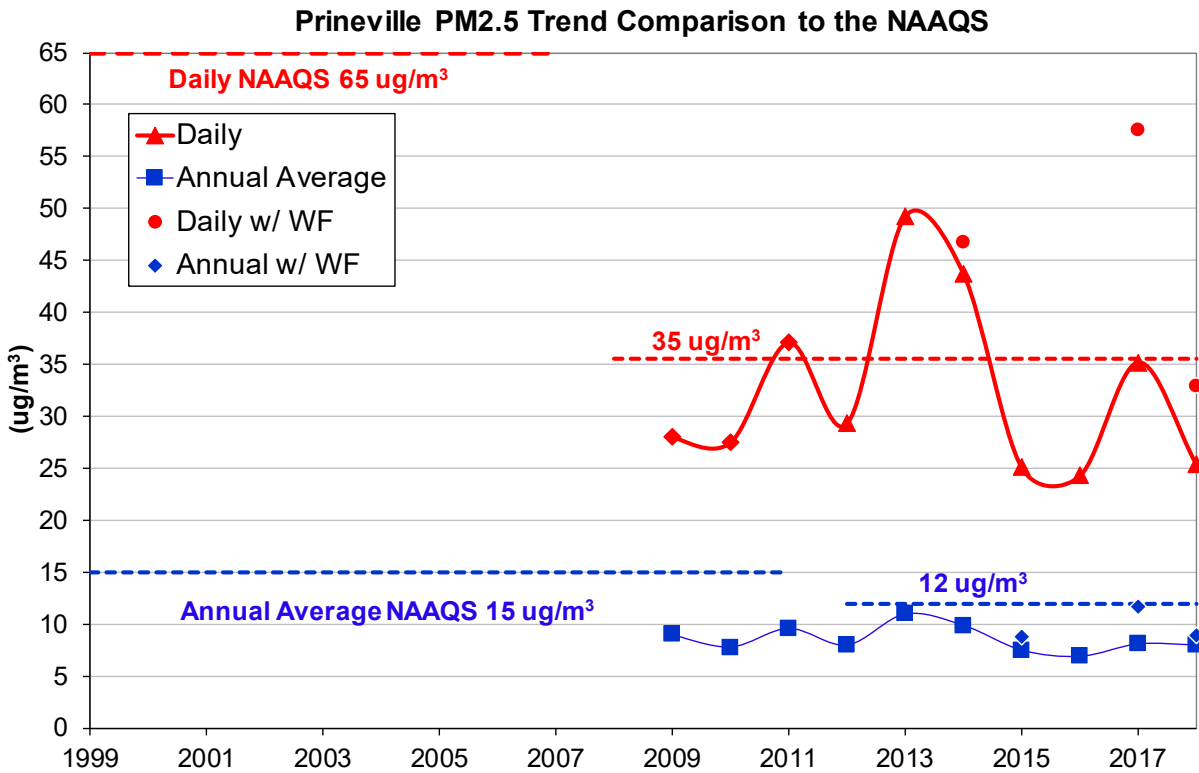


Figure 60. Prineville PM2.5 trends.

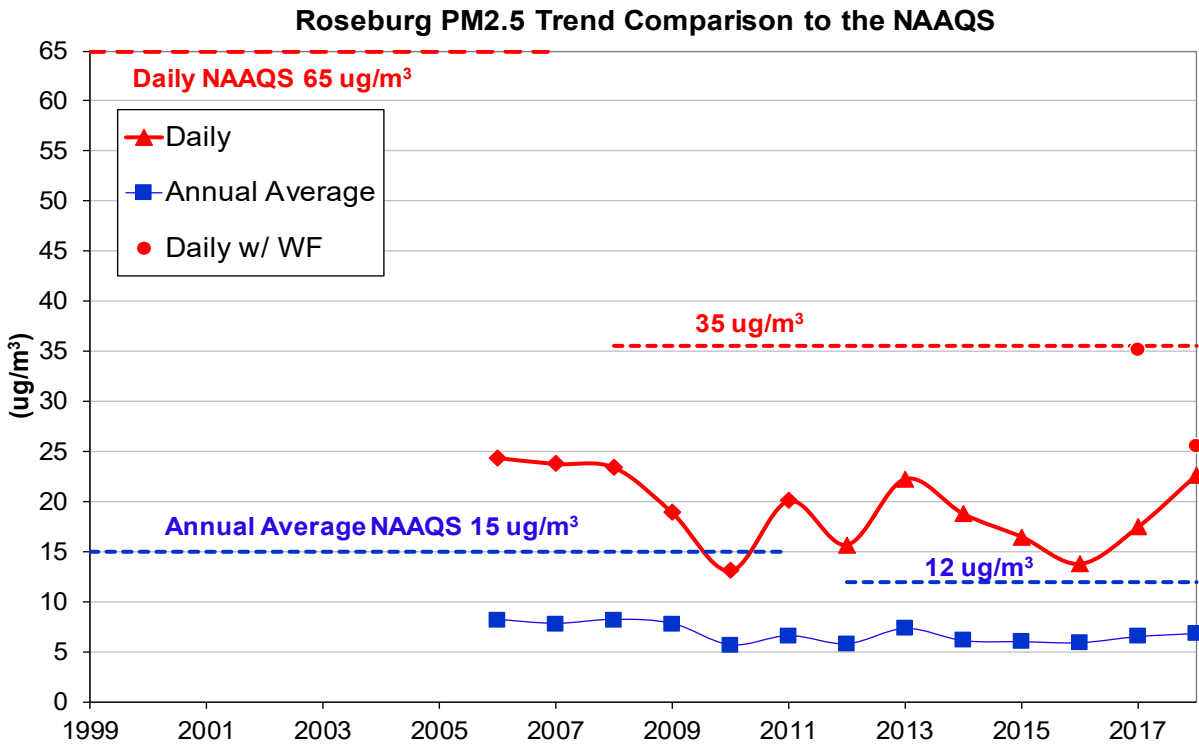


Figure 61. Roseburg PM2.5 trends.

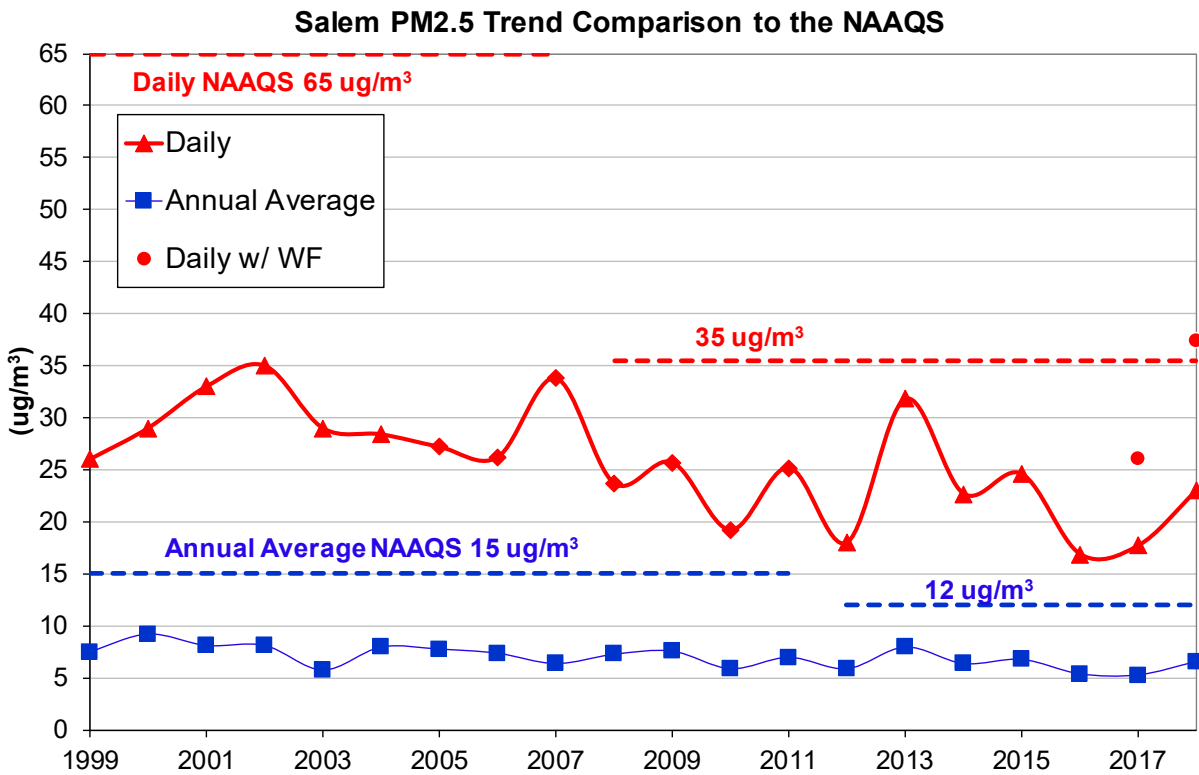


Figure 62. Salem PM2.5 trends.

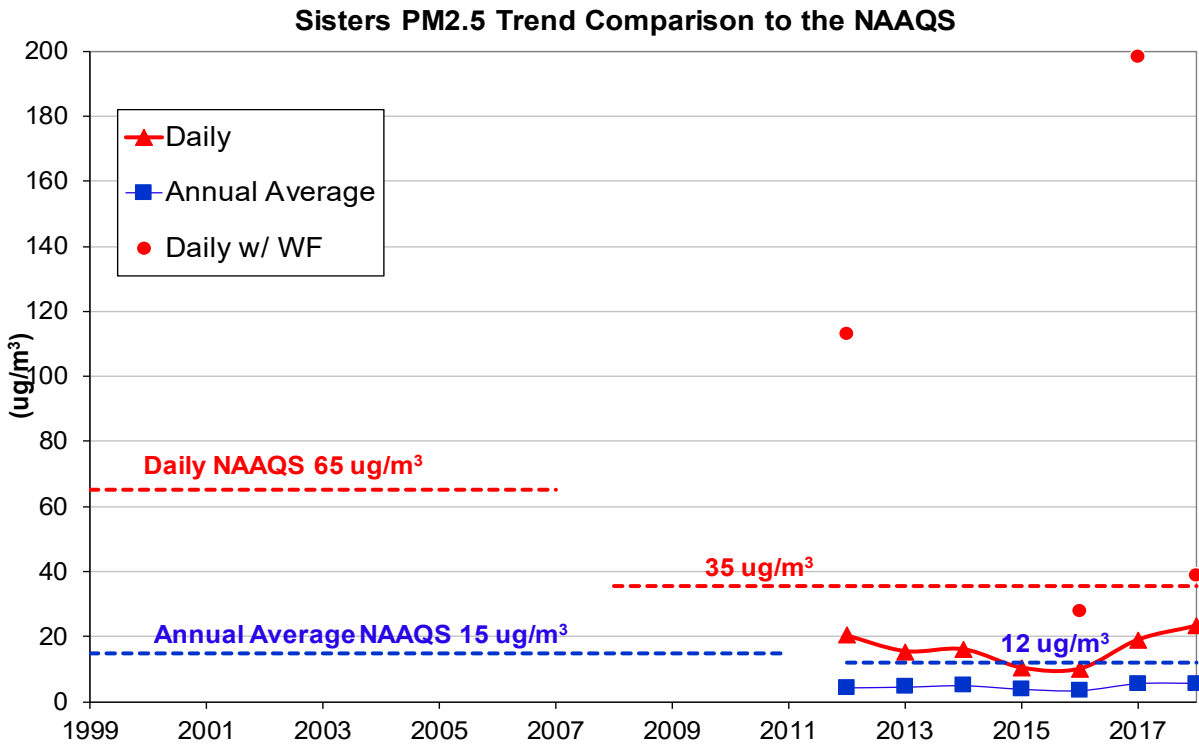


Figure 63. Sisters PM2.5 trends.

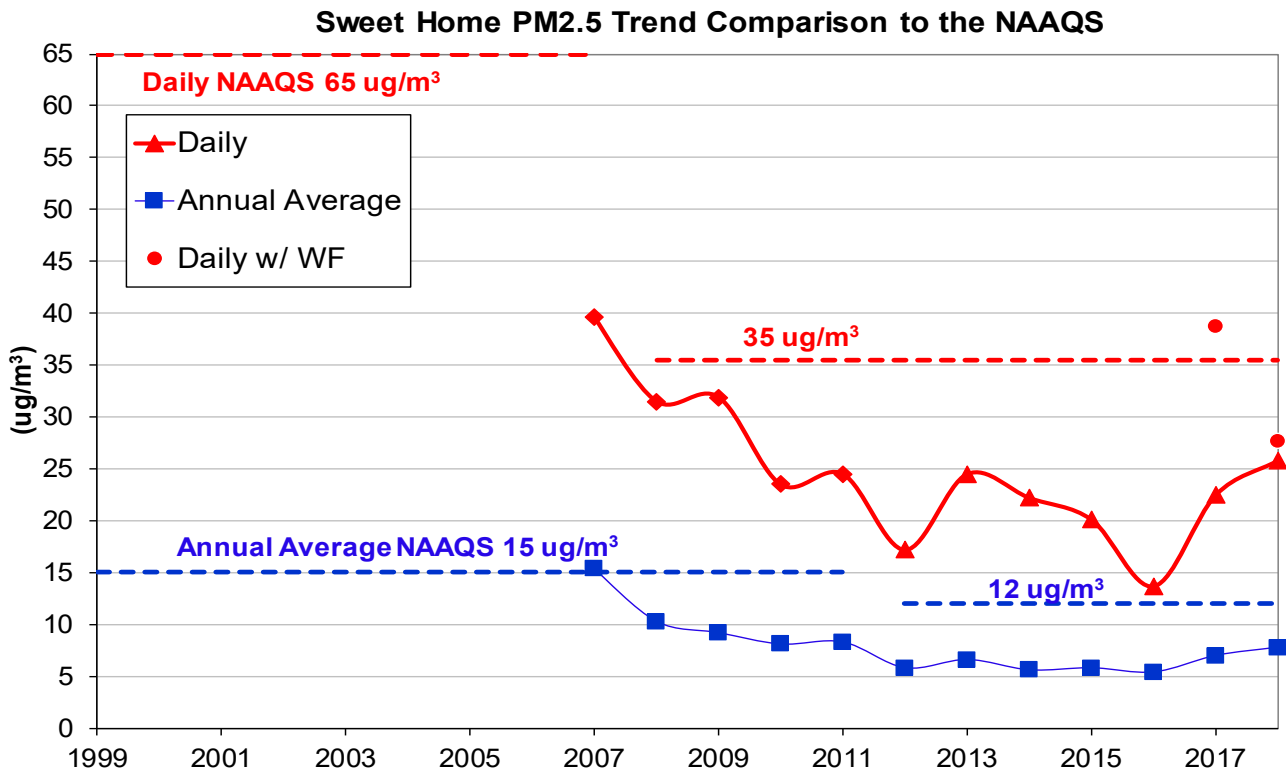


Figure 64. Sweet Home PM2.5 trends.

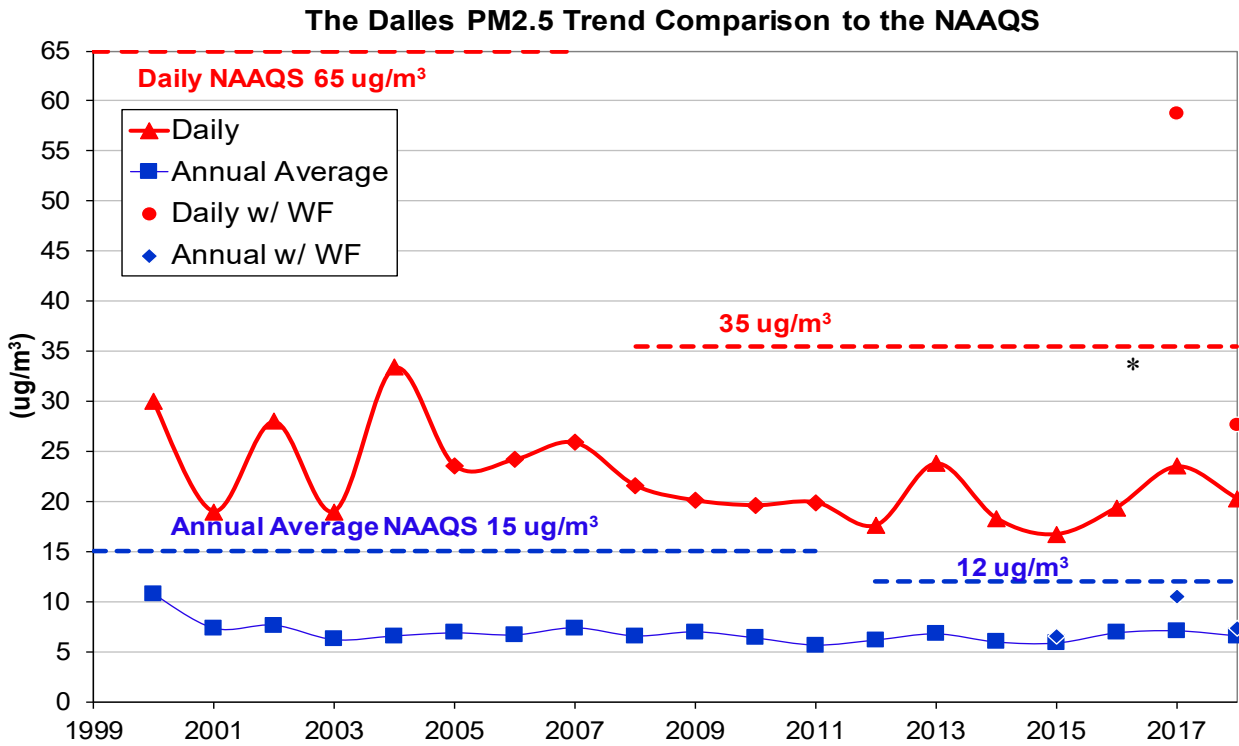


Figure 65. The Dalles PM2.5 trends.

The figures below show the three year average 98th Percentile PM2.5 (daily standard) and annual average PM2.5 (annual standard) levels with and without wildfire smoke impacts. It is useful to understand how much wildfire smoke contributed to raise PM2.5 concentrations above the National Ambient Air Quality Standard and what the levels would be with wildfire emissions excluded. Removing wildfire contributions show the effectiveness of local air quality improvement efforts in communities with PM2.5 reduction plans. Wildfire data would be excluded in determining airshed attainment status because it is considered an exceptional event that cannot be controlled locally.

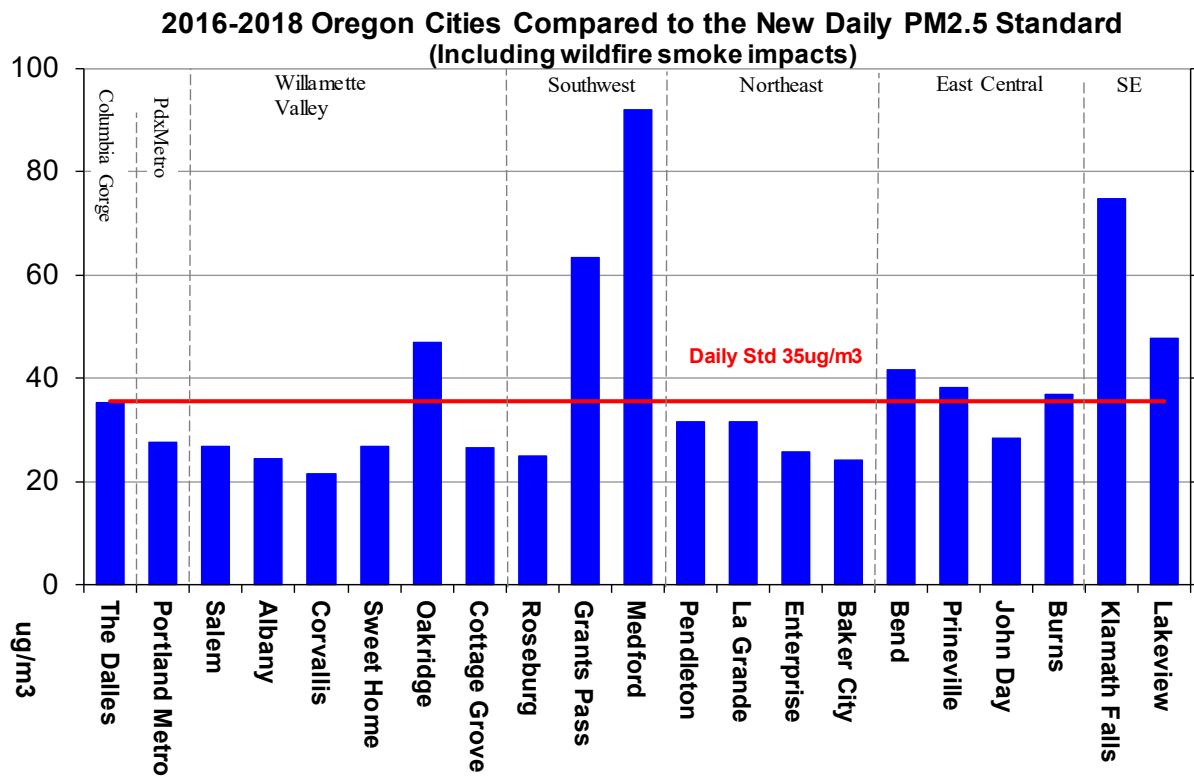
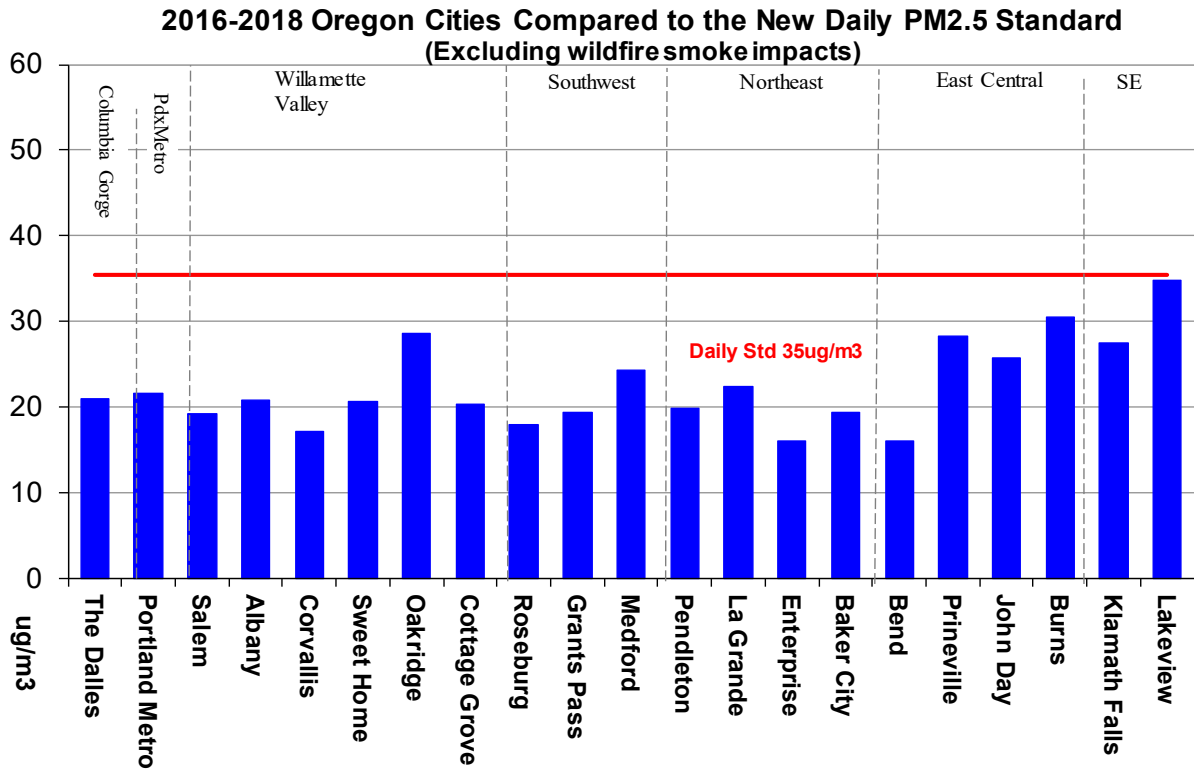


Figure 66. Oregon cities 2016-2018 daily PM2.5 comparison.
The chart shows the three year average 98th percentile. Wildfire data excluded and included.

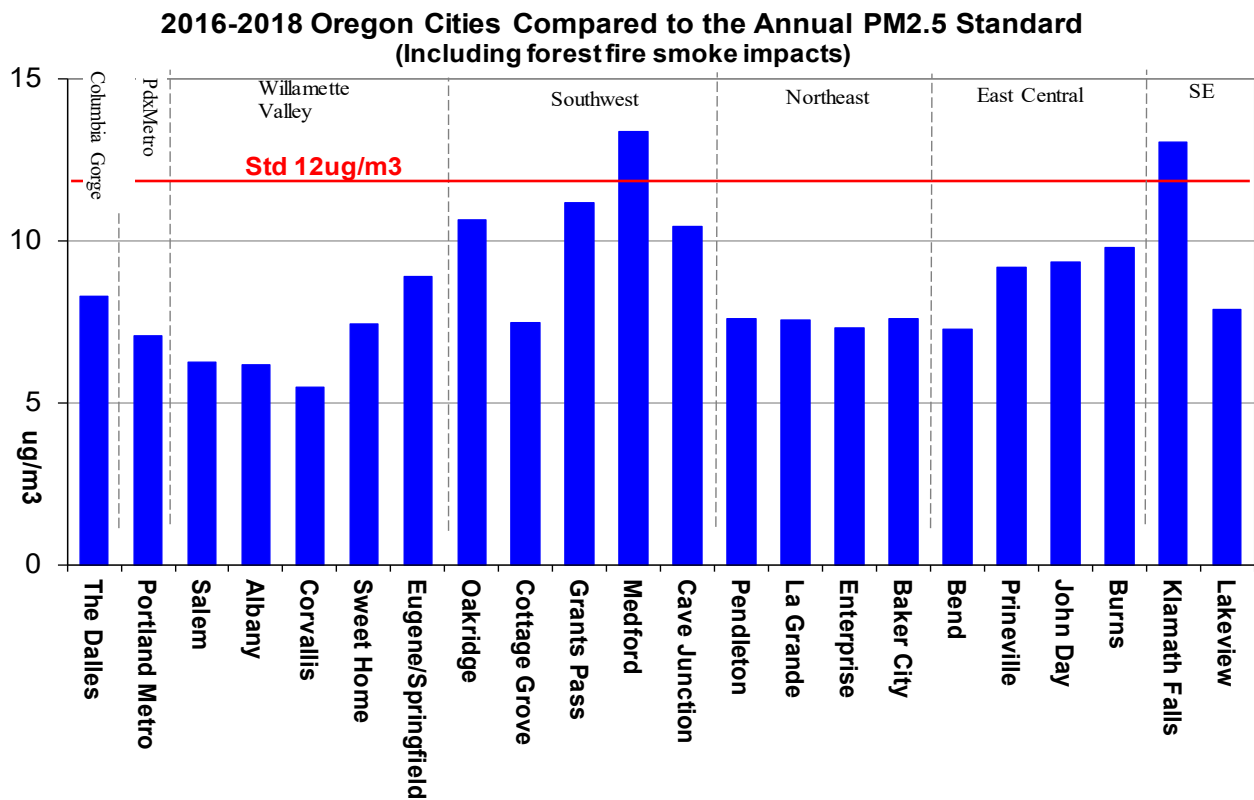
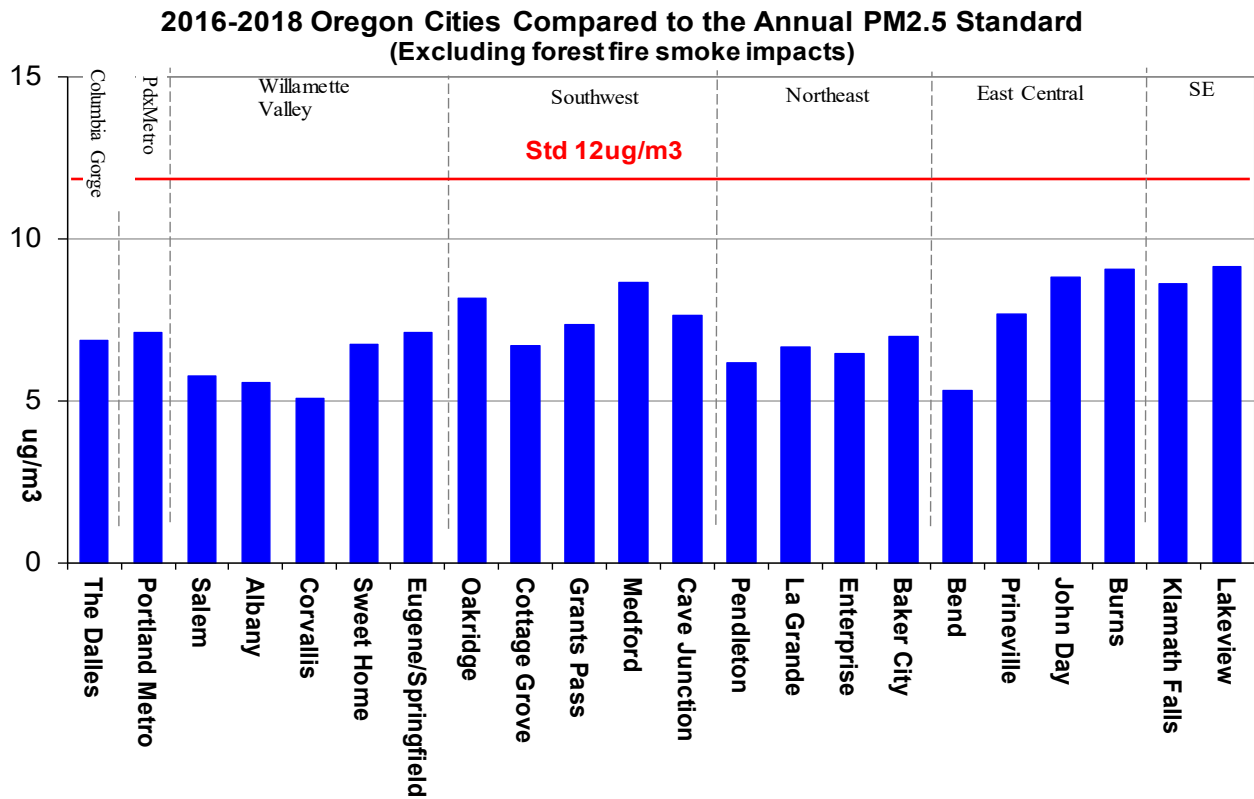


Figure 67. Oregon cities 2016-2018 annual average PM2.5 comparison.
The chart shows the three year average of the annual average with wildfire data included.

PM10 Trends

The PM10 trend chart shows the values in cities with the highest, average, and lowest concentrations. All cities are well below the National Ambient Air Quality Standard.

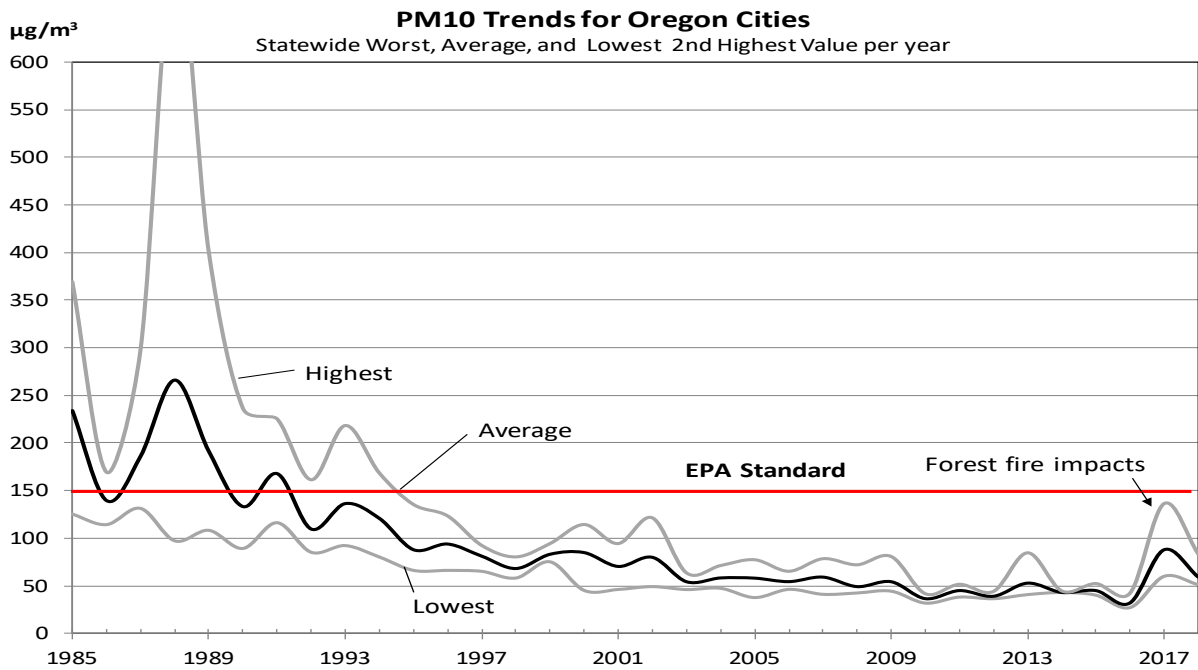


Figure 68. Oregon PM10 trends

Carbon Monoxide Trends

The figure below shows the CO trend in comparison to the National Ambient Air Quality Standard.

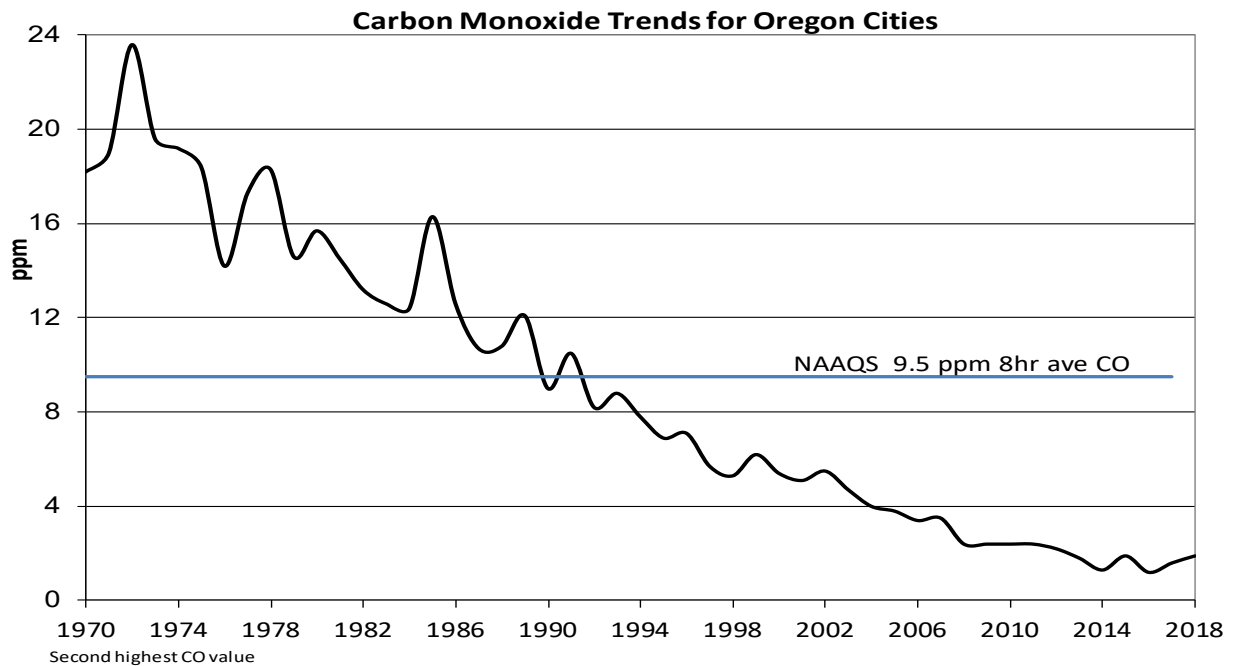


Figure 69. Oregon carbon monoxide Trend.
Trend chart uses the second highest annual, eight hour average.

Sulfur Dioxide Trends

The figure below shows the SO₂ trends in comparison to the federal standard.

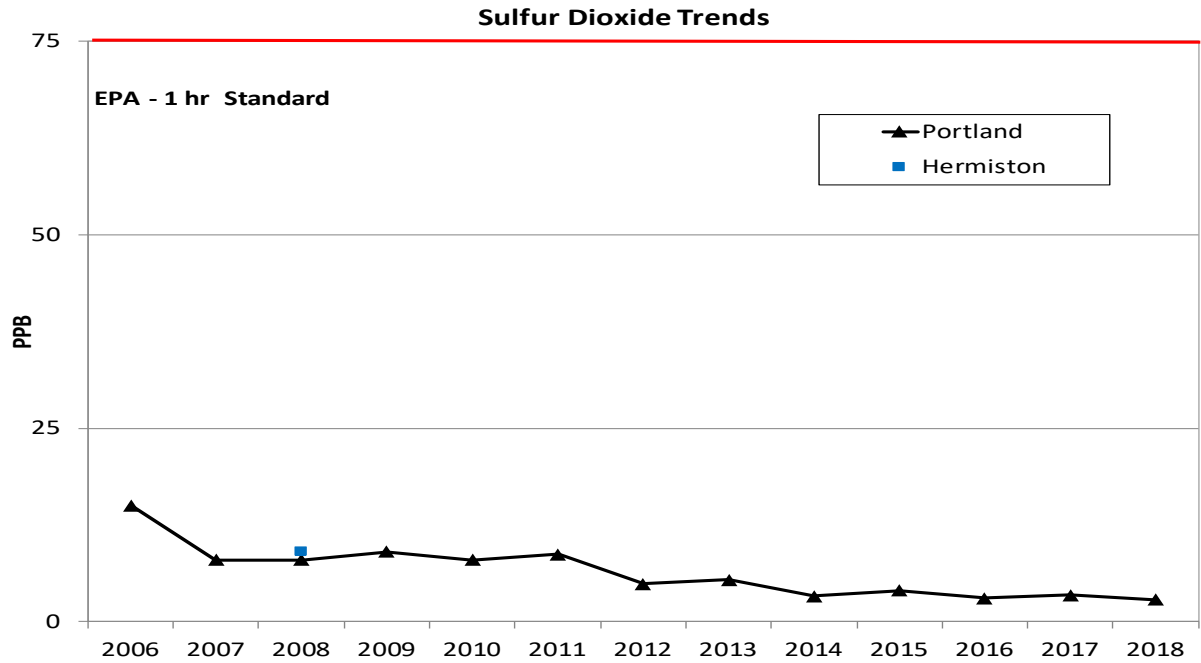


Figure 70. Oregon sulfur dioxide one hour average trends.

Nitrogen Dioxide Trends

The Figure below shows the NO₂ trends in comparison to the federal standard.

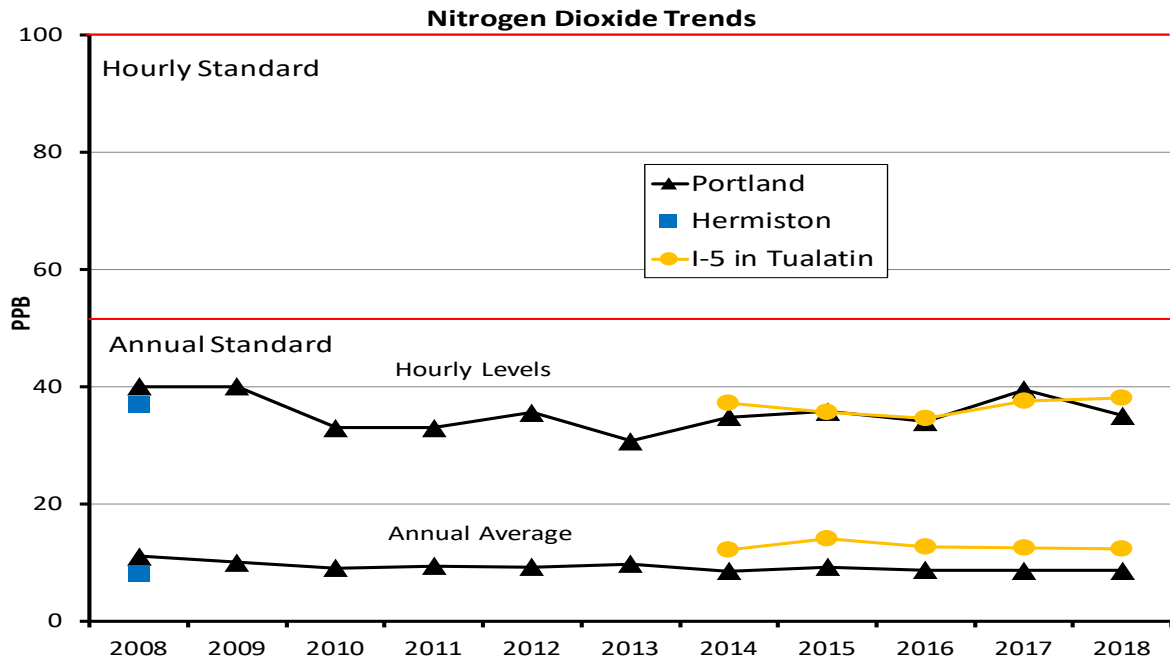


Figure 71. Oregon nitrogen dioxide one hour and annual average trends. *ppb = parts per billion*

Air Toxics Trends

Oregon DEQ and LRAPA began sampling for air toxics in Oregon in 1999. The Figures below show the trends for some air toxics of concern. More air toxic information can be found in Appendix H and at EPA's AIRData web site. The values are compared to the Oregon ambient concentration health benchmarks which are the levels where people exposed for a lifetime have an additional one in a million risk of cancer or of experiencing non-cancer health effects.

This information is for neighborhood monitoring only and does not include monitoring next to industrial facilities. That information is presented in separate reports specific to the monitoring project and facility.

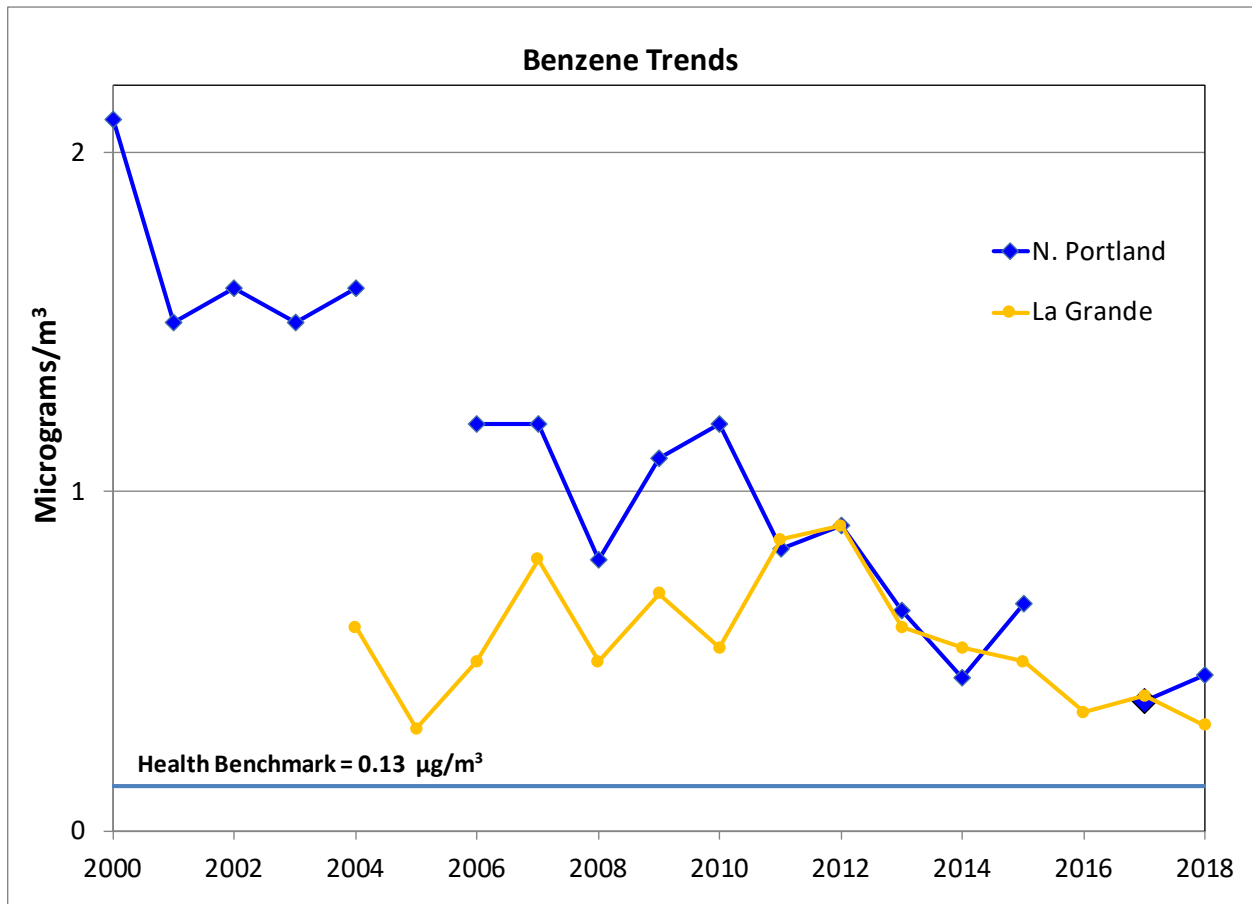


Figure 72. Oregon benzene trends.

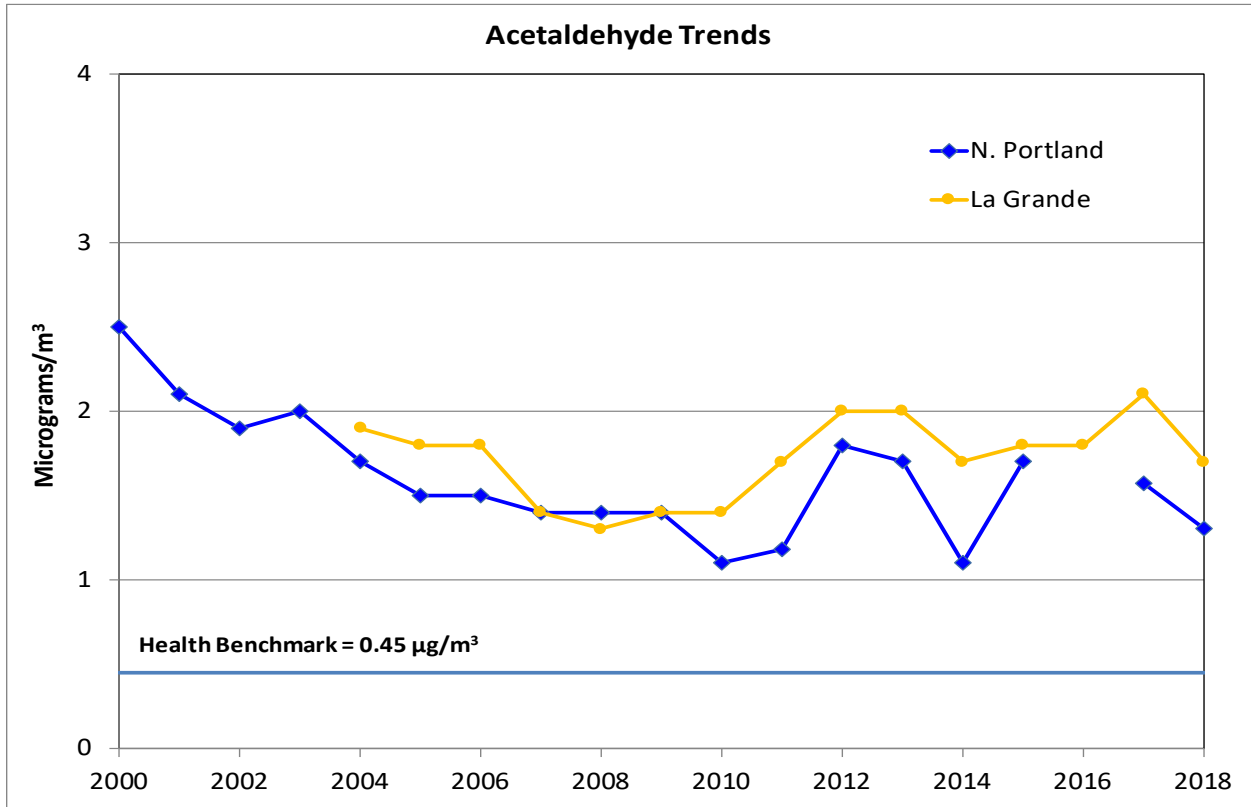


Figure 73. Oregon acetaldehyde trends.

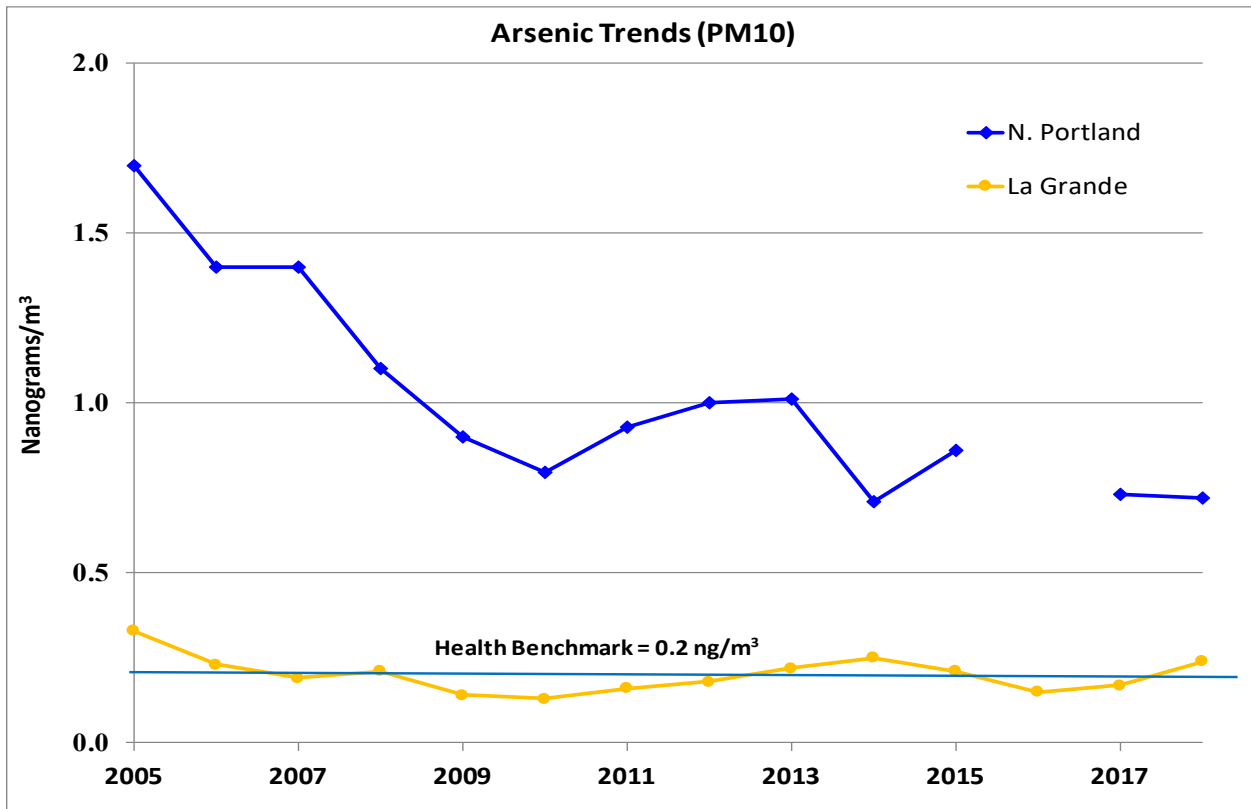


Figure 74. Oregon PM10 arsenic trends.

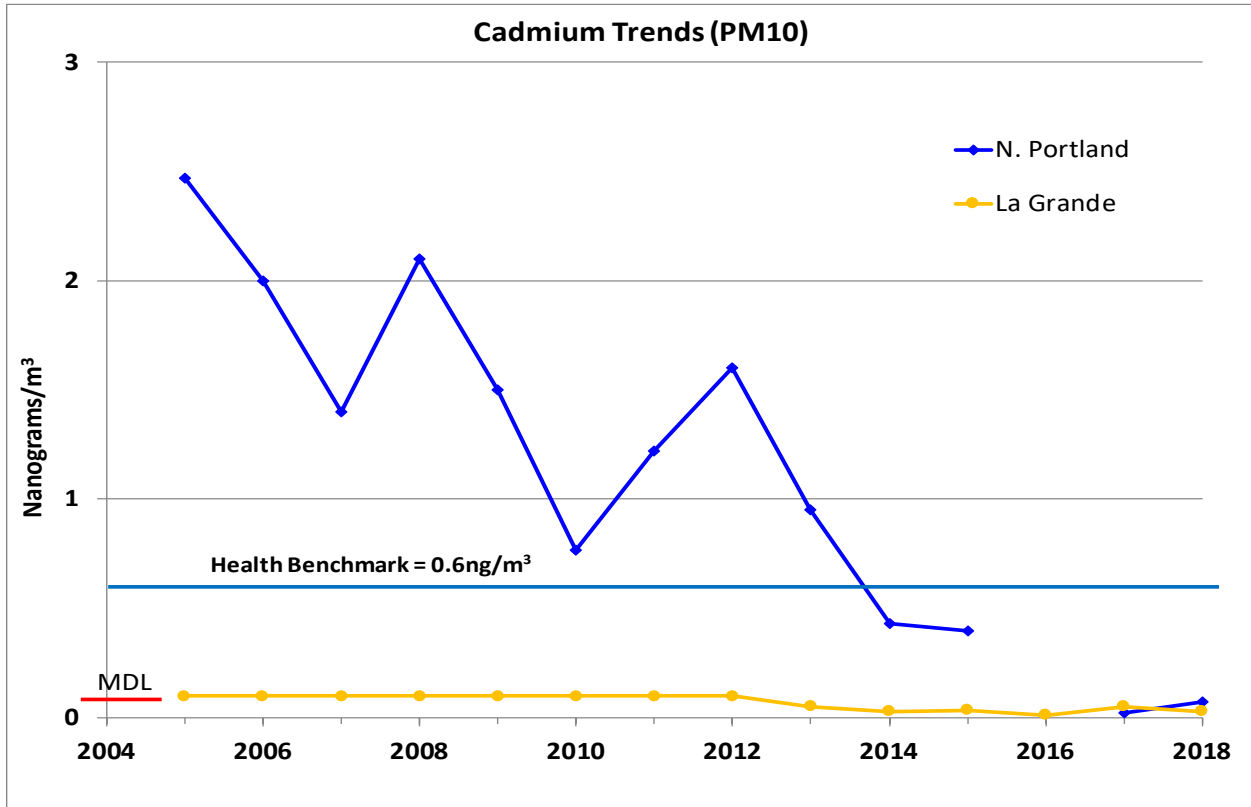


Figure 75. Oregon PM10 cadmium trends.

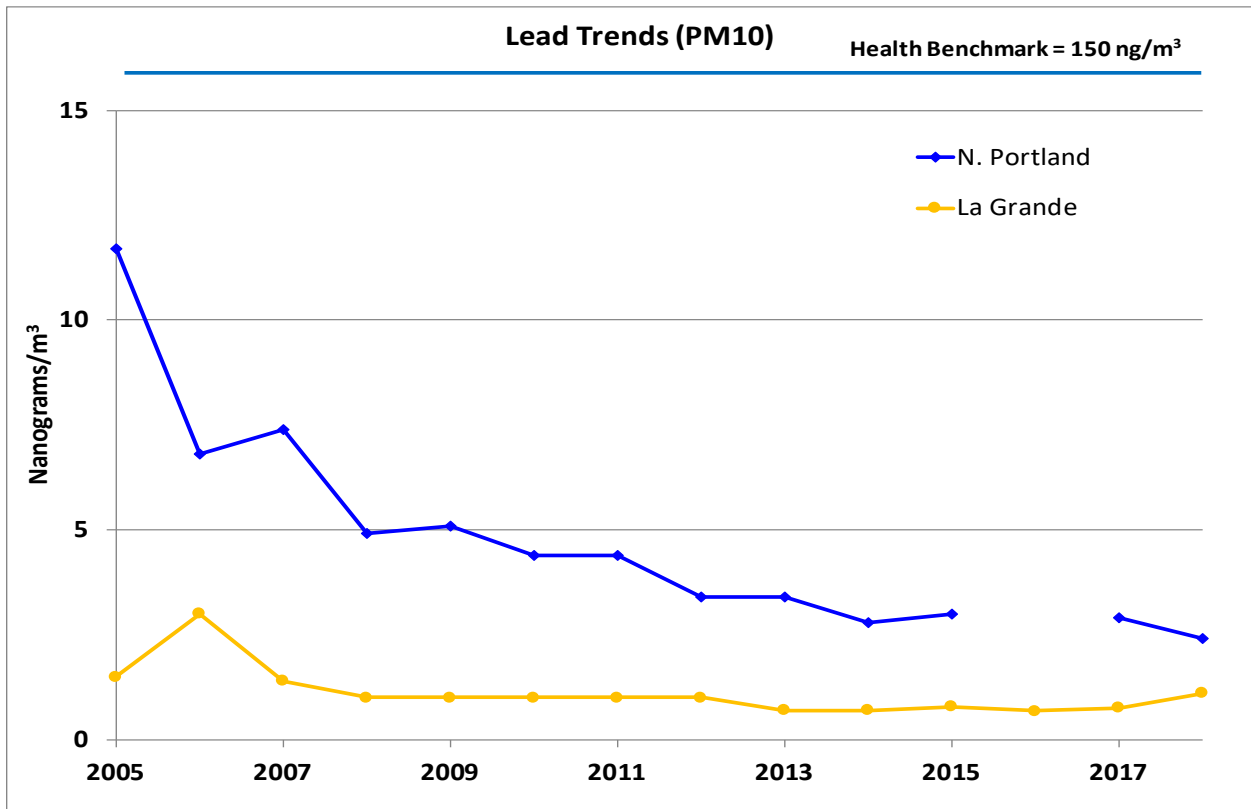


Figure 76. Oregon PM10 lead trends.

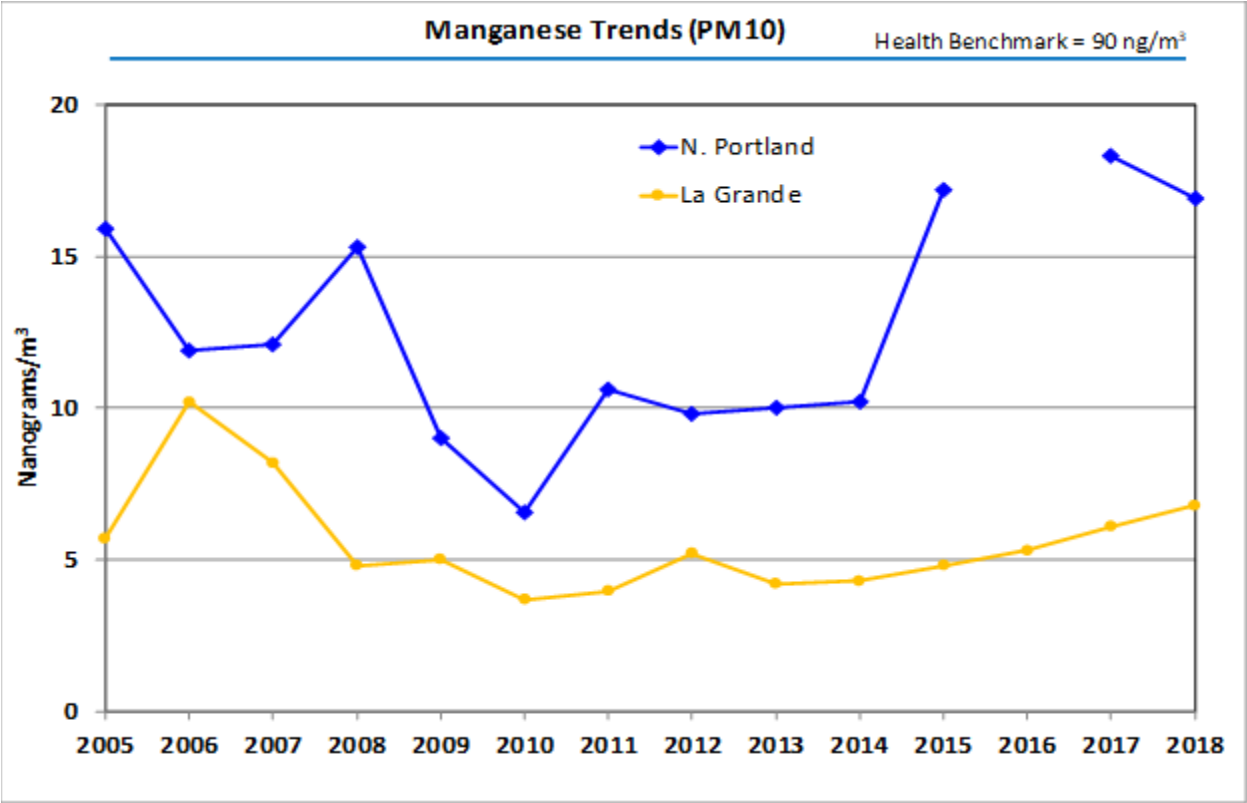


Figure 77. Oregon PM10 manganese trends.

Green House Gas Trends

Green house gas emissions from 1990 to 2014 are presented on DEQ's web page at <http://www.oregon.gov/DEQ/AQ/Pages/Greenhouse-Gas-Inventory-Report>. Some of these trends are shown in the Figures below.

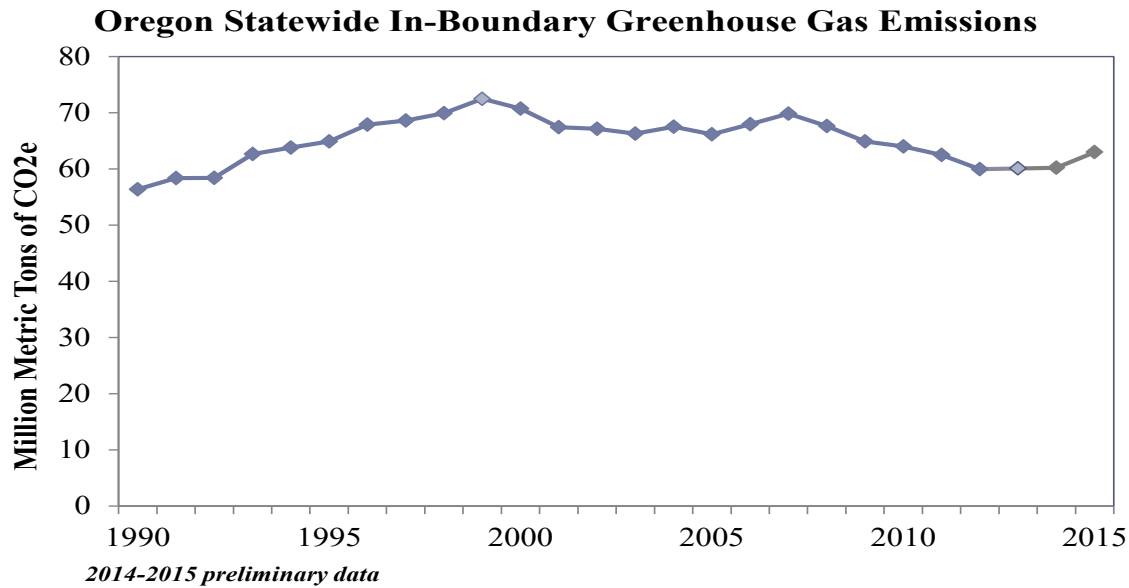


Figure 78. Oregon's total greenhouse gas emissions 1990-2015

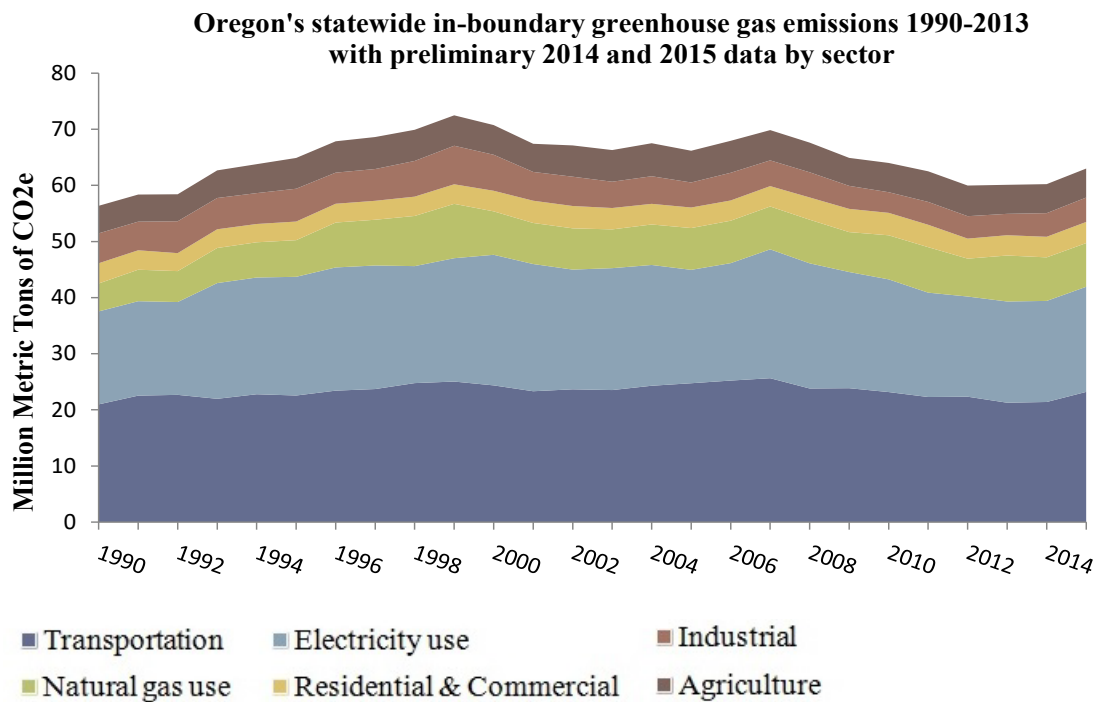


Figure 79. Oregon total greenhouse gas emissions by sector 1990-2015

Oregon's 2013 total greenhouse gas emissions by key sector

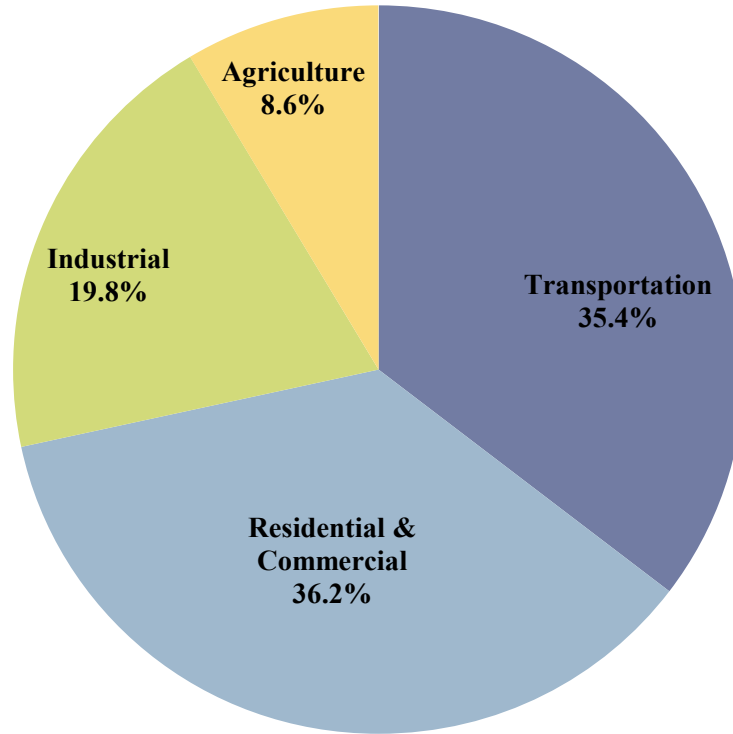


Figure 80. Oregon 2013 total emissions by sector.

National Ambient Air Quality Standards (NAAQS)

The EPA has established primary NAAQS to protect public health and secondary NAAQS to protect public welfare such as agriculture. The following Table has the NAAQS standards for the criteria pollutants. EPA summarizes the NAAQS at: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

Table 4. 2017 National Ambient Air Quality Standards (NAAQS).

Pollutant	Averaging Time	National Ambient Air Quality Standard (NAAQS) Violation Determination	Primary NAAQS Exceedance Level	Secondary NAAQS Exceedance Level
Carbon monoxide	1-hour	Not to be exceeded more than once/year.	35 ppm	-
	8-hour	Not to be exceeded more than once/year.	9 ppm	-
Lead	Three Months	Rolling 3 Month Average	0.15 $\mu\text{g}/\text{m}^3$	0.15 $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	Annual	Annual arithmetic mean	53 ppb	53 ppb
	1-hour	3yr average of the maximum daily 98 th percentile one hour average.	100 ppb	-
Ozone	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average.	0.070 ppm	0.070 ppm
PM2.5	24-hour	3-year average of the 24 hour average daily 98 th percentile.	35 $\mu\text{g}/\text{m}^3$	35 $\mu\text{g}/\text{m}^3$
	Annual Average	3-year average of the annual arithmetic mean	12 $\mu\text{g}/\text{m}^3$	12 $\mu\text{g}/\text{m}^3$
PM10	24-hour	Not to be exceeded more than once per year on average over 3 years.	150 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
Sulfur dioxide	1-hour	3yr average of the maximum daily 99 th percentile one hour average.	75 ppb	-
	3-hour	Not to be exceeded more than once per year.	-	0.5 ppm

Notes: $\mu\text{g}/\text{m}^3$ = micrograms of pollutant per cubic meter of air

ppm = parts per million

ppb = parts per billion

Exceedances vs. Violation

Exceedances occur when the NAAQS is surpassed but is not necessarily violated. Violations occur when the standards described in the table above are surpassed. An area can have multiple exceedances without violating the NAAQS. For example, an ozone violation is the three year average of the fourth highest, maximum daily eight hour average. For one year the fourth highest day may exceed the NAAQS but the other two years in the average may be below the NAAQS, bringing the three year average below the NAAQS. During wildfires or other events outside of the control of the community, a violation can be excused by EPA as an exceptional event.

Recent NAAQS Exceedances.

The following Tables summarize Oregon’s NAAQS exceedances for the last 10 years for PM2.5, PM10, CO, and Ozone. PM2.5 comparison to the NAAQS is determined by the 98th percentile.

Table 5. PM2.5 98th Percentile – Eastern Oregon.

Year	Bend	Burns	Klamath Falls	La Grande	Lakeview	Pendleton	Prineville	The Dalles
2009	14.0	26.5	44.0	23.3	43.2	21.8	28.0	<i>20.1</i>
2010	14.5	24.8	34.6	12.9	26.3	18.2	27.5	<i>19.6</i>
2011	<i>17.8</i>	39.4	37.1	<i>26.0</i>	37.8	25.9	37.1	<i>19.9</i>
2012	<i>20.3</i>	27.1	34.1	<i>21.7</i>	36.7	21.6	29.3	<i>17.6</i>
2013	<i>17.7</i>	38.0	46.5	<i>32.9</i>	93.6	32.0	49.2	<i>30.1</i>
2014	<i>21.7</i>	29.0	29.6	<i>35.2</i>	42.3	23.0	46.8	<i>18.3</i>
2015	<i>17.0</i>	25.8	25.2	<i>26.2</i>	32.7	17.6	41.7	<i>16.7</i>
2016	<i>11.1</i>	29.4	23.0	<i>27.8</i>	19.4	17.3	24.3	<i>19.4</i>
2017 ²	<i>76.2</i>	45.3	55.1	<i>38.1</i>	57.9	37.4	57.6	<i>58.7</i>
2017	<i>16.4</i>	33.8	31.6	<i>18.7</i>	56.3	20.5	35.2	<i>23.5</i>
2018 ²	<i>37.8</i>	35.6	146	<i>28.9</i>	65.9	39.9	32.9	<i>27.6</i>
2018	<i>20.7</i>	28.3	27.9	<i>20.8</i>	28.7	21.7	25.4	<i>20.3</i>

Table 6. PM2.5 98th Percentile – Western Oregon.

Year	Albany	Beaverton	Corvallis	Cottage Grove	Eugene/ Springfield	Grants Pass	Hillsboro	Medford	Oakridge	Portland	Salem
2009	<i>26.9</i>	<i>21.9</i>	<i>21.2</i>	30.2	36.4	34.8	33.3	32.5	41.3	21.5	<i>25.7</i>
2010	<i>16.0</i>	<i>15.0</i>	<i>14.8</i>	18.3	19.5	20.1	15.8	19.1	33.0	17.0	<i>19.2</i>
2011	<i>21.2</i>	<i>23.4</i>	<i>21.2</i>	20.5	22.2	30.0	36.2	29.0	42.0	36.1	<i>25.2</i>
2012	<i>16.4</i>	<i>17.9</i>	<i>15.4</i>	17.0	25.4	17.8	17.8	31.0	38.4	15.7	<i>18</i>
2013	<i>32.3</i>	<i>27.3</i>	<i>24.5</i>	31.1	40.2	32.4	42.8	65.6	41.0	35.6	<i>31.8</i>
2014	<i>22.9</i>	<i>20.4</i>	<i>16.3</i>	21.3	31.6	25.7	27.7	31.3	41.1	22.1	<i>22.7</i>
2015	<i>25.4</i>	<i>17.8</i>	<i>18.6</i>	20.1	26.7	18.4	33.9	35.2*	28.9	29.9	<i>22.9</i>
2016	<i>17.1</i>	<i>12.8</i>	<i>16.3</i>	18.3	25.9	15.2	18.4	20.8	21.7	13.6	<i>16.9</i>
2017 ²	<i>30.2</i>	<i>34.5</i>	<i>25.0</i>	37.7	41.6	115	33.0	111	86.2	25.7	<i>26.1</i>
2017	<i>22.3</i>	<i>16.8</i>	<i>16.6</i>	19.7	37.0	19.3	24.1	28.8	35.7	22.2	<i>17.7</i>
2018 ²	<i>26.2</i>	<i>23.7</i>	<i>23.1</i>	23.7	38.9	75.1	31.5	144	33.2	20.3	<i>37.4</i>
2018	<i>23</i>	<i>16.6</i>	<i>18.8</i>	23.2	31.8	23.5	22.2	23.6	28.6	17.4	<i>23</i>

Notes:

1. *Blue, italicized* values are from a non-Federal Reference Method and are informational.
2. ²Wildfire smoke impact data included
3. NAAQS is 35.5 µg/m³

Table 7. PM10 Number of Exceedances per year.

Year	Bend	Burns	Klamath Falls	La Grande	Lakeview	Pendleton	Cottage Grove	Eugene/ Springfield	Grants Pass	Medford	Oakridge	Portland
2009	-	-	0	0	-	0	-	0	-	0	0	0
2010	-	-	0	0	-	0	-	0	-	0	0	0
2011	-	-	0	0	-	-	-	0	0	0	0	0
2012	-	-	0	0	-	-	-	0	0	0	0	0
2013	-	-	0	0	-	-	-	0	0	0	0	0
2014	-	-	0	0	-	-	-	0	0	0	0	0
2015	-	-	0	0	-	-	-	0	0	0	0	0
2016	-	-	0	0	-	-	-	0	0	0	0	0
2017 [Ⓜ]	-	-	0	0	-	-	-	3	0	1	4	0
2017	-	-	0	0	-	-	-	0	0	0	0	0
2018	-	-	0	0	-	-	-	0	0	0	0	0

[Ⓜ]Wildfire smoke impact data included

Table 8. Carbon Monoxide Number of Exceedances per year.

Year	Eugene	Medford	Portland
2009	0	0	0
2010	0	-	0
2011	-	-	0
2012	-	-	0
2013	-	-	0
2014	-	-	0
2015	-	-	0
2016	-	-	0
2017	-	-	0
2018	-	-	0

Table 9. Ozone Number of Exceedances per year.

Year	Bend	Eugene	Medford	Portland	Salem	Hermiston	The Dalles
2009	0	0	0	2	1	0	-
2010	0	0	0	2	1	0	-
2011	0	0	0	0	0	0	-
2012	0	0	0	0	0	0	-
2013	0	0	0	0	0	0	-
2014	0	0	0	1	1	0	-
2015	0	1	1	0	1	0	-
Standard lowered from 0.075 to 0.070ppm							
2016	-	0	0	0	0	1	0
2017	-	5	5	9	6	7	1
2018	-	0	6	4	0	0	0

Appendix 1. Data Summaries

Oregon's Air Quality Monitors collect criteria pollutant data using EPA Federal Reference Methods. DEQ and LRAPA use other EPA approved methods for PM_{2.5} estimates for the AQI, and methods used for air toxics. The criteria data are summarized for comparison to the NAAQS. PM_{2.5} estimate and ozone AQI data are provided and Air Toxics are compared to Oregon Ambient Benchmark Concentration.

DEQ Air Monitoring Methods:

Appendix 1 -A&B. Particulate (PM₁₀ and PM_{2.5})

- A. The PM_{2.5} annual average is determined by averaging the quarterly means.
- B. The PM_{2.5} maximum daily sample is determined by taking the highest daily sample for the year.
- C. The PM_{2.5} 98th percentile is the value on the 98th percent highest day. (# of days sampled*0.98). E.g. 120 sample days*0.98 = 118; 120 is the highest day, 118th day is the third highest day.
- D. The PM₁₀ maximum daily sample is determined by taking the highest 24 hour sample for the year.
- E. The PM₁₀ 2nd highest daily sample is determined by taking the 2nd highest sample for the year.

Appendix 1-C. Ozone (O₃)

- A. Maximum daily, eight hour ozone average is calculated using a rolling eight hour average.
- B. Fourth highest eight hour average is determined from the data in C.

Appendix 1-D. Oxides of Nitrogen (NO₂ and NO)

- A. The one hour value is calculated using the 98th percentile of the maximum daily, hourly average.
- B. The annual standard is determined by averaging the annual one hour values.

Appendix 1-E. Sulfur Dioxide (SO₂)

- A. The one hour value is calculated using the 99th percentile of the maximum daily, hourly average.
- B. The maximum three hour average is calculated using three consecutive hours.

Appendix 1-F. Carbon Monoxide (CO)

- A. Maximum eight hour CO average is determined by calculating an eight hour rolling average.
- B. Second highest eight hour average CO is determined from the data in A. Only one maximum per CO episode is used to count to the second highest.

Appendix 1-G. Air Quality Index based on PM_{2.5} and ozone

- A. Where there are PM_{2.5} FRM filter data, that it is used rather than nephelometer data.
- B. Where there is not PM_{2.5} FRM filter data, nephelometer data is used to estimate PM_{2.5}.
- C. The maximum eight hour average daily ozone is used to calculate the daily ozone AQI.
- D. Where ozone and PM_{2.5} are both available, the higher AQI of the two is used for the day.

Appendix 1-H. Air Toxics (Hazardous Air Pollution)

- A. Air toxic levels are compared to benchmark levels.
- B. The annual averages are determined by taking the arithmetic mean of the quarterly averages. Where the values are below the minimum detection limit (MDL), the MDL is halved prior to inclusion in the average. If the quarterly average is below the MDL, the MDL is used.

The lists of the Federal Reference Methods and codes are at: <http://www.epa.gov/ttnamti1/>

Table 10. Ambient Air Quality Monitoring Methods

Pollutant	Method Code	Method Description
PM2.5	117, 118, 145	Low volume filter sampler and pre and post filter weighing.
PM10	127	Low volume filter sampler and pre and post filter weighing.
	063	High volume filter sampler and pre and post filter weighing.
PM10 Lead	811	Low volume filter sampler and XRF analysis
Ozone	047, 087	Ultraviolet photometry
NO2	590, 186	Chemiluminescent Detection
SO2	592	Ultraviolet fluorescence spectrometer
CO	588	Nondispersive infrared trace monitor
Visibility	027	Beta Scattering
PM2.5 Est	027/118, 027/145	Beta Scattering correlated with PM2.5 filter sampling
Air Toxics		
Carbonyls	114	Cartridge-DNPH-Silica-SEP-PAK/ HPLC photodiode Array
Volatile Organic Compounds	078	6L Subambient Canister sampling, GC/MS analysis
Poly Aromatic Hydrocarbon	117	TSP High Volume sampling on PUF/XAD media, Soxhlet Extraction, GCMS analysis.
PM10 Metals	089	High Volume PM10 with ICP/MS analysis on a Quartz Filter
Diesel Particulate	886	Aethalometer (optical absorption) black carbon surrogate

APPENDIX 1A PM2.5

PM2.5 Data Summary

Portland Area						
CITY AND STATION	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	MAXIMUM (µg/m ³)	98 th Percentile (µg/m ³)	
Hillsboro (HHF) Hare Field EPA # 410670004	2009	69	8.7	35 (01/16)	33 (02/03)	
	2010	93	6.6	40 (11/25)	16 (10/20)	
	2011	111	8.6	54 (12/05)	36 (01/03)	
	2012	109	7.2	39 (01/13)	22 (11/11)	
	2013	119	9.1	55 (12/12)	43 (11/30)	
	2014	117	7.0	37 (01/26)	23 (12/31)	
	2015 ^{fb}	120	8.3	58 (08/22)	34 (11/29)	
	2015*	119	7.6	34 (11/29)	32 (01/03)	
	2016	120	5.9	21 (12/17)	18 (10/12)	
	2017 ^{fb}	119	8.2	40 (08/02)	33 (08/08)	
	2017*	115	7.3	36 (01/13)	24 (01/16)	
	^{fb} forest fire data included	2018 ^{fb}	116	8.0	52 (08/21)	32 (11/13)
* forest fire flagged data removed	2018*	114	7.2	32 (11/13)	22 (12/22)	
S.E. Portland (SEL) SE Lafayette and 57 th EPA # 410510080	2009	116	7.6	22 (01/10)	22 (11/24)	
	2010	117	6.3	31 (11/25)	17 (02/07)	
	2011	111	8.3	42 (02/11)	36 (12/11)	
	2012	118	7.4	35 (01/28)	23 (09/18)	
	2013	120	8.7	42 (11/30)	36 (01/19)	
	2014	120	6.3	30 (02/10)	15 (01/17)	
	2015 ^{fb}	121	7.2	56 (08/22)	29 (01/03)	
	2015*	120	6.8	30 (11/23)	24 (01/24)	
	2016	122	5.6	28 (12/26)	14 (02/21)	
	2017 ^{fb}	119	7.9	53 (09/16)	34 (08/29)	
	2017*	115	6.8	24 (12/21)	22 (10/16)	
	^{fb} forest fire data included	2018 ^{fb}	120	7.4	48 (08/21)	20 (11/13)
* forest fire flagged data removed	2018*	118	6.8	20 (11/13)	17 (11/07)	
Tualatin Bradbury Court (I-5 site) EPA # 410670005	2016	108	6.3	22 (10/12)	18 (12/17)	
	2017 ^{fb}	118	7.9	50 (09/16)	36 (08/29)	
	2017*	115	6.9	24 (12/15)	20 (10/31)	
	^{fb} forest fire data included	2018 ^{fb}	121	7.7	47 (08/21)	19 (11/13)
	* forest fire flagged data removed	2018*	119	7.1	19 (11/13)	17 (10/20)

APPENDIX 1A PM2.5

Eugene Area					
CITY AND STATION	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	MAXIMUM (µg/m ³)	98 th Percentile (µg/m ³)
Eugene Amazon Park (AMZ) EPA # 410390060	2009	357	8.5	60 (12/11)	36 (02/04)
	2010	356	5.7	21 (01/29)	16 (01/03)
	2011	119	6.5	25 (02/02)	21 (12/05)
	2012	121	6.4	32 (01/13)	25 (02/06)
	2013	122	7.8	52 (12/09)	39 (11/27)
	2014	123	7.2	36 (01/26)	31 (11/16)
	2015 ^{fb}	121	7.4	55 (08/22)	27 (11/26)
	2016	122	5.4	38 (01/01)	20 (01/04)
	2017 ^{fb}	119	9.0	145 (09/04)	42 (01/16)
	2017*	115	6.9	42 (01/06)	37 (12/12)
^{fb} forest fire data included	2018 ^{fb}	121	7.5	40 (08/21)	32 (11/13)
* forest fire flagged data removed	2018*	120	7.2	34 (12/07)	29 (11/10)
Eugene Hwy 99 (E99) Pacific Hwy 99 N EPA# 410390059	2009	117	8.2	48 (12/12)	36 (12/09)
	2010	119	6.3	23 (12/07)	20 (01/29)
	2011	115	6.8	27 (01/03)	22 (10/18)
	2012	118	6.5	30 (02/06)	21 (10/18)
	2013	122	8.3	55 (12/09)	40 (11/24)
	2014	120	7.2	44 (01/26)	31 (11/16)
	2015 ^{fb}	122	8.0	55 (08/22)	27 (11/26)
	2016	119	5.7	18 (01/04)	16 (02/09)
	2017 ^{fb}	120	10.9	330 (09/04)	43 (01/16)
	2017*	117	7.2	43 (01/16)	32 (12/12)
^{fb} forest fire data included	2018 ^{fb}	122	8.7	46 (11/13)	39 (11/19)
* forest fire flagged data removed	2018*	121	8.4	46 (11/13)	32 (12/07)
Springfield City Hall (SCH) EPA# 410391009	2009	60	6.8	22 (12/09)	18 (01/19)
	2010	63	5.8	18 (08/06)	14 (09/29)
	2011	63	5.6	19 (01/03)	15 (12/14)
	2012	66	5.6	18 (10/18)	15 (09/18)
	2013	61	6.3	19 (11/24)	17 (01/22)
	2014	61	6.4	36 (11/19)	14 (12/07)
	2015 ^{fb}	60	6.3	54 (08/22)	13 (10/27)
	2016	58	4.7	10 (01/01)	9 (06/05)
^{fb} forest fire data included	2017 ^{fb}	58	13.6	287 (09/04)	134 (08/29)
* forest fire flagged data removed	2017*	56	6.2	28 (12/12)	21 (12/15)

APPENDIX 1A PM2.5

Western Oregon						
CITY AND STATION	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	MAXIMUM ($\mu\text{g}/\text{m}^3$)	98 th Percentile ($\mu\text{g}/\text{m}^3$)	
Cottage Grove City Shops (CGS) EPA # 410399004	2009	119	8.5	34 (12/12)	30 (01/22)	
	2010	121	6.9	21 (12/07)	18 (12/22)	
	2011	119	7.1	32 (02/02)	21 (12/23)	
	2012	119	6.7	25 (01/13)	17 (11/02)	
	2013	120	7.5	38 (12/09)	25 (11/27)	
	2014	124	6.9	34 (11/19)	21 (12/04)	
	2015 ^{fb}	118	7.3	40 (08/22)	20 (02/23)	
	2016	121	5.8	26 (01/01)	18 (11/02)	
	2017 ^{fb}	117	8.8	116 (09/04)	38 (09/07)	
	2017*	111	6.8	28 (01/16)	20 (12/28)	
	^{fb} forest fire data included	2018 ^{fb}	123	7.8	44 (08/21)	24 (11/13)
	* forest fire flagged data removed	2018*	122	7.5	26 (12/07)	23 (11/19)
Grants Pass Parkside School (GPP) EPA # 410330114	2009	58	8.5	39 (11/09)	35 (12/09)	
	2010	57	6.4	36 (12/04)	20 (10/29)	
	2011	61	7.6	32 (12/23)	30 (11/11)	
	2012	61	7.1	19 (01/04)	18 (11/17)	
	2013 ^{fb}	61	11.9	90 (08/02)	36 (11/24)	
	2013*	59	10.1	36 (11/24)	32 (12/12)	
	2014	61	7.4	43 (11/19)	26 (01/05)	
	2015 ^{fb}	57	8.2	24 (08/28)	18 (08/22)	
	2016	61	5.8	17 (12/20)	15 (10/21)	
	2017 ^{fb}	58	15.8	283 (09/04)	115 (08/29)	
	2017*	54	7.4	24 (01/01)	19 (08/11)	
	^{fb} forest fire data included	2018 ^{fb}	61	11.9	99 (08/06)	75 (07/25)
* forest fire flagged data removed	2018*	58	9.0	31 (11/16)	24 (11/10)	
Medford Grant & Belmont (MGB) 902 Grant Ave. EPA # 410290133	2009 ^{fb}	173	10.0	54 (09/25)	38 (11/30)	
	2009*	172	9.6	43 (12/12)	33 (01/22)	
	2010	117	7.1	22 (12/04)	19 (11/19)	
	2011	113	9.4	43 (12/11)	29 (12/23)	
	2012	119	9.3	33 (01/28)	31 (01/13)	
	2013 ^{fb}	121	14.2	157 (07/30)	66 (12/12)	
	2013*	118	12.0	66 (12/12)	43 (01/19)	
	2014 ^{fb}	122	9.3	39 (01/02)	31 (01/20)	
	2014*	121	9.1	39 (01/02)	28 (12/31)	
	2015 ^{fb}	119	12.1	112 (08/01)	46 (08/22)	
	2015*	115	9.6	36 (11/23)	35 (11/14)	
	2016	120	7.2	25 (12/17)	21 (01/04)	
	2017 ^{fb}	117	15.5	151 (09/04)	111 (08/29)	
	2017*	110	10.2	37 (12/15)	29 (01/16)	
	^{fb} forest fire data included	2018 ^{fb}	120	17.4	180 (08/09)	144 (08/06)
* forest fire flagged data removed	2018*	105	9.2	26 (01/14)	24 (11/16)	

APPENDIX 1A PM2.5

Western Oregon						
CITY AND STATION	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	MAXIMUM (µg/m ³)	98 th Percentile (µg/m ³)	
Oakridge Willamette Cntr. (OAK) School St. EPA # 410392013	2009	121	11.0	44 (12/12)	41 (01/16)	
	2010	119	8.9	43 (02/22)	33 (02/19)	
	2011	119	10.0	48 (12/23)	42 (02/02)	
	2012	116	7.6	50 (01/13)	38 (02/06)	
	2013	120	9.8	55 (12/09)	41 (01/19)	
	2014	122	10.0	46 (01/05)	41 (11/16)	
	2015	121	8.9	39 (11/29)	29 (02/23)	
	2016	120	6.7	31 (12/08)	22 (02/24)	
	2017 ^{fb}	125	13.0	200 (09/04)	86 (09/01)	
	2017*	116	8.8	42 (12/12)	36 (01/07)	
	^{fb} forest fire data included	2018 ^{fb}	114	12.2	62 (08/21)	33 (11/13)
	* forest fire flagged data removed	2018*	113	9.0	35 (02/13)	29 (12/07)
Eastern Oregon						
Burns Madison St. (BMS) Washington Park (BWS) EPA # 410250003	2009	94	8.4	28 (12/12)	27 (12/30)	
	2010	118	7.9	32 (01/05)	25 (12/01)	
	2011	116	10.0	47 (01/06)	39 (11/11)	
	2012	121	8.6	49 (09/21)	27 (11/11)	
	2013	119	9.9	39 (12/12)	38 (12/09)	
	2014 ^{fb}	119	9.0	61(08/06)	29 (12/04)	
	2015 ^{fb}	360	8.3	46 (08/29)	26 (01/28)	
	2016	118	8.2	30 (11/17)	29 (11/05)	
	2017 ^{fb}	122	11.1	90 (09/07)	45 (09/04)	
	2017*	119	9.8	52 (01/16)	34 (12/27)	
	^{fb} forest fire data included	2018 ^{fb}	116	10.1	88 (08/21)	36 (01/05)
	* forest fire flagged data removed	2018*	115	9.2	36 (12/16)	28 (11/16)
Klamath Falls Peterson School (KFP) 4856 Clinton St. EPA # 410350004	2009*	115	11.3	54 (12/09)	44 (01/10)	
	2010	118	9.8	53 (11/25)	35 (01/05)	
	2011	115	11.1	38 (11/26)	37 (02/11)	
	2012	115	10.7	43 (08/28)	34 (08/31)	
	2013*	112	11.6	50 (01/16)	46 (12/09)	
	2014	118	8.8	31 (08/03)	30 (01/20)	
	2015 ^{fb}	112	10.2	85 (08/01)	44 (08/19)	
	2015*	108	8.2	38 (11/29)	25 (11/14)	
	2016	118	6.8	29 (12/08)	23 (01/07)	
	2017 ^{fb}	122	11.7	102 (09/04)	55 (08/20)	
	2017*	115	8.5	32 (12/12)	32 (12/15)	
	^{fb} forest fire data included	2018 ^{fb}	117	20.6	156 (08/03)	146 (07/31)
* forest fire flagged data removed	2018*	103	10.7	28 (12/13)	22 (02/13)	

APPENDIX 1A PM2.5

Eastern Oregon					
CITY AND STATION	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	MAXIMUM (µg/m ³)	98 th Percentile (µg/m ³)
Lakeview Center and M Street (LCM) EPA # 410370001	2009	121	10.6	62 (01/13)	43 (12/09)
	2010	116	7.5	34 (12/31)	26 (01/05)
	2011	110	9.1	58 (01/03)	38 (01/27)
	2012	113	9.7	42 (11/15)	37 (01/10)
	2013	121	14.6	104 (01/19)	94 (01/16)
	2014	120	8.6	47 (01/20)	42 (01/14)
	2015	115	8.4	45 (11/29)	33 (01/06)
	2016	106	6.3	70 (12/29)	19 (02/09)
	2017 ^{fb}	108	11.0	64 (12/12)	58 (09/04)
	2017*	107	8.3	64 (12/12)	56 (12/08)
	<i>fb forest fire data included</i>	2018 ^{fb}	101	12.8	112 (07/31)
<i>* forest fire flagged data removed</i>	2018*	91	7.8	30 (11/13)	29 (12/07)
Prineville Davidson Park (PDP) EPA # 410130100	2009	82	9.0	32 (01/22)	28 (01/10)
	2010	75	7.8	28 (01/02)	28 (12/07)
	2011	99	9.6	40 (02/02)	37 (12/17)
	2012	119	8.0	37 (11/26)	29 (09/21)
	2013	122	11.0	56 (12/27)	49 (11/27)
	2014 ^{fb}	119	9.9	69 (07/19)	47 (02/10)
	2014*	118	9.4	48 (01/17)	44 (11/16)
	2015 ^{fb}	108	8.9	83 (08/13)	42 (08/22)
	2015*	104	7.5	42 (01/06)	25 (01/21)
	2016	116	6.9	41 (12/17)	24 (12/11)
	2017 ^{fb}	112	11.7	131(09/07)	58 (09/04)
	2017*	107	8.5	50 (12/15)	35 (12/18)
	<i>fb forest fire data included</i>	2018 ^{fb}	113	8.9	60 (08/21)
<i>* forest fire flagged data removed</i>	2018*	110	8.0	33 (10/17)	25 (11/19)

APPENDIX 1B PM10

PM10 Data Summary

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	24-HOUR AVERAGES (µg/m ³)	
				MAXIMUM (date)	2ND HIGHEST (date)
Eugene Area					
Eugene Pacific Hwy 99 N (EKB)	2009	108	0	80 (02/03)	55 (01/22)
EPA# 410390058	2010	116	0	49 (08/24)	41 (02/19)
Eugene Hwy 99 (E99)	2011	65	0	58 (09/06)	38 (01/03)
Pacific Hwy 99 N	2012	61	0	47 (08/13)	43 (09/06)
EPA# 410390059	2013	60	0	59 (08/20)	42 (11/24)
	2014	61	0	46 (11/19)	37 (09/08)
	2015 ^{Pf}	60	0	97 (08/22)	53 (07/29)
	2016	60	0	57 (08/22)	42 (09/13)
	2017 ^{Pf}	355	3	239 (09/04)	226 (09/03)
^{Pf} forest fire data included	2017*	338	0	57 (01/16)	52 (12/09)
* forest fire flagged data removed	2018 ^{Pf}	339	0	134 (08/21)	83 (08/20)
La Grande					
Ash Street (LAS)	2009	54	0	53 (09/28)	34 (07/18)
EPA # 410610119	2010	55	0	37 (07/25)	32 (08/06)
	2011	56	0	32 (09/24)	32 (09/12)
	2012	57	0	37 (08/07)	36 (08/13)
	2013	62	0	76 (01/22)	35 (12/06)
^{Pf} forest fire data included	2014	60	0	50 (11/19)	43 (11/13)
* forest fire flagged data removed	2015 ^{Pf}	60	0	69 (08/22)	41 (08/28)
Moved to Hall and N Street (Sept, 2016)	2016	45	0	45 (11/02)	27 (12/20)
La Grande					
Hall and North St. (LHN)	2017	56	0	64 (08/11)	55 (08/05)
EPA # 410610123	2017*	54	0	54 (01/07)	28 (03/02)
	2018 ^{Pf}	61	0	54 (07/14)	51 (08/06)
Medford					
Welch & Jackson (MWJ)	2009	61	0	49 (01/19)	46 (12/09)
EPA # 410292129	2012 ^{Pf}	44	0	37 (01/28)	36 (08/13)
	2013 ^{Pf}	58	0	91 (08/08)	84 (08/14)
	2014	54	0	41 (01/05)	35 (12/31)
	2015 ^{Pf}	57	0	61 (08/22)	52 (08/28)
	2016	53	0	33 (12/20)	28 (01/07)
	2017 ^{Pf}	58	1	175 (09/04)	136 (08/29)
^{Pf} forest fire data included	2017*	53	0	47 (01/31)	39 (12/09)
* forest fire flagged data removed	2018 ^{Pf}	55	0	99 (07/25)	66 (07/19)
Oakridge					
Willamette Center Trailer (OAK)	2009	117	0	47 (02/21)	45 (12/12)
EPA# 410392013	2010	118	0	51 (02/22)	39 (01/05)
	2011	59	0	53 (12/23)	49 (02/02)
	2012	63	0	47 (02/03)	44 (01/04)
	2013	61	0	53 (12/30)	41 (01/22)
	2014	61	0	55 (01/05)	43 (08/27)
	2015	60	0	37 (02/17)	32 (02/23)
	2016	60	0	30 (12/08)	25 (02/24)
^{Pf} forest fire data included	2017 ^{Pf}	352	4	210 (09/04)	173 (09/05)
* forest fire flagged data removed	2017*	336	0	55 (12/07)	44 (12/13)
	2018 ^{Pf}	354	0	76 (08/21)	60 (08/22)

APPENDIX 1B PM10

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	24-HOUR AVERAGES	
				MAXIMUM (date)	2ND HIGHEST (date)
Portland Area	2009	121	0	29 (01/31)	29 (12/12)
SE Portland (SEL)	2010	117	0	38 (11/25)	31 (11/10)
SE Lafayette	2011	111	0	56 (02/11)	51 (12/23)
EPA# 410510080	2012	111	0	45 (01/28)	34 (09/18)
	2013	120	0	44 (12/12)	43 (12/12)
	2014	120	0	37 (02/10)	30 (09/11)
	2015 ^{Pb}	119	0	68 (08/22)	33 (11/24)
	2016	119	0	34 (08/19)	32 (12/26)
	2017 ^{Pb}	120	0	70 (09/16)	59 (08/02)
^{Pb} forest fire data included	2017*	118	0	49 (08/29)	41 (08/08)
* forest fire flagged data removed	2018 ^{Pb}	117	0	54 (08/15)	27 (02/07)
N. Portland (PNR)	2009	59	0	41 (09/10)	35 (09/22)
N. Emerson (N. Roselawn)	2010	57	0	22 (08/24)	22 (01/26)
EPA # 410510246	2011	59	0	38 (12/23)	35 (12/11)
	2012	58	0	36 (01/28)	35 (09/18)
^{Pb} forest fire data included	2013	61	0	43 (11/30)	40 (12/12)
	2014	60	0	18 (09/14)	17 (11/19)
Site shut down, restarted as PHS in 2017	2015 ^{Pb}	58	0	73 (08/22)	45 (11/24)
	2016	23	-	-	-
N. Portland (PHS)					
Humboldt School	2017 ^{Pb}	46	0	52 (09/16)	29 (08/29)
EPA # 410512010	2018	61	0	29 (02/07)	27 (10/17)
Gresham (GLC)					
Learning Center	2017 ^{Pb}	57	0	90 (09/16)	62 (09/04)
EPA # 410512008	2017*	54	0	34 (12/21)	34 (01/07)

APPENDIX 1C Ozone

Ozone Data Summary

Station Location and Number	Year	8 Hr Aver. Maximum (ppm)	4th Highest 8hr Aver. (ppm)	# of Days >Std	3 Yr Aver. of 4th High (ppm)
Eugene Area Eugene Amazon Park (AMZ) EPA# 410390060	2009	68 (07/28)	63 (07/29)	0	60
	2010	73 (08/25)	56 (07/07)	0	59
	2011	72 (09/10)	59 (09/09)	0	59
	2012	65 (08/12)	59 (05/13)	0	58
	2013	57 (07/09)	53 (05/03)	0	57
	2014	61 (07/15)	58 (08/26)	0	56
	2015 ^[b]	78 (07/02)	68 (07/30)	1	59
	2016	64 (08/19)	57 (08/13)	0	61
	2017 ^[b]	91 (08/02)	70 (08/08)	3	65
<i>^[b]Wildfire smoke – this can elevate ozone concentrations</i>	2018 ^[b]	65 (07/25)	60 (08/21)	0	62
Saginaw (SAG) 79980 Delight Valley School Road EPA# 410391007	2009	67 (07/02)	66 (08/19)	0	61
	2010	74 (08/25)	60 (08/13)	0	61
	2011	68 (09/10)	59 (08/20)	0	61
	2012	65 (09/17)	62 (09/13)	0	60
	2013	59 (07/09)	56 (07/26)	0	59
	2014	62 (07/15)	58 (08/01)	0	58
	2015	80 (07/02)	71 (08/19)	1	61
	2016	63 (08/19)	56 ^a (07/28)	0	61
	2017 ^[b]	91 (08/02)	73 (08/01)	4	66
<i>a. Errata: was 54ppb</i> <i>^[b]Wildfire smoke – this can elevate ozone concentrations</i>	2018 ^[b]	68 (07/25)	60 (07/12)	0	63
Bend Road Dept. (BRD) EPA# 410170121	2009	64 (09/28)	60 (07/22)	0	-
	2010	65 (07/29)	59 (08/05)	0	-
	2011	61 (09/12)	57 (06/20)	0	58
	2012	67 (07/11)	62 (08/12)	0	59
	2013	59 (05/02)	56 (07/21)	0	58
	2014	65 (07/10)	60 (07/15)	0	59
	2015	71 (07/03)	63 (06/10)	0	60
Hermiston Municipal Airport (HMA) EPA # 410591003	2009	64 (08/01)	61 (07/03)	0	63
	2010	68 (07/29)	63 (08/17)	0	63
	2011	63 (09/09)	58 (09/11)	0	60
	2012	73 (05/15)	68 (08/07)	0	63
	2013	66 (07/19)	62 (05/07)	0	62
	2014	67 (07/12)	64 (08/03)	0	64
	2015	73 (07/03)	70 (08/19)	0	65
	2016	74 (06/07)	63 (07/14)	0	65
	2017 ^[b]	80 (08/08)	73 (08/09)	7	68
<i>^[b]Wildfire smoke – this can elevate ozone concentrations</i>	2018 ^[b]	66 (07/13)	60 (05/22)	0	65

*Parts per million

23

The 8 hr standard is the 3-year average of the 4th highest value.

APPENDIX 1C Ozone

Station Location and Number	Year	8 Hr Aver. Maximum (ppm)	4th Highest 8hr Aver. (ppm)	# of Days >Std	3 Yr Aver. of 4th High (ppm)
<u>The Dalles</u>					
Cherry Heights (TDC)					
EPA# 410670007	2016	62 (05/12)	56 (05/31)	0	-
^{fb} forest fire data included	2017 ^{fb}	73 (08/09)	68 (08/11)	1	-
Insufficient data completion	2018	69 (09/16)	53 (07/24)	0	59*
<u>Medford Area</u>					
	2009	67 (07/29)	65 (08/26)	0	67
Talent (TAL)	2010	68 (08/25)	61 (08/24)	0	65
7112 Rapp Lane	2011	63 (09/07)	57 (09/10)	0	61
EPA# 410290201	2012	73 (08/14)	66 (07/11)	0	61
	2013	70 (07/09)	67 (08/06)	0	63
	2014	64 (07/16)	59 (07/10)	0	64
	2015 ^{fb}	86 (08/01)	69 (07/03)	1	64
	2016	50 (05/13)	49 (05/11)	0	58
^{fb} Wildfire smoke – this can	2017 ^{fb}	83 (08/02)	78 (08/03)	5	65
elevate ozone concentrations	2018 ^{fb}	76 (07/23)	74 (07/24)	6	67
<u>Salem Area</u>					
	2009	82 (07/29)	69 (07/03)	1	64
Cascade Jr High (CJH)	2010	78 (08/25)	57 (08/24)	1	64
Turner	2011	68 (09/10)	58 (09/09)	0	61
EPA# 410470004	2012	68 (09/14)	63 (08/04)	0	59
	2013	62 (08/21)	55 (05/10)	0	58
	2014	81 (09/15)	62 (07/12)	1	59
	2015	78 (08/18)	65 (06/27)	1	60
	2016	69 (08/18)	65 (08/12)	0	64
^{fb} Wildfire smoke – this can	2017 ^{fb}	85 (08/03)	78 (08/28)	6	69
elevate ozone concentrations	2018 ^{fb}	70 (08/14)	66 (07/25)	0	69
<u>State Hospital (SSH)</u>					
EPA# 410470041	2018 ^{fb}	58 (07/16)	55 (07/15)	0	-
<u>Portland Metro Area</u>					
	2009	80 (08/19)	69 (09/12)	0	64
Carus (SPR)	2010	94 (07/08)	66 (08/05)	0	67
13575 Spangler Road	2011	68 (09/07)	63 (09/10)	0	66
Canby	2012	73 (08/17)	65 (05/13)	0	64
EPA# 410050004	2013	65 (09/11)	59 (05/06)	0	62
	2014	72 (08/11)	62 (09/14)	0	62
	2015	73 (08/18)	69 (07/30)	0	63
	2016	63 (08/19)	64 (07/28)	0	65
^{fb} Wildfire smoke – this can	2017 ^{fb}	116 (08/03)	83 (08/28)	8	72
elevate ozone concentrations	2018 ^{fb}	76 (08/22)	70 (08/07)	3	72

*Parts per million

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The 8 hr standard is the 3-year average of the 4th highest value.

APPENDIX 1C Ozone

Station Location And Number	Year	8-Hour Average Maximum (ppm)	4th Highest 8-Hour Average (ppb)	# Of Days >Std**	3 Year Avg Of 4th High (ppb)	
Sherwood (SLR) EPA# 410671004	2009	69 (08/19)	65 (07/29)	0	-	
	2010	71 (08/25)	56 (08/24)	0	-	
	2011	67 (09/07)	56 (09/08)	0	59	
	2012	70 (08/17)	62 (09/14)	0	58	
	2013	55 (05/06)	52 (05/04)	0	56	
	[Ⓜ] <i>Wildfire smoke – this can elevate ozone concentrations</i>	2014	76 (08/11)	57 (05/14)	1	57
		2015	70 (08/23)	63 (06/27)	0	57
	<i>Site discontinued after 2017</i>	2016	60 (08/12)	58 (05/13)	0	59
	2017 [Ⓜ]	93 (08/03)	76 (08/02)	6	65	
SE Portland (SEL) SE 57 & SE Lafayette EPA# 410510080	2009	80 (08/19)	61 (07/02)	0	59	
	2010	64 (08/25)	54 (08/16)	0	58	
	2011	76 (09/11)	57 (09/07)	1	57	
	2012	63 (08/16)	61 (05/14)	0	57	
	2013	58 (06/30)	53 (05/06)	0	57	
	2014	75 (08/11)	55 (05/01)	0	56	
	2015	62 (08/18)	57 (08/01)	0	55	
	2016	60 (08/12)	55 (08/12)	0	55	
[Ⓜ] <i>Wildfire smoke – this can elevate ozone concentrations</i>	2017 [Ⓜ]	87 (08/02)	68 (08/09)	1	60	
	2018 [Ⓜ]	76 (08/08)	67 (07/15)	2	63	
Sauvie Island (SIS) Social Security Beach EPA# 410090004	2009	72 (08/19)	60 (07/27)	0	58	
	2010	61 (08/25)	49 (06/23)	0	56	
	2011	57 (09/11)	51 (09/07)	0	53	
	2012	57 (05/13)	53 (05/14)	0	51	
	2013	52 (08/21)	47 (05/04)	0	50	
	2014	56 (05/01)	50 (05/13)	0	50	
	2015	63 (07/30)	58 (07/01)	0	52	
	2016	58 (08/18)	51 (08/12)	0	54	
[Ⓜ] <i>Wildfire smoke – this can elevate ozone concentrations</i>	2017 [Ⓜ]	86 (08/02)	64 (08/04)	2	57	
	2018 [Ⓜ]	55 (08/21)	53 (08/08)	0	56	
Tualatin Near Road I-5 EPA# 410670005	2014	72 (08/11)	53 (09/07)	1	-	
	2015	67 (08/23)	52 (07/04)	0	-	
	2016	57 (06/05)	48 (04/18)	0	51	
	[Ⓜ] <i>Wildfire smoke – this can elevate ozone concentrations</i>	2017 [Ⓜ]	85 (08/03)	71 (08/02)	4	57
		2018 [Ⓜ]	56 (07/15)	54 (08/15)	0	57

*Parts per million

25

The 8 hr standard is the 3-year average of the 4th highest value.

APPENDIX 1D Nitrogen Dioxide
APPENDIX 1E Sulfur Dioxide
APPENDIX 1F Carbon Monoxide

Nitrogen Dioxide Data Summary

Station Location And Number	Year	# Of Days	Annual Arithmetic Mean (ppb)	98th Percentile Of Daily Maximum (ppb)	3YR Average of 98 th Percentile Daily Max (ppb)
Portland SE Lafayette at 57th (SEL) EPA # 410510080	2009	344	10	40	-
	2010	363	9	33	-
	2011	348	9	33	35
	2012	348	9	36	34
	2013	351	10	33	33
	2014	340	8	35	34
	2015	365	9	36	34
	2016	366	9	34	35
	2017	346	9	40	36
2018	337	9	9	35	36
Tualatin Bradbury Ct. (25meters from I-5) (TBC) EPA# 410670005	2015	332	14	36	-
	2016	363	13	35	-
	2017	361	12	38	36
	2018	341	12	38	37

Sulfur Dioxide Data Summary

Station Location And Number	Year	# Of Days	One Hour Aver. 99 th Percentile (ppb)	3 Hour Aver. Maximum (ppb)	3 Hour Aver. 2 nd Highest (ppb)
Portland SE Lafayette at 57th (SEL) EPA # 410510080	2009	363	9	10	8
	2010	365	8	8	8
	2011	343	9	6	6
	2012	334	10	5	5
	2013	342	5	6	6
	2014	343	3	4	4
	2015	359	4	8	8
	2016	353	3	3	3
	2017	332	3	4	4
2018	330	3	3	3	

Carbon Monoxide Data Summary

Station Location And Number	Year	Days >9ppm	8-HOUR AVERAGES	
			Maximum (ppm)	2 ND Highest (ppm)
Portland SE Lafayette at 57th (SEL) EPA # 410510080	2009	0	2.5	2.3
	2010	0	2.4	2.4
	2011	0	2.6	2.4
	2012	0	2.3	2.2
	2013	0	2.0	1.8
	2014	0	1.3	1.3
	2015	0	2.0	1.9
	2016	0	1.5	1.5
	2017	0	1.7	1.6
2018	0	1.6	1.6	
Tualatin Bradbury Ct. (25meters from I-5) (TBC) EPA# 410670005	2015	0	1.3	1.3
	2016	0	1.3	1.3
	2017	0	1.4	1.3
	2018	0	1.0	1.0

ppm - parts per million
 ppb – parts per billion

APPENDIX G Air Quality Index

Air Quality Index Summary

Number of days in each health category by year.

Portland Metro		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Portland (Includes: PM2.5, Ozone, CO, NO ₂ , & SO ₂)	2009	309	52	4	0	0	0	0
	2010	342	21	2	0	0	0	0
	2011	310	49	6	0	0	0	0
	2012	330	35	0	0	0	0	1
	2013	282	77	5	0	0	0	1
	2014	332	32	1	0	0	0	0
	2015	305	58	0	2	0	0	0
	2016	340	26	0	0	0	0	0
	2017	309	41	9	5	1	0	0
	2018	301	54	9	1	0	0	0
Hillsboro (PM2.5 only)	2009	288	62	7	0	0	0	8
	2010	338	17	1	0	0	0	9
	2011	308	50	7	0	0	0	0
	2012	334	29	1	0	0	0	2
	2013	281	71	8	1	0	0	4
	2014	324	40	1	0	0	0	0
	2015	309	54	1	1	0	0	0
	2016	331	33	0	0	0	0	2
	2017	298	60	5	0	0	0	2
	2018	306	51	6	0	0	0	2
Beaverton (PM2.5 only)	2009	330	22	0	0	0	0	13
	2010	358	6	0	0	0	0	1
	2011	337	24	0	0	0	0	4
	2012	354	12	0	0	0	0	0
	2013	307	53	5	0	0	0	0
	2014	349	16	0	0	0	0	0
	2015	338	24	1	1	0	0	1
	2016	357	9	0	0	0	0	0
	2017	334	23	7	0	0	0	1
	2018	328	28	6	0	0	0	3
McMinnville (PM2.5 only) Shut down	2009	351	8	1	0	0	0	5
	2010	360	3	0	0	0	0	2
	2011	183	4	0	0	0	0	0

APPENDIX G Air Quality Index

Willamette Valley		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Salem (PM2.5 and Ozone)	2009	310	47	3	0	0	0	5
	2010	346	18	1	0	0	0	0
	2011	355	10	0	0	0	0	0
	2012	340	24	0	0	0	0	2
	2013	283	71	5	0	0	0	6
	2014	322	42	1	0	0	0	0
	2015	311	51	1	2	0	0	0
	2016	326	35	0	0	0	0	5
	2017	301	53	6	2	0	0	3
	2018	294	37	7	1	0	0	26
Albany (PM2.5 only)	2009	331	28	3	0	0	0	3
	2010	348	11	0	0	0	0	6
	2011	329	30	1	0	0	0	5
	2012	354	12	0	0	0	0	0
	2013	305	56	4	0	0	0	0
	2014	335	28	2	0	0	0	0
	2015	305	43	2	3	0	0	12
	2016	343	23	0	0	0	0	0
	2017	320	39	3	3	0	0	0
	2018	328	34	3	0	0	0	0
Sweet Home (PM2.5 only)	2009	292	60	1	1	0	0	11
	2010	310	48	0	0	0	0	7
	2011	329	32	1	0	0	0	3
	2012	355	9	0	0	0	0	2
	2013	284	70	5	0	0	0	6
	2014	336	27	0	0	0	0	2
	2015	332	31	0	2	0	0	0
	2016	346	19	0	0	0	0	1
	2017	299	57	4	5	0	0	0
	2018	299	65	1	0	0	0	0
Corvallis (PM2.5 only) *Site closed in summer	2009	327	27	0	0	0	0	11
	2010	358	6	0	0	0	0	1
	2011	343	18	0	0	0	0	4
	2012	348	7	0	0	0	0	11
	2013	302	52	1	0	0	0	10
	2014	344	19	1	0	0	0	1
	2015	333	30	1	1	0	0	0
	2016*	185	9	0	0	0	0	172*
	2017	319	36	2	0	0	0	8
	2018	340	23	2	0	0	0	0

APPENDIX G Air Quality Index

Willamette Valley		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Eugene/ Springfield (PM2.5 and Ozone)	2009	312	44	8	1	0	0	0
	2010	341	24	0	0	0	0	0
	2011	324	41	0	0	0	0	0
	2012	333	32	1	0	0	0	0
	2013	282	69	0	1	0	0	0
	2014	301	59	5	0	0	0	0
	2015	282	77	4	2	0	0	0
	2016	335	30	0	0	0	0	1
	2017	290	57	10	5	2	1	0
	2018	290	69	6	0	0	0	0
SW OR	2009	298	47	18	2	0	0	0
Oakridge (PM2.5 only)	2010	309	48	6	0	0	0	2
	2011	296	54	15	0	0	0	0
	2012	339	19	6	0	0	0	2
	2013	272	80	13	0	0	0	0
	2014	277	75	13	0	0	0	0
	2015	286	71	6	1	0	0	1
	2016	330	36	0	0	0	0	0
	2017	267	74	13	8	2	0	1
	2018	286	74	2	1	0	0	2
Cottage Grove (PM2.5 only)	2009	322	40	2	0	0	0	1
	2010	354	11	0	0	0	0	0
	2011	349	16	0	0	0	0	0
	2012	348	18	0	0	0	0	0
	2013	296	65	3	0	0	0	1
	2014	323	40	1	1	0	0	0
	2015	329	34	1	1	0	0	0
	2016	346	20	0	0	0	0	0
	2017	295	60	3	7	0	0	0
	2018	318	45	1	0	0	0	1
Roseburg (PM2.5 only)	2009	339	19	2	0	0	0	5
	2010	361	2	0	0	0	0	2
	2011	336	23	1	0	0	0	5
	2012	354	8	0	0	0	0	4
	2013	301	64	0	0	0	0	0
	2014	330	34	0	0	0	0	1
	2015	326	35	1	0	0	0	3
	2016	314	14	0	0	0	0	27
	2017	303	49	4	3	0	0	6
	2018	293	43	2	0	0	0	27

APPENDIX G Air Quality Index

SW Oregon		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Grants Pass (PM2.5 only)	2009	298	52	4	0	0	0	11
	2010	342	17	1	0	0	0	5
	2011	326	34	1	0	0	0	4
	2012	343	20	0	0	0	0	3
	2013	262	91	2	6	2	1	1
	2014	323	40	2	0	0	0	0
	2015	307	55	2	1	0	0	0
	2016	322	39	0	0	0	0	5
	2017	265	81	2	9	4	1	3
	2018	252	85	9	14	0	0	5
Cave Junction (PM2.5 only)	2009	359	6	0	0	0	0	0
	2010	361	1	0	0	0	0	3
	2011	337	18	0	0	0	0	10
	2012	357	7	0	0	0	0	2
	2013	267	83	6	7	1	1	0
	2014	327	38	0	0	0	0	0
	2015	275	71	3	1	0	0	15
	2016	337	29	0	0	0	0	0
	2017	273	75	4	7	4	0	2
	2018	261	71	18	15	0	0	0
Applegate Valley (PM2.5 only)	2009	346	10	2	0	0	0	7
	2010	358	6	1	0	0	0	0
	2011	350	7	0	0	0	0	8
	2012	356	2	0	0	0	0	8
	2013	311	37	1	8	2	0	6
	2014	349	16	0	0	0	0	0
	2015	330	27	3	2	0	0	3
	2016	360	5	0	0	0	0	1
	2017	298	39	5	9	5	1	8
	2018	288	40	6	19	0	0	12
Shady Cove (PM2.5 only)	2009	340	9	3	1	0	0	12
	2010	362	2	0	0	0	0	1
	2011	360	1	0	0	0	0	4
	2012	364	0	0	0	0	0	2
	2013	308	46	4	5	0	0	2
	2014	341	20	1	0	0	0	3
	2015	333	15	9	6	1	1	0
	2016	346	5	0	0	0	0	15
	2017	294	32	9	11	1	0	18
	2018	303	25	9	27	1	0	0

APPENDIX G Air Quality Index

SW Oregon		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Medford (PM2.5 and Ozone)	2009	277	78	7	1	0	0	2
	2010	331	34	0	0	0	0	0
	2011	283	74	4	0	0	0	4
	2012	286	79	1	0	0	0	0
	2013	222	126	10	5	2	0	0
	2014	276	88	1	0	0	0	0
	2015	248	99	11	7	0	0	0
	2016	312	54	0	0	0	0	0
	2017	238	98	14	9	5	1	0
	2018	232	87	8	22	3	0	13
Ashland (PM2.5 only)	2016	163	8	0	0	0	0	195
	2017	300	43	7	11	1	2	1
	2018	300	26	11	20	4	0	4
Central OR								
Bend (PM2.5 only)	2009	349	9	1	0	0	0	6
	2010	357	8	0	0	0	0	0
	2011	349	16	0	0	0	0	0
	2012	343	15	3	0	0	0	5
	2013	332	33	0	0	0	0	0
	2014	335	29	1	0	0	0	0
	2015	329	33	2	1	0	0	0
	2016	335	5	1	0	0	0	25
	2017	291	48	4	8	3	0	11
	2018	307	47	5	4	0	0	2
Prineville (PM2.5 only)	2009	304	56	5	0	0	0	0
	2010	333	26	0	0	0	0	6
	2011	293	56	7	0	0	0	9
	2012	313	45	2	0	0	0	6
	2013	255	97	11	2	0	0	0
	2014	289	66	4	6	0	0	0
	2015	290	63	6	2	0	0	4
	2016	288	59	1	0	0	0	18
	2017	260	81	8	8	0	0	8
	2018	289	71	3	2	0	0	0
Sisters (PM2.5 only)	2012	334	10	1	11	2	3	4
	2013	348	16	0	0	0	0	1
	2014	350	15	0	0	0	0	0
	2015	332	31	0	2	0	0	0
	2016	346	1	0	0	0	0	19
	2017	286	29	2	15	8	0	22
	2018	317	33	7	3	0	0	5

APPENDIX G Air Quality Index

Central OR		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Madras Summer (PM2.5 only)	2009	309	42	0	0	0	0	14
	2010	323	24	0	0	0	0	18
	2011	145	19	1	0	0	0	12
	2012	63	7	0	0	0	0	0
	2013	76	16	0	0	0	0	0
	2014	61	19	0	2	0	0	0
	2015	75	13	3	1	0	0	0
	2016	119	1	0	0	0	0	2
	2017	58	25	5	3	1	0	0
	2018	135	46	6	1	0	0	177
John Day (PM2.5 only)	2009	288	43	3	0	0	0	31
	2010	331	33	1	0	0	0	0
	2011	289	59	4	0	0	0	13
	2012	302	58	2	1	0	0	3
	2013	221	127	3	0	0	0	14
	2014	266	91	1	1	0	0	6
	2015	279	75	4	5	0	0	2
	2016	285	56	0	0	0	0	25
	2017	257	89	9	3	0	0	7
	2018	251	104	1	2	0	0	7
Burns (PM2.5 only)	2009	297	64	0	0	0	0	4
	2010	308	51	0	0	0	0	6
	2011	292	64	8	0	0	0	1
	2012	314	49	1	0	0	0	2
	2013	266	89	8	0	0	0	2
	2014	277	83	3	2	0	0	0
	2015	282	80	3	0	0	0	0
	2016	279	77	1	0	0	0	8
	2017	248	109	6	2	0	0	9
	2018	251	104	1	2	0	0	7
Klamath Falls (PM2.5 only)	2009	268	82	9	2	0	0	4
	2010	295	57	5	0	0	0	8
	2011	274	75	11	0	0	0	5
	2012	280	70	9	0	0	0	7
	2013	220	118	21	3	0	0	3
	2014	274	89	2	0	0	0	0
	2015	263	92	8	2	0	0	0
	2016	292	71	0	0	0	0	3
	2017	246	93	13	8	1	0	4
	2018	219	105	11	25	3	0	2

APPENDIX G Air Quality Index

SE Oregon		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
Lakeview (PM2.5 only)	2009	294	49	14	6	0	0	2
	2010	334	27	2	0	0	0	2
	2011	296	50	13	5	0	0	1
	2012	292	48	8	2	0	0	16
	2013	262	63	18	20	0	0	2
	2014	302	48	12	1	0	0	2
	2015	294	68	3	0	0	0	0
	2016	318	41	0	1	0	0	6
	2017	288	57	17	1	0	0	2
	2018	277	59	13	9	0	0	7
NE Oregon	2009	340	25	0	0	0	0	0
The Dalles (PM2.5 only)	2010	340	24	1	0	0	0	0
	2011	349	16	0	0	0	0	0
	2012	350	15	0	0	0	0	1
	2013	322	35	3	1	0	0	4
	2014	331	33	1	0	0	0	0
	2015	326	30	0	2	0	0	7
	2016	319	31	0	0	0	0	16
	2017	287	59	6	8	1	0	4
	2018	293	33	4	2	0	0	33
	Hermiston (Ozone - summer only)	2009	136	7	0	0	0	0
2010		139	10	0	0	0	0	4
2011		150	2	0	0	0	0	1
2012		130	19	0	0	0	0	4
2013		140	11	0	0	0	0	2
2014		132	11	0	0	0	0	10
2015		133	18	0	0	0	0	2
2016		115	19	1	0	0	0	18
2017		103	43	6	1	0	0	0
2018		90	7	0	0	0	0	56
Pendleton (PM2.5 only)	2009	320	45	0	0	0	0	0
	2010	325	38	0	0	0	0	2
	2011	317	44	1	0	0	0	3
	2012	339	24	0	0	0	0	3
	2013	298	58	6	0	0	0	3
	2014	312	40	0	0	0	0	13
	2015	312	47	2	2	0	0	2
	2016	341	25	0	0	0	0	0
	2017	279	74	7	2	1	0	2
	2018	276	40	5	3	1	0	40

APPENDIX G Air Quality Index

NE Oregon		Good	Moderate	USG	Unhealthy	Very Unhealthy	Hazardous	Missing days
La Grande (PM2.5 only)	2009	313	40	0	0	0	0	12
	2010	339	23	1	0	0	0	2
	2011	318	39	3	1	0	0	4
	2012	332	31	1	0	0	0	2
	2013	286	73	6	0	0	0	0
	2014	291	66	6	0	0	0	2
	2015	285	59	8	3	0	0	10
	2016	329	35	0	0	0	0	2
	2017	308	49	5	3	0	0	0
	2018	322	35	5	1	0	0	2
Enterprise (PM2.5 only)	2009	343	19	0	0	0	0	3
	2010	355	5	0	1	0	0	4
	2011	342	18	0	0	0	0	5
	2012	340	13	1	0	0	0	12
	2013	323	41	0	0	0	0	1
	2014	329	33	3	0	0	0	0
	2015	322	34	3	5	0	0	1
	2016	318	31	0	0	0	0	17
	2017	291	50	6	3	0	0	15
	2018	272	46	2	0	0	0	45
Baker City (PM2.5 only)	2009	335	26	0	0	0	0	4
	2010	343	13	0	0	0	0	9
	2011	324	26	0	0	0	0	15
	2012	349	15	2	0	0	0	0
	2013	302	63	0	0	0	0	0
	2014	317	48	0	0	0	0	0
	2015	326	29	8	2	0	0	0
	2016	339	27	0	0	0	0	0
	2017	307	52	3	3	0	0	0
	2018	313	35	1	1	0	0	15

APPENDIX 1H Air Toxics

Pollutant		Acet aldehyde		Form aldehyde		Benzene		1,3-butadiene		Perchloro ethylene		Arsenic		Cadmium		Chromium (VI) TSP		Lead		Mang anese		Nickel	
Units		(µg/m3)		(µg/m3)		(µg/m3)		(µg/m3)		(µg/m3)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)	
City/Site	Year	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average
Portland	2003	57	2.0	57	4.2	58	1.5	58	<0.2	58	<0.7	54	> 1.0	--	--	--	--	48	9.3	--	--	54	< 0.8
NE Portland	2004	59	1.7	59	2.9	58	1.6	59	>0.2	59	<0.5	56	1.8	58	1.6	--	--	56	8.8	58	14.6	56	2.1
N Roselawn	2005	55	1.5	58	2.2	*	*	59	>0.2	59	<0.7	59	1.7	60	2.5	49	>0.04	59	11.7	60	15.9	59	1.8
24 N Emerson (PNR)	2006	57	1.5	54	2.1	56	1.2	61	>0.2	61	<0.7	60	1.4	60	2.0	--	--	60	6.8	61	11.9	61	< 1.0
	2007	53	1.4	52	2.0	56	1.2	57	<0.4	57	<0.7	56	1.4	56	1.4	--	--	57	7.4	57	12.1	57	< 1.0
	2008	45	1.4	52	1.9	50	0.8	49	<0.2	52	<0.7	56	1.1	56	2.1	59	<0.04	56	4.9	56	15.3	56	1.7
	2009	57	1.4	57	2.1	43	1.0	45	<0.2	50	<0.3	56	0.9	57	1.5	60	<0.04	57	5.1	57	9.0	57	1.1
	2010	55	1.1	53	1.6	46	1.1	52	<0.2	52	<0.3	55	0.8	55	0.8	61	<0.04	55	4.4	55	6.6	55	1.4
	2011	61	1.2	61	1.6	46	0.8	60	0.11	60	0.14	59	0.9	59	1.2	59	<0.04	59	4.4	59	10.6	59	1.5
	2012	57	1.8	57	2.1	58	0.9	58	0.09	58	<0.1	57	1.0	57	1.6	59	<0.04	57	3.4	57	9.8	57	1.2
	2013	61	1.7	61	2.0	51	0.7	53	0.09	51	0.14	61	1.0	61	1.0	59	<0.04	61	3.4	61	10.0	61	1.3
	2014	52	1.1	52	1.8	49	0.5	50	<0.09	49	0.14	60	0.7	60	0.4	58	<0.04	60	2.8	60	10.2	60	1.2
	2015	59	1.7	59	2.7	52	0.7	52	0.13	52	0.22	58	0.7	58	0.4	-	-	58	3.0	58	17.6	58	0.8
N. Portland	2017	38	1.6	38	2.6	35	0.4	35	0.03	35	0.14	41	0.7	41	0.1	40	0.03	41	2.9	41	18.3	41	0.6
Humboldt (PHS)	2018	56	1.3	56	1.8	51	0.5	51	0.02	51	0.03	61	0.7	61	0.07	60	0.03	61	2.4	61	16.9	61	0.6
Forest Heights	2003	28	0.7	28	1.9	26	1.3	26	<0.2	26	2.6	--	--	--	--	28	0.18	--	--	--	--	--	--
NW 24 th & Savior (PNW)	2004	43	1.7	52	2.7	58	1.5	58	<0.2	58	<0.5	44	1.1	45	0.4	--	--	44	7.0	45	29.8	44	3.7
	2005	55	1.7	56	2.4	*	*	54	<0.2	54	<0.7	59	0.9	59	0.6	49	<0.04	59	6.6	59	42.2	59	4.2
SE Portland (SEL)	2003	23	1.3	23	2.3	23	1.3	23	<0.2	23	<0.5	--	--	--	--	--	--	--	--	--	--	--	--
57 th & SE Lafayette	2004	56	1.4	56	2.4	52	1.5	52	<0.2	52	<0.5	50	1.6	51	0.3	--	--	50	6.0	51	6.6	51	1.7
	2005	55	1.6	57	2.1	54	1.6	56	<0.2	56	<0.7	60	1.3	60	0.5	46	<0.04	60	5.7	60	6.4	60	1.8
Beaverton (BHP)	2005	48	1.3	52	1.6	*	*	49	<0.2	49	<0.7	60	1.1	60	0.4	49	<0.04	60	3.2	60	3.8	60	<1.0
ODEQ Benchmarks		0.45		3.0		0.13		0.03		35		0.2		0.6		0.08		150		90		2	

APPENDIX 1H Air Toxics

Pollutant		Acet aldehyde		Form aldehyde		Benzene		1,3-butadiene		Perchloro ethylene		Arsenic		Cadmium		Chromium (VI) TSP		Lead		Mang anese		Nickel	
Units		(µg/m ³)		(µg/m ³)		(µg/m ³)		(µg/m ³)		(µg/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)	
City/Site	Year	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Samples	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual	Samples	Annual Average	Samples	Annual Average
Gresham (GLC)	2017	60	1.4	60	1.9	65	0.6	65	0.05	65	0.1	58	1.1					58	2.1				
SE Portland (PFH)	2017	42	1.7	42	2.2	48	0.5	48	0.04	48	0.2	41	0.5	41	0.04			41	1.7	41	7.5	41	0.46
SW Portland (PKC)	2005	49	1.5	52	2.2	*	*	49	<0.2	49	<0.7	62	1.2	62	0.9	50	<0.04	62	5.6	62	19.1	62	1.6
Vancouver (VKT)	2005	52	1.4	53	2.0	*	*	48	<0.2	48	<0.7	59	1.0	59	0.5	49	<0.04	59	3.8	59	8.1	59	< 1.0
Sauvie Is. (SIS)	07/08	52	0.8	45	1.2	49	0.6	52	<0.2	52	<0.7	62	0.8	62	0.17	--	--	62	2.8	62	4.1	57	< 1.0
Hillsboro (HHF)	2013	48	1.5	48	1.6	48	0.7	48	<0.1	48	<0.1	56	1.0	56	0.13	54	<0.04	56	3.0	56	3.6	56	<0.2
	2014	50	1.1	50	1.8	44	0.6	44	<0.1	44	<0.1	61	0.8	61	0.07	-	-	61	2.1	61	4.5	61	<0.3
Salem (SSH)	08/09	52	1.2	54	1.6	55	1.1	56	<0.2	50	<0.3	57	0.6	57	0.16	50	<0.04	56	2.8	57	4.9	57	< 1.0
	09/10	52	1.2	51	1.7	31	0.6	42	<0.2	45	<0.3	53	0.9	53	0.18	54	<0.04	53	2.9	53	4.9	53	< 1.0
Eugene	2003	52	1.4	52	4.3	45	1.1	45	<0.2	45	<0.7	53	< 2.0	--	--	--	--	53	3.7	--	--	53	< 1.8
Amazon Park (AMZ)	2004	57	1.3	57	2.8	57	1.4	57	<0.2	57	<0.5	48	0.7	48	0.13	--	--	48	2.5	48	4.8	48	<1.0
	2005	27	1.5	28	1.9	28	1.6	28	<0.2	28	<0.7	31	0.7	31	<0.1	--	--	31	2.5	31	6.3	31	<1.0
	2006	27	1.4	27	1.8	28	1.0	28	<0.2	28	<0.7	30	0.8	30	0.1	--	--	30	2.6	30	5.5	30	< 1.0
	2007	38	1.6	33	1.5	39	1.0	41	<0.4	41	<0.7	44	0.6	44	<0.1	--	--	44	2.0	44	5.3	44	< 1.0
	2008	50	1.2	54	1.5	49	0.8	52	<0.2	48	<0.3	58	0.6	58	<0.1	--	--	58	2.0	58	5.3	58	< 1.0
Q2 2010–Q1 2011	10/11	56	1.1	46	1.6	59	1.1	58	<0.2	58	<0.3	55	0.7	54	<0.1	--	--	55	1.4	55	3.9	55	< 1.0
	2015	59	1.6	59	2.6	58	0.1	58	0.2	58	0.1	--	--	--	--	--	--	--	--	--	--	--	--
Hwy 99 (E99)	2015	59	3.2	59	2.2	59	0.6	59	0.3	59	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Eugene																							
Peterson Park Q2 2010 –Q12011	10/11	59	1.7	59	1.9	52	0.6	48	<0.2	50	<0.3	57	0.6	57	<0.1	--	--	57	1.9	57	4.7	57	< 1.0
ODEQ Benchmarks		0.45		3.0		0.13		0.03		35		0.2		0.6		0.08		150		90		2	

APPENDIX 1H Air Toxics

Pollutant		Acet aldehyde		Form aldehyde		Benzene		1,3-butadiene		Perchloro ethylene		Arsenic ³		Cadmium ³		Chromium (VI) TSP		Lead ³		Mang anese ³		Nickel ³	
Units		(µg/m3)		(µg/m3)		(µg/m3)		(µg/m3)		(µg/m3)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)		(ng/m ³)	
City/Site	Year	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Samples	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average	Samples	Annual Average
Klamath Falls																							
Q4 2010–Q3 2011	10/11	60	2.0	60	2.6	54	1.1	54	<0.2	54	<0.3	50	0.3	50	>0.1	52	<0.035	50	1.4	50	5.2	50	< 1.0
La Grande																							
Ash St. (LAS)	2004	52	1.9	52	3.4	50	0.6	50	<0.2	50	<0.5	48	0.33	48	0.2	--	--	48	1.3	48	6.2	48	< 1.0
	2005	52	1.8	56	2.6	55	<0.3	55	<0.2	55	<0.7	60	0.33	60	>0.1	--	--	60	1.5	60	5.7	60	< 1.0
	2006	53	1.8	52	2.7	57	0.5	58	<0.2	58	<0.7	58	0.23	58	<0.1	50	>0.04	58	3.0	58	10.2	58	< 1.0
	2007	53	1.4	52	2.1	54	0.8	55	<0.4	55	<0.7	56	0.19	56	<0.1	59	<0.04	56	1.4	56	8.2	56	< 1.0
	2008	48	1.3	51	1.7	52	0.5	54	<0.4	54	<0.7	51	0.21	51	<0.1	48	<0.04	51	< 1.0	51	4.8	51	< 1.0
	2009	58	1.4	58	1.8	42	0.7	47	<0.4	47	<0.3	53	0.14	53	<0.1	54	<0.04	53	< 1.0	53	5.0	53	< 1.0
	2010	52	1.4	53	1.9	51	0.5	46	<0.2	50	<0.3	55	0.13	55	>0.1	57	<0.04	55	< 1.0	55	3.7	55	< 1.0
	2011	56	1.7	56	2.2	57	0.9	57	0.09	57	<0.3	59	0.16	56	>0.1	57	>0.04	56	< 1.0	56	4.0	56	< 1.0
	2012	55	2.0	55	2.5	55	0.9	55	0.09	55	<0.1	59	0.18	59	>0.1	60	>0.04	59	< 1.0	59	5.2	59	< 1.0
	2013	60	2.0	60	2.6	54	0.6	57	0.1	57	0.17	62	0.22	62	0.05	61	>0.04	62	0.7	62	4.2	62	< 0.3
<i>*1 outlier removed from average</i>	2014	58	1.7	58	2.5	50	0.5	50	0.1	49	0.15*	60	0.25	60	<0.03	-	-	60	0.7	60	4.3	60	< 0.3
	2015	51	1.8	51	2.4	40	0.5	42	0.1	42	0.19	59	0.21	59	<0.03	-	-	60	0.8	60	4.8	60	< 0.3
	2016	59	1.8	59	2.5	58	0.4	49	0.04	58	0.04	60	0.16	60	0.014	-	-	60	0.7	60	5.5	60	<0.4
Hall & North(LHN)	2017	61	2.1	61	2.9	58	0.4	58	0.02	58	0.2	56	0.17	56	0.02	-	-	56	0.8	56	6.1	56	0.4
	2018	44	1.7	44	2.5	44	0.3	44	0.01	44	0.01	61	0.24	60	0.03	-	-	61	1.1	61	6.8	61	0.4
Medford																							
Grant & Belmont (MGB)	2008	48	1.8	53	2.4	53	1.3	55	<0.2	55	0.7	54	0.54	54	<0.1	--	--	54	1.9	54	6.0	54	< 1.0
	2009	59	1.8	59	2.2	46	1.5	53	<0.2	53	0.8	60	0.59	60	0.12	--	--	60	2.0	60	4.9	60	< 1.0
	2010	59	1.4	59	1.7	55	0.9	52	<0.2	55	<0.3	61	0.38	61	<0.1	--	--	61	1.3	61	3.4	61	< 1.0
Welch & Jackson	2012	53	2.6	53	3.2	59	1.0	59	<0.1	59	<0.1	58	0.42	58	<0.1	61	<0.04	58	2.0	58	6.8	58	< 1.0
Dodge Rd. (MDR)	08/09	50	1.2	55	1.5	58	0.4	58	<0.2	58	<0.3	51	0.27	51	<0.1	--	--	51	2.1	51	4.7	51	< 1.0
ODEQ Benchmarks		0.45		3.0		0.13		0.03		35		0.2		0.6		0.08		150		90		2	

APPENDIX 1H Air Toxics

DEQ analyzes more air toxics than are shown in the table above. Here is list of the main air toxics and some additional compounds not classified as air toxics that DEQ measures. Summary data for all air toxics can be found in EPA's "air data" web site which you can access from EPA AIRNow.

Carbonyl		PAH	
Parameter	CAS #	Parameter	CAS #
Acetaldehyde	75070	Acenaphthene	83329
Benzaldehyde	100527	Acenaphthylene	208968
Butyraldehyde	123728	Anthracene	120127
Crotonaldehyde	123739	Benzo(a)anthracene	56553
Formaldehyde	50000	Benzo(a)pyrene	50328
Heptaldehyde	111717	Benzo(a)pyrene-d12	
Hexaldehyde	66251	Benzo(b)fluoranthene	205992
Isovaleraldehyde	590863	Benzo(e)pyrene	197972
m-Tolualdehyde	620235	Benzo(g,h,i)perylene	191242
o-Tolualdehyde	529204	Benzo(k)fluoranthene	207089
Propionaldehyde	123386	Chrysene	218019
p-Tolualdehyde	104870	Coronene	191071
Valeraldehyde	110623	Dibenzo(a,h)anthracene	53703
Metals		Dibenzofuran	132649
Antimony, Total		Dibenzothiophene	132650
Arsenic, Total		Fluoranthene	206440
Beryllium, Total		Fluoranthene-d10	
Cadmium, Total		Fluorene	86737
Chromium, Total		Fluorene-d10	
Cobalt, Total		Indeno(1,2,3-cd)pyrene	193395
Hexavalent Chromium [Cr(VI)]		Naphthalene	91203
Lead, Total		Perylene	198550
Manganese, Total		Phenanthrene	85018
Nickel, Total		Pyrene	129000
Selenium, Total		Pyrene-d10	

APPENDIX 1H Air Toxics

VOC			
Parameter	CAS #	Parameter	CAS #
1,1,1-Trichloroethane	71556	Carbon disulfide	75150
1,1,2,2-Tetrachloroethane	79345	Carbon tetrachloride	56235
1,1,2-Trichloroethane	79005	Chlorobenzene	108907
1,1-Dichloroethane	75343	Chloroethane	75003
1,1-Dichloroethylene	75354	Chloroform	67663
1,2,4-Trichlorobenzene	120821	Chloromethane	74873
1,2,4-Trimethylbenzene	95636	cis-1,2-Dichloroethene	156592
1,2-Dibromoethane (EDB)	106934	cis-1,3-Dichloropropene	10061015
1,2-Dichlorobenzene	95501	Cyclohexane	110827
1,2-Dichloroethane (EDC)	107062	Dibromochloromethane	124481
1,2-Dichloropropane	78875	Dichlorodifluoromethane (Freon 12)	75718
O-Xylene	95476	Dichlorotetrafluoroethane (Freon 114)	76142
1,3,5-Trimethylbenzene	108678	Ethylbenzene	100414
1,3-Butadiene	106990	Hexachloro-1,3-butadiene	87683
1,3-Dichlorobenzene	541731	Isopropanol	67630
p-Xylene + m-Xylene	106423 + 108383	Methyl tert-butyl ether (MTBE)	1634044
2,5-Dimethylbenzaldehyde	5779942	Methylene chloride	75092
2-Butanone (MEK)	78933	Methylmethacrylate	80626
Chloroprene	126998	n-Heptane	142825
2-Hexanone	591786	n-Hexane	110543
4-Ethyltoluene	622968	1,4-Dichlorobenzene	106467
Methyl Isobutyl Ketone (MIBK)	108101	Perchloroethylene (Perc)	127184
Acetonitrile	75058	Styrene	100425
Acrolein	107028	Tetrahydrofuran	109999
Acrylonitrile	107131	Toluene	108883
Benzene	71432	trans-1,2-Dichloroethene	156605
Benzyl chloride	100447	trans-1,3-Dichloropropene	10061026
Bromodichloromethane	75274	Trichloroethylene	79016
Bromofluorobenzene	460004	Trichlorofluoromethane (Freon 11)	75694
Bromoform	75252	Trichlorotrifluoroethane (Freon 113)	76131
Bromomethane	74839	Vinyl chloride	75014

APPENDIX 2 Oregon Ambient Air Monitoring Network

Appendix 2. Oregon Air Quality Monitoring Network

The following tables and map describe the air quality monitoring network. The following abbreviations are used in the network location tables and maps:

BP	Barometric pressure
CO	Carbon monoxide
DT	Delta temperature (inversion indicator)
HAPS	Air Toxics (Hazardous Air Pollutants)
IMPROVE	EPA visibility program
Lead	Lead sampling
NADP	National Atmospheric Deposition Program
NO ₂	Nitrogen dioxide
O ₃	Ozone
PM _{2.5}	Fine particulate (2.5 microns) based on filter sampling
PM _{2.5} Estimate	PM _{2.5} estimate based on light scattering.
PM _{2.5} Spec	PM _{2.5} chemically speciated
PM ₁₀	Fine particulate (10 micron)
RH	Relative humidity
SO ₂	Sulfur dioxide
SR	Solar radiation
Temp	Temperature
WS/WD	Wind direction and speed

APPENDIX 2 Oregon Ambient Air Monitoring Network

Table 11. Oregon Ambient Air Monitoring Network.

City	Address	Site Code	EPA#	SO ₂	CO	NO ₂	Ozone	PM2.5	PM2.5 Est	PM2.5 Spec	PM10	HAPS	Lead	WS/WD	TEMP	DT	BP	RH	SR
Albany	Calapooia School	ACS	410430009						x										
Applegate	Provolt	PSO	410330011						x										
Bend	Bend Pump Station	BPS	410170120						x										
	Road Department	BRD	410140121											x	x			x	x
Baker City	Forest Service	BFS	410010004						x										
Burns	Washington St.	BWS	410250003					x	x					x	x		x		
Cave Junction	USFS Station	CJFS	410330036						x										
Corvallis	Intermediate School	CCB	410030013						x										
Cottage Grove	City Shops	CGC	410399004					x	x										
Crater Lake	Maintenance Building	CLM	410351002						x										
Detroit Lake	USFS Station	DFS	410470123						x										
Eugene (Saginaw)	Pacific Highway 99N	E99	410390059					x	x		x								
	Amazon Park	AMZ	410390060				x	x	x										
	Wilkes Drive	EWD	41039						x					x					
	Delight Valley Road	SAG	410391007				x												
Enterprise	Forest Service	EFS	410630001						x										
Grants Pass	Parkside School	GPP	410330114					x	x					x	x				
Hermiston	Municipal Airport	HMA	410591003				x							x	x				
John Day	Davidson Street	JDD	410230002						x										
Klamath Falls	Peterson School	KFP	410350004					x	x					x	x	x	x		
La Grande (Cove)	Hall and North	LHN	410610123						x		x	x	x	x	x		x	x	
	City Hall	CCH	410610120						x					x					
Lakeview	Center & M Streets	LCM	410370001					x	x					x	x		x		
Lyons	Marylynn School	LMS	410432003						x										
Madras	Westside School	MWS	410310007						x										
Medford (Ashland)	Grant and Belmont	MGB	410290133					x	x										
	Rapp Rd Talent	TAL	410290201				x												
	Rossanley Drive	MTV	410291002											x	x	x	x	x	x
	Welch & Jackson	MWJ	410292129								x								
	Fire Department	AFD	410290203						x										
Mill City	High School	MCS	410430104						x										
Mt. Hood	Multopor	MUL	410050102						x										
Oakridge	School Street	OAK	410392013					x	x		x			x					
Pendleton	SW Marshall Place	PMC	410590121						x										

APPENDIX 2 Oregon Ambient Air Monitoring Network

Oregon Ambient Air Monitoring Network. (Continued)

City	Address	Site Code	EPA#	SO2	CO	NO2	Ozone	PM2.5	PM2.5 Est	PM2.5 Spec	PM10	HAPS	Lead	WS/WVD	TEMP	DT	BP	RH	SR
Portland	57 th & SE Lafayette	SEL	410510080	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
	Tualatin – I-5	NRS	410670005		x	x	x	x	x					x	x				x
(Beaverton) (Carus) (Hillsboro) (Sauvie Is)	Humboldt School	PHS	410512010								x	x	x						
	Jefferson High Sch.	PJH	410511191											x					
	Highland Park Sch.	BHP	410670111						x										
	Spangler Rd.	SPR	410050004				x		x					x	x				
	NE Grant Street	HHF	410670004					x	x			x	x						
	NW Sauvie Island	SIS	410090004				x		x					x	x				
	SE Court Street	PDP	410130100					x	x					x	x		x	x	x
Roseburg	NW Garden Valley	RGV	410190002						x										
Salem (Turner)	Salem State Hosp.	SSH	410470041				x		x										
	Cascade Jr. High	CJH	410470004				x							x	x				
Shady Cove	Shady Cove School	SCS	410290019						x										
Sisters	USFS office	SFS	410170004						x										
Springfield	City Hall	SCH	410391009					x	x					x					
Sweet Home	Fire Department	SFD	410432002						x										
The Dalles	Cherry Heights	TDC	410650007						x										
	Wasco Co. Library	TWL	410650008						x		x	x	x	x					

APPENDIX 2 Oregon Ambient Air Monitoring Network

Table 12. Oregon Ambient Air Monitoring Visibility and Forest Health Network.

Region	Location	EPA & IMPROVE Code	Neph	IMPROVE	WS/WD
Visibility Sites					
Crater Lake NP	Park HQ	CRLA	x	x	x
Eagle Cap Wild.	Strawberry Mt.	STAR		x	
Kalmiopsis Wild.	Kalmiopsis	KALM		x	
Mt Hood Wild.	Multopor	410050102/ MOHO	x	x	x
Three Sisters Wild.	Three Sisters	THIS		x	
Forest Health Sites (funded by USFS & BLM)					
Wallowa -Whitman NF	Baker City	410010003	x		
Malheur & Ochoco NF	Burns	410250003	x		
Wallowa-Whitman NF	Enterprise	410630001	x		
Siskiyou NF	Grants Pass	410330114	x		
Siskiyou NF	Cave Junction	410330036	x		
Malheur NF	John Day	410230002	x		
Winema, Fremont NF	Klamath Falls	410350004	x		
Siskiyou NF	Provolt	410330011	x		
	Roseburg	410190002	x		
Rogue River NF	Shady Cove	410290019	x		
	Sisters	410170004	x		
Ag Burning Sites					
Willamette Valley	Carus,	410050004	x		x
Willamette Valley	Silverton	410470007	x		x
Willamette Valley	Lyons	410432003	x		
Willamette Valley	Mill City	410430104	x		
Willamette Valley	Detroit Lake	410470123	x		
Willamette Valley	Salem	410470041	x		
Union County	Cove	410610120	x		x

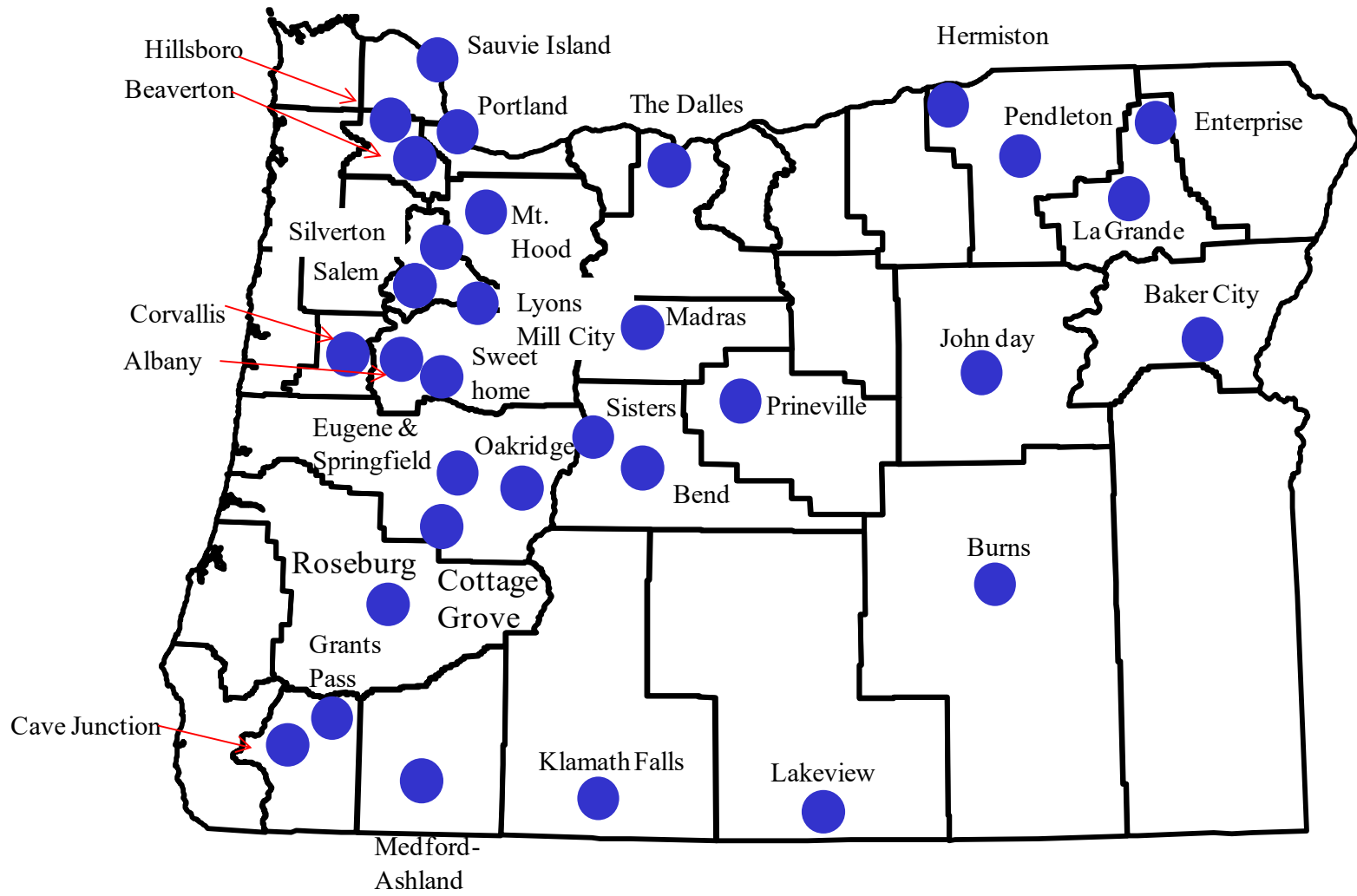


Figure 81. 2017 Ambient Air Monitoring Network.

Appendix 3 Data Quality

Quality Assurance

It is a policy of DEQ that all data used by the Department will be of sufficient quality to support the regulatory decisions based upon them. The minimum quality assurance requirements set by EPA are consistently met or exceeded by DEQ.

The continued assurance of data quality requires carrying out the two complimentary tasks discussed below:

Quality Control

The ambient air quality monitoring and sampling done by the Department follows a number of procedures intended to maintain the system within control. Standard operating procedures are documented and followed throughout. Federal Reference or Equivalent Methods are used wherever applicable. Care in using accepted methodology is what makes the Department's air quality data representative and also comparable to the data collected in other states. Routine preventative maintenance and periodic calibrations, using National Institute of Standards Technology gases or other primary standards, are used to achieve a database sufficient in quantity and quality to meet the needs of the Air Quality Program.

Quality Assessment

Evaluations of data quality are made in several ways. At least each quarter, DEQ conducts a system audit in which each sampling and monitoring site is visited to evaluate whether the site location is still appropriate, whether procedures are being followed, and to ensure that documentation is complete. Data quality is assessed in terms of precision, accuracy, and completeness. Precision, or repeatability, is determined by analysis of a known control sample or by replicate analyses. Accuracy, or the ability to measure a "true" value, is assessed by quarterly audits of analyzer performance or sampler flow. DEQ reports these assessments to EPA as summary statistics. Completeness is measured by the amount of data actually captured relative to the amount which ideally could have been collected. EPA also hires independent contractors to evaluate Oregon's sites for accuracy.