Report

2009 Oregon Air Quality Data Summaries

State of Oregon Department of Environmental Quality

http://www.oregon.gov/DEQ

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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_2e -	Carbon dioxide equivalent – Way to compare other GHG to CO_2
GHG –	Greenhouse Gas
HAPs –	Hazardous Air Pollutant as defined in Title III of the Clean Air Act
$MMTCO_2e$ -	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.
NOx –	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.
SOx –	Sulfur oxides - mainly SO_2
UFSG –	Unhealthy For Sensitive Groups – an AQI air quality category
$\mu g/m^3$ –	Microgram per meters cubed - air pollutant concentration
VOC –	Volatile Organic Compounds
WAQR –	Wildfire Air Quality Rating - wildfire smoke health internet page

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Air Quality Annual Report

About DEQ

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.

Air Quality Division
The DEQ Air Quality Division is responsible for protecting Oregon's air quality. DEQ monitors air pollution to ensure that communities meet the national ambient air quality health standards (NAAQS), to report hourly health levels to the public, and to protect Oregon's pristine views.

The air pollutants of greatest concern in Oregon are:
- ground-level **ozone**, commonly known as smog
- fine particulate matter (mostly from wood smoke, other combustion sources, cars and dust) known as **$PM_{2.5}$** (2.5 micrometers and smaller diameter)
- hazardous air pollutants (also called **Air Toxics)**

DEQ also is concerned about **greenhouse gases** and along with the Oregon Department of Energy (DOE) is working on strategies to mitigate their release. Greenhouse gases cause global warming and according to a DOE report *"The impacts of such changes on Oregon citizens, businesses and environmental values are likely to be extensive and destructive. Coastal and river flooding, snow pack declines, lower summer river flows, impacts to farm and forest productivity, energy cost increases, public health effects, and increased pressures on many fish and wildlife species are some of the effects anticipated by scientists at Oregon and Washington universities*."

The Governor of Oregon is also taking global climate change seriously and has created an advisory group which has come up with a strategy to reduce greenhouse gases. For this report and more on what the State of Oregon is doing to lower greenhouse gases go to: http://egov.oregon.gov/ENERGY/GBLWRM/Strategy.shtml

Oregon's 2009 Ambient Air Quality in Summary:
- $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller) remains near or above the federal health standards in many areas. Klamath Falls, Lakeview, and Oakridge violated the daily $PM_{2.5}$ standard.
- Ground level ozone (smog) exceeded the federal standards twice in Portland and once in Salem. They did not violate the standard which requires four exceedance days.
- Forest Fire smoke inundated Klamath Falls, Bend, Medford, and Grants Pass in September.
- Smoke from a prescribed burn inundated Medford and Klamath Falls in November.
- Air toxics, such as benzene and formaldehyde, remain near or above the health benchmarks. The 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.
- Carbon monoxide and PM_{10} (particulate matter 10 micrometers diameter and smaller) remained far below the federal health standard. The pollutants have been trending down in the past 10 to 15 years.

Air Quality Index

The Air Quality Index (AQI) is an EPA health index which normalizes the various air pollutants in order to report one health level. The AQI updates hourly and is posted online by EPA at www.AIRNow.Gov and on ODEQ and Lane Regional Air Protection Agency (LRAPA) websites. The AQI uses index numbers, health levels, and colors to communicate the health levels. Table 1 displays the current AQI scale used by ODEQ and LRAPA.

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.

Emergency Action Plan

DEQ uses the AQI to trigger its Emergency Action Plan for extreme air pollution episodes. The AQI and associated episode stages are listed in Table 2. The possible actions are:

- 100 AQI - Air Stagnation Advisory may be declared by the National Weather Service if a prolonged inversion is forecast. DEQ may issue public health advisories.
- 200 AQI - DEQ may declare an Air Pollution Alert if the conditions causing the elevated levels are forecast to persist. DEQ may issue public health advisories.
- 300 AQI – DEQ may declare an Air Pollution Warning if the conditions causing the elevated levels are forecast to persist. At the Warning level, specific sources of air pollution (such as industry) may be requested to curtail non-essential operations and additional cautions are issued to the public.
- 400 AQI – DEQ may declare an Air Pollution Emergency and emergency measures may be enacted to prevent serious health impacts to the entire population. At the Emergency levels, many air pollution sources are required to cease or severely curtail operations to alleviate pollution levels.

How the AQI is computed

The AQI is computed hourly using the 24-hour average for $PM_{2.5}$ and the eight hour average for ozone and CO. The $PM_{2.5}$ AQI is derived from light scattering data. EPA provides all states with the AQI equation for national uniformity. The AQI is reported by DEQ or Lane County Regional Air Protection Authority (LRAPA) for various cities in Oregon.

Table 2. Air Quality Index Ranges and Episode Stages.

AIR QUALITY INDEX, (AQI) and Episode Stage							
Episode Stage	**Within Standard**		**≥ Standard**	**Alert**	**Warning**	**Emergency**	**Significant Harm**
AQI range	0-50	51-100	101-150	151-200	201-300	301-400	401-500p
AQI Descriptor	***Good***	***Moderate***	***Unhealthy For Sensitive Groups***	***Unhealthy***	***Very Unhealthy***	***Hazardous***	***Very Hazardous***
$PM_{2.5}$ µg/m^3 (24-hr aver)	0-15.4	15.5-35.4	35.5-55.4	55.5-140.4	140.5-210.4	210.5-500.4	na
PM_{10} µg/m^3 (24-hr aver)	0-54	55-154	155-254	255-354	355-424	425-504	505-604
CO ppm (8-hr aver)	0.0-4.4	4.5-9.4	9.5-12.4	12.5-15.4	15.5-30.4	30.5-40.4	40.5-50.4
Ozone ppm (1-hr aver)	n/a	n/a	0.125-0.164	0.165-0.204	0.205-0.404	0.405-0.504	0.505-0.604
Ozone ppm (8-hr aver)	0.000-0.059	0.060-0.075	0.076-0.095	0.096-0.115	0.116-0.374	use 1hr std	use 1hr std

2009 Oregon Air Quality Index by City

The AQI was designed to provide current Air Quality health information in a timely manner. In addition, the AQI provides a review of the health levels over the past year. Figures 1 through 38 display the AQI health levels over the past year for all the cities where ODEQ and LRAPA monitor air quality.

Table 3. Figures Key for 2009 Air Quality Index.

Figure	City or Area	Figure	City or Area	Figure	City or Area
1	Albany	14	Grants Pass	27	Pendleton
2	Appelgate Valley	15	Hermiston	28	Portland
3	Baker City	16	Hillsboro	29	Prineville
4	Beaverton	17	John Day	30	Roseburg
5	Bend	18	Klamath Falls	31	Salem
6	Burns	19	Klamath Falls Background	32	Shady Cove
7	Cave Junction	20	La Grande	33	Sweet Home
8	Corvallis	21	Lakeview	34	The Dalles
9	Cottage Grove	22	Lyons	35	Crater Lake
10	Cove	23	Madras	36	Eagle Cap Wilderness
11	Enterprise	24	McMinnville	37	Mt. Hood Wilderness
12	Eugene/Springfield	25	Medford	38	Mt Jefferson Wilderness
13	Florence	26	Oakridge		

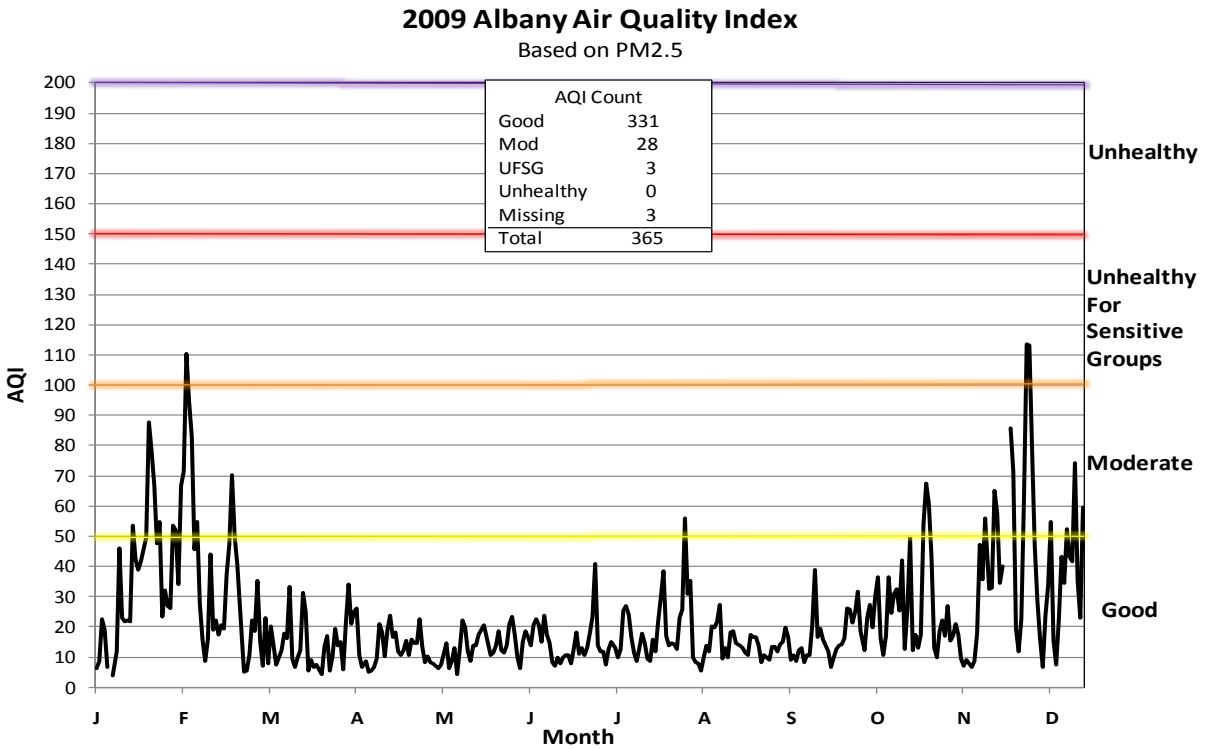


Figure 1. 2009 Albany Air Quality Summary.

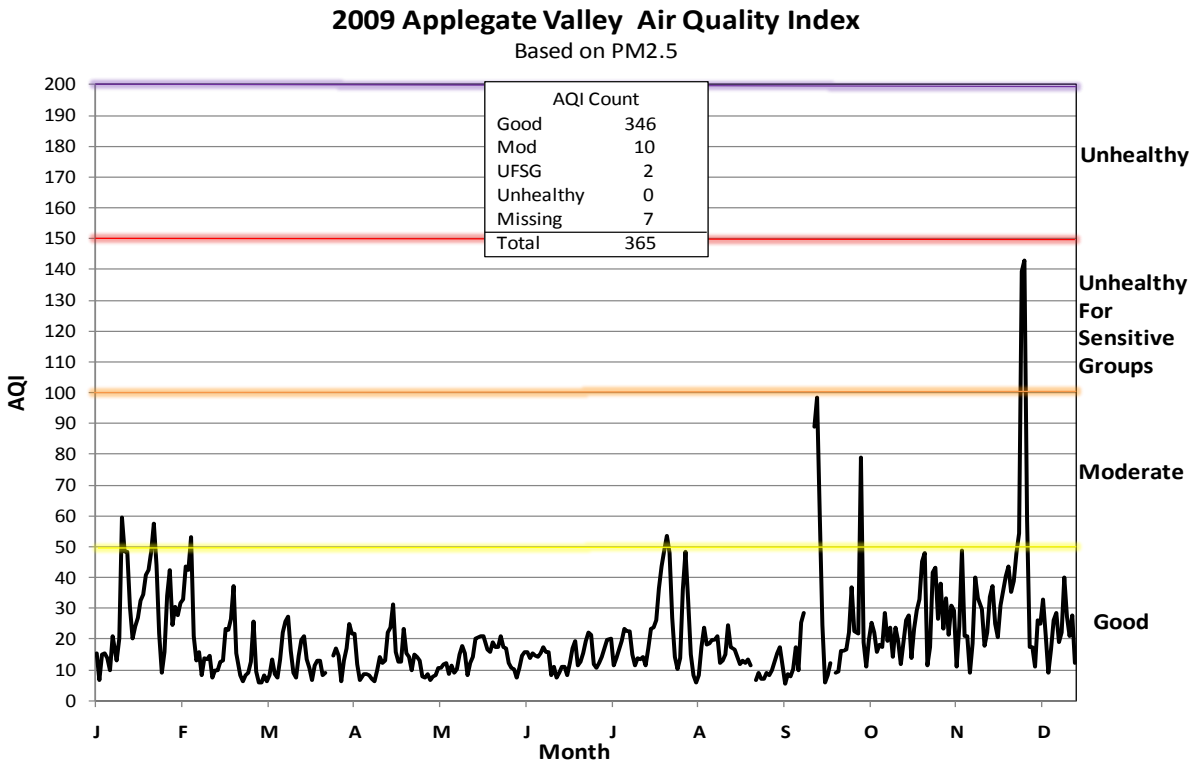


Figure 2. 2009 Applegate Valley Air Quality Summary.

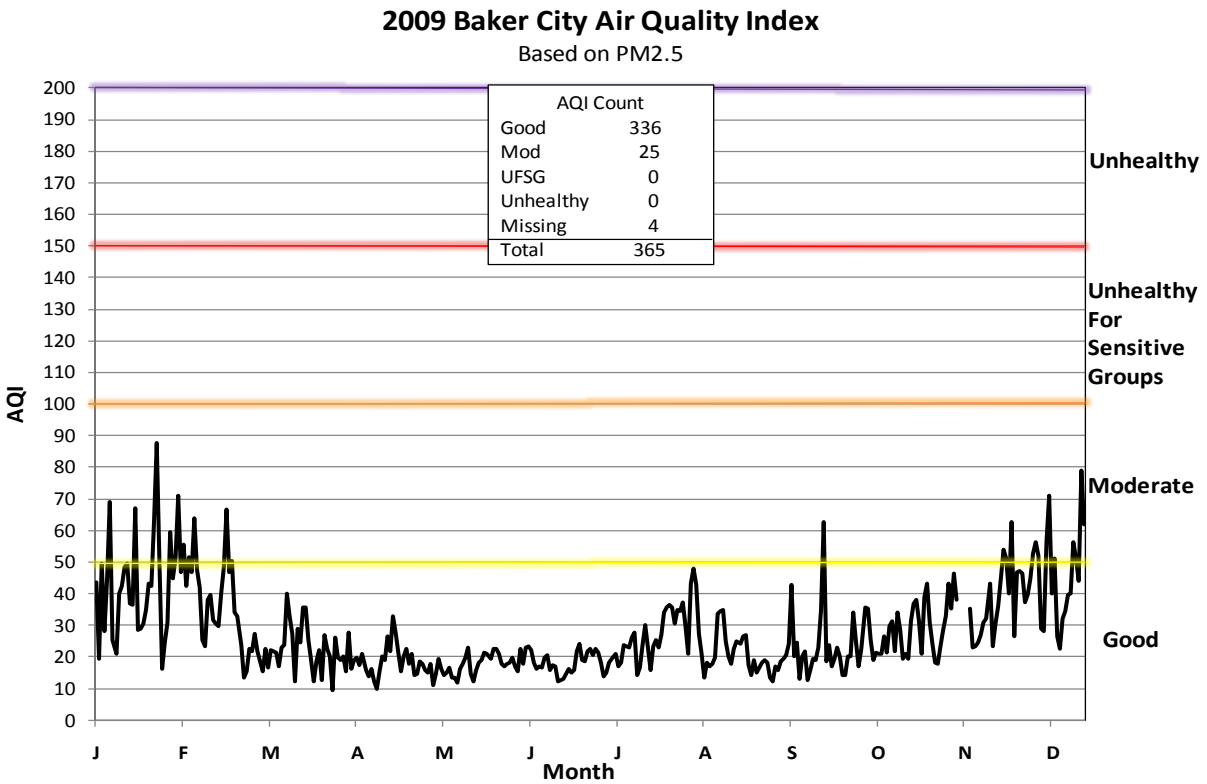


Figure 3. 2009 Baker City Air Quality Summary.

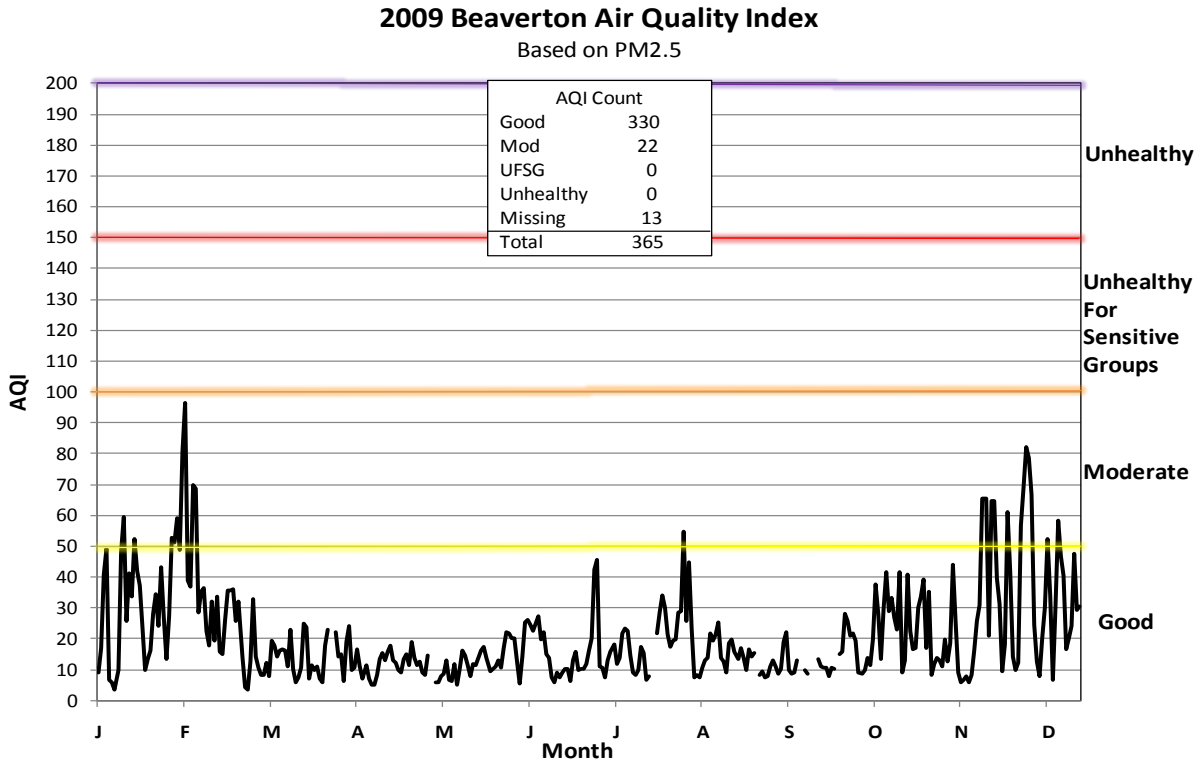


Figure 4. 2009 Beaverton Air Quality Summary.

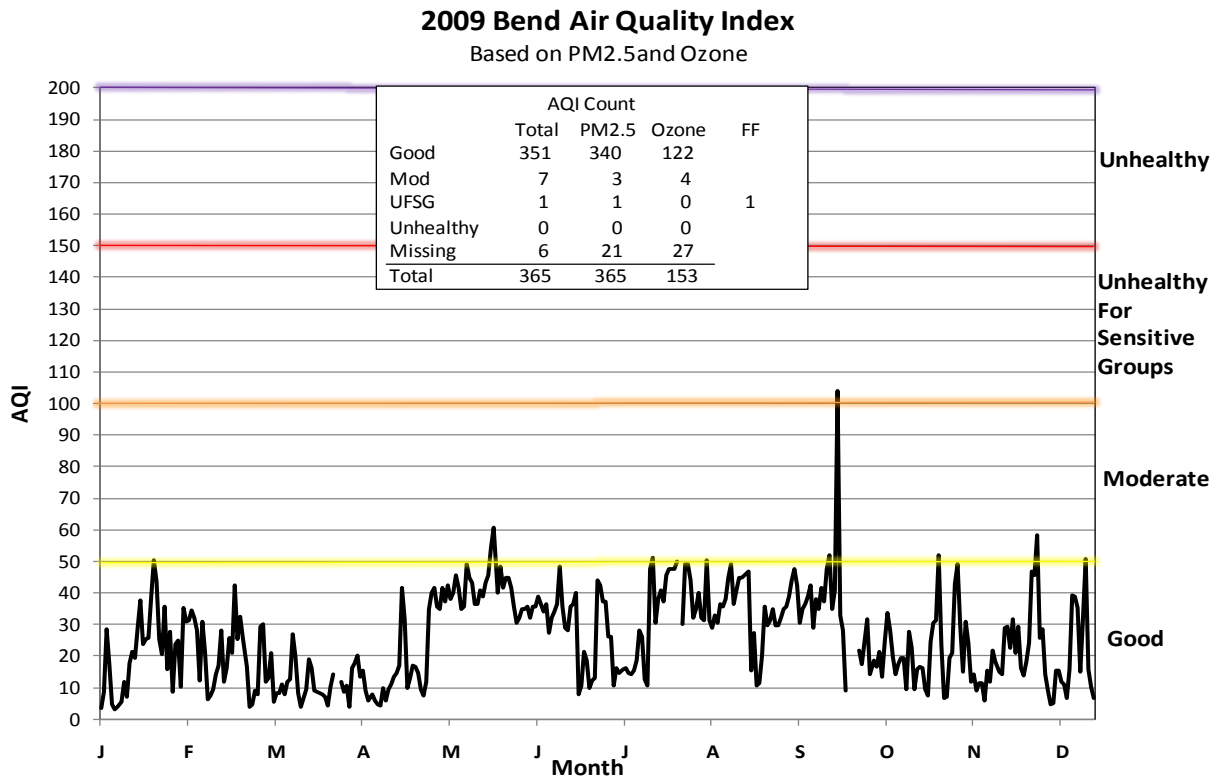


Figure 5. 2009 Bend Air Quality Summary.

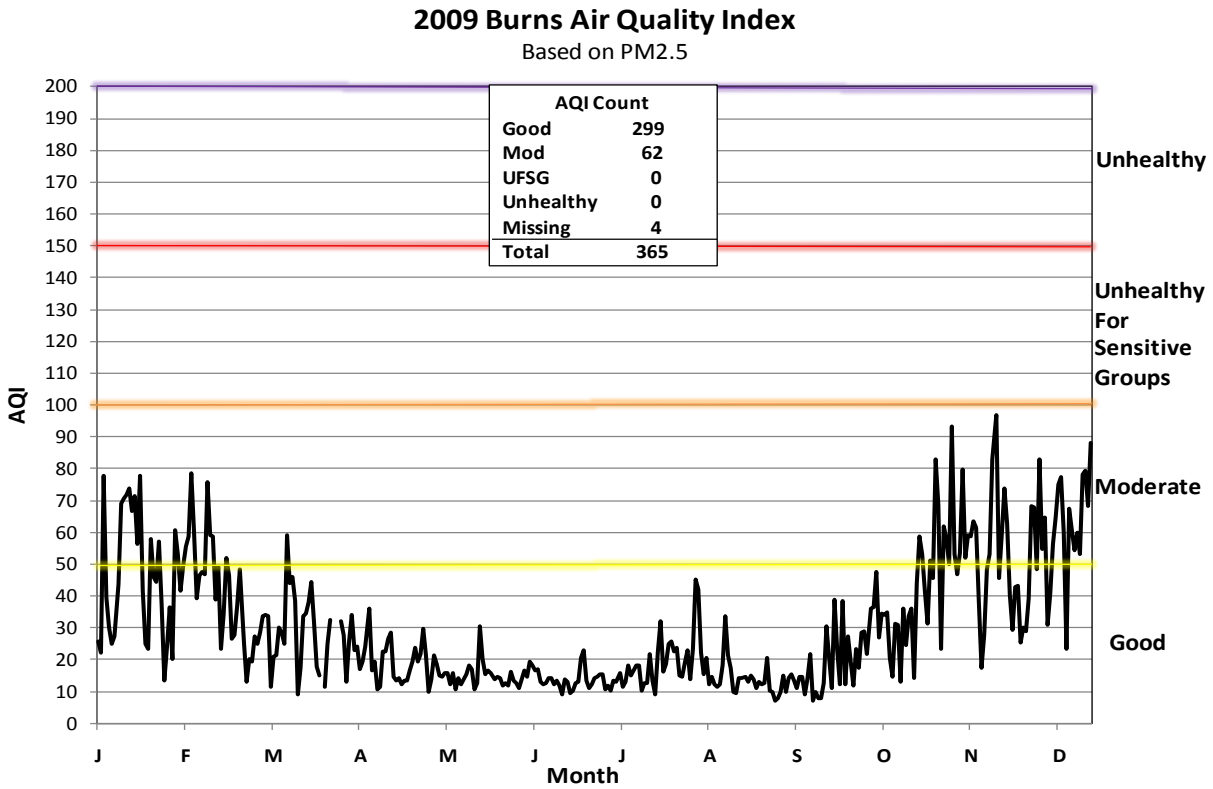


Figure 6. 2009 Burns Air Quality Summary.

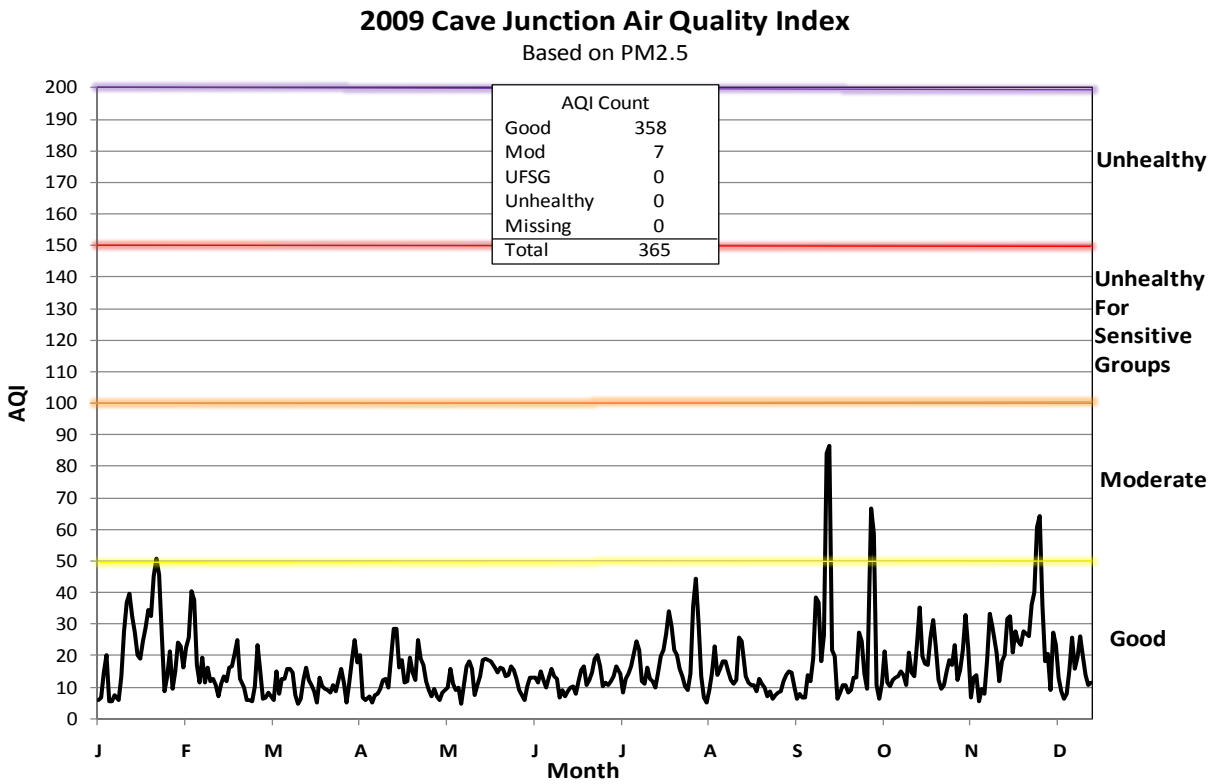


Figure 7. 2009 Cave Junction Air Quality Summary.

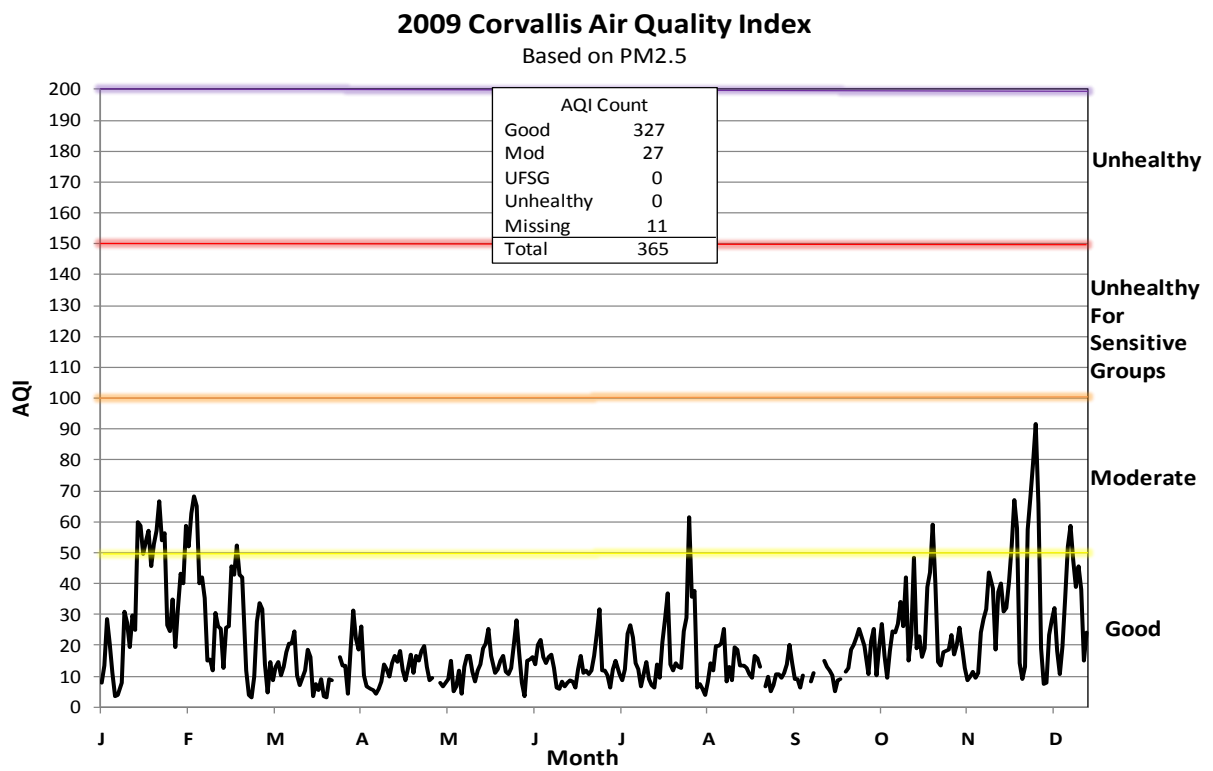


Figure 8. 2009 Corvallis Air Quality Summary.

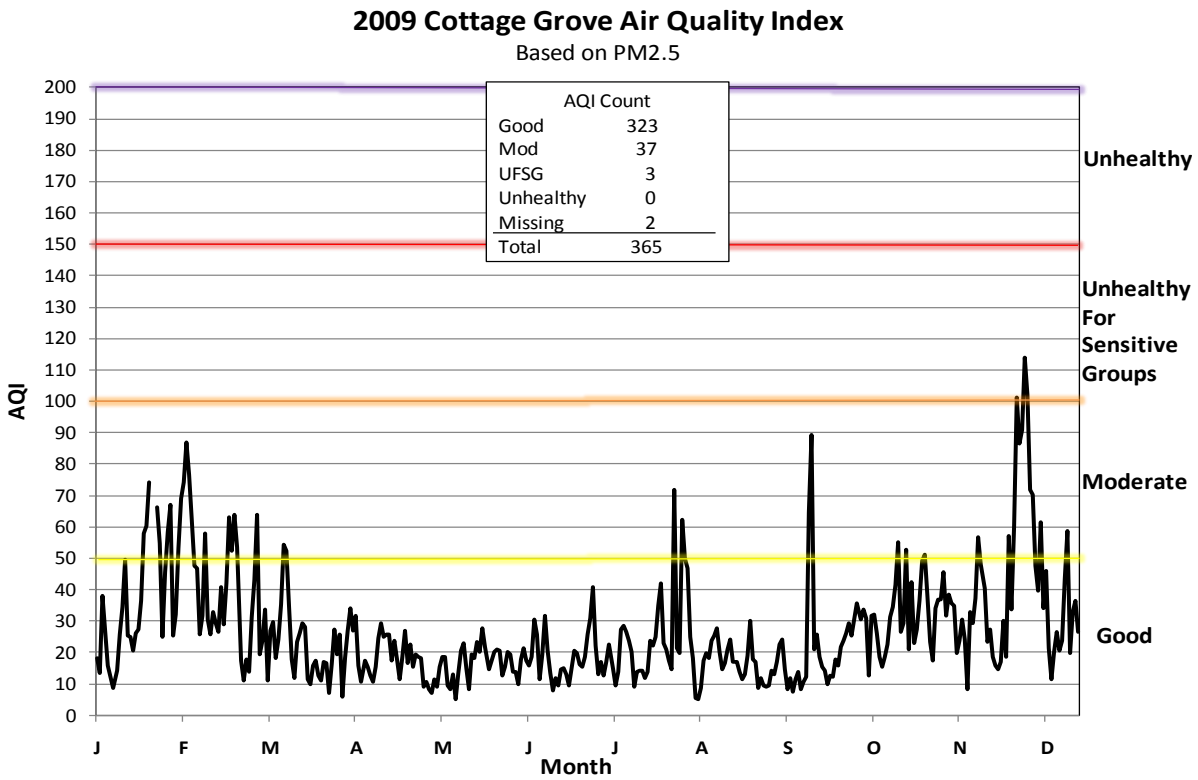


Figure 9. 2009 Cottage Grove Air Quality Summary.

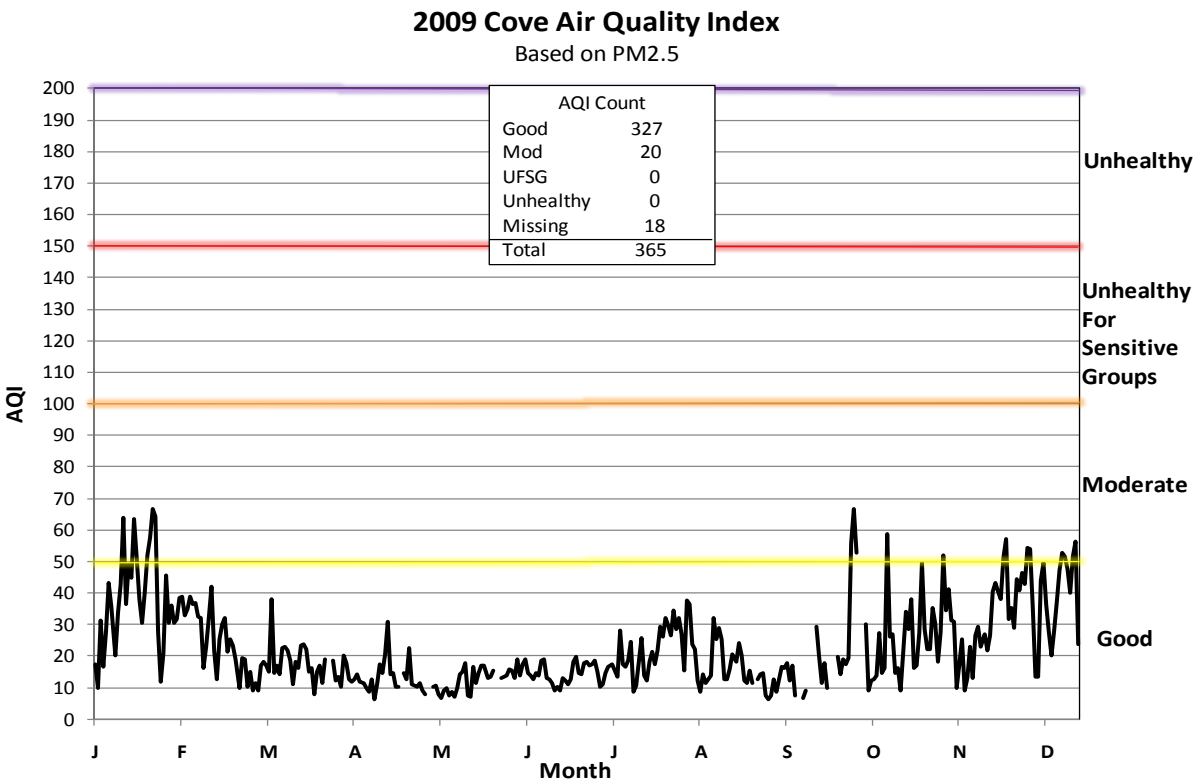


Figure 10. 2009 Cove Air Quality Summary.

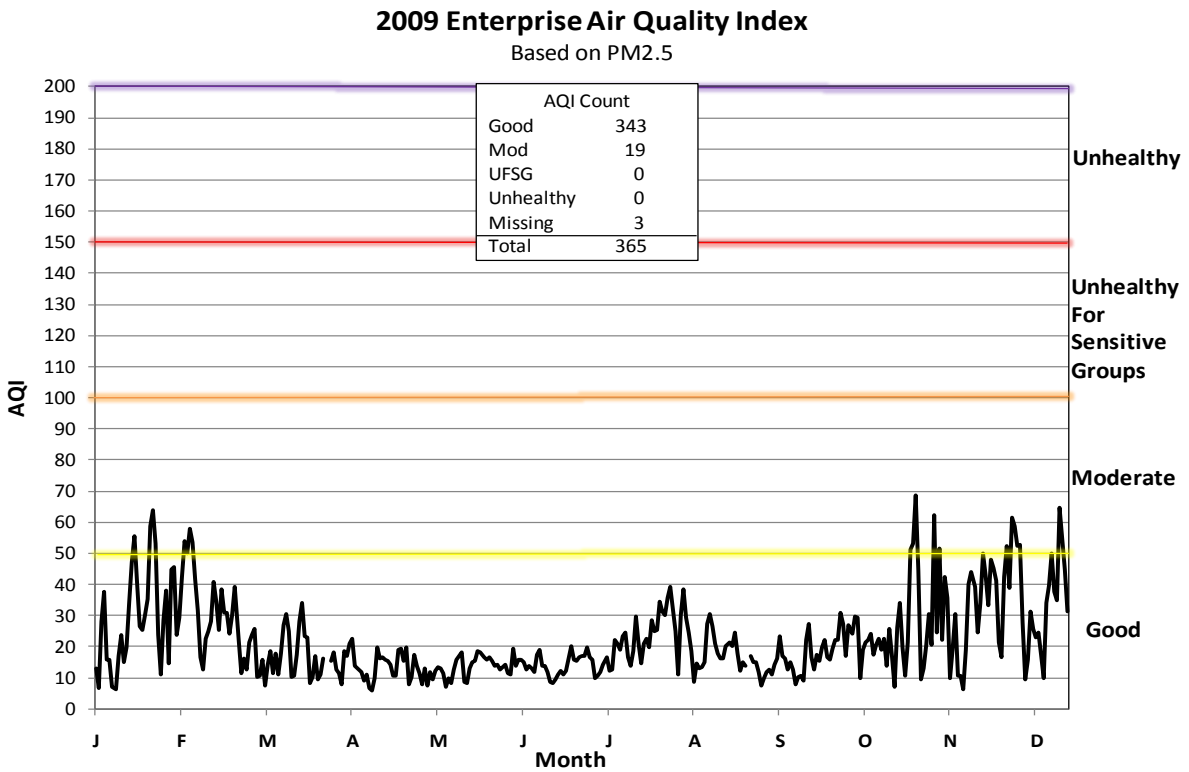


Figure 11. 2009 Enterprise Air Quality Summary.

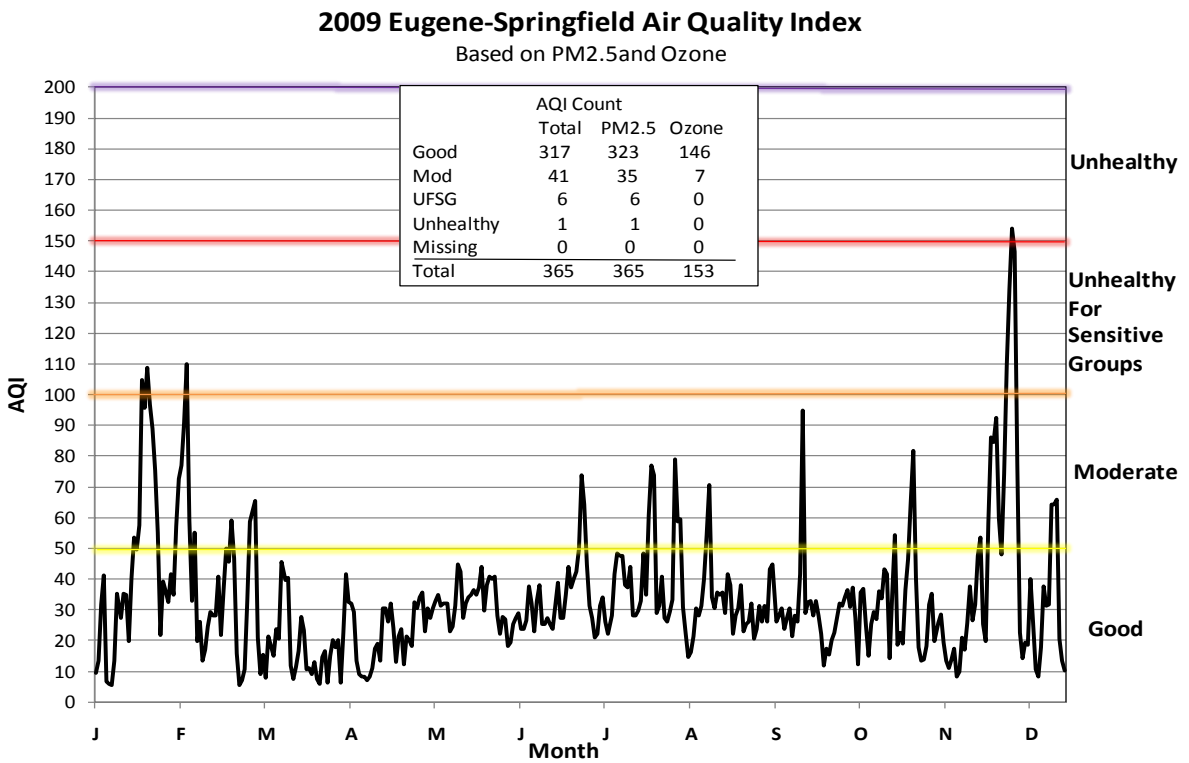


Figure 12. 2009 Eugene/Springfield Air Quality Summary.

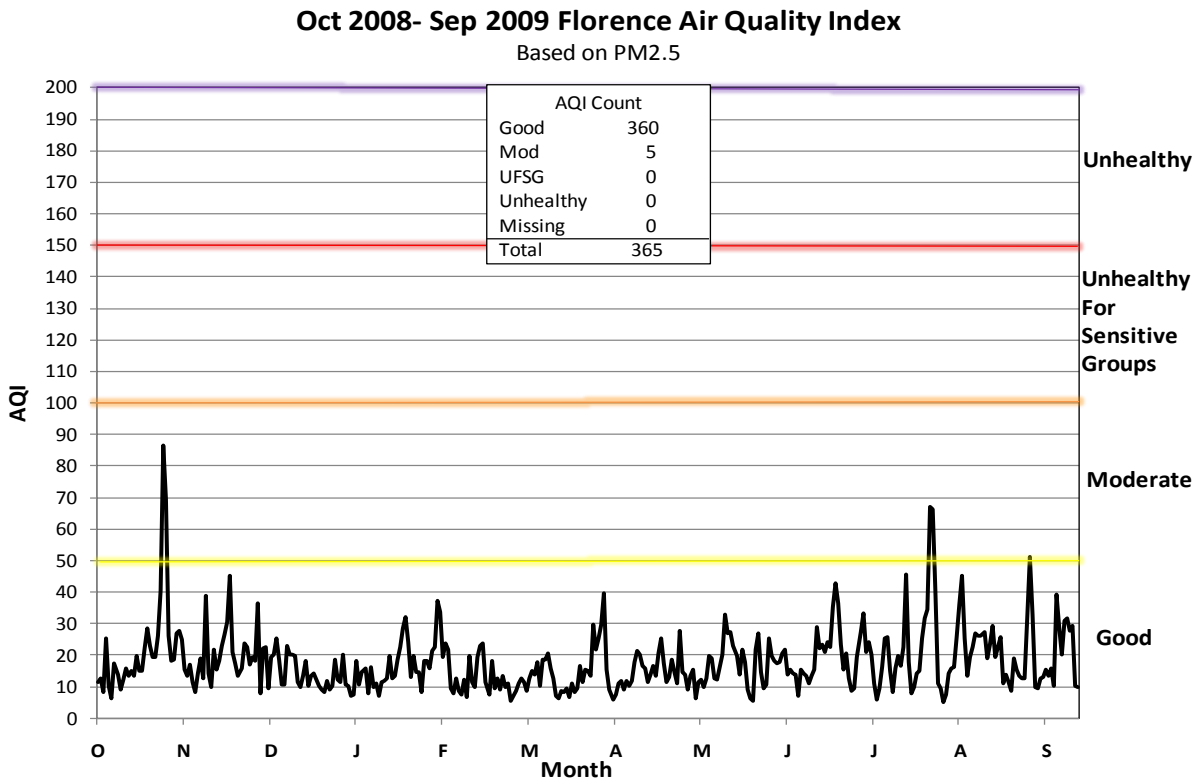


Figure 13. 2009 Florence Oct 2008- Sept 2009 Air Quality Summary.

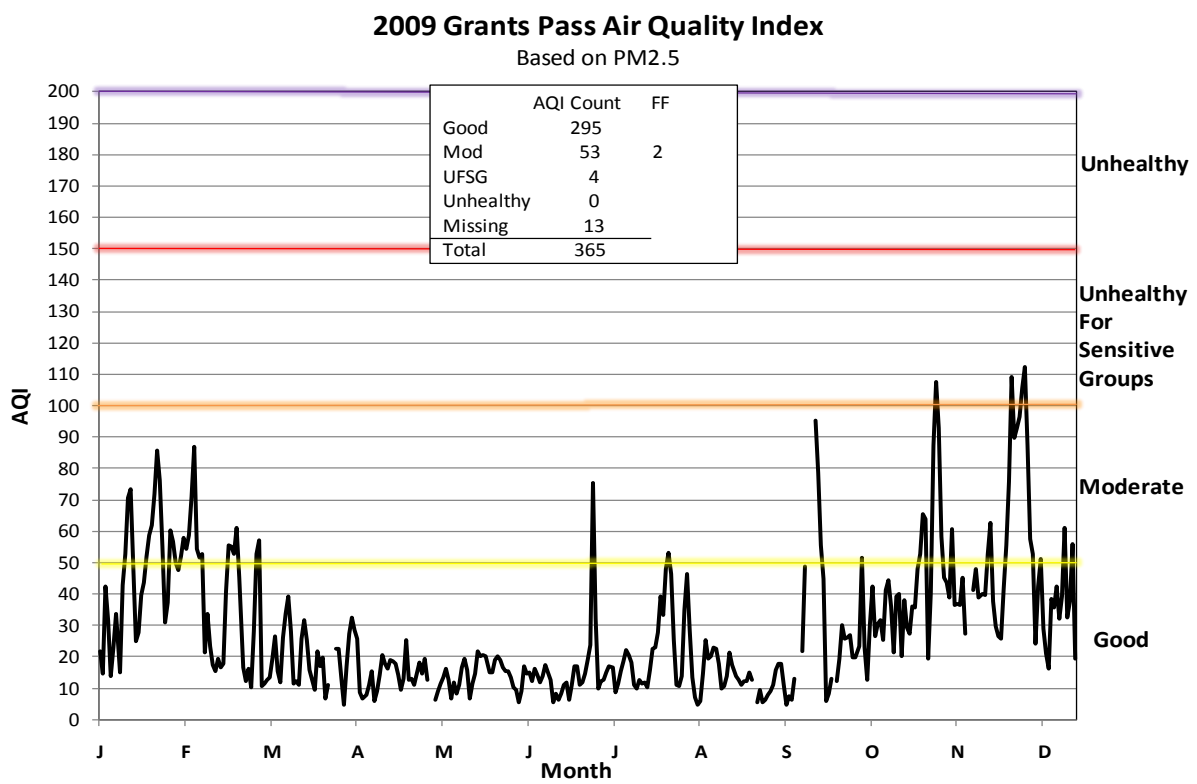


Figure 14. 2009 Grants Pass Air Quality Summary.

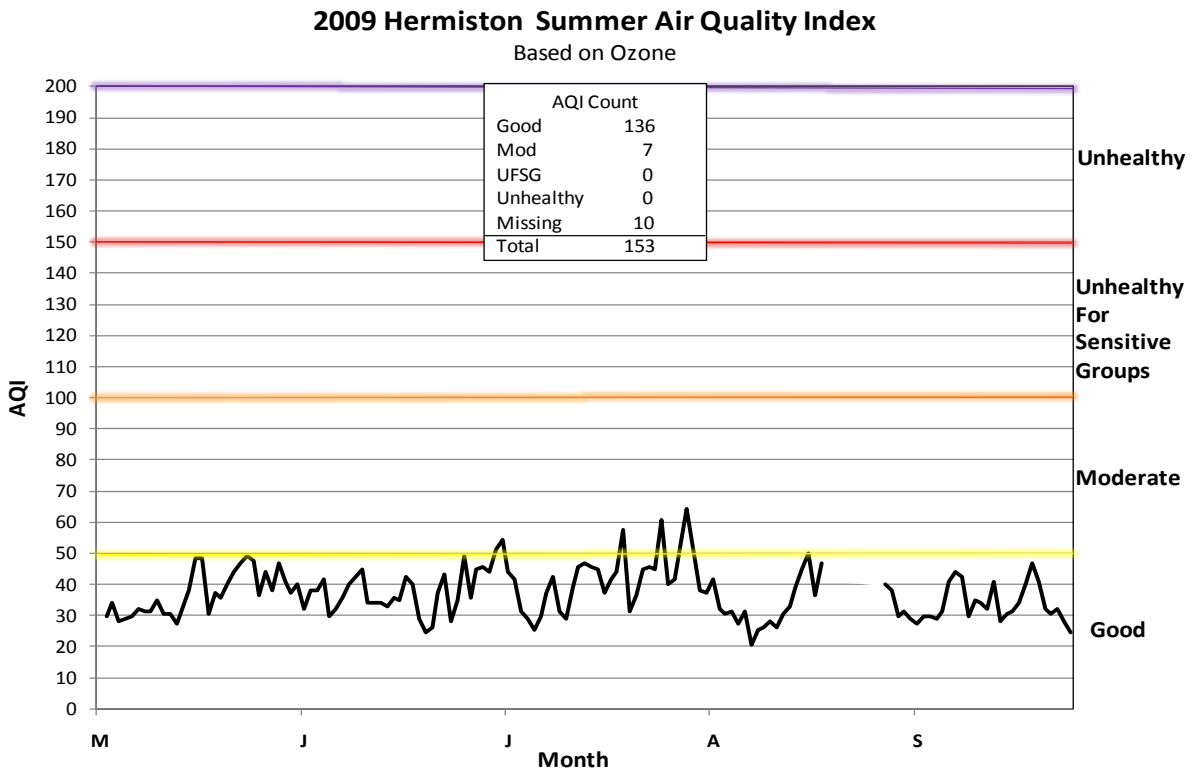


Figure 15. 2009 Hermiston Air Quality Summary.

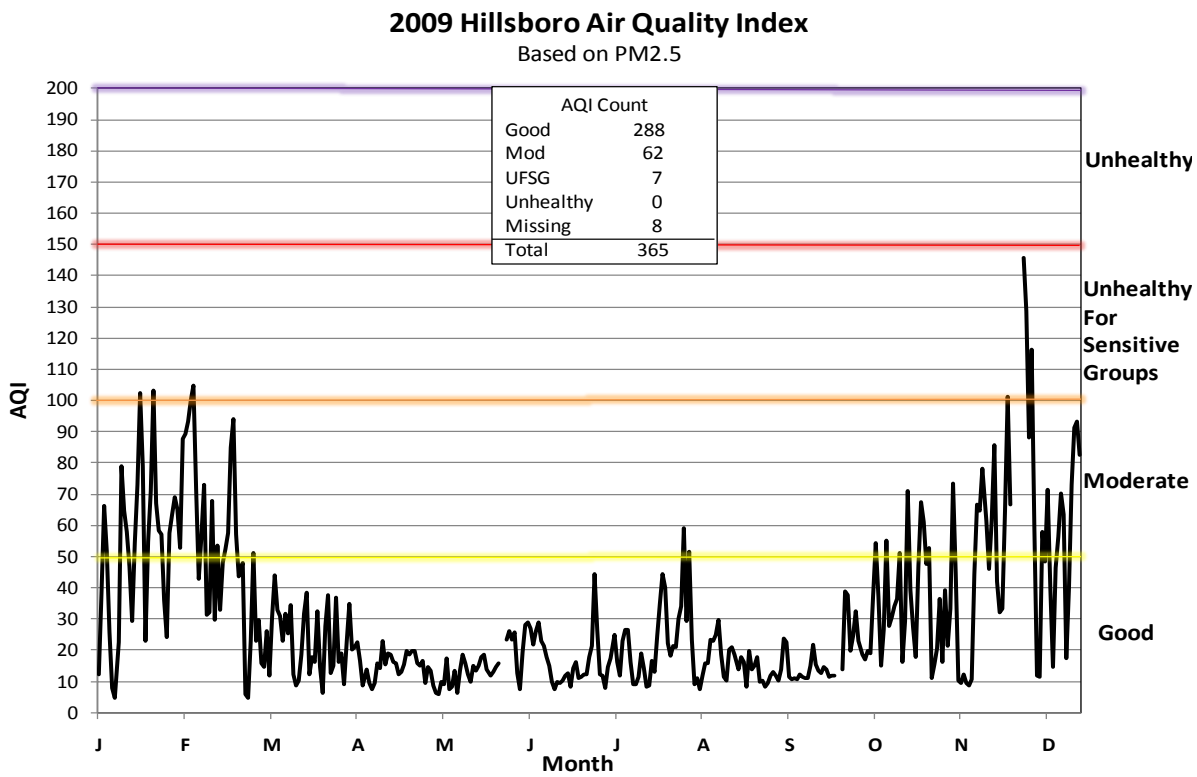


Figure 16. 2009 Hillsboro Air Quality Summary.

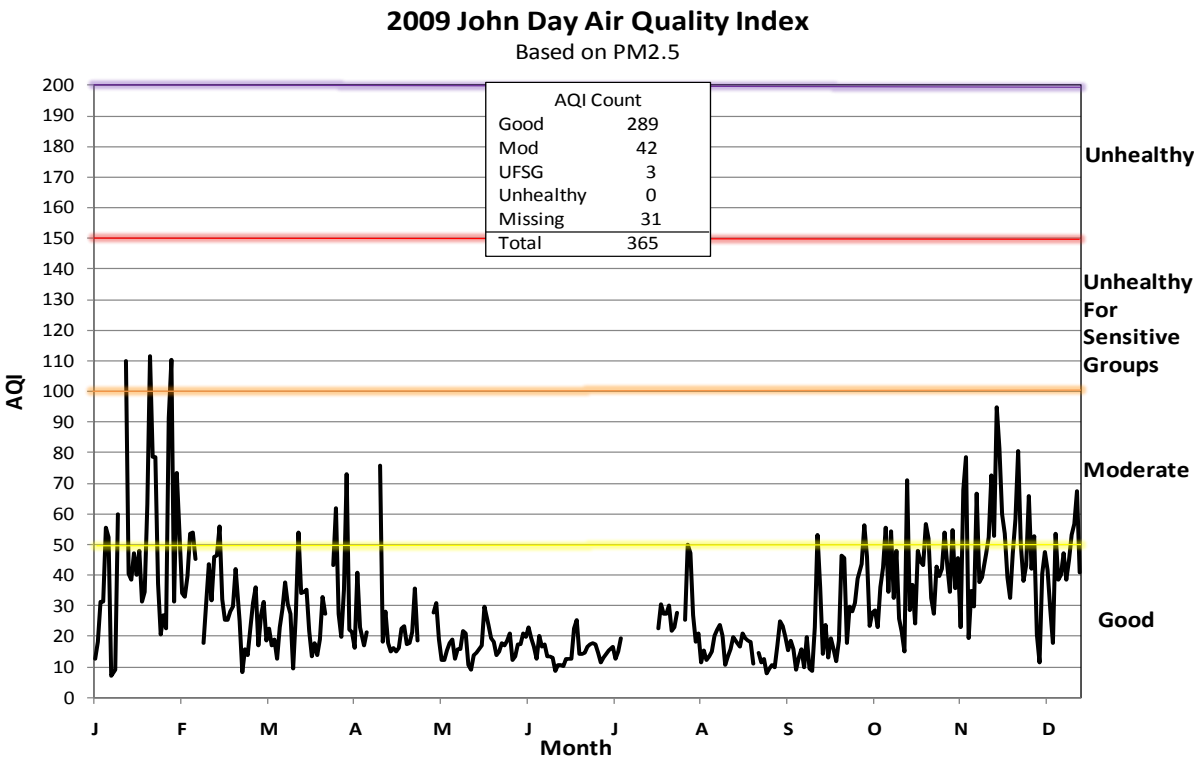


Figure 17. 2009 John Day Air Quality Summary.

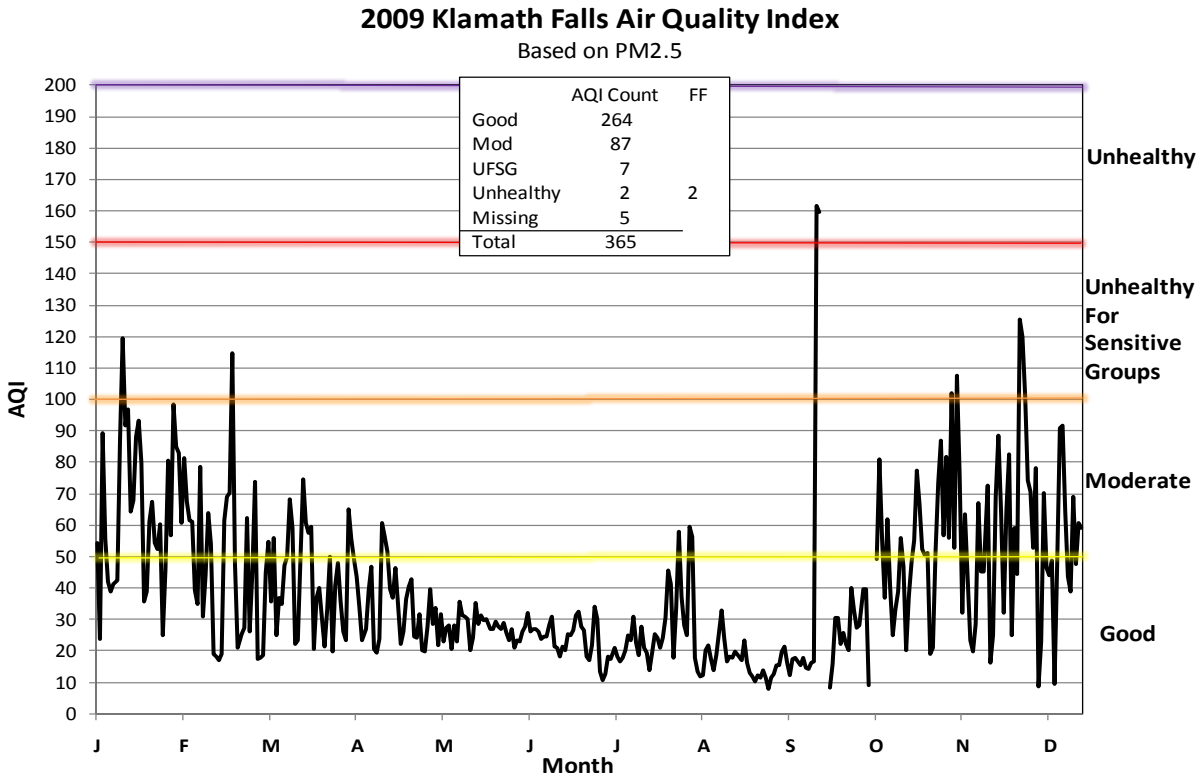


Figure 18. 2009 Klamath Falls Air Quality Summary.

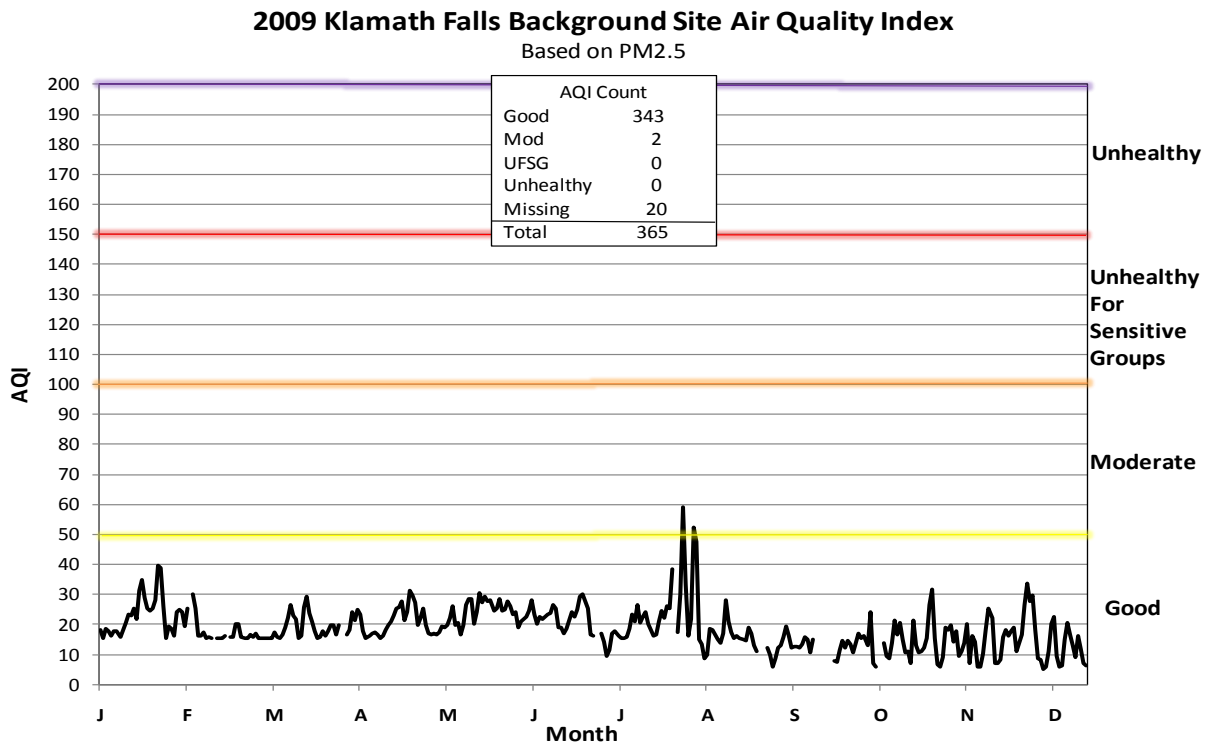


Figure 19. 2009 Klamath Falls Background on Stateline Road Air Quality Summary.

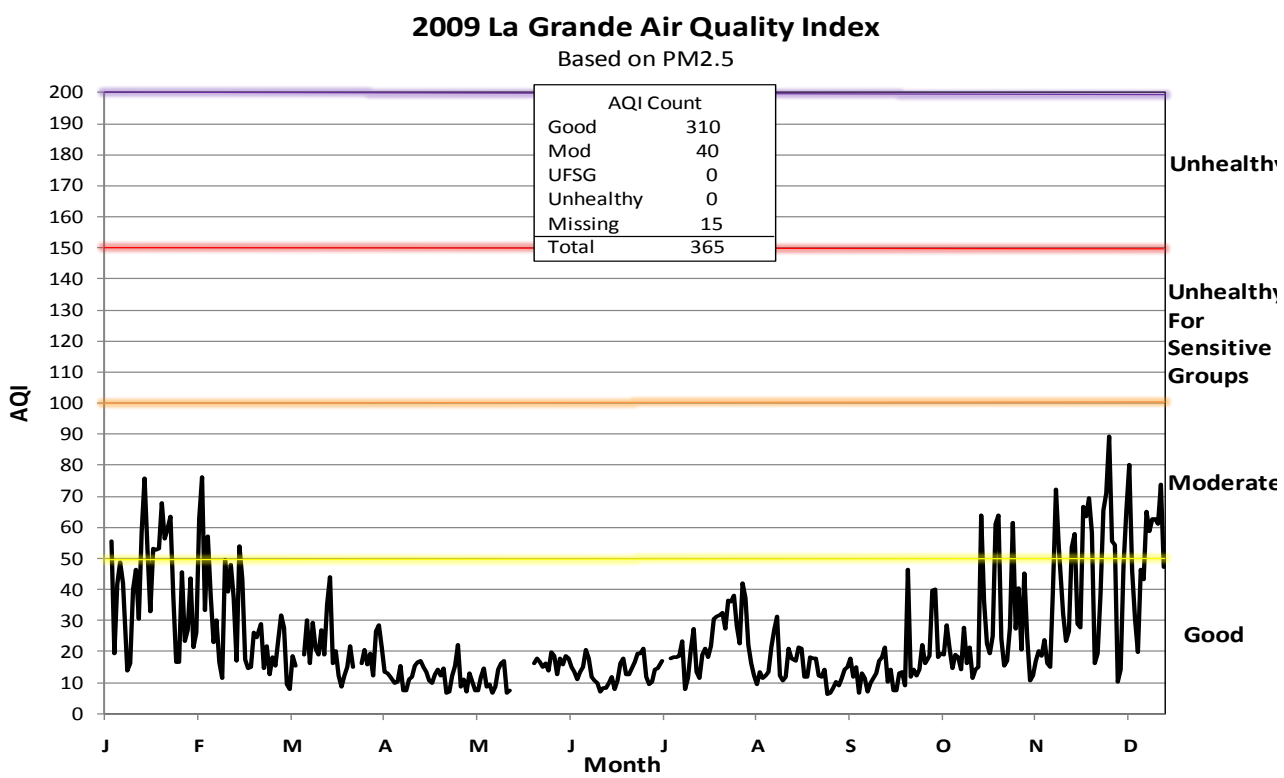


Figure 20. 2009 La Grande Air Quality Summary.

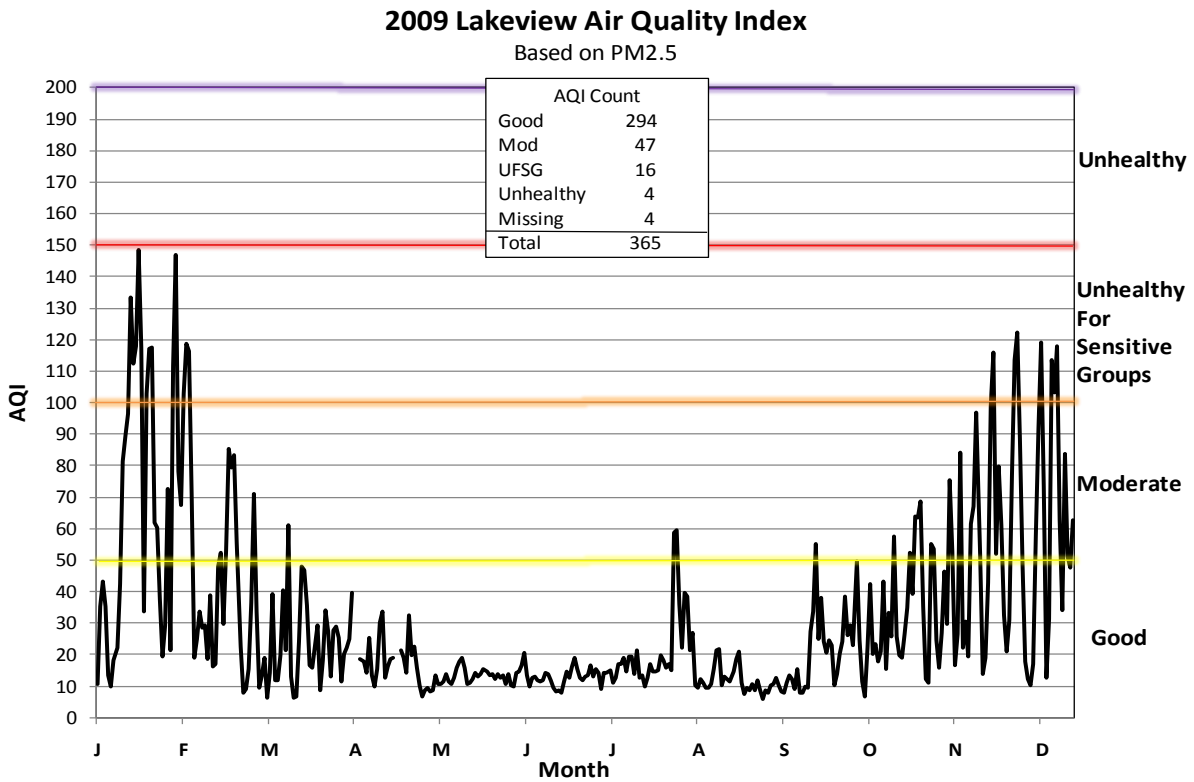


Figure 21. 2009 Lakeview Air Quality Summary.

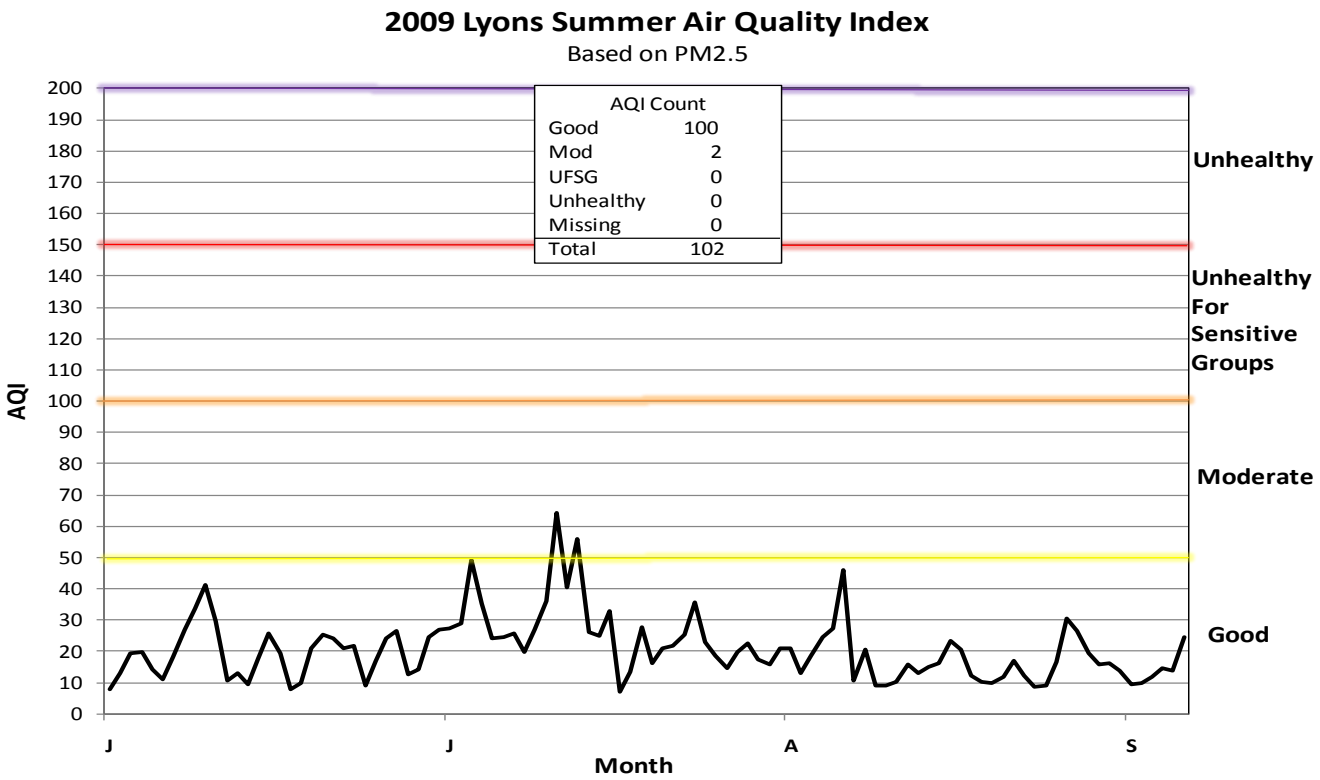


Figure 22. 2009 Lyons Air Quality Summary.

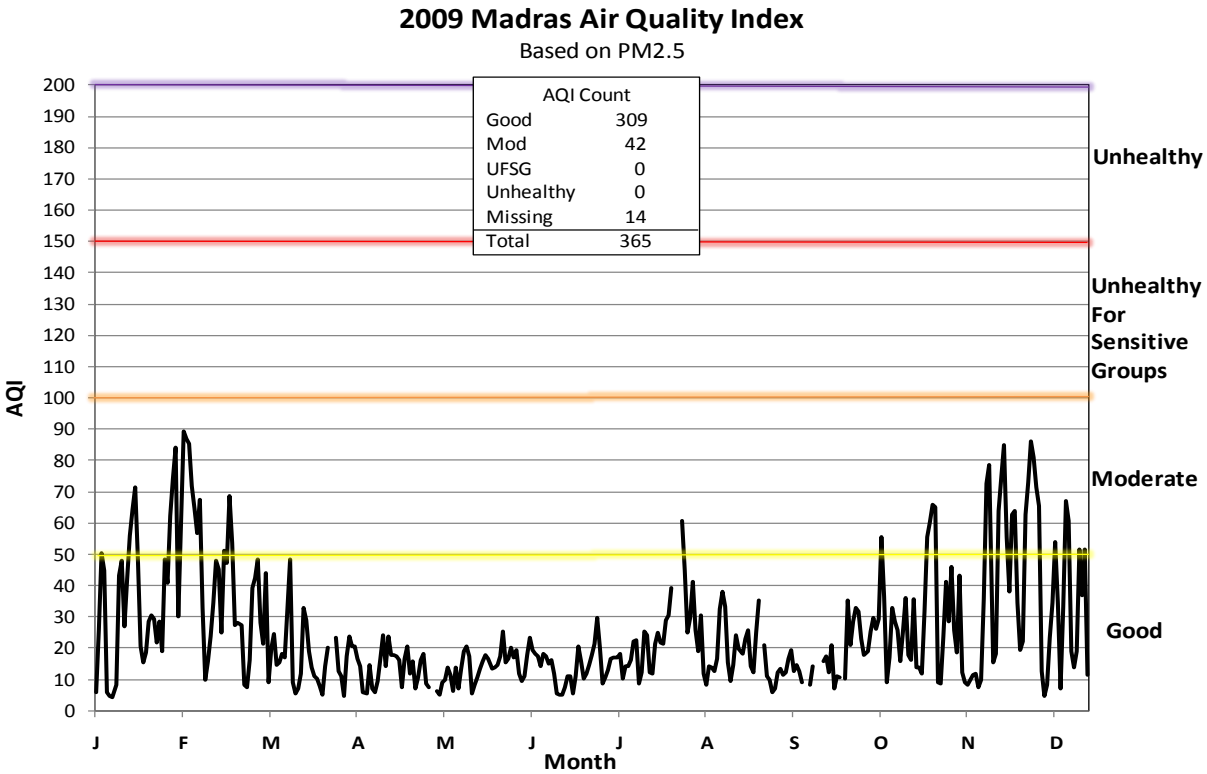


Figure 23. 2009 Madras Air Quality Summary.

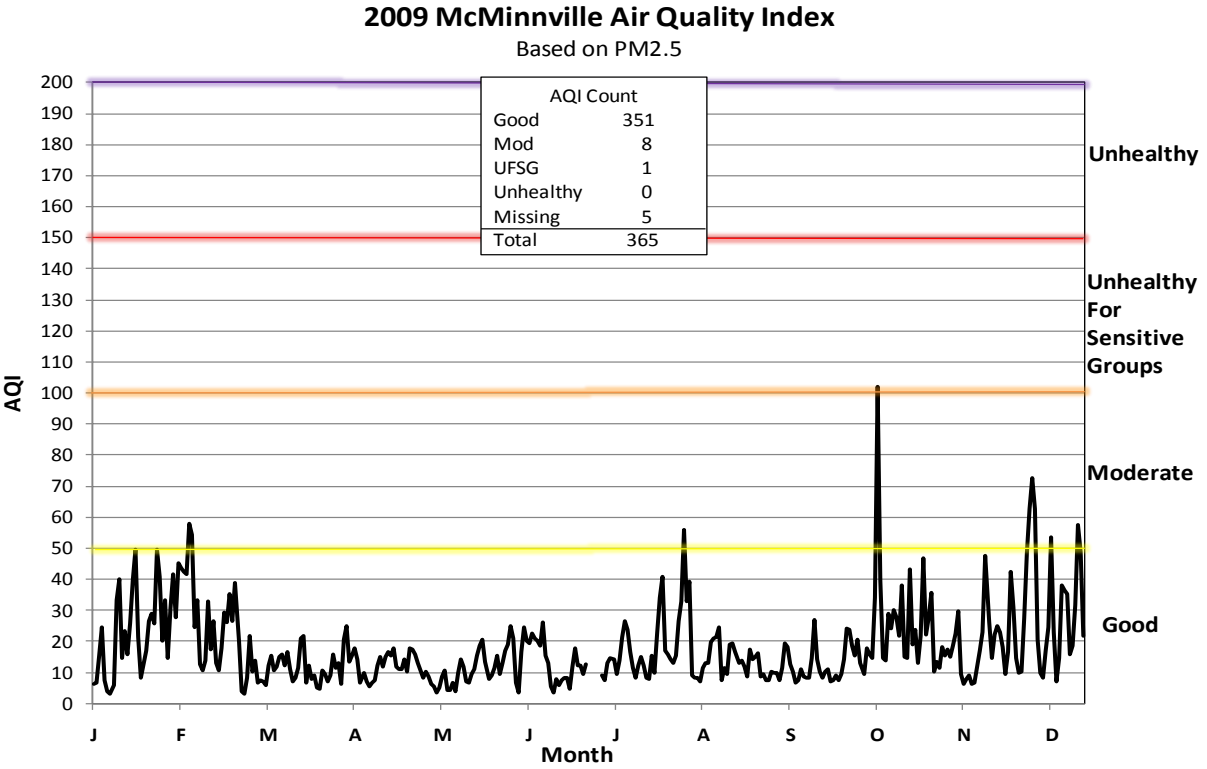


Figure 24. 2009 McMinnville Air Quality Summary.

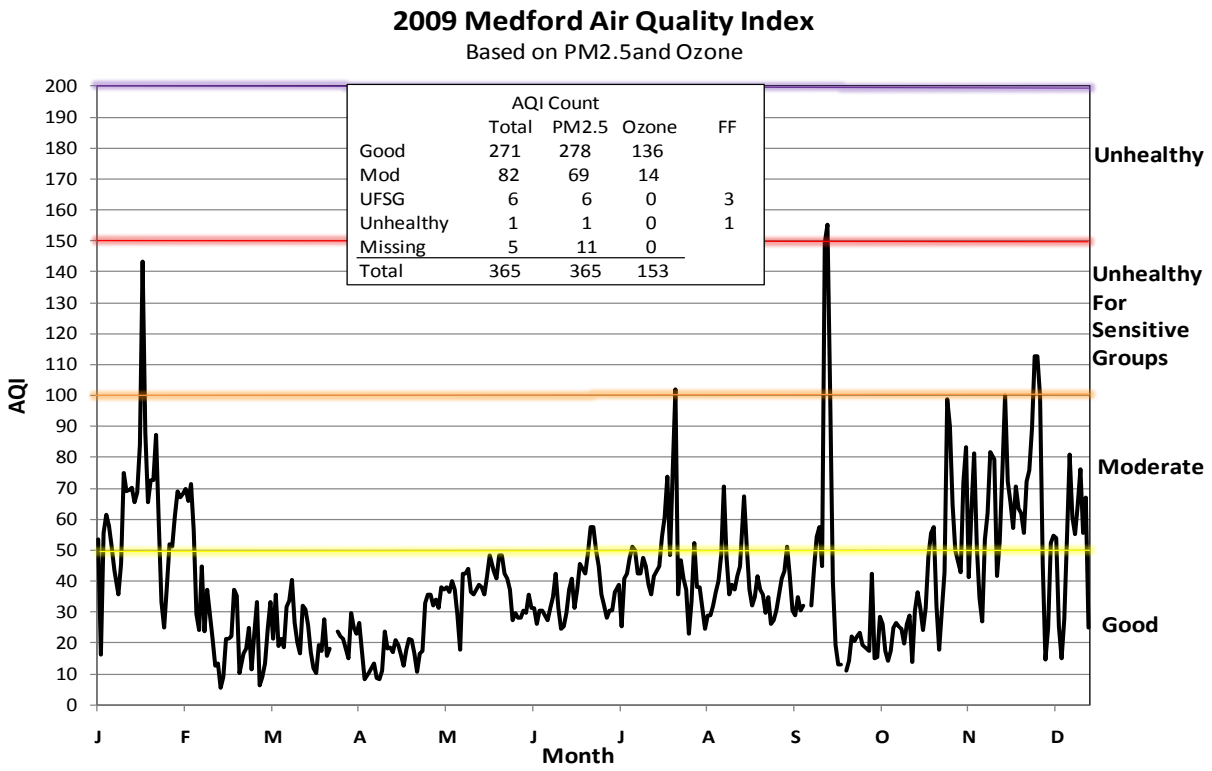


Figure 25. 2009 Medford Air Quality Summary.

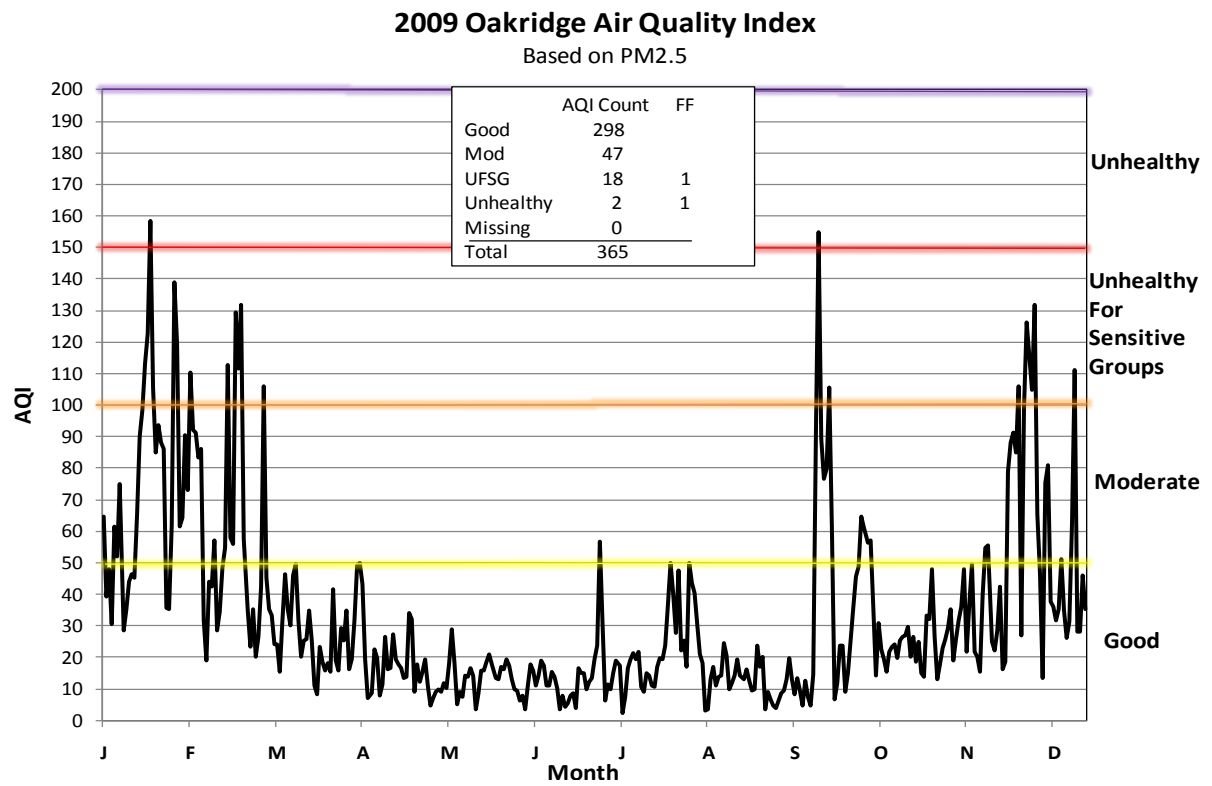


Figure 26. 2009 Oakridge Air Quality Summary.

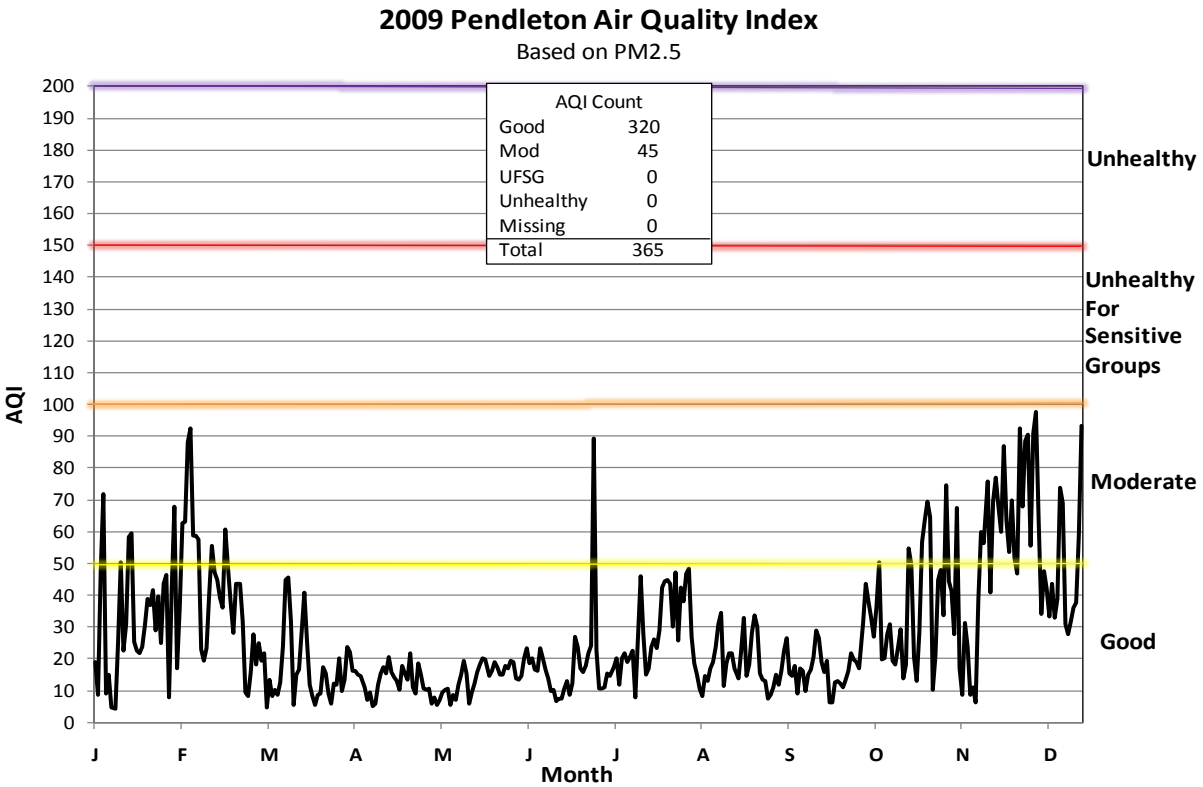


Figure 27. 2009 Pendleton Air Quality Summary.

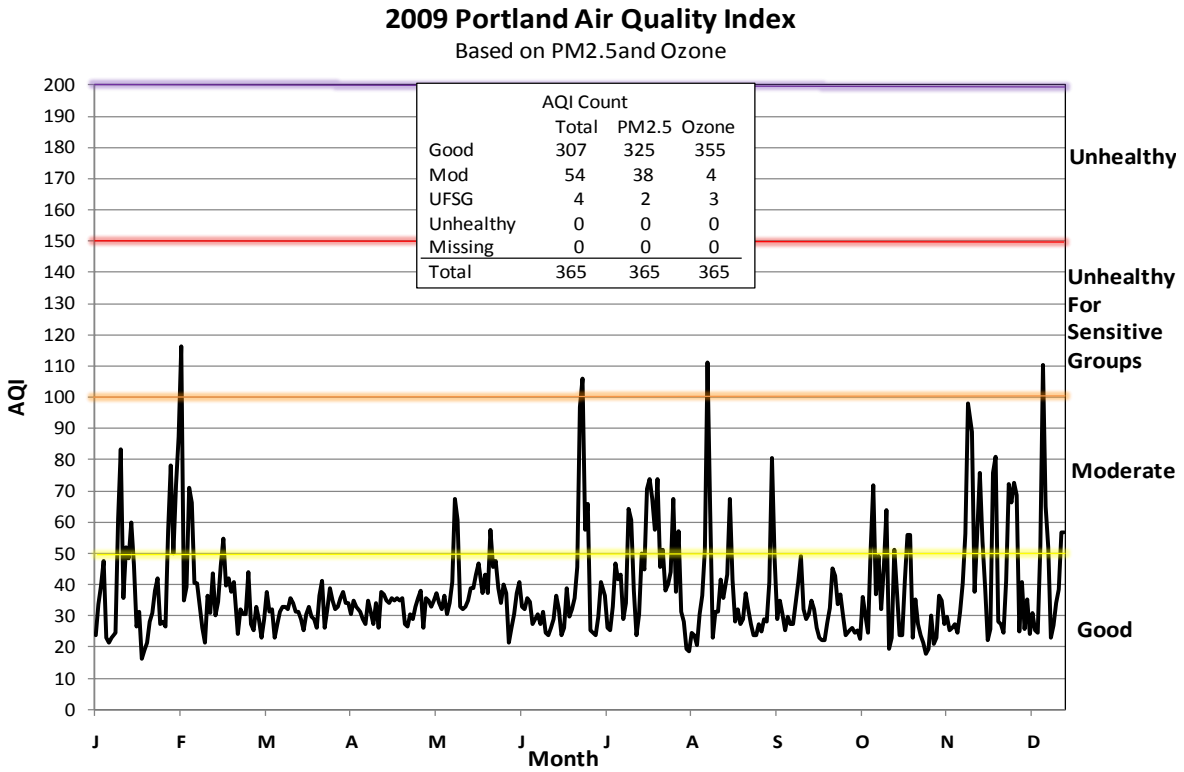


Figure 28. 2009 Portland Air Quality Summary.

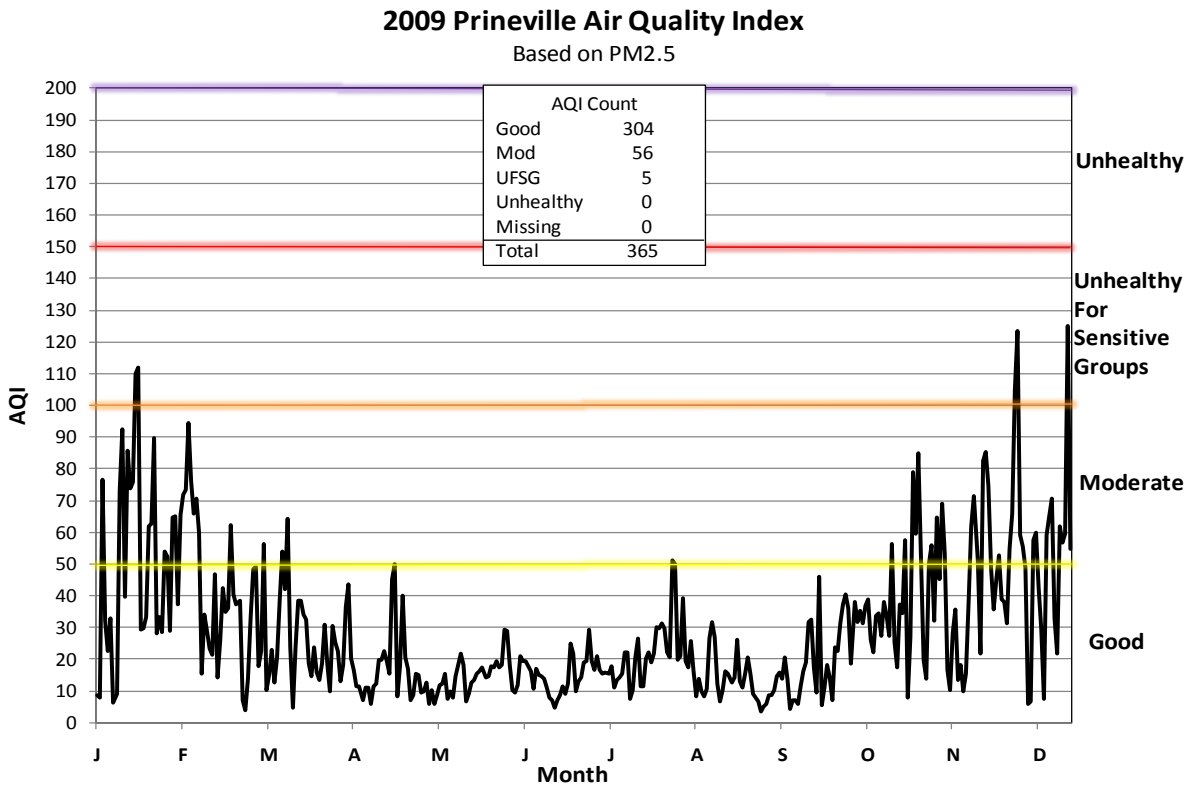


Figure 29. 2009 Prineville Air Quality Summary.

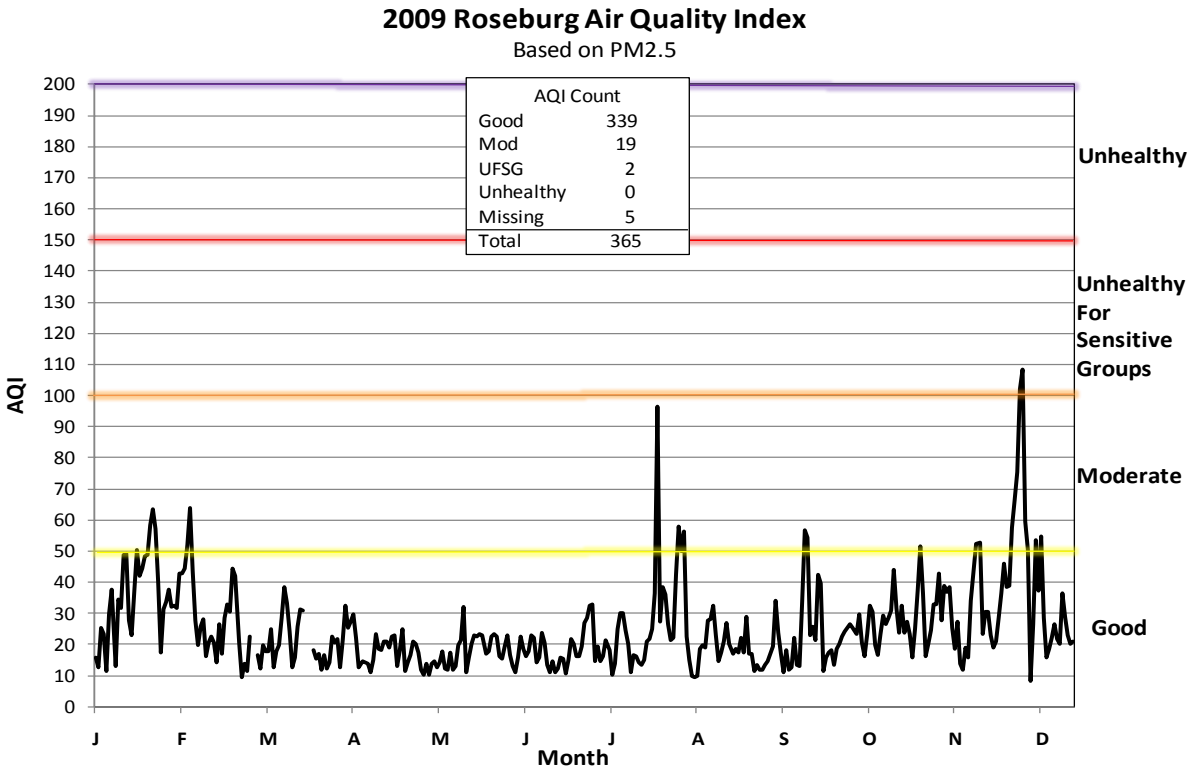


Figure 30. 2009 Roseburg Air Quality Summary.

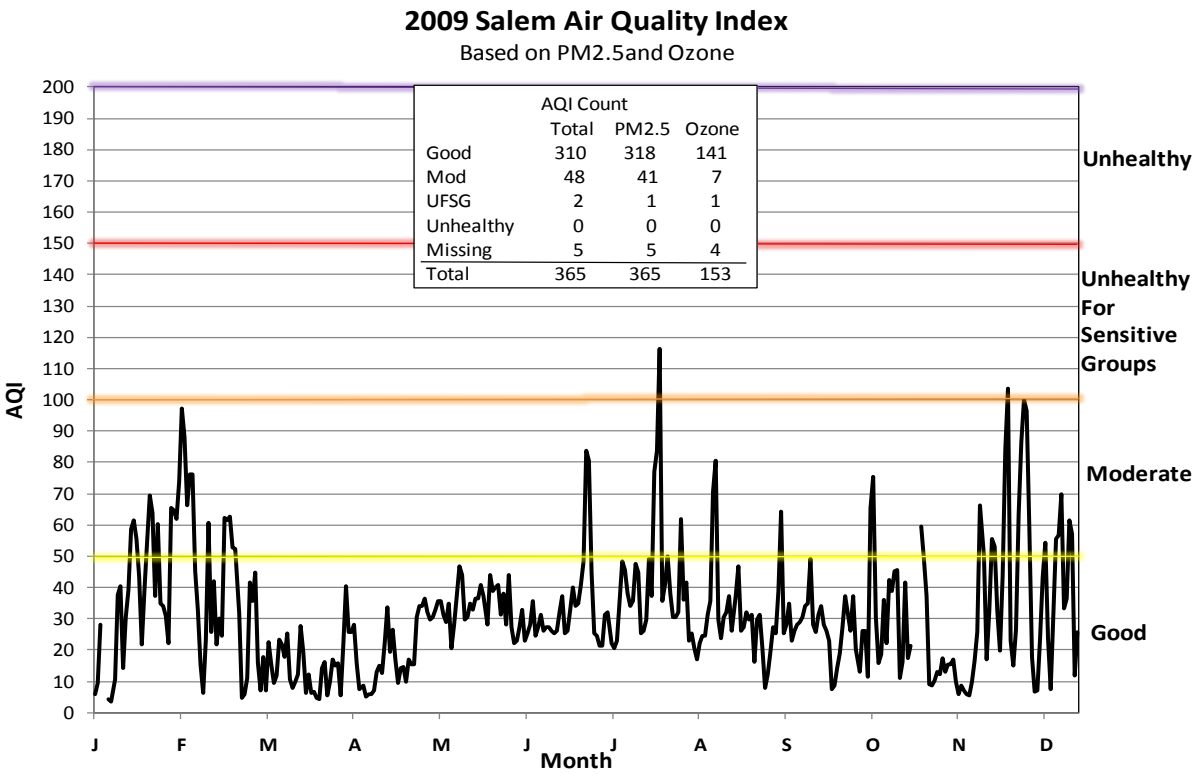


Figure 31. 2009 Salem Air Quality Summary.

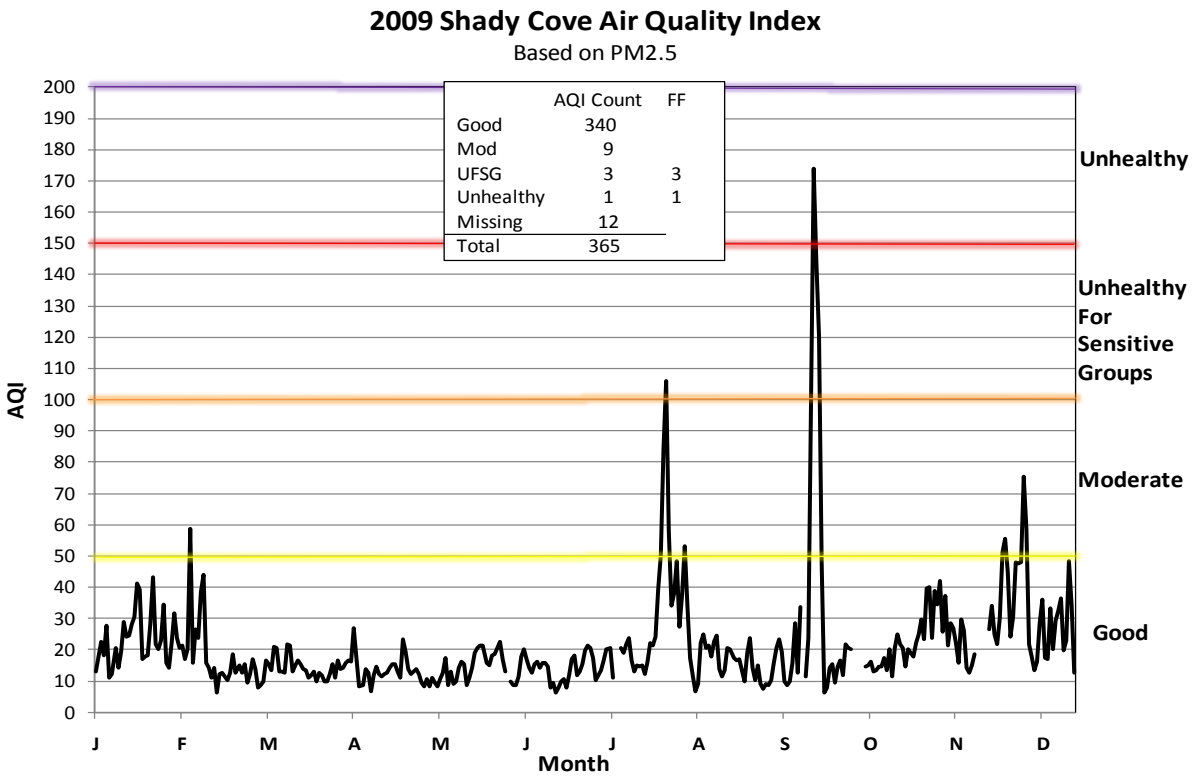


Figure 32. 2009 Shady Cove Air Quality Summary.

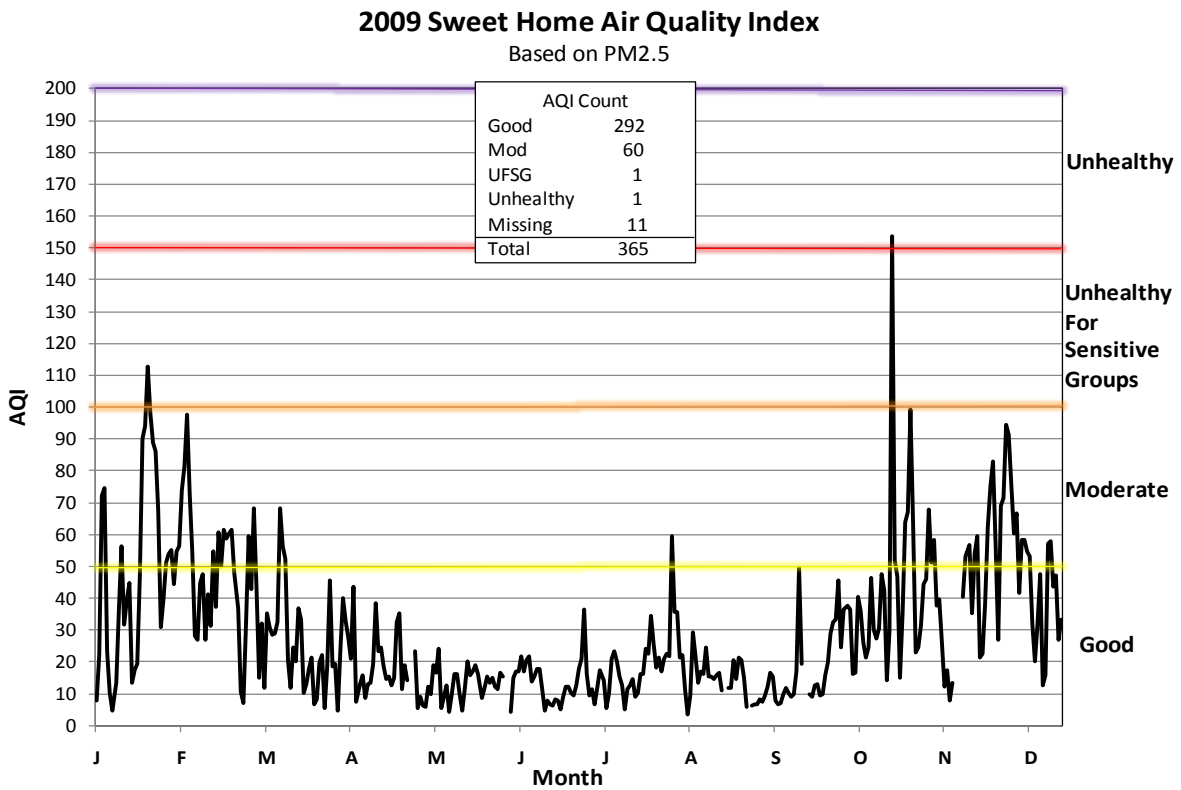


Figure 33. 2009 Sweet Home Air Quality Summary.

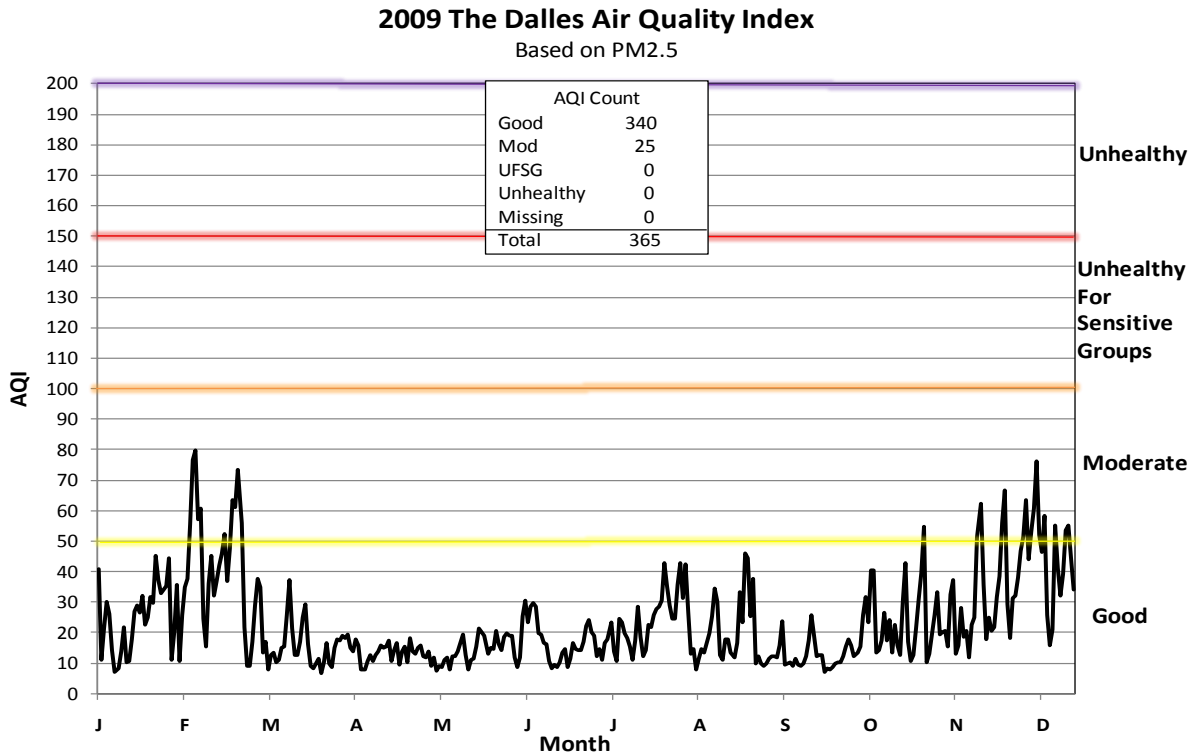


Figure 34. 2009 The Dalles Air Quality Summary.

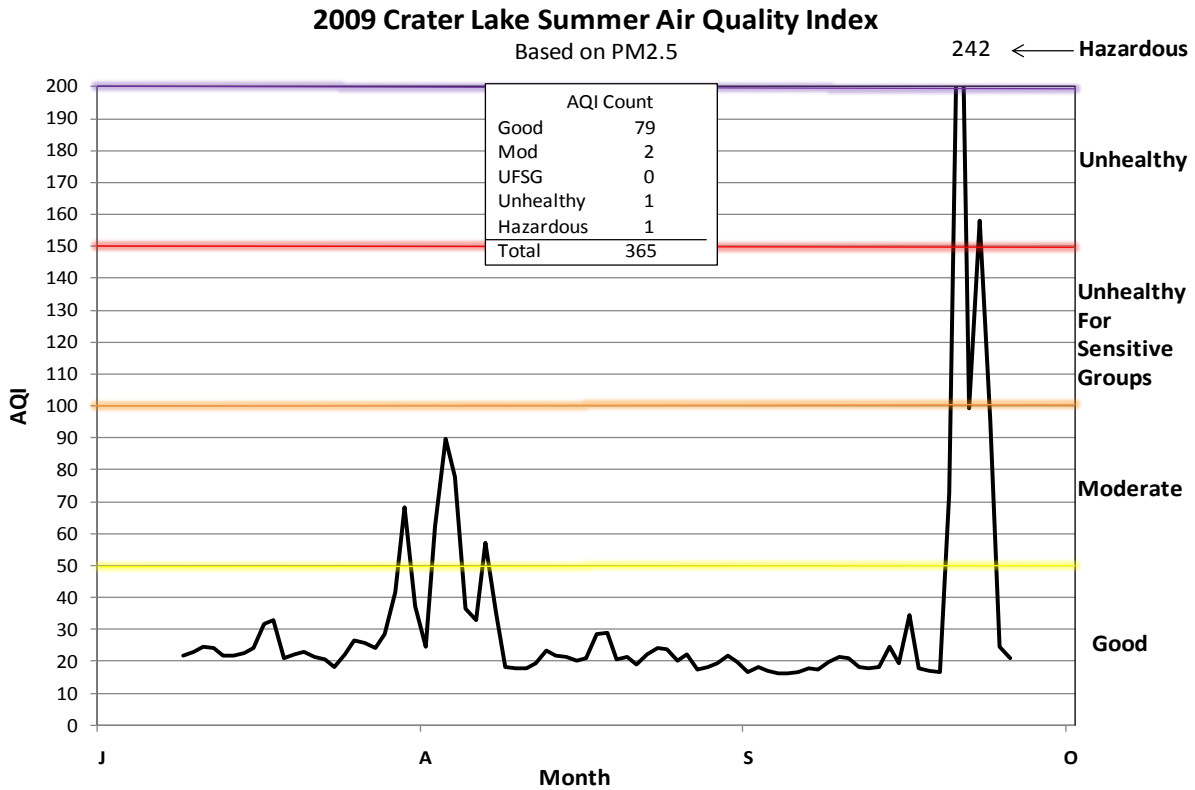


Figure 35. 2009 Crater Lake July–Sept, 2009Air Quality Summary.

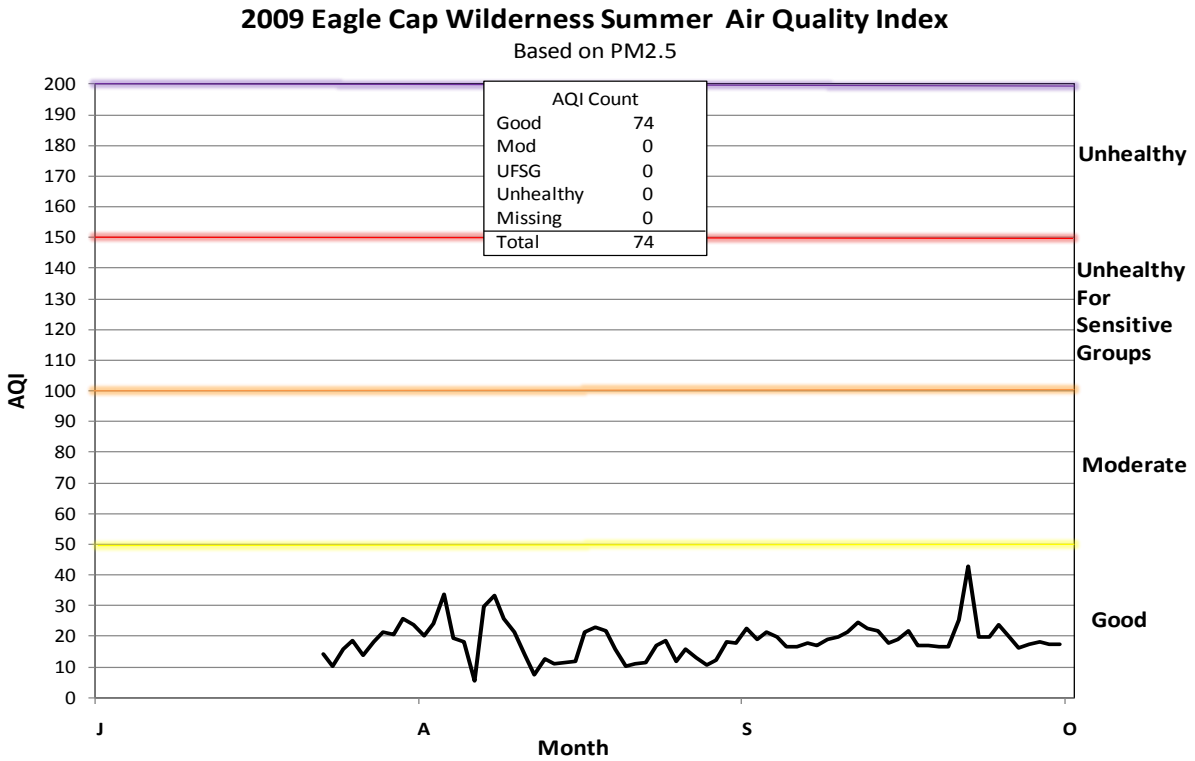


Figure 36. 2009 Eagle Cap Wilderness July–Sept, 2009Air Quality Summary.

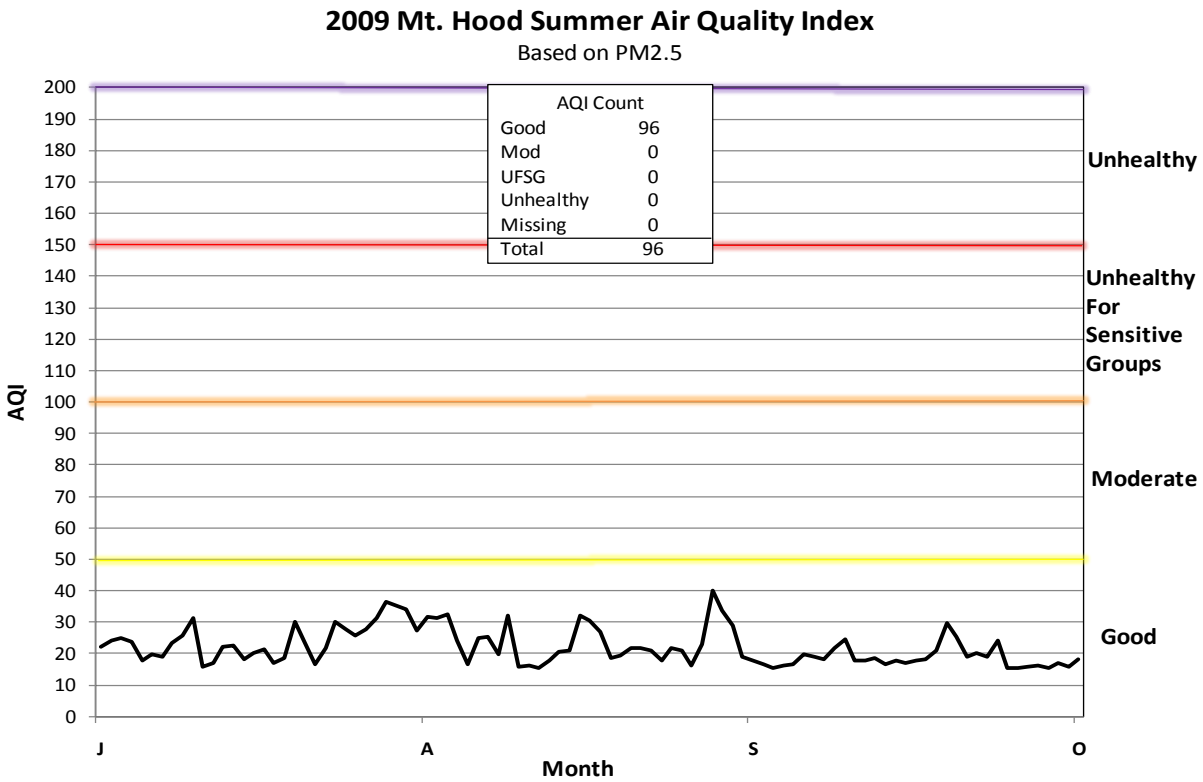


Figure 37. 2009 Mt. Hood Summer Air Quality Summary.

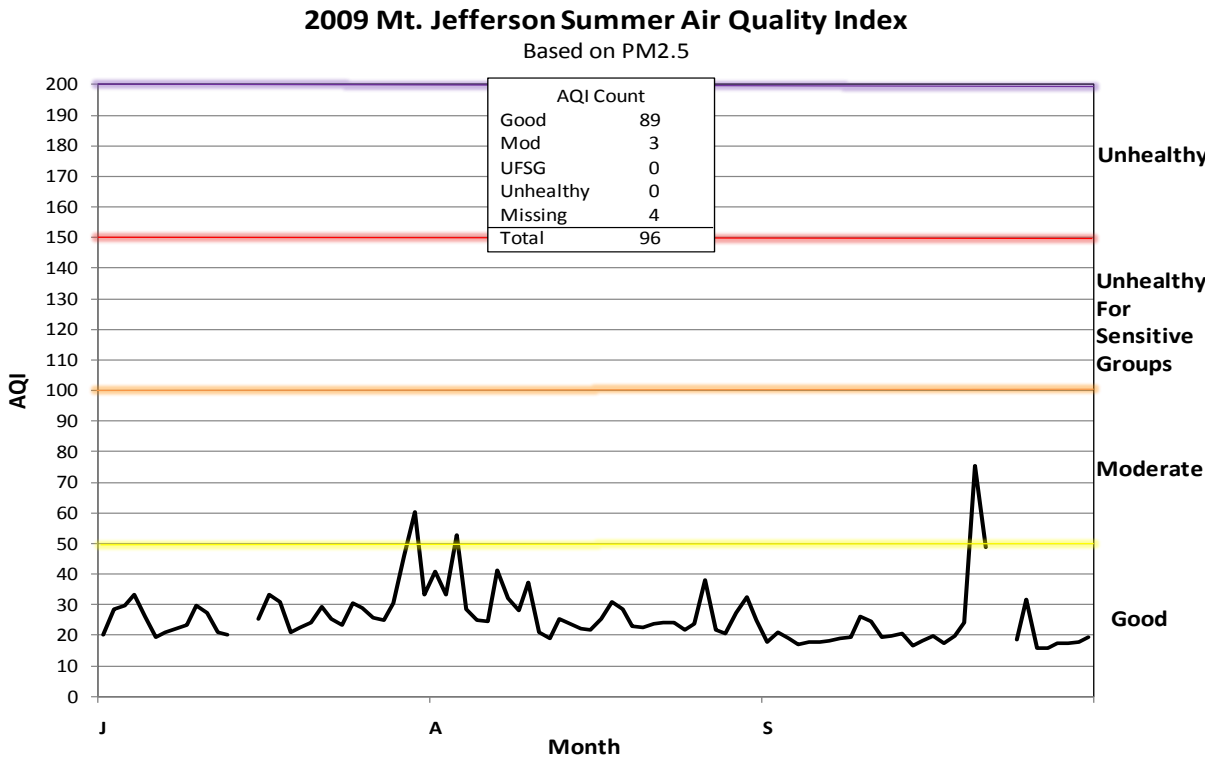


Figure 38. 2009 Mt Jefferson Summer Air Quality Summary.

The 2009 AQI days in the different health categories are shown in Table 4.

Table 4. Summary of the 2009 daily AQI values.

County	City	Good	Moderate	USG	Unhealthy	Missing	Total
Baker	Baker City	336	25	0	0	4	365
Benton	Corvallis	327	27	0	0	11	365
Crook	Prineville	304	56	5	0	0	365
Deschutes	Bend	351	7	1	0	6	365
Douglas	Roseburg	339	19	2	0	5	365
Grant	John Day	289	42	3	0	31	365
Harney	Burns	299	62	0	0	4	365
Jackson	Medford	271	82	6	1	5	365
	Shady Cove	340	9	3	1	12	365
Jefferson	Madras	309	42	0	0	14	365
Josephine	Applegate Valley	346	10	2	0	7	365
	Cave Junction	358	7	0	0	0	365
	Grants Pass	295	53	4	0	13	365
Klamath	Klamath Falls	264	87	7	2	5	365
Lake	Lakeview	294	47	16	4	4	365
Lane	Cottage Grove	323	37	3	0	2	365
	Eugene/Springfield	317	41	6	1	0	365
	Oakridge	298	47	18	2	0	365
Linn	Albany	331	28	3	0	3	365
	Sweet Home	292	60	1	1	11	365
Marion	Salem	310	48	2	0	5	365
Multnomah, Clackamas	Portland	307	54	4	0	0	365
Umatilla	Hermiston	136	7	0	0	10	153
	Pendleton	320	45	0	0	0	365
Union	Cove	327	20	0	0	18	365
	La Grande	310	40	0	0	15	365
Wallowa	Enterprise	343	19	0	0	3	365
Wasco	The Dalles	340	25	0	0	0	365
Washington	Beaverton	330	22	0	0	13	365
	Hillsboro	288	62	7	0	8	365
Yamhill	McMinnville	351	8	1	0	5	365

Air Quality Trends

Most areas in the state meet the National Ambient Air Quality Standards (NAAQS) except Klamath Falls, Oakridge, and Lakeview which currently violate the daily $PM_{2.5}$ standard. Figures 39 through 41 show the trends in PM_{10} and CO ambient pollution, while Figure 42 illustrates that ozone is still near the NAAQS. Figure 43 shows Portland ozone trends relative to population and vehicle miles. Figures 44 through 55 show the $PM_{2.5}$ trends for the daily and annual average standards.

PM_{10} Trends

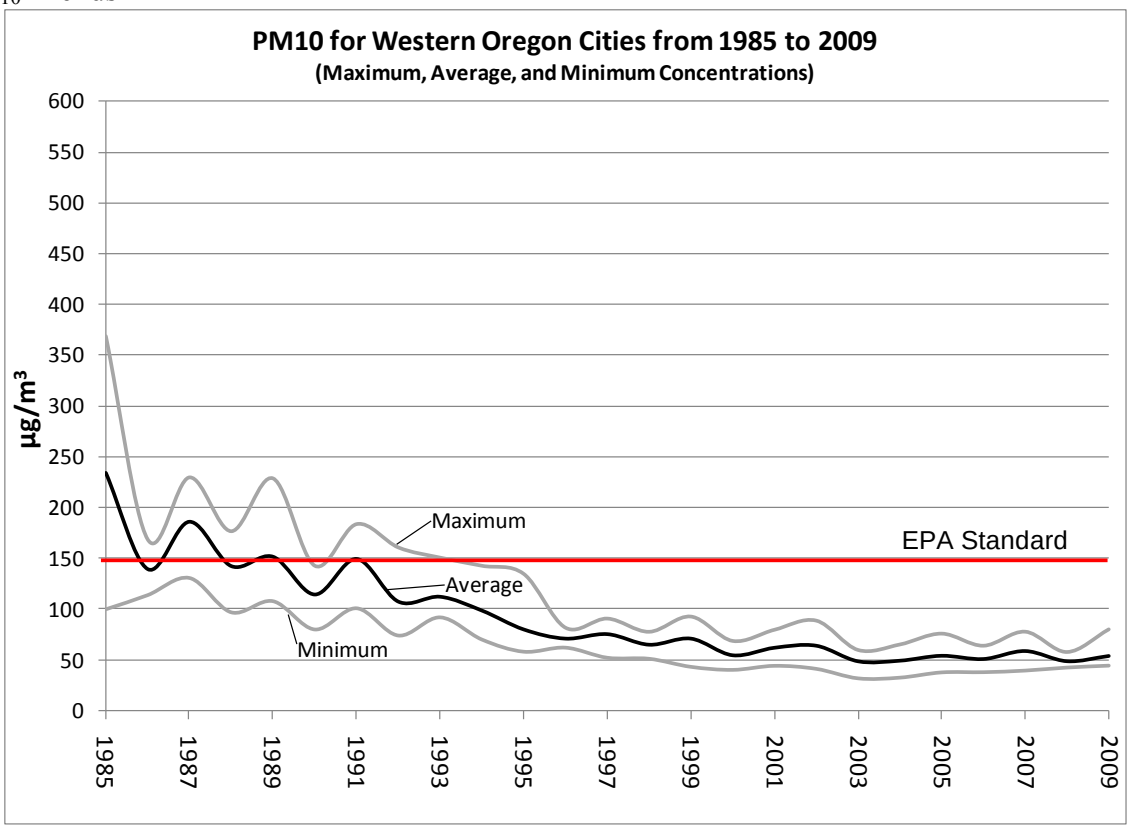


Figure 39. PM_{10} trend for Western Oregon cities.
Trend chart uses the 2nd highest annual 24 hour average

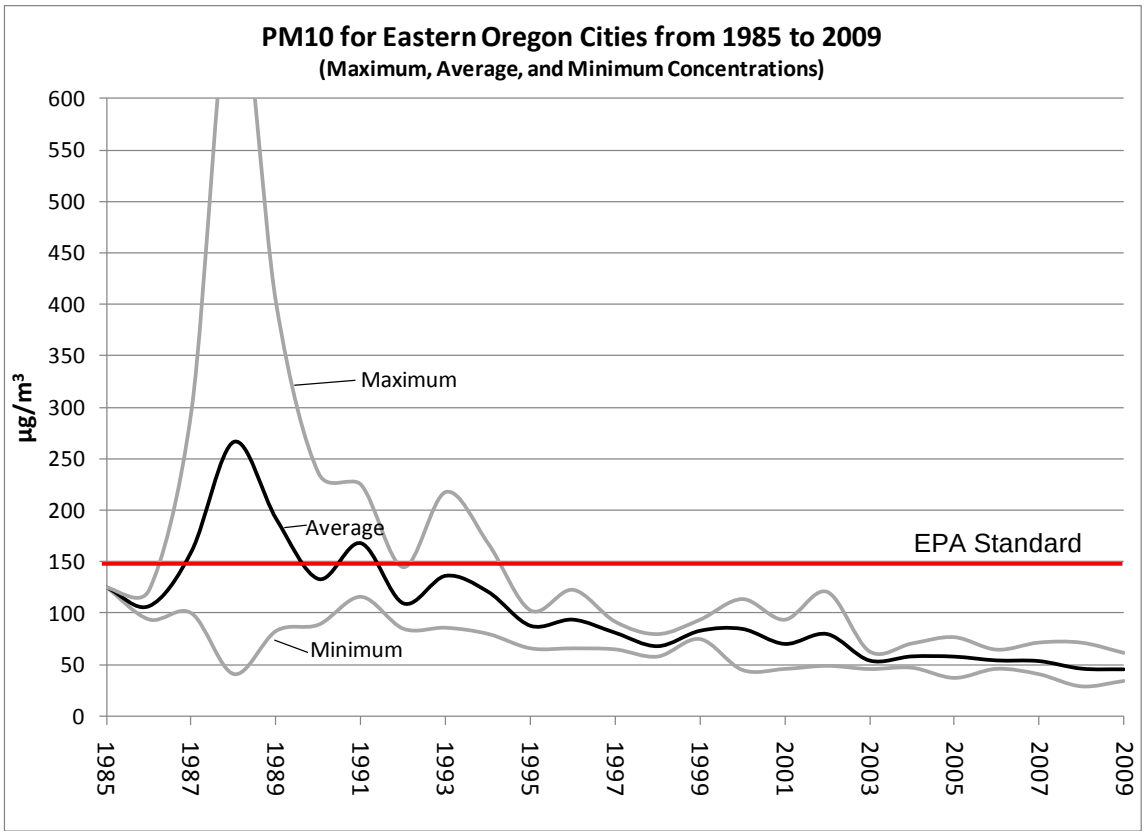


Figure 40. PM_{10} trend for Eastern Oregon cities.
Trend chart uses the 2nd highest annual 24 hour average

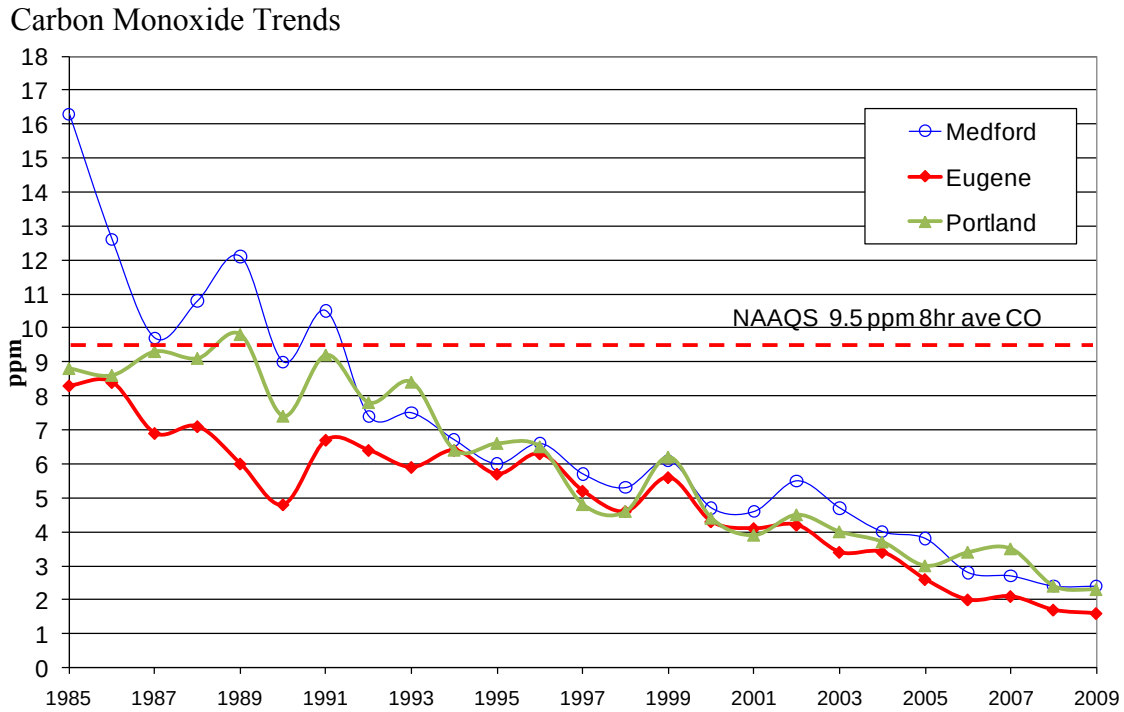


Figure 41. Carbon Monoxide Trend.
Trend chart uses the second highest annual, eight hour average

Ozone Trends

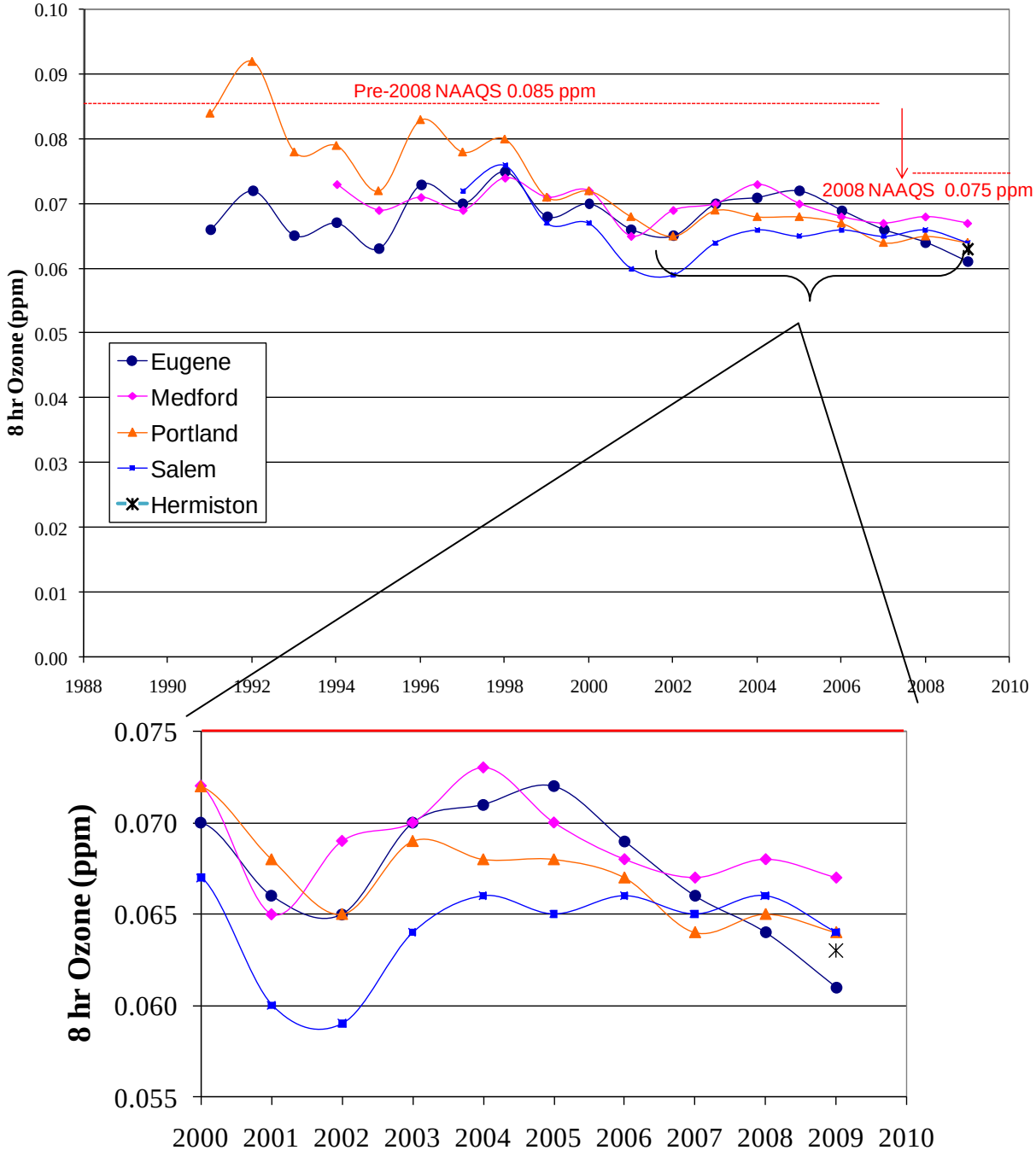
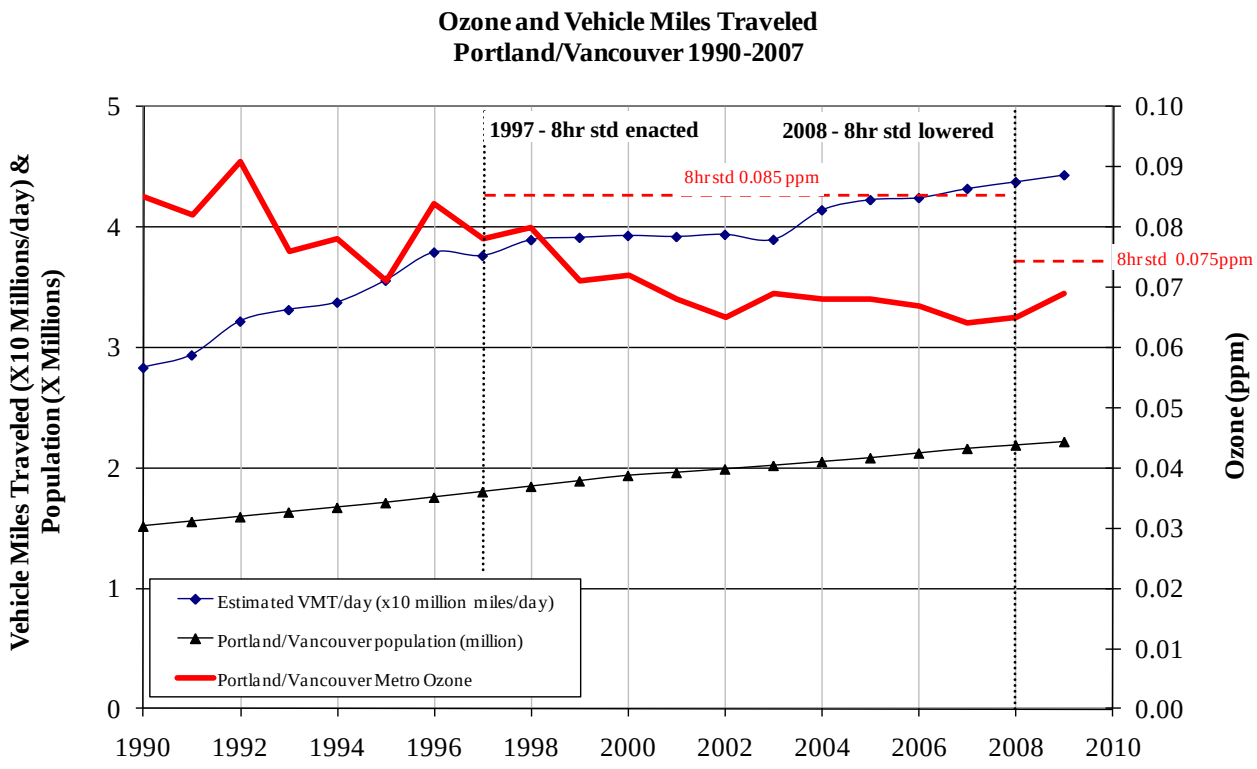


Figure 42. Ozone trend.
The trend chart uses the three year average of fourth highest annual eight hour ozone value.
In 2008 the eight hour standard was lowered to 0.075 ppm.



Ozone is the 3yr average of the fourth highest 8hr average at the maximum site

Figure 43. Portland/Vancouver ozone trend.
The trend chart uses the three year average of fourth highest eight hour ozone value with Vehicle Miles Traveled and Population trends.

In 2008 the eight hour standard was lowered to 0.075 ppm. Population figures are from Portland State University Population Research Center. Vehicle miles traveled are taken from Metro for the Portland/Vancouver area.

$PM_{2.5}$ Trends

Figures 44 through 55 provide the $PM_{2.5}$ 98th percentile and annual average.

Note: The 98th Percentile is a NAAQS standard and is the 98th percent highest sample day. For example, it is the 4th highest sample day if a site has 200 sample days (200*0.98)=196; 200-196= 4.

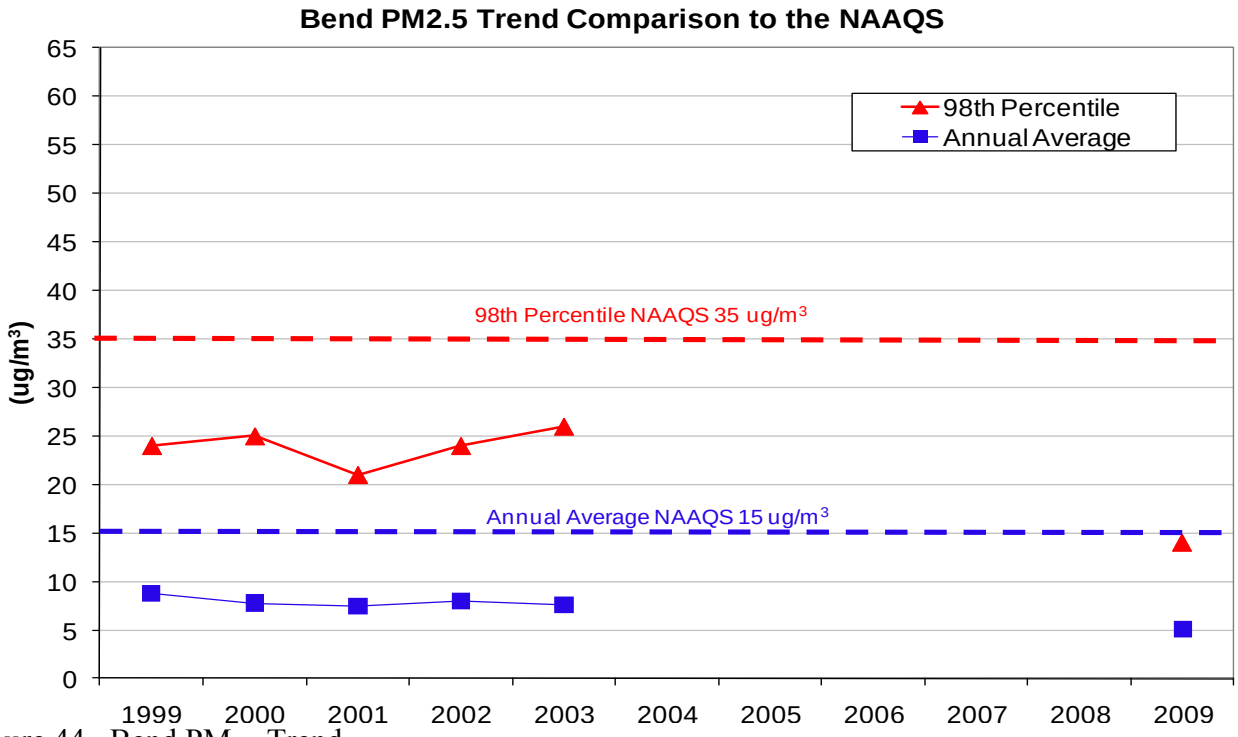


Figure 44. Bend $PM_{2.5}$ Trend.

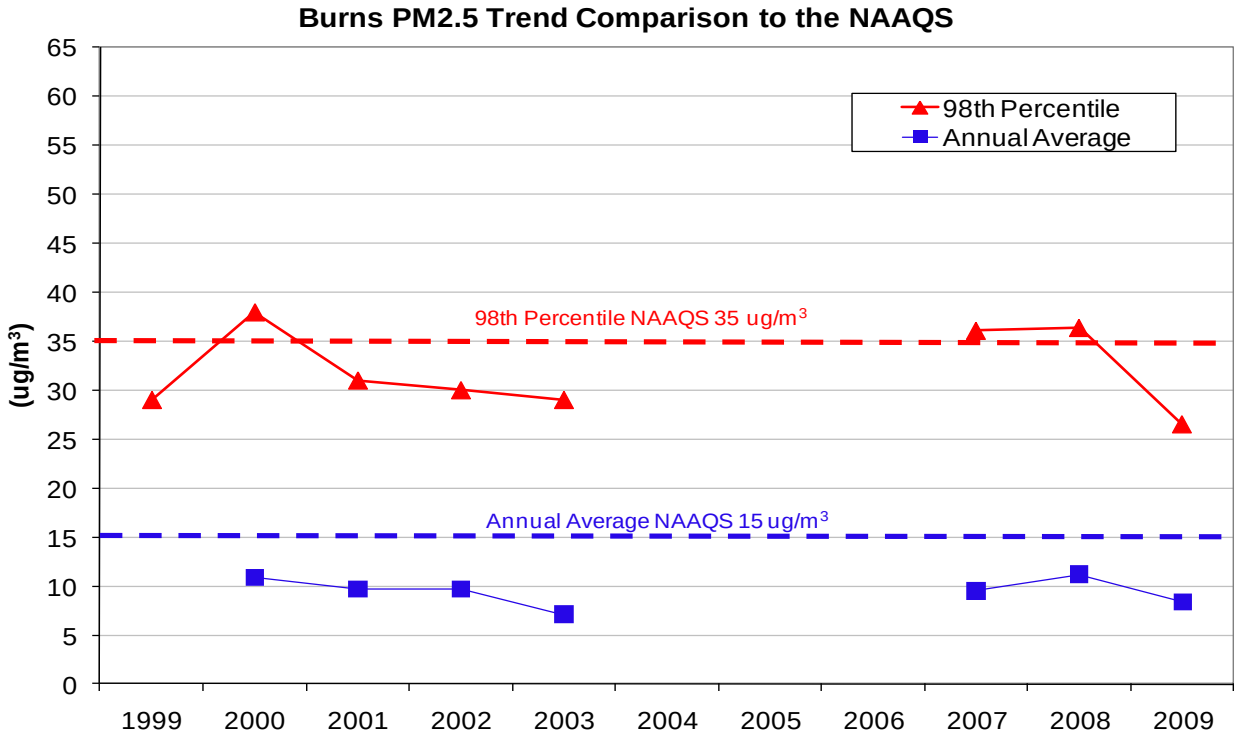


Figure 45. Burns $PM_{2.5}$ Trend.

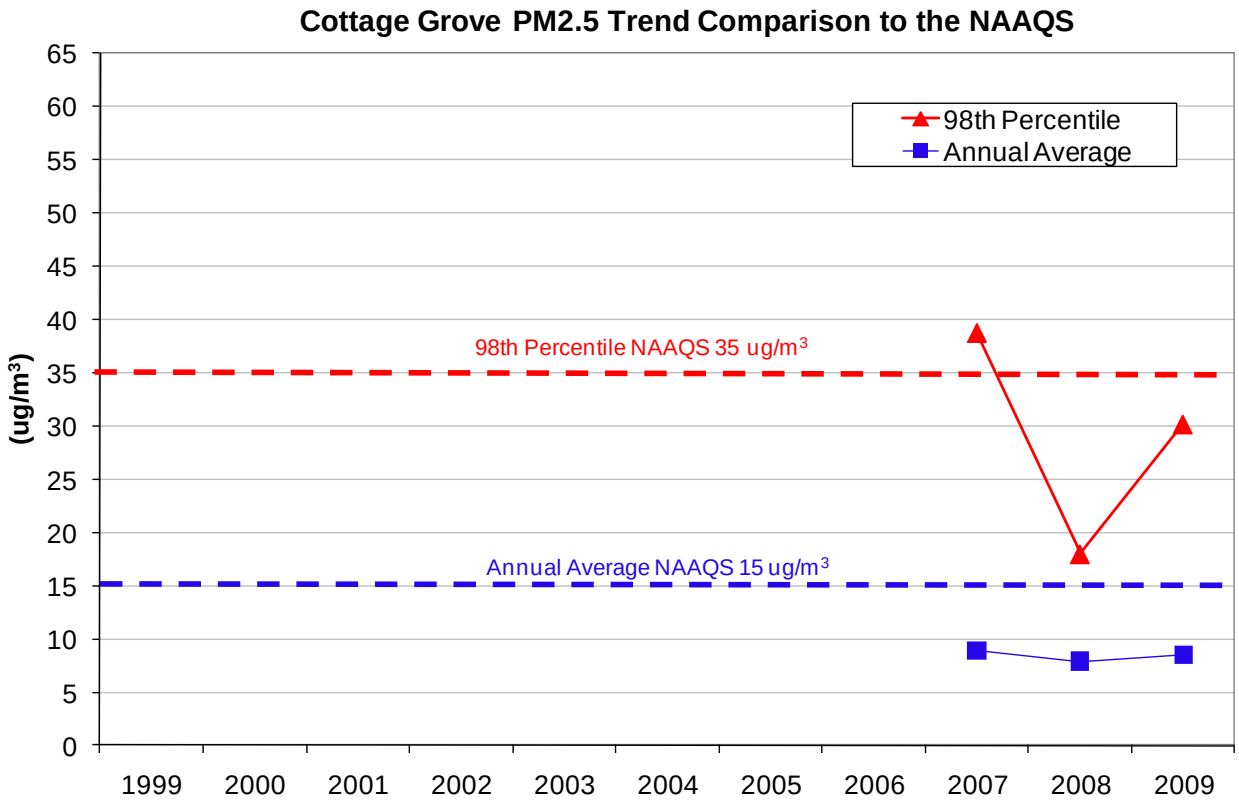


Figure 46. Cottage Grove $PM_{2.5}$ Trends.

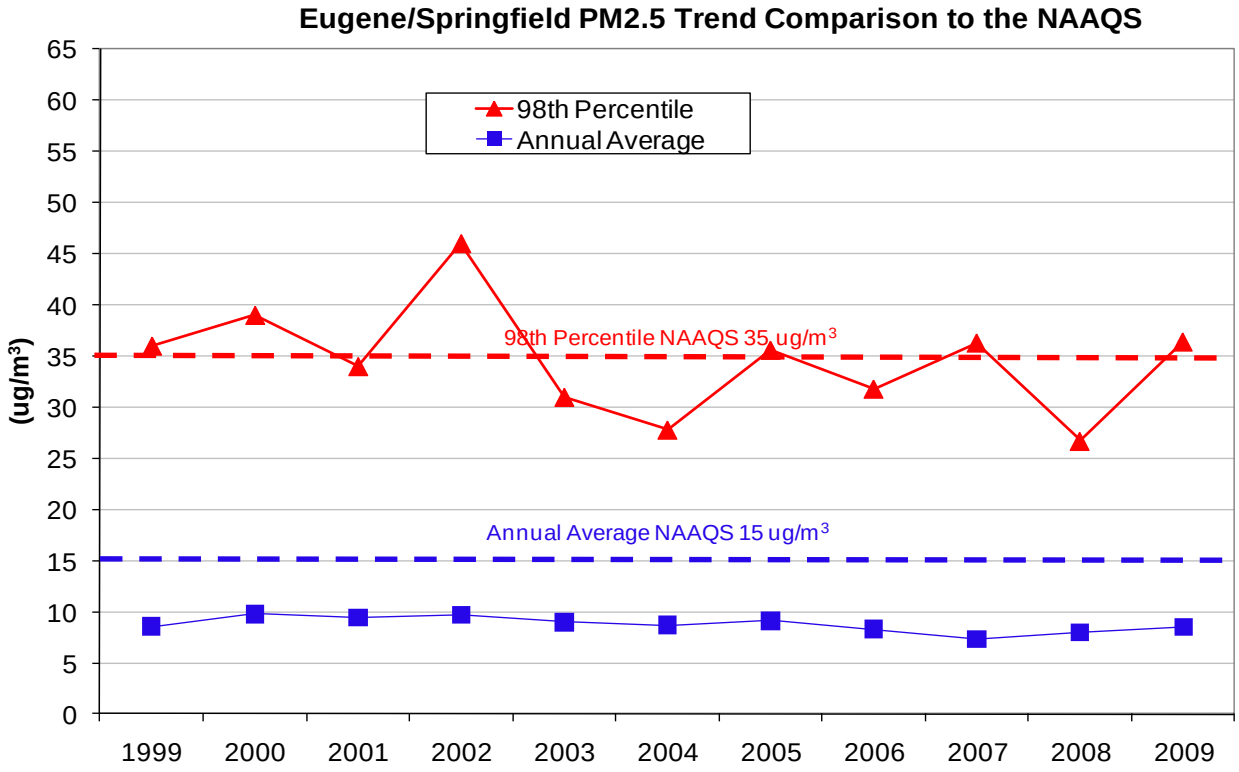


Figure 47. Eugene/Springfield $PM_{2.5}$ Trends.

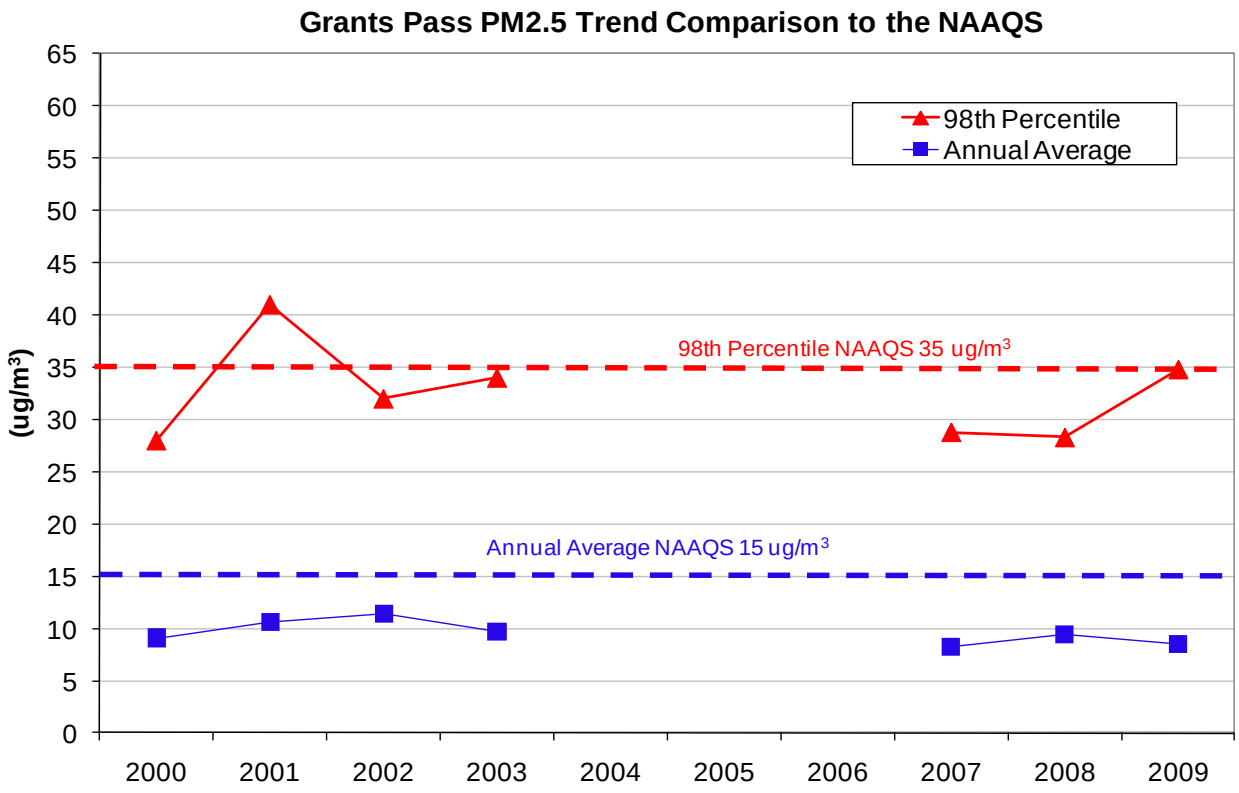


Figure 48. Grants Pass $PM_{2.5}$ Trends.

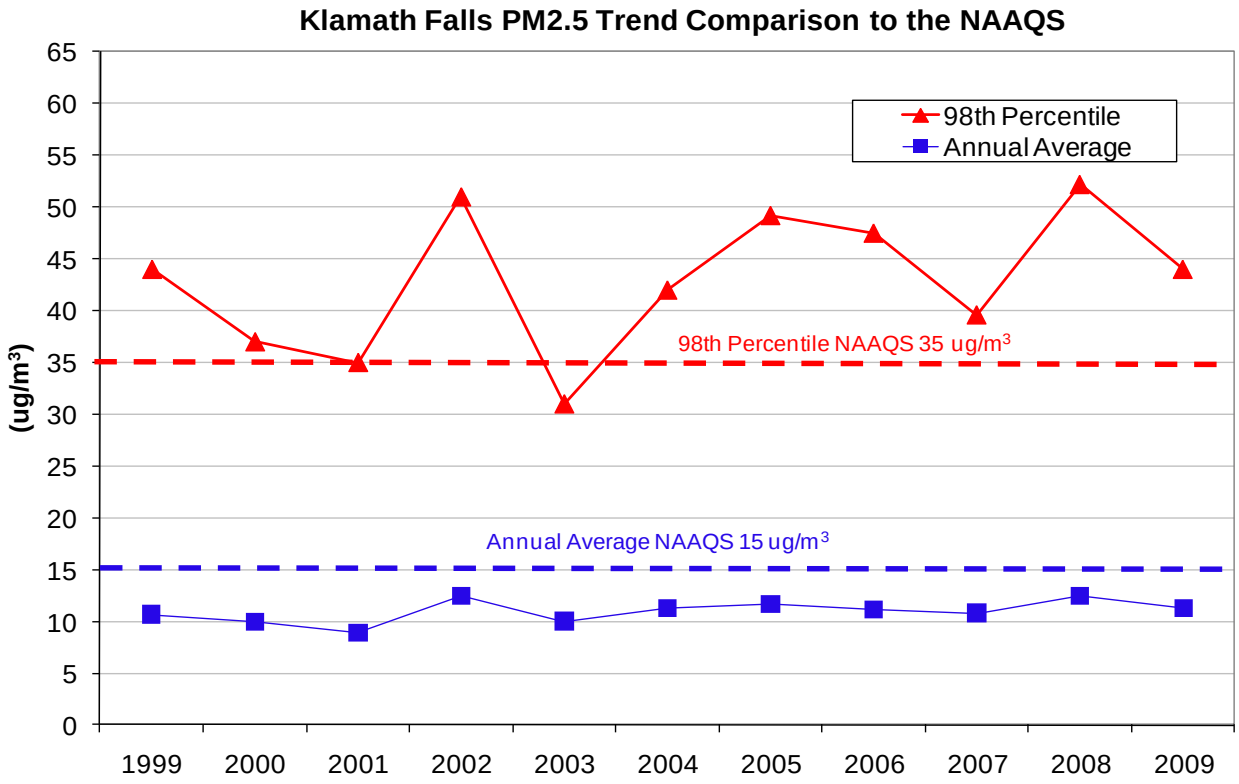


Figure 49. Klamath Falls $PM_{2.5}$ Trends.

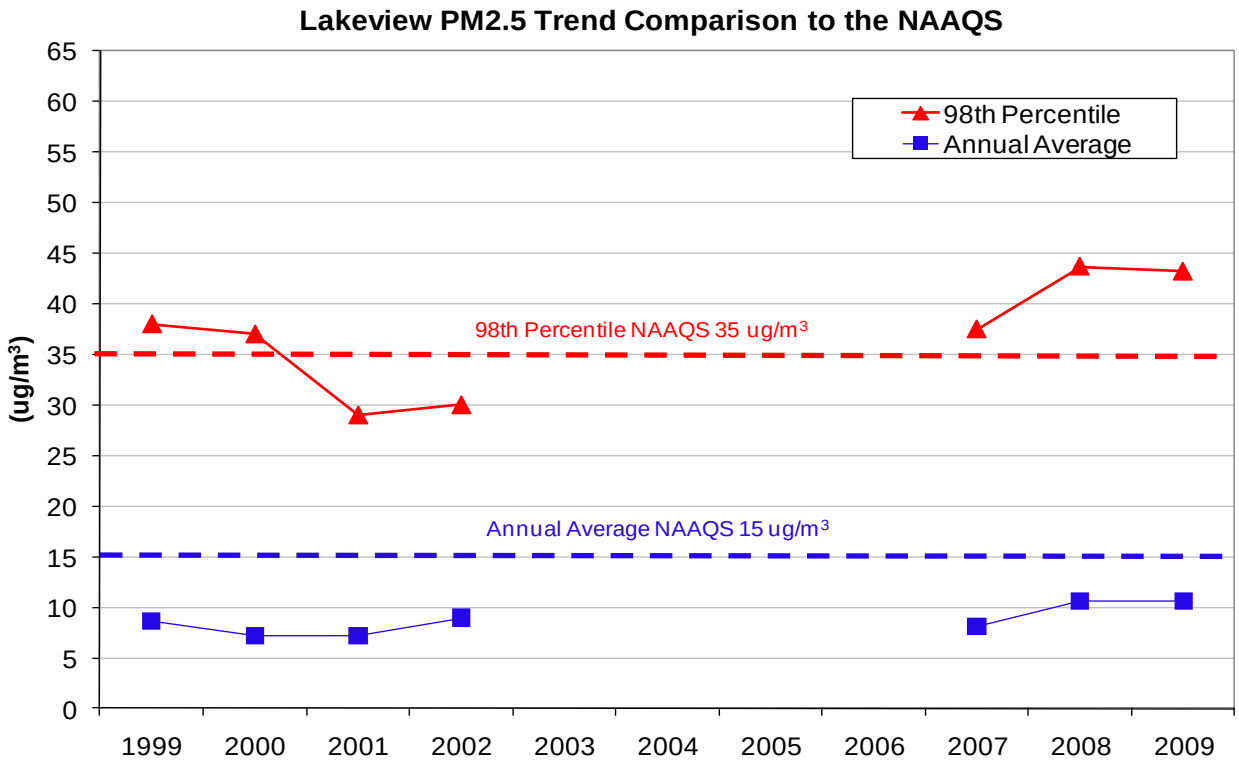


Figure 50. Lakeview $PM_{2.5}$ Trends.

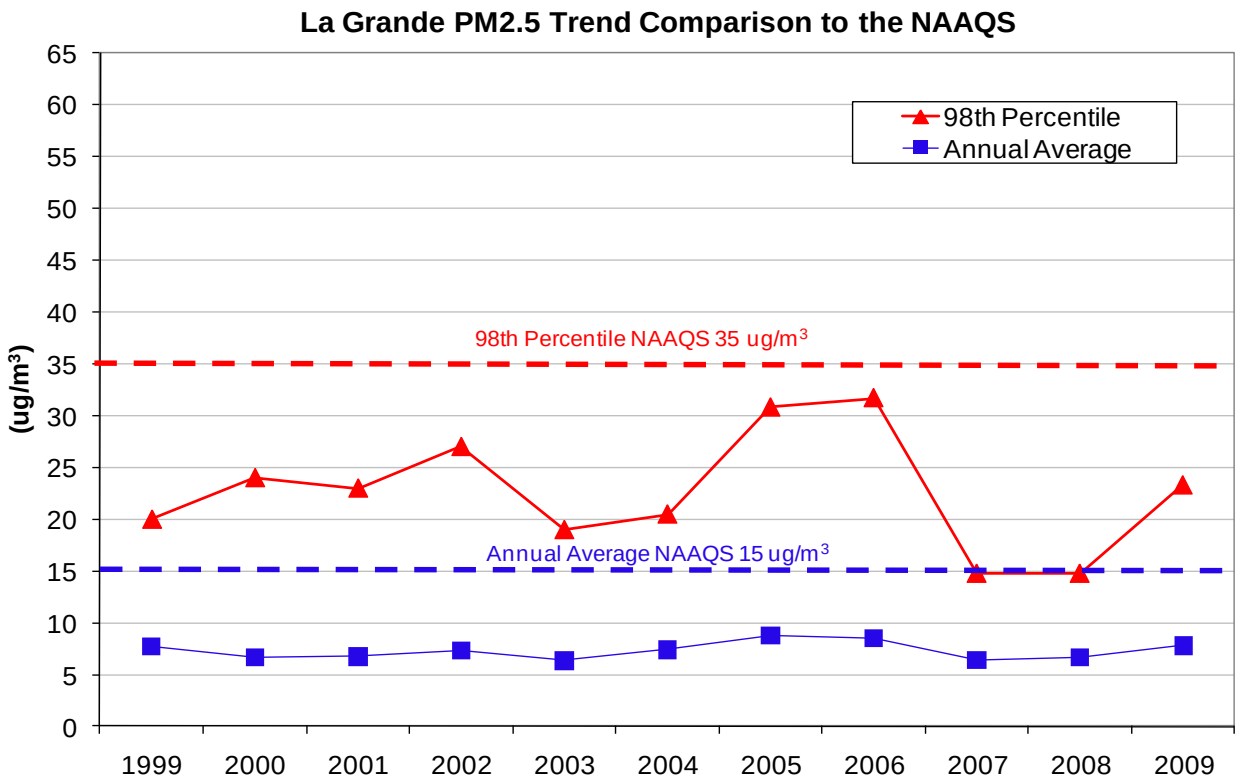


Figure 51. La Grande $PM_{2.5}$ Trends.

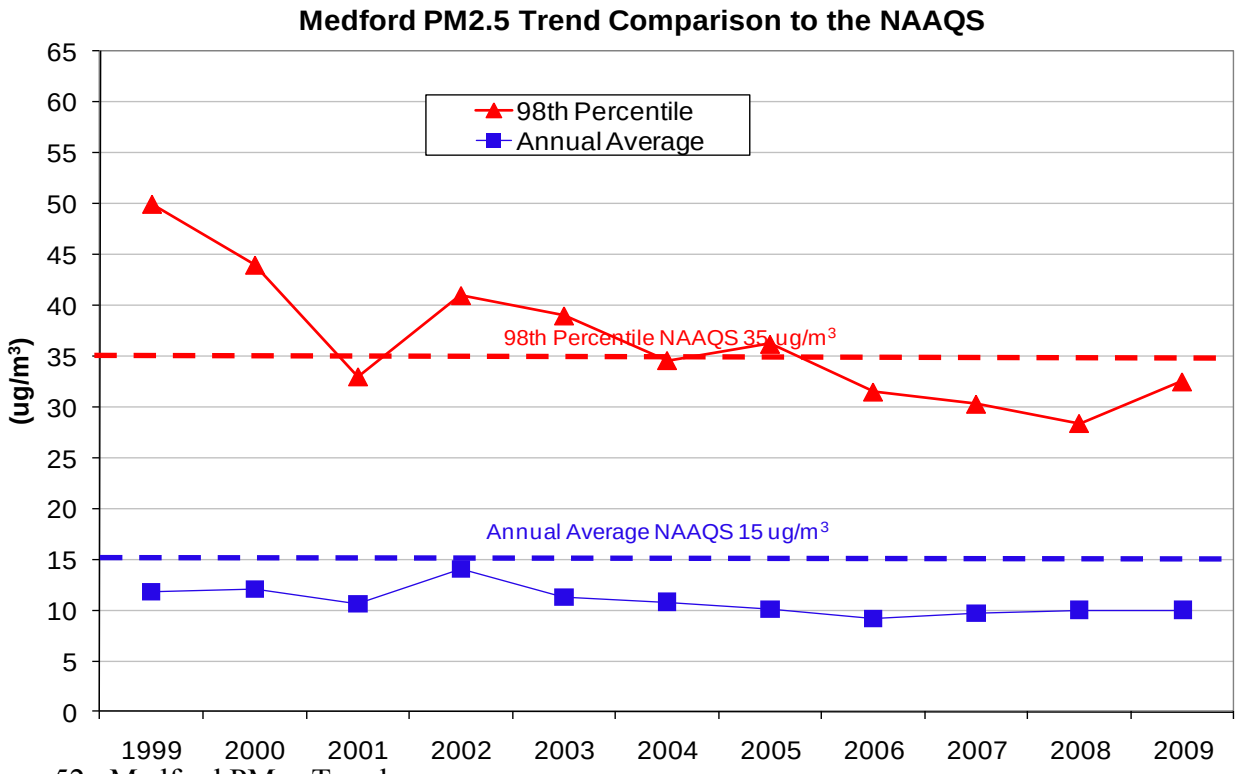


Figure 52. Medford $PM_{2.5}$ Trends.

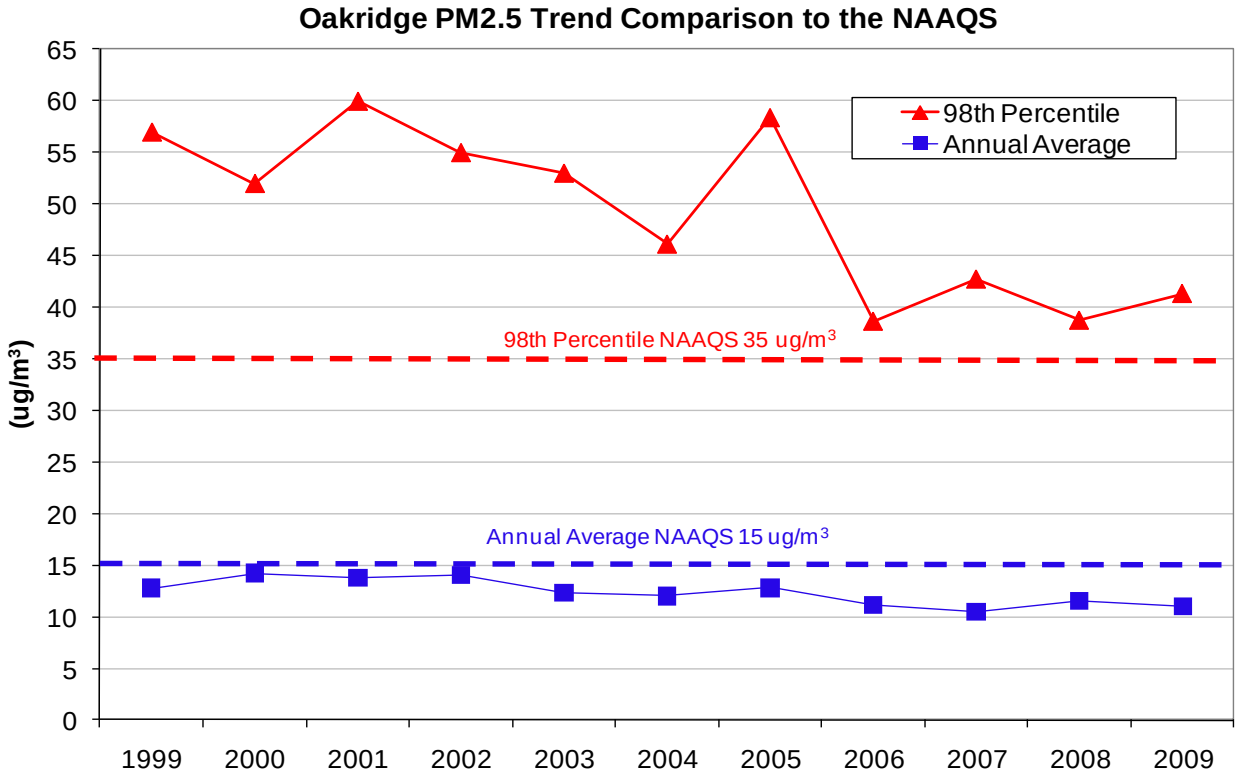


Figure 53. Oakridge Oregon $PM_{2.5}$ Trends.

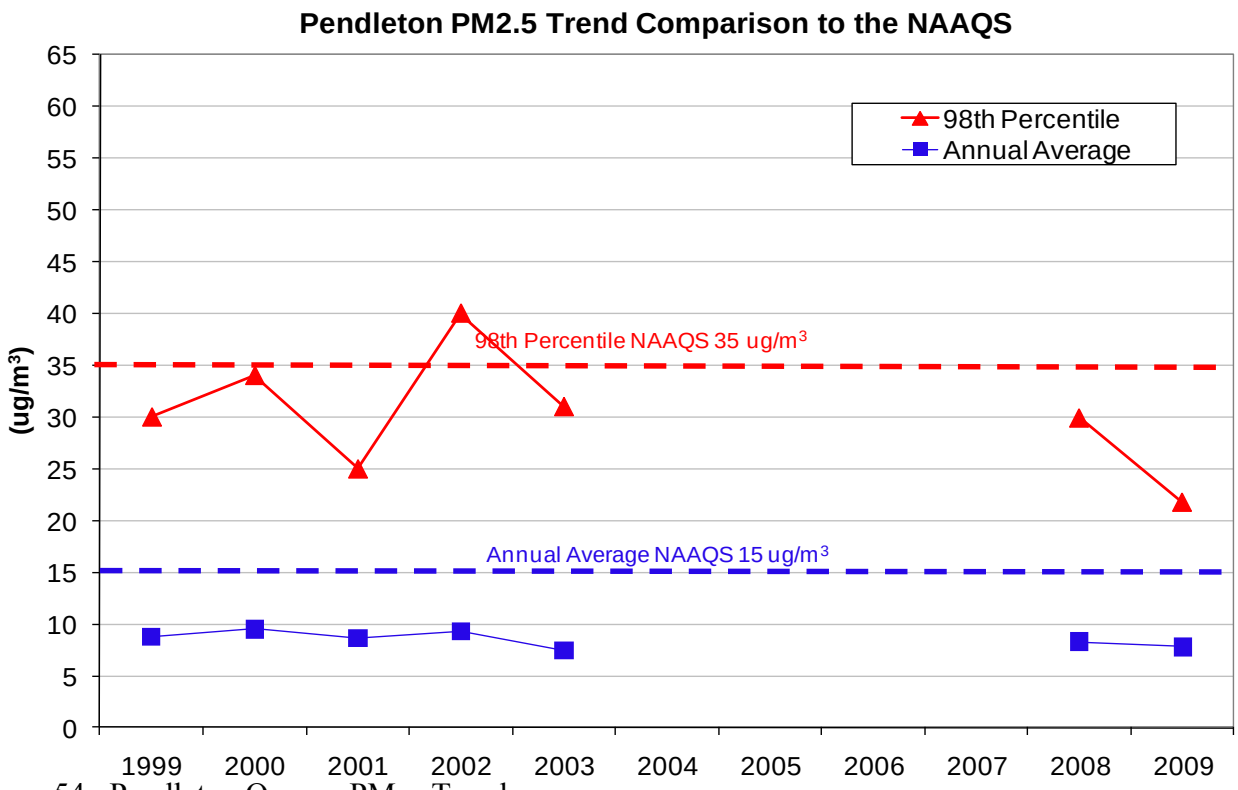


Figure 54. Pendleton Oregon $PM_{2.5}$ Trends.

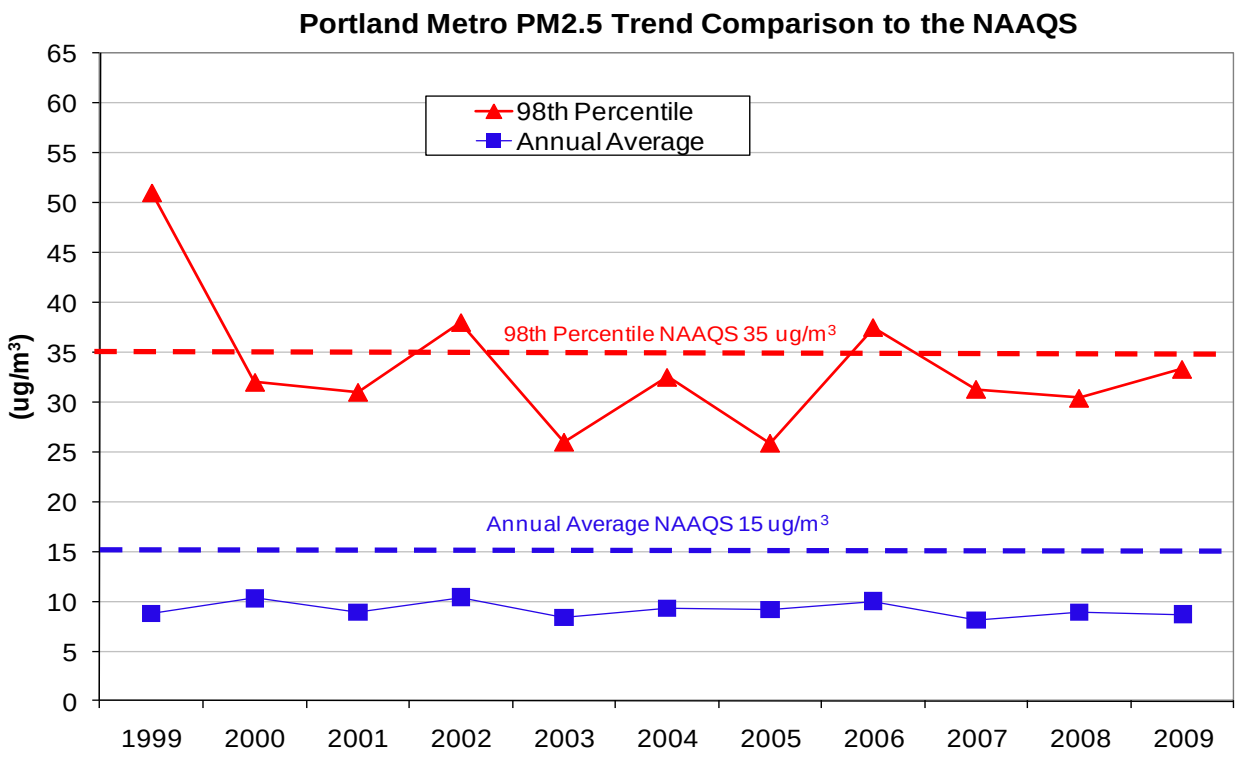


Figure 55. Portland Metro, Oregon $PM_{2.5}$ Trends.

Figure 56 summarizes the 2007 through 2009 (three year average) $PM_{2.5}$ levels for Oregon. Klamath Falls and Oakridge are designated non-attainment and Lakeview is in danger of being designated non-attainment. Eugene, Portland, Salem, Albany, Cottage Grove, Grants Pass, Medford, Pendleton, Burns, and John Day are above 25ug/m3 and are considered areas of concern.

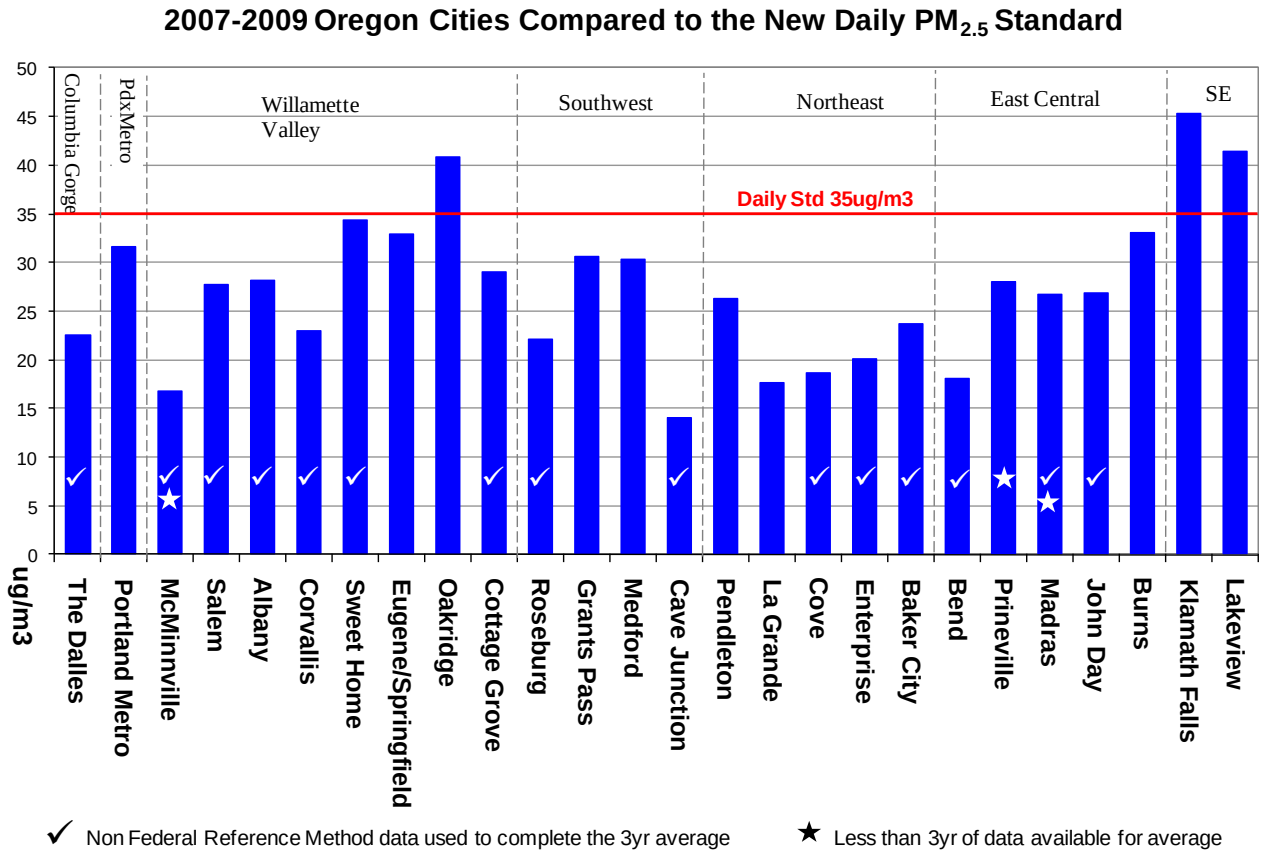


Figure 56. Oregon City 2007-2009 $PM_{2.5}$ Comparison.
Chart uses the three year average 98th percentile (the daily standard is 35ug/m^3).

Air Toxics Trends

Oregon DEQ began sampling for air toxics in Portland in 1999, La Grande in 2005, Medford in 2007, and Salem in 2008. The Lane Regional Air Pollution Authority (LRAPA) began sampling for air toxics in Eugene in 2000. Figures 57 through 59 illustrate some trends for North Portland for select air toxics. More air toxic information can be found in Appendix H. The values are compared to the Health Benchmark which is the level where an individual, if exposed for a lifetime, has an increased risk of one in a million chance of getting cancer.

The Quarters in the x axis are defined as:

Quarter	Months
1	Jan - Mar
2	Apr – Jun
3	Jul – Sep
4	Oct - Dec

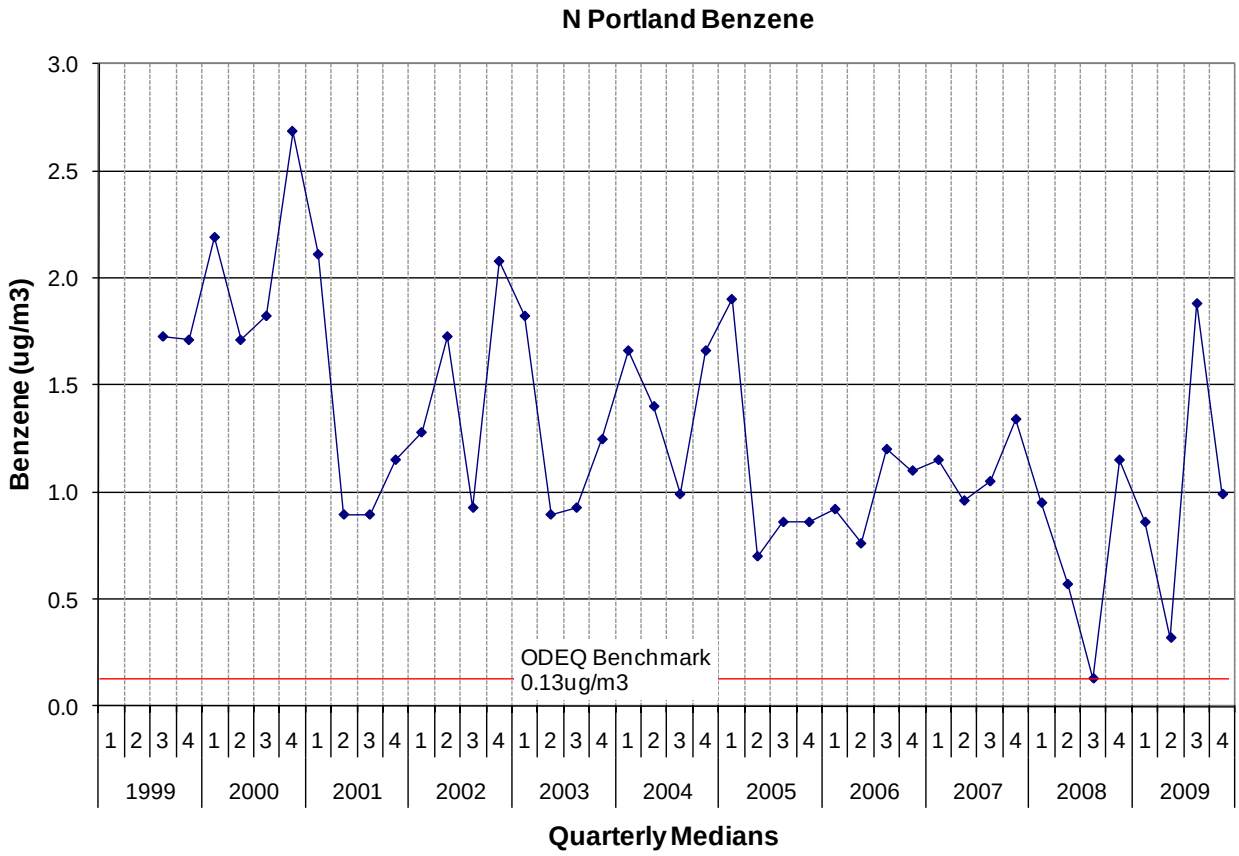


Figure 57. Benzene Trends for N. Portland.
Chart shows median quarterly concentrations.

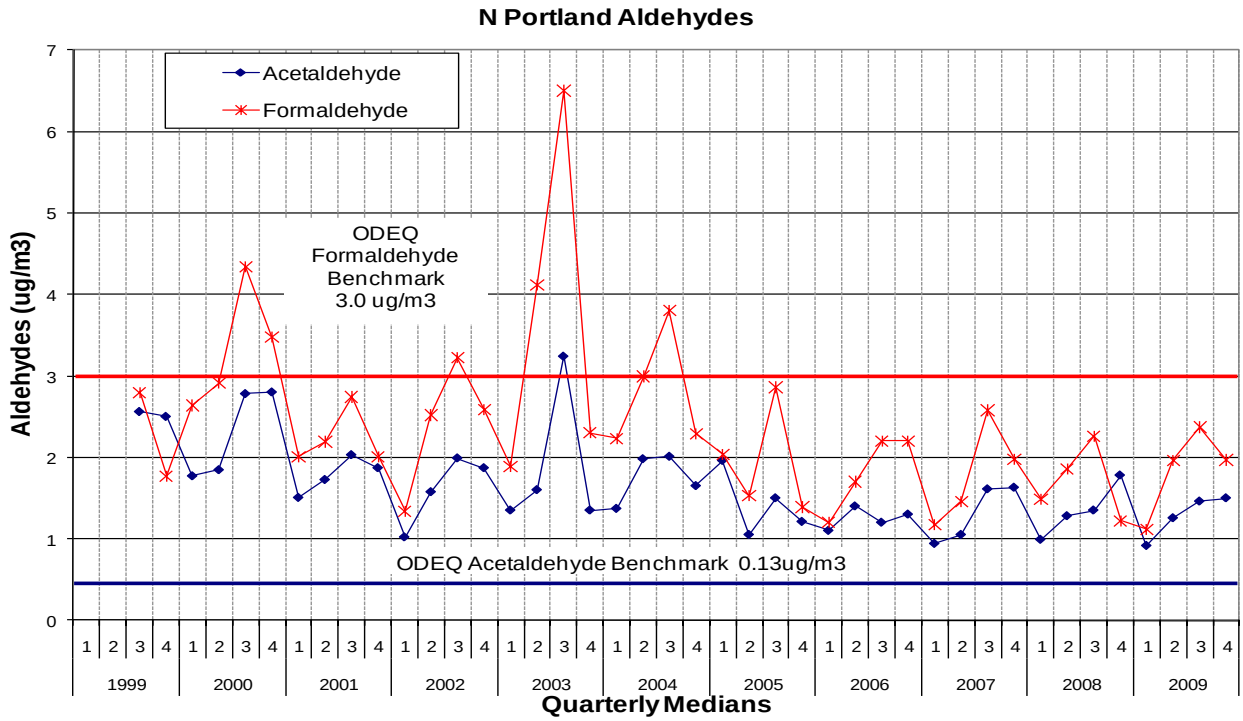


Figure 58. Aldehyde Trends for N. Portland.
Chart shows median quarterly concentrations.

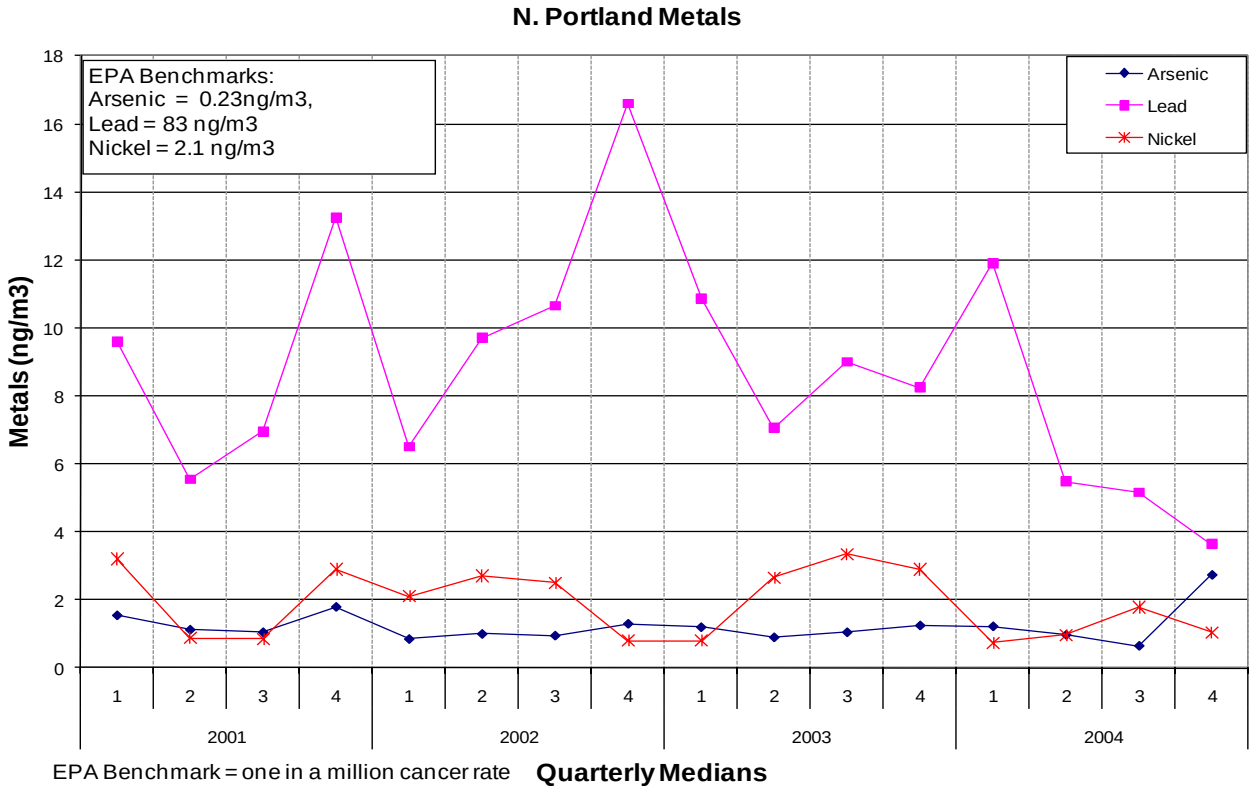


Figure 59. Air Toxic Metals Trends in N. Portland.
Chart shows median quarterly concentrations.

Maintenance and Non-attainment Areas

Oregon hasn't always met the National Ambient Air Quality Standards and initially had several communities designated by the EPA as non-attainment areas. Many of these non-attainment areas have been officially re-designated as maintenance areas while the remaining cities are in the various stages of doing so. Table 5 lists the Oregon maintenance areas. Table 6 shows the remaining non-attainment areas and their re-designation status. Table 7 shows areas that are in danger of be designated out of attainment. DEQ's web site has current information at http://www.deq.state.or.us/aq/planning/maintenance.

Table 5. Maintenance Areas.
(re-designated from non-attainment areas)

City	Pollutant	Re-designation Date
Eugene/Springfield	CO	1994
Grants Pass	CO	1999
Portland	CO	1996
Klamath Falls	CO	2001
Medford/Ashland	CO	2001
Salem-Keizer	CO	2007
Klamath Falls	PM_{10}	2002
Grants Pass	PM_{10}	2003
La Grande	PM_{10}	2006
Lakeview	PM_{10}	2006
Medford	PM_{10}	2006
Portland-Vancouver	1 hr O_3	1996
Medford-Ashland	1 hr O_3	1985

Table 6. Pending Maintenance Areas.
(Maintenance Plans in Progress).

City	Pollutant	Redesignation Status
Eugene/Springfield	PM_{10}	NAAQS met, plan in development
Oakridge	PM_{10}	NAAQS met, plan in development
Klamath Falls	$PM_{2.5}$	Non-attainment in 2009
Oakridge	$PM_{2.5}$	Non-attainment in 2009

Table 7. Future Non-attainment Areas.
Areas violating the $PM_{2.5}$standard but not designated yet.

.City	Pollutant	Redesignation Status
Lakeview	$PM_{2.5}$	Not designated

Greenhouse Gases:
Greenhouse gases cause global warming and according to the Oregon Department of Energy (DOE) *"The impacts of such changes on Oregon citizens, businesses and environmental values are likely to be extensive and destructive. Coastal and river flooding, snowpack declines, lower summer river flows, impacts to farm and forest productivity, energy cost increases, public health effects, and increased pressures on many fish and wildlife species are some of the effects anticipated by scientists at Oregon and Washington universities*."

DOE has produced a report discussing global climate change in Oregon titled **Oregon Strategy for Greenhouse Gas Reductions**. The report is available online at http://egov.oregon.gov/ENERGY/GBLWRM/Strategy.shtml

The Governor's Climate Change Integration Group released a more recent report in January 2008 called **A Framework for Addressing Rapid Climate Change**. The report is available at: www.oregon.gov/ENERGY/GBLWRM/docs/CCIGReport08Web.pdf

The following graphs and text are from Appendix 1 of the 2008 Climate Change Integration Group report.

In 2004, Oregon's greenhouse gas (GHG) emissions were 67.5 million metric tons of carbon dioxide equivalent ($MMTCO_2e$). That was about one percent of greenhouse gas emissions for the United States as a whole, which were roughly 7.1 billion metric tons CO_2e. Greenhouse gas emissions increased by 12 million metric tons from 1990 levels by 2004, which is a 22 percent increase over Oregon's 1990 greenhouse gas emissions of 55.5 million metric tons of CO_2e. This compares with a 16 percent increase for the United States. Figure 40 shows the change in emissions for different greenhouse gases between 1990 and 2004.

Note: *Carbon dioxide equivalent (CO_2e)" refers to a comparison of the radiative force of different greenhouse gases related to CO_2, based on their global warming potential. It is a way to compare all greenhouse gases on a uniform scale of how much CO_2 would be needed to have the same warming potential as other gases over the same time scale.*

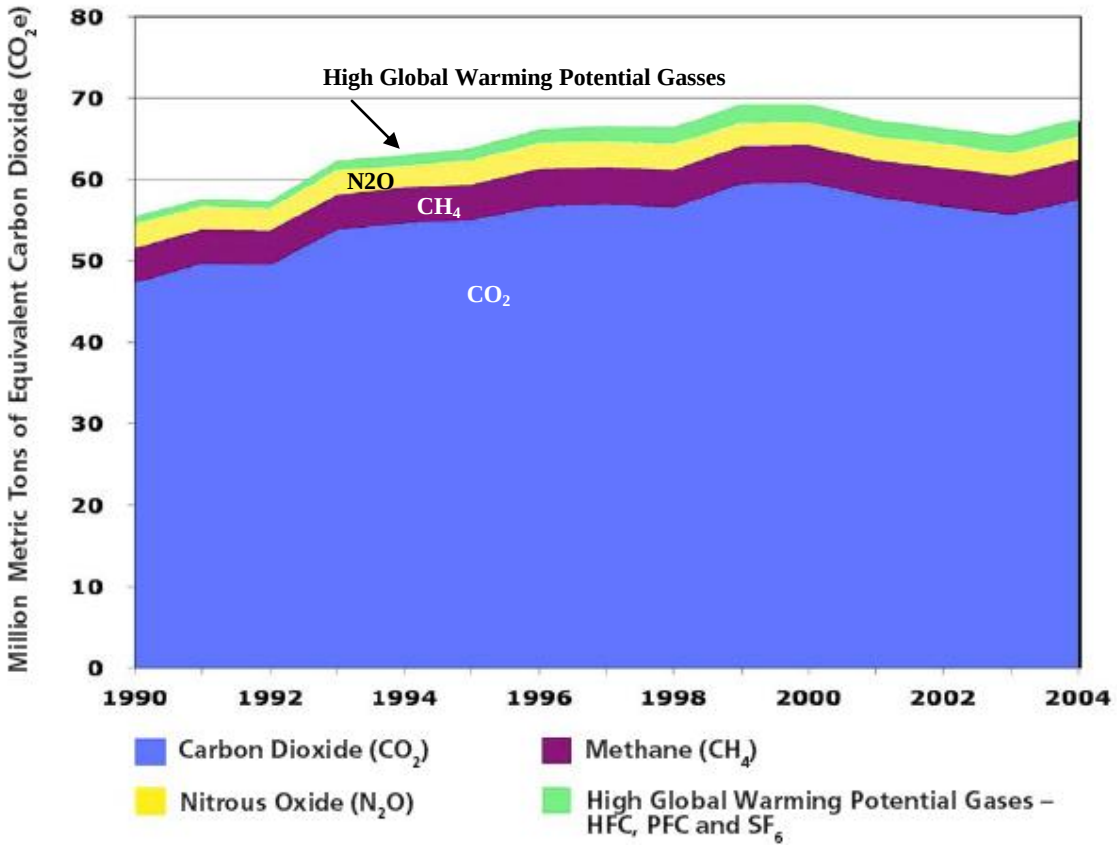


Figure 60. Oregon Green house gas emissions trends.
From the Governor's Climate Change Integration Group report: ***A Framework for Addressing Rapid Climate Change.***

As shown in Figure 61, the vast majority of Oregon's greenhouse gas emissions (86 percent) came from carbon dioxide (CO_2). The primary source of CO_2 pollution came from burning fossil fuels, such as coal at power plants serving the state, gasoline, diesel, and natural gas. There were also emissions from industrial processes, such as the manufacture of cement and from combustion of fossil-fuel derived products in burning municipal and industrial wastes.

In 2004, emissions from methane (CH_4), primarily from cattle and landfills, contributed seven percent of greenhouse gas emissions in Oregon. Nitrous oxide (N_2O) emissions, primarily from agricultural practices, contributed about four percent to greenhouse gas emissions. The "high global warming potential gases" which consist of two classes of gases – hydrofluorocarbons (HFC) and perfluorocarbons (PFC) – and one individual gas – sulfur hexafluoride (SF_6) – accounted for the remaining four percent of emissions.

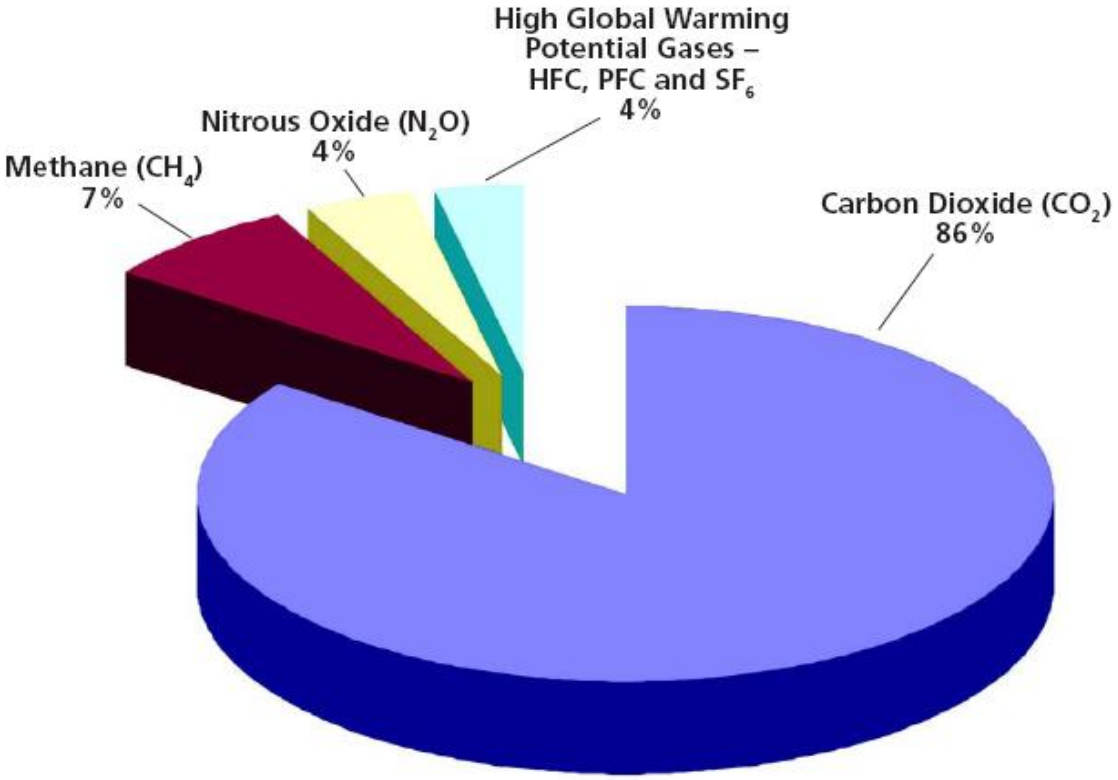


Figure 61. Types of Greenhouse Gasses by Percent in Oregon.
From the Governor's Climate Change Integration Group report: ***A Framework for Addressing Rapid Climate Change.***

Different sectors of Oregon's economy contribute differently to the emission of greenhouse gases. Those contributions have changed over time. Figures 62 and 63 illustrate how key sectors contribute in 1990 and in 2004 based on Oregon's economy. Of particular note is the continuing dominance of the transportation sector as the major source of Oregon's greenhouse gas emissions. The industrial sector is a distant second. Oregon's population growth is reflected in the increase in emissions from the residential sector, and the nation's continuing trend toward service economy jobs is likely one reason for the growth in the commercial sector. Note that the electricity consumption associated with each sector is included in both Figures 62 and 63, but is embedded as part of the sub-totals in each relevant sector.

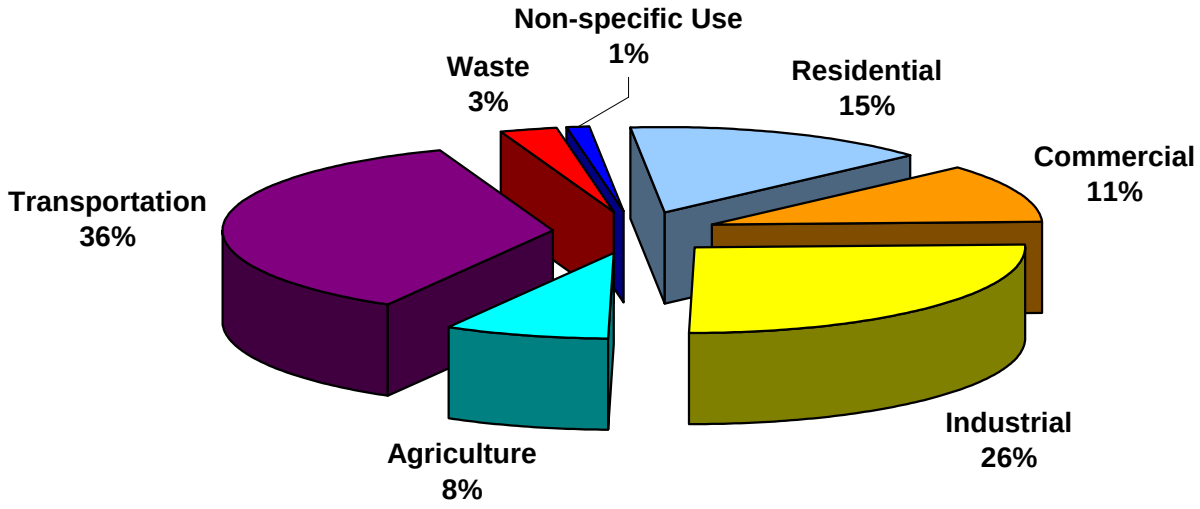


Figure 62. 1990 GHG Contribution by Sector.
Energy generation is embedded among the sectors. *From the Governor's Climate Change Integration Group report:* ***A Framework for Addressing Rapid Climate Change.***

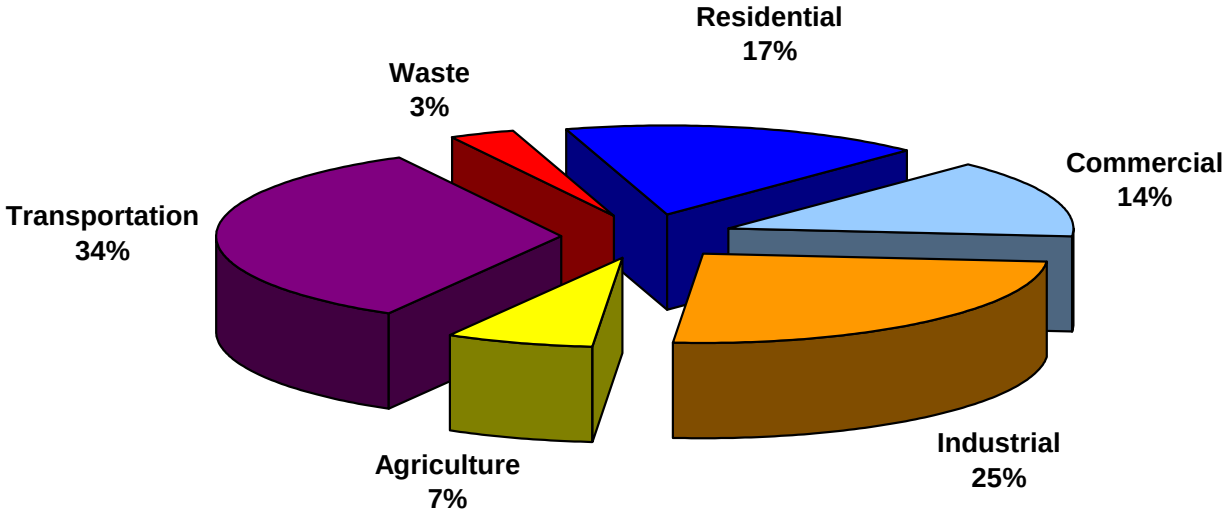


Figure 63. 2004 GHG Contribution by Sector.
Energy generation is embedded among the sectors. *From the Governor's Climate Change Integration Group report:* ***A Framework for Addressing Rapid Climate Change.***

Based on U.S. EPA forecasting tools and previously conducted sector-specific forecasts, the Oregon Department of Energy forecasts that Oregon's greenhouse gas emissions will grow by 30 million metric tons of CO_2e, or 55 percent, in the worst case estimate from 1990 to 2020. That rate assumes no change from current practices (a "business as usual" estimate). In reality, it will probably grow less, although domestic reductions may be offset by increased emissions as production shifts overseas. Table 8 shows the forecast by sources of gases, and contrasts it with historical data. Table 8 also provides a hybrid inventory/forecast estimate for 2005. Figures 64 and 65 illustrate the projected future growth of greenhouse gas emissions. The relative contribution of electricity consumption as compared with the direct combustion of fossil fuels (particularly in the transportation sector) is highlighted in Figure 64. The overall contributions of each type of greenhouse gas through 2020 are plotted in Figure 65.

Table 8. Historical and Forecast Greenhouse Gas Emissions.
Through 2020 (Consumption Basis)

Gross $MMTCO_2e$	Inventory Data				Forecast Data			
	1990	1995	2000	2004	2005	2010	2015	2020
Carbon Dioxide (CO_2)								
CO_2 from Fossil Fuel Combustion[1]	29.25	32.16	34.48	34.47	33.84 **	35.90	37.96	42.10
CO_2 from Electricity Consumption	16.70	21.27	23.41	21.54	23.85 *	27.01	28.92	31.49
Industrial Processes	1.11	1.19	1.46	1.06	0.98 *	1.21	1.21	1.20
Waste Combustion	0.27	0.31	0.27	0.32	0.36 *	0.31	0.32	0.34
CO_2 Total	47.33	54.93	59.61	57.39	59.03	64.43	68.41	75.13
Methane (CH_4)								
Stationary Combustion	0.10	0.10	0.10	0.14	0.10 **	0.09	0.09	0.09
Mobile Combustion	0.06	0.05	0.04	0.03	0.02 *	0.02	0.02	0.02
Natural Gas and Oil Systems	0.58	0.61	0.64	0.67	0.68 *	0.71	0.74	0.78
Enteric Fermentation	2.00	2.21	2.13	2.20	2.15 *	1.74	1.74	1.73
Manure Management	0.26	0.28	0.31	0.41	0.41 *	0.40	0.40	0.39
Burning of Agricultural Crop Waste	0.00	0.00	0.00	0.00	0.00 *	0.01	0.01	0.01
Waste	1.04	0.93	1.12	1.29	1.26 *	1.65	1.92	2.08
Wastewater	0.20	0.22	0.24	0.25	0.25 *	0.28	0.29	0.31
CH_4 Total	4.23	4.41	4.58	5.01	4.88	4.90	5.22	5.42
Nitrous Oxide (N_2O)								
Stationary Combustion	0.11	0.10	0.10	0.09	0.09 **	0.08	0.07	0.08
Mobile Combustion	0.52	0.62	0.60	0.44	0.44 **	0.32	0.31	0.27
Industrial Processes	0.00	0.00	0.00	0.00	0.00 *	0.00	0.00	0.00
Manure Management	0.11	0.09	0.12	0.16	0.13 *	0.18	0.20	0.23
Agricultural Soil Management	2.06	2.08	1.96	1.99	2.37 *	2.07	2.07	2.08
Burning of Agricultural Crop Waste	0.00	0.00	0.00	0.00	0.00 *	0.01	0.01	0.01
Waste Combustion	0.02	0.02	0.03	0.03	0.03 *	0.03	0.03	0.03
Wastewater	0.00	0.00	0.00	0.00	0.00 *	0.00	0.00	0.00
N_2O Total	2.82	2.92	2.82	2.70	3.07	2.68	2.69	2.70
HFC, PFC, and SF_6								
Industrial Processes	1.04	1.47	2.19	2.26	2.44 *	1.62	2.00	2.41
Total Emissions	**55.42**	**63.72**	**69.19**	**67.36**	**69.42**	**73.63**	**78.32**	**85.66**

* = Inventory data for 2005 ** = Forecast data for 2005 from EPA projection tool (data for 2005 inventory due in 2008)

NOTE: Totals for 1990 through 2004 differ slightly from the detailed inventory (in Table 6) due to rounding differences.

[1] The fossil fuel combustion totals do not count in-state generation of electricity (this is a consumption-based inventory).

From the Governor's Climate Change Integration Group report: ***A Framework for Addressing Rapid Climate Change.***

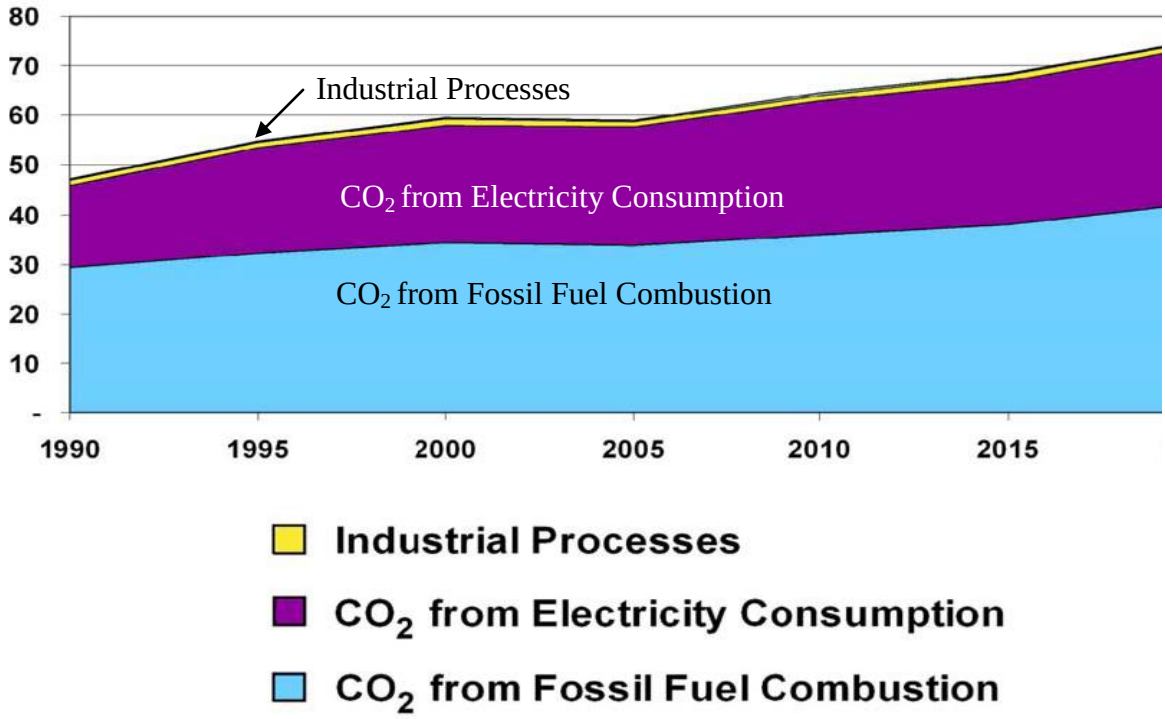


Figure 64. Historical & Projected CO2 Emissions.
(Million Metric Tons of CO_2). *From the Governor's Climate Change Integration Group report:* ***A Framework for Addressing Rapid Climate Change.***

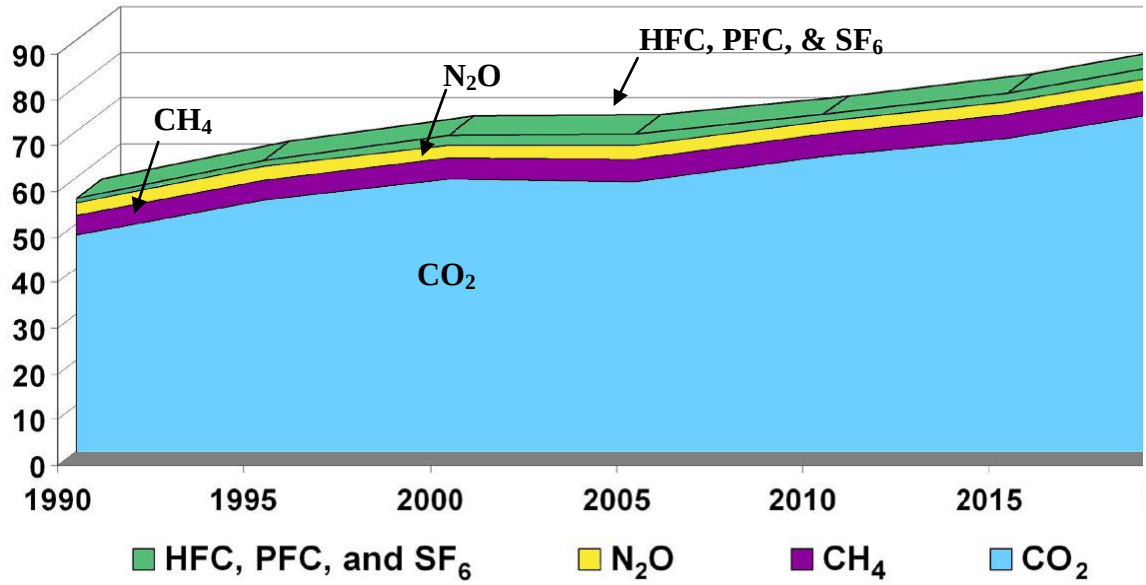


Figure 65. Projected Greenhouse Gas Emissions by type.
(MMTC02e). *From the Governor's Climate Change Integration Group report:* ***A Framework for Addressing Rapid Climate Change.***

Pollutants: Properties, Health and Welfare Effects, and Causes.

EPA has identified pollutants that are hazardous in ambient concentrations and people who are most sensitive to them. In general the pollutants can cause the following health effects:

General Health Effects

People most susceptible to severe health problems from air pollution are:

- Individuals with heart or lung disease
- Individuals with respiratory problems such as asthma or emphysema
- Pregnant women
- Outdoor workers
- Children under age 14 (their lungs are still developing)
- Athletes who exercise vigorously

High air pollution levels can cause immediate health problems:

- Aggravated cardiovascular and respiratory illness
- Added stress to heart and lungs, which must work harder to supply oxygen
- Damaged cells in respiratory system

Long-term exposure to polluted air can have permanent health effects:

- Accelerated aging of the lungs and loss of lung capacity
- Decreased lung function
- Development of diseases such as asthma, bronchitis, emphysema, and possibly cancer
- Shortened life span

The pollutants EPA has identified as hazardous are:

Fine Particulate (PM_{10} and $PM_{2.5}$)

Fine particulate air pollution consists of solid particles or liquid droplets that are less than 10 micrometers in diameter (PM_{10}) or less than 2.5 micrometers in diameter ($PM_{2.5}$) (see diagram on next page).

Particles in these size ranges are of great concern because they can be inhaled deeply into the lungs where they can remain for years. The health effects of particulate matter vary with the size, concentration, and chemical composition of the particles. In general, particulate matter causes three kinds of health problems:

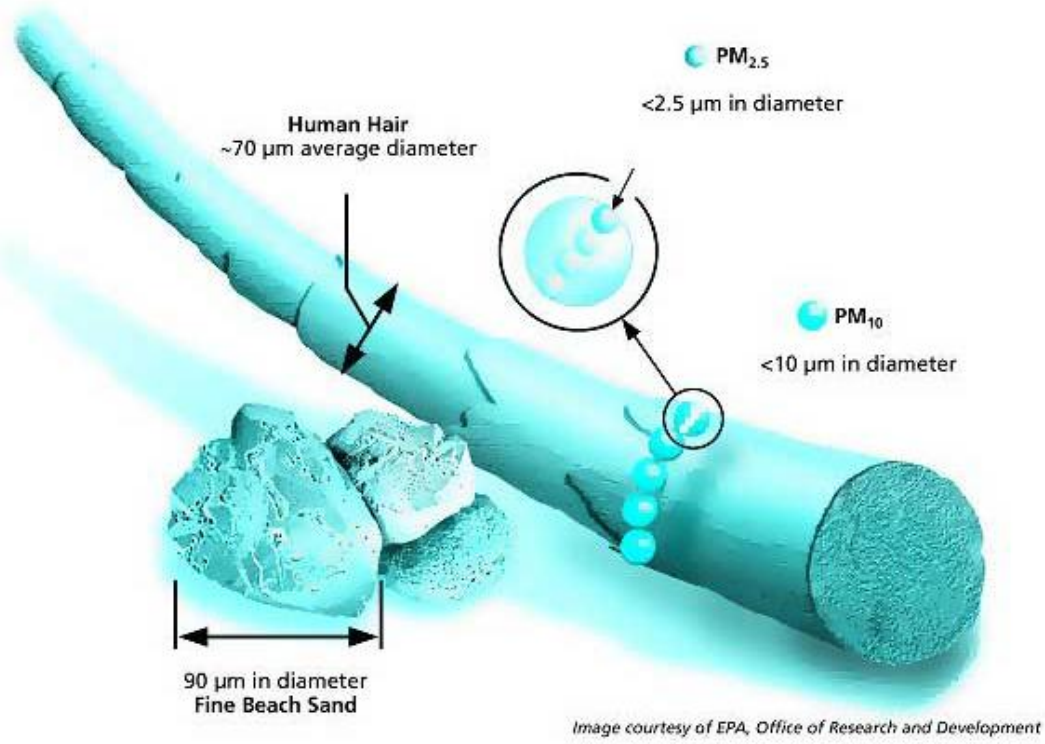
- The particles may be inherently toxic because of their chemistry
- The particles may mechanically damage the respiratory system
- The particles may be carriers for adsorbed toxic substances

Relationships have been shown between exposure to high concentrations of particulate matter and increased hospital admissions for respiratory infections, heart disease, bronchitis, asthma, emphysema, and similar diseases. In addition, there may be several potential carcinogens present on particulate matter. Of particular concern are the condensed organic compounds released from low temperature combustion processes (wood stove smoke, for example).

Among the most obvious effects of fine particles are reductions in visibility due to absorption and scattering of light by suspended particles. Almost all smoke particles from residential wood stoves

and fireplaces, industrial boilers, field burning, diesel combustion, and other combustion processes can be characterized as fine particulate and most of it is thought to be $PM_{2.5}$. In contrast, only a small fraction of the particles from road dust, agricultural tilling, and wind blown dust are fine particulate.

PM2.5 and PM10 size compared to human hair.



Total Suspended Particulate (TSP)

Pollution made up of particulate less than about 100 micro-meters in diameter is called TSP (100 micrometers is about the diameter of a human hair.) Larger particles tend to settle out of the air quickly and are often more of a nuisance than a health affecting pollution problem. In addition to health problems caused by the fine particulate component of TSP (see PM_{10} & $PM_{2.5}$), it may cause soiling and corrosion of building materials and textiles, damage to vegetation, and toxicity to animals that feed on vegetation covered by toxic particulate matter.

Natural sources of TSP include pollen, wind-blown dust, and smoke from wild fires. Humans create TSP from combustion sources--like motor vehicles, utility and industrial boilers and dryers, wood stoves, open burning, slash burning, and field burning. Other anthropogenic sources include dust from roads, agriculture, construction, and mining.

Sulfur dioxide (SO_2)

Sulfur dioxide is a colorless, pungent gas. In the body it acts as a lung and eye irritant. When SO_2 is inhaled, it causes bronchial constriction which results in breathing difficulty and increased pulse and respiratory rate. People with respiratory diseases like asthma, bronchitis, or emphysema are particularly susceptible to the effects of SO_2.

When particles capable of oxidizing sulfur dioxide to sulfuric acid are present, the irritant response increases in magnitude by two to three times. When sulfuric acid is inhaled, mucous production increases. This reduces the respiratory system's ability to remove particulate matter, and can lead to more severe respiratory infections, such as pneumonia. Chronic exposure to SO_2 can lead to coughing, shortness of breath, fatigue, and bronchitis.

SO_2 can also damage plants and building materials. The leaves of some vegetables (spinach and lettuce, for example) are damaged by exposure to high levels of SO_2. Sulfur oxides accelerate corrosion of metals and other building materials (limestone, marble, mortar) by forming sulfuric acid on the surface of the material or in the atmosphere. In addition, sulfuric acid and sulfate particles formed in the atmosphere from SO_2 can cause scattering of visible light, thus contributing to haze. These same processes can contribute to acid rain and lead to acidification of lakes and soils.

The major source of SO_2 nationwide is combustion of high sulfur coal. In Oregon, where burning of high sulfur coal is not allowed, diesel, heating oil, and low sulfur coal are the major sources.

Carbon monoxide (CO)

Carbon monoxide is a colorless, odorless gas. In the body, CO binds tightly to hemoglobin (the red pigment in blood which transports oxygen from the lungs to the rest of the body). Once hemoglobin is bound to CO, it can no longer carry oxygen. In this way, CO reduces the oxygen-carrying capacity of the blood and can result in adverse health effects. High concentrations of CO strongly impair the functions of oxygen-dependent tissues, including brain, heart, and muscle. Prolonged exposure to low levels of CO aggravates existing conditions in people with heart disease or circulatory disorders. There is a correlation between CO exposure and increased hospitalization and death among such patients. Even in otherwise healthy adults, carbon monoxide has been linked to increased heart disease, decreased athletic performance, and diminished mental capacity. Carbon monoxide also affects newborn and unborn children. High CO levels have been associated with low birth weights and increased infant mortality.

A major natural source of CO is spontaneous oxidation of naturally occurring methane (swamp gas). The major human-caused source is incomplete combustion of carbon-based fuels, primarily from gasoline-powered motor vehicles. Other important sources are wood stoves and slash burns.

Ozone (O_3)

Ozone (a component of smog) is a pungent, toxic, highly reactive form of oxygen. The eight hour standard protects the public against lower level exposures over a longer time period which has been found to be more detrimental than shorter peak levels. The long term exposure effects cause significant breathing problems, such as loss of lung capacity and increased severity of both childhood and adult asthma.

Ozone causes irritation of the nose, throat, and lungs. Exposure to ozone can cause increased airway resistance and decreased efficiency of the respiratory system. In individuals involved in strenuous physical activity and in people with pre-existing respiratory disease, ozone can cause sore throats, chest pains, coughing, and headaches. Plants can also be affected. Reductions in growth and crop yield have been attributed to ozone. Ozone can affect a variety of materials, resulting in fading of paint and fiber, and accelerated aging and cracking of synthetic rubbers and similar materials. It is also a major contributor to photochemical smog.

Ozone is not emitted directly into the air. It is formed through a series of photochemical (sunlight requiring) reactions between other pollutants and oxygen (O_2) during hot weather. Most important are nitrogen oxides and volatile organic compounds. To control ozone pollution, it is necessary to control emissions of these other pollutants. It is primarily caused by chemicals from car and small engine exhaust, and business and industry emissions on hot sunny days.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide is a reddish-brown gas that is toxic in high concentrations. It is a lung irritant and may be related to chronic pulmonary fibrosis. It is also important in the photochemical reactions leading to the formation of ozone. It can cause indirect damage to materials when it combines with moisture in the air to form nitric acid. The nitric acid can then cause corrosion of metal surfaces and can also contribute to acid rain. In addition, NO_2 absorbs visible light and causes reduced visibility. It has also been linked to suppressed growth rates in some plants.

The major human-caused source of NO_2 is fuel combustion in motor vehicles, utility and industrial boilers. Nitric oxide (NO) is the major nitrogen oxide produced during the combustion process, but once in the atmosphere, NO is rapidly oxidized to form NO_2.

Volatile Organic Compounds (VOC)

Volatile Organic Compounds are a large family of compounds made up primarily of hydrogen and carbon. These compounds are instrumental in the complex series of reactions leading to the formation of ozone and photochemical smog. Many of these compounds are also air toxics.

The compounds come mainly from motor vehicles, fuel evaporation, the coatings industry, and combustion processes. The EPA and DEQ do not have a standard for VOCs, however, they are still controlled because of their contribution to ozone formation and because many are air toxics.

Air Toxics

Air toxics are generally defined as air pollutants known or suspected to cause serious health problems, like birth defects and cancer. The U.S. EPA regulates 188 air toxics.

Out of these 188 air toxics, EPA selected 33 as the toxics of concern in the air, nationwide. Oregon DEQ identified Acetaldehyde, Acrolein, Arsenic, Benzene, 1,3-Butadiene, Chromium compounds, diesel particulate matter, Formaldehyde, Perchloroethylene (PERC), polycyclic organic matter (POM) compounds, and Nickel. All of these substances, except Acrolein, are known or suspected to cause cancer. Other air toxics in Oregon are believed to be below levels of concern. The DEQ Portland Air Toxics Assessment limited the air toxics of concern excluding Beryllium, Carbon Tetrachloride, Chloroform, Ethylene dibromide, Ethylene dichloride from the EPA's list.

<u>Acetaldehyde</u>

Acetaldehyde forms as a product of incomplete wood combustion, coffee roasting, burning tobacco, and vehicle exhaust fumes. Residential fireplaces and woodstoves are the two largest sources of acetaldehyde.

Health effects from breathing small amounts of acetaldehyde over long periods are uncertain. EPA has classified acetaldehyde as a probable human carcinogen.

Arsenic and its Compounds

Arsenic is a natural element in the earth's crust that occurs in two different forms, organic and inorganic. Organic arsenic contains carbon and hydrogen and occurs in plants and animals. Inorganic arsenic typically contains elements such as oxygen, chlorine, and sulfur. Inorganic arsenic is the more harmful of the two.

Inorganic arsenic is ubiquitous in the environment. Volcanoes release it into the air, as does the weathering of arsenic-containing minerals and ores. Commercial and industrial processes like metal smelting and power generation from fossil fuels also release arsenic, as does burning wood treated with arsenic. Inorganic arsenic can settle from the air to the ground. Food is the largest source of inorganic arsenic exposure for most people, primarily due to pesticide use on crops.

Inorganic arsenic is a human poison. High levels (60 parts per million or more) in food or water can be fatal. Arsenic damages many tissues including nerves, stomach and intestines, and skin. Lower levels of exposure to inorganic arsenic may cause nausea, vomiting, and diarrhea, decreased production of red and white blood cells, abnormal heart rhythm, blood vessel and nerve damage. Breathing inorganic arsenic increases the risk of lung cancer. EPA has classified inorganic arsenic as a known human carcinogen.

Benzene

Benzene is widely used in the United States and ranks in the top 20 chemicals for production volume. Benzene is used in the processes that make plastics, resins, and nylon and synthetic fibers. It is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources include volcanoes and forest fires. Other sources are coal, oil, and wood combustion, car/truck exhaust, and evaporation from gas stations and industrial solvents. Tobacco smoke contains benzene and accounts for approximately 50% of our exposure.

Long-term inhalation of benzene causes many disorders including anemia, excessive bleeding, damage to the immune system and genetic damage. On the job exposure to benzene has been shown to produce an increased incidence of leukemia (cancer of the tissues that form white blood cells). EPA has classified benzene as a known human carcinogen.

1,3-Butadiene

1,3-Butadiene is a combustion product found in motor vehicle exhaust, gas, oil, and wood furnaces, and industrial processes. 1,3-Butadiene is also manufactured and used in making plastics.

Studies have shown that long-term inhalation of 1,3-butadiene can result in an increased incidence of cardiovascular diseases, including rheumatic and atherosclerotic heart diseases (hardening of the arteries) and can cause blood disorders. EPA has classified 1,3-butadiene as a probable human carcinogen.

Chromium and its Compounds

Chromium is a geological metal found in rocks, soil, volcanic dust and gases, plants, and animals.

Chromium metal is used mainly for making steel and other alloys. Chromium compounds are also used to manufacture dyes and pigments, and in leather and wood preservation. Manufacturing,

chrome plating, or burning fossil fuels can release chromium to the air. Chromium particles can settle from the air and persist in soil.

Chromium occurs in several forms, one of which is chromium VI. Long-term inhalation of chromium VI causes respiratory tract damage. Studies suggest that exposure to chromium VI may result in complications during pregnancy and childbirth. Inhalation of chromium VI can also increase the risk of lung cancer. EPA has classified chromium VI as a known human carcinogen. The most common form of chromium, chromium III, is not known to cause cancer and is less toxic.

Formaldehyde

Formaldehyde is a common combustion product, produced by human activities but also occurs naturally. The highest levels can occur indoors and tobacco smoke is an important source. Major outdoor sources are power plants, manufacturing facilities, incinerators and car exhaust.

Chronic exposure to inhaled formaldehyde is associated with respiratory symptoms and eye, nose, and throat irritation. Increased incidences of menstrual disorders and pregnancy problems have been observed in women workers using urea-formaldehyde resins. Studies of workers have shown significant associations between exposure to formaldehyde and increased incidence of lung and nasal cancer. EPA considers formaldehyde to be a probable human carcinogen.

Nickel and its Compounds

Nickel is a very abundant element. In the environment it is usually combined with oxygen (nickel oxides) or sulfur (nickel sulfides). Nickel is a hard silvery white metal that is combined with other metals to form mixtures called alloys.

Nickel is used to make metal coins and jewelry and in industry for making many metal items. It is also used for electroplating baths, batteries, spark plugs and machinery parts. Since so many consumer products contain nickel it is released when municipal garbage is incinerated.

Respiratory effects, including chronic bronchitis and reduced lung function, have been observed in workers who breathe large amounts of nickel. Nickel may also cause reactions in sensitive skin upon contact. Some people react if they consume nickel in food or water, or react if they breathe it. EPA has classified several forms of nickel as known or probable human carcinogens.

Perchloroethylene

Perchloroethylene, also called Perc or tetrachloroethene is most well known as a dry-cleaning fluid. It is also used in textile processing, chemical manufacturing, as a degreasing agent in metalworking, and as a solvent.

Exposure to high levels of perchloroethylene can cause acute human health effects. These effects include central nervous system damage, kidney dysfunction, and severe respiratory irritation. Long term, low level exposures can cause neurological impairment, and severe liver and kidney damage. EPA has classified perchloroethylene as a possible human carcinogen.

Polycyclic Organic Matter (POM)

The term Polycyclic Organic Matter defines a class of compounds that includes the polynuclear aromatic hydrocarbons (PAHs). These compounds exist either as gases or particulates in the air.

Combustion is the primary source of most POMs. Air emissions sources include vehicle exhaust, forest fires, residential wood and backyard burning, agricultural burning, and asphalting roads.

Information about short and long-term human health impacts is limited. Long-term exposure to one form of POM, benzo(a)pyrene, has resulted in dermatitis, eye irritation, and reduced fertility. Cancer is the major concern from long-term exposure based on animal research. EPA has classified most POM compounds as probable human carcinogens.

Lead (Pb)

Lead is a toxic heavy metal, abundant in the earth's crust. Air borne lead particles are of sufficiently small size (less than 0.7 microns) that they can penetrate deep within the lungs and ultimately be absorbed in the blood. High concentrations of lead in the blood can cause severe and permanent brain damage, especially in children. Lower levels have vague, non-specific symptoms, including headaches, malaise, stomach pains, irritability, and pallor. Damage can be caused to heart, kidney, liver, and nerve and blood tissues.

Noise Pollution

Noise control standards have been adopted in Oregon to protect the public from the known adverse health effects of noise, as well as protecting public welfare. Budget cuts eliminated the DEQ noise program and enforcement of the standards is now the responsibility of local enforcement officials.

Noise has often been treated as merely a nuisance, however, studies have shown that noise has a definite effect on public health and welfare. Exposure to loud noises can result in hearing loss or tinnitus. Exposure of pregnant women to high noise levels has been linked to low birth weights and hearing loss in infants. Noise has also been linked to high blood pressure and, in the elderly, to heart attack and stroke. Noise contributes to irritability and stress.

Visibility

Visibility impairment may be caused by meteorological effects (clouds, rain), man-made pollution (open burning, industry), and natural pollution (wildfire, dust storms). The Department monitors visibility conditions in selected Oregon Class I (or pristine) areas during the summer months. Information from the monitoring is used to determine the extent of man-made visibility impairment, and to evaluate the effectiveness of the Department's Visibility Program.

Air Quality Maintenance and Improvement Programs
DEQ works with local communities to identify and prevent or solve air quality problems by:

- planning and implementing air pollution reduction strategies
- issuing and enforcing air pollution control permits for industry
- enforcing environmental regulations
- informing, educating, and involving the public
- measuring air pollutant concentrations

DEQ's Air Quality programs include:

Oregon Low Emission Vehicle	Asbestos	Emission Inventory & Modeling
Vehicle Testing	Wood Burning	Ambient Monitoring
Fuels	Outdoor Burning	Air Quality Index
Industrial Air Permitting	Air Toxics	Wildfire Air Quality Rating
Business Assistance	Visibility	

Oregon Low Emission Vehicle (ORLEV)
Oregon adopted emission standards developed by California, which requires that new light and medium-duty passenger vehicles, pick-ups, and SUVs sold in Oregon must meet the low emission vehicle standards.

The Oregon Low Emission Vehicle program requires greenhouse gas reductions, which are not required under federal standards. The program also reduces emissions of smog-forming compounds, CO and toxic air pollutants to levels lower than required by federal regulations.

Vehicle Inspection (VIP)
Vehicle Inspection is one of DEQ's most successful programs in preventing automobile air pollution. The inspection procedure is designed to ensure that emission control systems of cars and trucks are functioning. The Portland Metro area and the Rogue Valley have VIP programs.

Fuels Program
This program's goal is to reduce ground level ozone (smog) and CO that result from the use of gasoline and other fuel blends. The program reduces wintertime CO in the Portland area by adding compounds containing oxygen to the fuel (typically Ethanol).

Vapor recovery programs in the Portland area have reduced the emission of ozone-forming gasoline vapors. Gasoline vapors can be released to the atmosphere when fueling cars and when transferring fuel from tank trucks. Accordion-shaped hoses used at service stations prevent 90% of gasoline vapors from escaping during refueling. Tanker trucks and service station tanks have been modified with equipment to eliminate the loss of vapor during transfer. On-board vapor control systems on newer cars prevent vapor loss during operation and storage.

Air Permits for Industry
Approximately 1,400 industrial and commercial Oregon businesses have air permits which regulate the amount of annual air pollution they can emit. Staff members from regional DEQ offices regularly inspect these air pollution sources for compliance with their permit conditions.

When businesses are out of compliance, DEQ issues notices of violation and when necessary recommends civil penalties.

An important element of DEQ's permitting program is the Title V (five) Air Operating Permit for major industrial sources of air pollution. A major industrial source of air emissions has the potential to emit 100 tons per year of PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, lead, or volatile organic compounds. For emitters of hazardous air pollutants (HAPs), a major source has the potential to emit 10 tons per year of any individual HAP or 25 tons per year of any combination of HAPs. DEQ currently requires less than 100 businesses to have Title V permits for HAPs. Other permitted businesses in the state operate with the Air Contaminant Discharge Permits.

Business Assistance Program (BAP)
The Business Assistant Program provides technical assistance on air quality regulation and related environmental issues to small businesses such as dry cleaners, auto-body shops, metal finishers, and printers. The program works with individual business owners and trade groups to inform them about solutions to air quality problems, including ways to reduce the use of toxic chemicals. Program services are free and confidential. This cooperative effort is designed to promote a healthy environment for all Oregonians without causing unnecessary hardship for small business.

Asbestos Program
DEQ certifies and licenses asbestos abatement contractors, inspects asbestos abatement projects and enforces laws regarding the proper removal and disposal of asbestos-containing materials. DEQ informs homeowners about the dangers of exposure to asbestos and the best ways to deal with asbestos-containing materials in the home. Visit DEQ's web site for more information.

Wood Burning Program
DEQ's Wood Burning Program works with Oregon communities to solve and prevent air pollution problems caused by residential wood burning. DEQ provides information about burning wood cleanly and helps local counties prepare and implement strategies to reduce wood smoke.

Outdoor Burning
The open-burning program works with local fire districts to educate people about and enforce burning regulations that apply to land clearing, as well as household, agricultural, commercial and construction, industrial and demolition activities.

Air Toxics (Hazardous Air Pollutant) Program
Air Toxics can harm the environment and your health. Most of these substances are classified as volatile organic compounds, aldehydes and ketones, polycyclic organic compounds, and metals. Title III of the 1990 Clean Air Act Amendments requires the U.S. EPA to regulate emissions of 188 Hazardous Air Pollutants.

DEQ controls hazardous air pollutants in several ways:

- regulating toxic air pollutant emissions from businesses by the permits described above
- adopting as state rules the federal standards for hazardous air pollutant sources
- implementing programs to reduce Volatile Organic Compound emissions
- monitoring for air toxics as resources allow
- modeling air toxics to estimate population exposure.

EPA regulations also require certain industrial facilities and businesses to have a plan to prevent accidental toxic air pollutant releases, and to minimize their impacts on the surrounding community in a worst case accident scenario.

Visibility
DEQ monitors visibility in federally designated wilderness areas and Crater Lake National Park to determine if visibility is impaired. DEQ develops strategies to improve protection for these areas including managing field and forestry burning practices. Most slash burning now takes place in spring and fall to preserve summer visibility when most people are enjoying Oregon's scenery.

Emission Inventory and Modeling
The emission inventory group estimates how much CO, NO_2, SO_2, lead, PM, VOCs, and air toxics are emitted in a given year. DEQ will start estimating greenhouse gases soon. The modeling group uses the emission inventory, meteorology, and ambient monitoring data to estimate pollutant concentrations. DEQ also requires industry to model pollutant impacts before they construct any major production expansion.

Air Quality Monitoring
DEQ's Laboratory Division measures pollutant levels throughout the state. Air quality monitoring data is used to demonstrate attainment with the ambient air quality standards. Monitoring information is also used for wood stove burning advisories, air quality health alerts, forest fire smoke health alerts, the Air Quality Index, the Wildfire Air Quality Rating, air quality forecasting, and EPA's AIRNow nationwide website.

Air Quality Index (AQI)
The AQI provides hourly air quality health information for over 30 cities in Oregon at: http://www.oregon.gov/DEQ or http://www.lrapa.org/ for Lane County. The AQI is updated daily by phone at 1-800-961-6313. AQI for all the states is available on EPA's AIRnow.gov.

Wildfire Air Quality Rating (WAQR)
Like the AQI, the WAQR provides hourly air quality health information. The WAQR was designed to fix a deficiency in the AQI during forest fire smoke inundations. The AQI does not always report forest fire smoke inundations accurately because its particulate health levels are based on 24 hour averages and are designed for measuring normal winter smoke episodes. The WAQR averaging time of one hour can capture the more rapidly shifting plume of smoke that can move into an area quickly. The WAQR is at: http://www.oregon.gov/DEQ/AQ/index.shtml

Getting Involved
DEQ is committed to informing and involving the public in air quality decisions related to rule changes, permit activities and air pollution prevention programs. DEQ wants to hear from and work with citizens on air quality issues that affect them. Air Quality Program phone numbers are listed on the inside of the back cover. DEQ uses advisory committees composed of citizens and technical experts to develop rules. The public has an opportunity to comment on new permits and modifications of existing permits during publicized comment periods. No rules affecting the state's air quality are adopted without public notice and the opportunity to comment. Opportunities to comment are published in newspapers.

National Ambient Air Quality Standards (NAAQS)
The NAAQS were adopted by Oregon to protect the public health. The EPA has established primary NAAQS to protect public health and secondary NAAQS to protect public welfare. Table 9 shows the primary NAAQS standards for the criteria pollutants.

Table 9. 2009 Ambient Air Quality Standards (NAAQS).

Pollutant	**Averaging Time**	**National Ambient Air Quality Standard (NAAQS) Violation Determination[1]**	**Federal Standard (NAAQS) Exceedance Level**	**State Standard Exceedance Level**
Carbon monoxide	1-hour	Not to be exceeded more than once/year.	35 ppm	35 ppm
	8-hour	Not to be exceeded more than once/year.	9 ppm	9 ppm
Lead	Three Months	Rolling 3 Month Average	0.15 $\mu g/m^3$	0.15 $\mu g/m^3$
Nitrogen dioxide	Annual	Annual arithmetic mean	0.053 ppm	0.053 ppm
Ozone	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average concentration.	0.075 ppm	0.075 ppm
$PM_{2.5}$	24 hour	98th percentile of the 24-hour values determined for each year. 3-year average of the 98th percentile values.	35 $\mu g/m^3$	35 $\mu g/m^3$
	Annual Average	3-year average of the annual arithmetic mean	15 $\mu g/m^3$	15 $\mu g/m^3$
PM_{10}	24 hour	The expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is $\leq$ 1 over a 3-yr period.	150 $\mu g/m^3$	150 $\mu g/m^3$
Sulfur dioxide	Annual Arithmetic Mean	Not to be exceeded more than once per calendar year.	0.03 ppm	0.02 ppm
	24 hour	Not to be exceeded more than once per calendar year.	0.14 ppm	0.10 ppm
	3 hour	Not to be exceeded more than once per calendar year.	N/A	0.50 ppm

Notes: **$\mu g/m^3$** = *micrograms of pollutant per cubic meter of air*
ppm = *parts per million*

Exceedances vs. Violation

Exceedances occur when the NAAQS is surpassed. Violations consist of one or more exceedances of the NAAQS as discussed in Table 9.

2000-2009 NAAQS Exceedances.

Tables 10 through 15 summarize Oregon's NAAQS exceedances for the last 10 years for PM_{10}, CO and Ozone. $PM_{2.5}$ comparison to the NAAQS is determined by the 98th percentile.

Table 10. $PM_{2.5}$ 98th Percentile – Eastern Oregon.

Year	Bend	Burns	Klamath Falls	La Grande	Lakeview	Pendleton	Prineville	The Dalles
2000	25	38	37	24	37	34	-	30
2001	21	31	35	23	29	25	-	19
2002	24	30	51	27	30	40	-	28
2003	26	36	31	19	-	-	-	19
2004	-	-	42	21	-	-	-	33
2005	-	-	49	31	-	-	-	-
New Daily Standard of 35ug/m3 (old standard was 65ug/m3)								
2006	-	-	**48**	32	-	-	-	-
2007	-	**36**	**40**	15	**38**	-	-	-
2008	-	**36**	**52**	15	**44**	30	-	-
2009	14	**27**	**44**	23	**43**	22	32	-

Table 11. $PM_{2.5}$ 98th Percentile – Western Oregon.

Year	Albany	Beaverton	Corvallis	Cottage Grove	Eugene/ Springfield	Grants Pass	Hillsboro	Medford	Oakridge	Portland	Salem
2000	33	28	30	-	39	28	32	40	52	27	29
2001	29	24	28	-	34	41	31	32	60	25	33
2002	30	28	27	-	46	32	38	41	55	28	35
2003	28	18	-	-	31	34	23	32	53	23	-
2004	31	30	-	-	28	-	-	35	46	33	-
2005	-	-	-	-	36	-	-	36	58	26	-
New Daily Standard of 35ug/m3 (old standard was 65ug/m3)											
2006	-	-	-	-	32	-	-	26	**39**	**38**	-
2007	-	-	-	**39**	**36**	29	31	30	**43**	29	-
2008	-	-	-	18	27	27	30	28	**39**	27	-
2009	-	-	-	30	**36**	35	33	33	**41**	22	-

Table 12. PM_{10} Number of Exceedances – Eastern Oregon.

Year	Bend	Burns	Klamath Falls	La Grande	Lakeview	Pendleton
2000	1	0	0	0	0	0
2001	0	0	0	0	0	0
2002	0	0	2⚐	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
2007	0	-	0	0	-	0
2008	-	-	0	0	-	0
2009	-	-	0	0	-	0

⚐ The flagged exceedances were caused by the July and August, 2002 forest fires.

Table 13. PM_{10} Number of Exceedances – Western Oregon.

Year	Cottage Grove	Eugene /Springfield	Grants Pass	Medford	Oakridge	Portland
2000	0	0	0	0	0	0
2001	0	0	0	0	0	0
2002	0	0	0	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
2007	-	0	0	0	0	0
2008	-	0	0	0	0	0
2009	-	0	-	0	0	0

Table 14. Carbon Monoxide Number of Exceedances.

Year	Bend	Eugene	Grants Pass	Klamath Falls	Medford	Portland	Salem
2000	0	0	0	0	1	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0
2006	-	0	-	-	0	0	-
2007	-	0	-	-	0	0	-
2008	-	0	-	-	0	0	-
2009	-	0	-	-	0	0	-

Table 15. Ozone Number of Exceedances.

Year	Bend	Eugene	Medford	Portland	Salem	Hermiston
2000	-	0	0	0	0	-
2001	-	0	0	0	0	-
2002	-	0	0	**1**	0	-
2003	-	0	0	0	0	-
2004	-	0	0	0	0	-
2005	-	0	0	0	0	-
2006	-	0	0	**1**	**1**	-
2007	-	0	0	0	0	0
Standard lowered from 0.085 to 0.075ppm						
2008	0*	0	**1**	**3**	**2**	0
2009	0	0	0	**2**	**1**	0

(Eight Hour Average)

Appendix 1 Air Quality Data Summaries for 2000 through 2009

The following pages present ambient air quality data summaries for the past 10 years.

DEQ's Air Quality Surveillance Network collects data throughout the state for a number of pollutants and meteorological parameters. DEQ uses air sampling methods designated by the U.S. EPA as Federal Reference Methods to judge attainment with the NAAQS. The following air quality data summaries for particulate and gaseous pollutants are summarized for comparison to the federal standards. If Oregon has more stringent standards than the NAAQS, compliance with state standards means compliance with federal. The following notes apply to the summary tabulation:

Appendix 1 -A&B. Particulate (PM_{10} and $PM_{2.5}$)

A. For 2009 - PM_{10} is sampled every sixth day.
B. The annual average is determined by averaging the quarterly means.
C. The PM_{10} max daily sample is determined by taking the highest 24 hour sample for the year.
D. The PM_{10} second highest daily sample is determined by taking the second highest value for the year.
E. The $PM_{2.5}$ max daily sample is determined by taking the highest 24 hour sample for the year.
F. The $PM_{2.5}$ 98th percentile is determined by multiplying the number of days sampled by 0.98.

Appendix 1-C. Carbon Monoxide (CO)

A. Portland, Eugene, and Medford have year round sites.
B. Max one hour CO average is determined by taking the highest one hour average for the year.
C. Max eight hour CO average is determined by calculating a rolling average (across midnight).
D. Second highest eight hour average CO is determined from the data in C. Only one max per CO episode is used to count to the second highest.

Appendix 1-D. Ozone (O_3)

A. All sites sample from May 1st to Sept 30th except Portland SE Lafayette which samples year round.
B. Max one hour average ozone value is determined by taking the highest one hour average for the year.
C. Max eight hour ozone average is determined by calculating a rolling average (across midnight).
D. Fourth highest eight hour average is determined from the data in C. Only one max per day is used to count to the fourth highest.
E. Three year average of the fourth highest eight hour ozone is calculated by averaging the current fourth highest value determined in D with the respective values calculated for the previous two years.

Appendix 1-E. Oxides of Nitrogen (NOx)

A. Sampling occurs from May to Sept until 2009, then year round.
B. Only NO_2 has a NAAQS standard.
C. The max one hour average NO_2 is determined by taking the highest one hour average for the year.

D. The max one hour average NO is determined by taking the highest one hour average for the year.
E. Hydrocarbon data is collected for ozone modeling but not included here.

Appendix 1-F.Sulfur Dioxide (SO_2)

A. Sampling is done year around.
B. The maximum three hour average is calculated (must have three consecutive hours)
C. The maximum 24 hour daily average is calculated (must have ≥ 18hrs/day)
D. The annual average is calculated.

Appendix 1-G. Light Scattering ($PM_{2.5}$ estimate)

A. No air quality standards have been adopted.
B. The annual average is determined by taking the arithmetic mean of all the one hour averages.
C. The one hour max is determined by taking the highest one hour average for the year.
D. The 24 hour max is determined by averaging the one hour averages from midnight to midnight.

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

A. Ambient air toxic levels are compared to bench mark levels of one in a million chance of cancer.
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.

Appendix 1-I. Visibility (Light Scattering)

A. No air quality standards have been adopted. Light scattering measures visibility of scenic areas.
B. One hour averages were determined for 9 A.M. to 9 P.M. PST from July 1 to September 15.
C. The one hour averages were counted when the visibility was in the perceptible range (0.60 to 0.79 BScat), the moderate range (0.80 to 1.29 BScat), and the heavy range (>1.30 BScat).

Lead (Pb) DEQ discontinued TSP lead sampling in 2001. See air toxics for lead.

DEQ Air Monitoring Methods

Appendix 1-A&B. Fine Particulate Matter (PM_{10} and $PM_{2.5}$)

High-Volume Sampler: Some PM_{10} samples were collected with high volume samplers which draw air through a size-separating inlet then a pre-weighed quartz filter at about 40 cubic feet per minute. After 24 hours of sampling, the filter is removed and reweighed. The difference between the starting and the ending weight is expressed as micrograms of fine particulate per cubic meter of air sampled. This is an EPA Federal Reference Method.

Medium-Volume Sampler: PM_{10} samples are collected with DEQ designed medium volume samplers which draw air through size-separating inlets at four cubic feet per minute. The samplers collects particles on two separate filters simultaneously (quartz and Teflon), allowing for chemical analysis. The difference between the starting and the ending weight is expressed as micrograms of fine particulate per cubic meter of air sampled. This is an EPA Federal Equivalency Method.

Federal Reference Method (FRM) samplers: PM_{10} and $PM_{2.5}$ samples are collected with the FRM samplers which draw air through a size-separating inlet then a pre-weighed fiber filter at about 16.7 liters per minute. After 24 hours of sampling, the filter is removed and reweighed. The difference between the starting and the ending weight is expressed as micrograms of fine particulate per cubic meter of air sampled. This is an EPA Federal Reference Method.

Appendix 1-C. Carbon Monoxide

Nondispersive Infrared (NDIR): Infrared energy from a lamp is passed through a cell containing the gas sample to be analyzed and simultaneously through a reference cell containing a non-absorbing gas. Carbon monoxide in the sample absorbs some of the energy, creating an out-of-balance condition in the detector. The imbalance is proportional to the amount of carbon monoxide in the sample air and is electronically amplified and recorded. This is an EPA Federal Reference Method.

Appendix 1-D. Ozone

Ultraviolet Photometry: The air sample enters a chamber with an ultraviolet lamp at one end and detector at the other. The ozone in the sample stream absorbs the ultraviolet light at a specific wavelength. The amount absorbed is proportional to the amount of ozone in the air stream. The detector signal is then amplified and recorded. This is an EPA Federal Reference Method.

Appendix 1-E. Oxides of Nitrogen

Chemiluminescent Detection: The air sample is continuously pumped into two paths within the analyzer, one leading through a converter to reduce Nitrogen dioxide (NO_2) to Nitric oxide (NO); the other bypasses the converter. Both samples reach reaction chambers where the nitric oxide is detected by its chemiluminescent (light emitting) reaction with ozone. The light emissions are detected by photomultiplier tubes, amplified, and recorded. This is an EPA Federal Reference Method.

Appendix 1-F. Sulfur Dioxide

Ultraviolet Fluorescence Spectrometer: The UV fluorescence method operates on the principle that when the SO_2 molecules contained in the sample gas are excited by ultraviolet radiation they emit a characteristic fluorescence in the range of 220- 240 nm. This fluorescence is measured and the SO_2 concentration is obtained from changes in the intensity of the fluorescence. This is an EPA Federal Reference Method.

Appendix 1-G & I. Light Scattering

Nephelometer: The nephelometer measures a common property of small particles in the air; the ability to scatter light and cause visibility reduction. The instrument measures the scattering coefficient (BScat) of the sample by drawing air into the detection chamber where it is illuminated by a pulsed-flash lamp. The scattered light is measured over a range of angles by means of a photomultiplier tube. This signal is averaged, amplified, and recorded. The amount of light scattered is roughly proportional to the fine particle mass concentration and to observed visibility.

Appendix 1-H. Air Toxics:

Aldehydes/ketones - Ambient air is drawn through a carbonyl cartridge at one liter/minute for 24 hour then solid phase extracted and analyzed with by High Pressure Liquid Chromatography.

Volatile Organic Carbons - Ambient air is drawn into an evacuated canister during preprogram cycle times at about 50cc/minute for 24 hours. The sample is analyzed using Gas Chromatography/Mass Spectroscopy.

Poly Organic Carbons - Ambient air is drawn through a quartz filter then through polyurethane foam/XAD sandwich at eight cubic feet per minute for 24 hours. The sample is Soxhlet extracted from the filter and foam/XAD and analyzed using Chromatography/Mass Spectroscopy.

Metals - A PM_{10} or $PM_{2.5}$ sample is collected by a High Volume or Low Volume sampler on a quartz for 24 hours then the filter is analyzed using inductively coupled plasma mass spectrometry (ICP-MS).

Diesel Particulate – Using an Aethalometer, Ambient air is drawn through a glass filter tape and measured with an Ultraviolet/Visible lamp and photodiode detector every five minutes. The five minute measurements are compiled for an hourly average. Black Carbon is measured and used as a surrogate for diesel particulate.

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

$PM_{2.5}$ Data Summary

STATION LOCATION AND NUMBER	Years	SAMPLE Days	ARITHMETIC MEAN	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Albany	2000	115	8.7	44 (11/17)	33 (01/28)
Calapooia Middle Sch. (ACS)	2001	120	8.2	37 (11/09)	29 (11/12)
830 SE 24th	2002	119	8.2	39 (11/28)	30 (12/01)
DEQ# 21886 EPA# 410430009	2003	111	8.0	31 (01/09)	28 (02/08)
	2004	95	8.0	35 (11/11)	31 (01/10)
Bend					
8th & Newport (BEN)	2000	351	7.3	40 (11/16)	25 (11/20)
DEQ# 10099 EPA # 410170113	2001	46	*	21 (01/08)	21 (01/08)
*Moved to PumpStation 3/02/01					
Pump Station (BPS)	2001	286	7.2	42 (11/03)	21 (08/15)
35 Portland Ave	2002	321	8.0	31 (12/09)	24 (11/28)
DEQ# 24172 EPA # 410170120	2003	87	7.6	27 (08/25)	26 (06/29)
⚐ *forest fire data included*	2009⚐	57	5.6	39 (09/28)	19 (12/09)
* *forest fire flagged data removed*	2009*	56	5.1	19 (12/09)	14 (08/11)
Burns	2000	44	9.3	38 (12/08)	38 (12/08)
267 E Madison St. (BMS)	2001	60	9.1	39 (01/31)	31 (11/15)
DEQ# 10105 EPA # 410250002	2002	54	9.7	36 (11/16)	30 (01/08)
	2007	58	9.5	37 (11/08)	36 (12/14)
	2008	54	11.2	41 (01/25)	36 (11/20)
	2009	94	8.4	28 (12/12)	27 (12/30)
Corvallis					
Corvallis Intermed Sch (CIS)	2000	120	7.8	38 (11/17)	30 (11/20)
1310 NW Circle Blvd.	2001	116	7.3	33 (11/09)	28 (01/28)
DEQ# 20478 EPA # 410030013	2002	116	7.6	30 (11/28)	27 (11/25)
Cottage Grove					
Harrison School	2007	59	8.9	42 (01/30)	39 (02/05)
DEQ# 18515 EPA # 410399002					
City Shops (CGS)					
DEQ# 31004 EPA # 410399004	2008⚐	119	7.1	32 (01/25)	21 (01/22)
⚐ *forest fire data included*	2008*	118	7.9	32 (01/25)	18 (10/30)
* *forest fire flagged data removed*	2009	119	8.5	34 (12/12)	30 (01/22)

⚐ Forest Fire Impact.

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Eugene	2000	342	9.4	59 (11/18)	39 (12/26)
Amazon Park (EAP)	2001	361	9.4	51 (11/09)	34 (01/02)
499 E 29TH	2002	345	9.7	56 (11/27)	46 (11/03)
DEQ# 18524 EPA # 410390060	2003	120	9.5	40 (01/18)	31 (11/08)
	2004	121	8.7	38 (01/13)	28 (12/20)
	2005	122	9.1	40 (01/16)	36 (02/03)
	2006	123	8.4	43 (12/08)	32 (12/07)
	2007	119	7.3	43 (02/05)	36 (02/02)
	2008⚐	345	7.8	40 (01/24)	29 (01/22)
⚐ *forest fire data included*	2008✶	343	7.6	40 (01/24)	27 (12/10)
✶ *forest fire flagged data removed*	2009	357	8.5	60 (12/11)	36 (02/04)
Eugene Key Bank (EKB)					
450 Pacific Hwy 99 N	2008⚐	117	8.3	32 (06/29)	25 (10/27)
DEQ# 18522 EPA# 410390058	2008✶	116	8.0	31 (01/25)	24 (02/15)
⚐ *forest fire data included*	2009	117	8.2	48 (12/12)	36 (12/09)
✶ *forest fire flagged data removed*					
Saginaw	2000	114	6.7	21 (11/17)	19 (11/14)
Delight School (SAG)	2001	119	7.0	27 (11/12)	17 (10/04)
79980 Delight Valley School Rd	2002	121	6.7	22 (11/13)	18 (03/03)
DEQ# 18315 EPA # 410391007	2003	59	6.2	17 (11/05)	16 (02/08)
	2004	60	6.0	14 (11/23)	13 (02/21)
	2005	61	6.8	25 (01/16)	18 (02/03)
Grants Pass					
Sewage Treatment Plant (GPS)					
1200 SW Greenwood Ave.	2000	117	8.8	35 (11/11)	28 (11/17)
DEQ# 18508 EPA # 410330107	2001	116	10.6	55 (11/12)	41 (01/07)
*Moved to GPP 7/02,	2002	63	*	32 (02/16)	29 (02/10)
GPS & GPP combined					
Parkside School (GPP)	2002⚐	52	11.5*	39 (11/19)	32 (02/16)
	2003	85	9.7	46 (11/23)	34 (02/08)
DEQ# 28859 EPA # 410330114	2007	58	8.2	32 (02/05)	29 (01/30)
⚐ *forest fire data included*	2008⚐	56	9.4	34 (06/29)	28 (01/01)
✶ *forest fire flagged data removed*	2008✶	54	8.5	28 (01/01)	27 (01/19)
*2009 max value due to slash burning	2009	58	8.5	39(11/09)*	35 (12/09)

⚐ Forest Fire Impact.

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Hermiston					
Municipal Airport (HMA)	2007*	98	*	28(11/08)	23(11/23)
DEQ# 31000 EPA # 410591003					
*Started 2/07 – not a complete year					
Pump Station (HPS)					
DEQ# 24735 EPA # 410591002	2007*	104	*	32 (11/08)	24 (12/23)
*Started 3/07 – not a complete year					
Klamath Falls	2000	346	9.6	63 (12/07)	37 (11/19)
Peterson School (KFP)	2001	322	8.9	40 (12/12)	35 (11/12)
4856 Clinton St.	2002⚐	339	17.1	155(08/02)	93 (08/19)
DEQ# 10118 EPA # 410350004	2002✶	314	12.5	66 (12/02)	51 (01/31)
	2003	115	10.0	54 (11/23)	31 (12/17)
	2004	105	11.3	51 (12/02)	42 (11/11)
	2005	109	11.7	51 (01/19)	49 (01/22)
	2006	112	11.1	53 (12/31)	48 (01/23)
	2007	116	10.8	56 (01/18)	40 (11/23)
	2008⚐	118	13.0	74 (12/17)	52 (12/23)
⚐ ***forest fire data included***	2008✶	113	12.5	74 (12/17)	52 (12/23)
✶ ***forest fire flagged data removed***	2009⚐	116	11.8	63 (09/25)	48 (11/15)
	2009✶	115	11.3	54 (12/09)	44 (01/10)
La Grande					
3rd & I Street (LTI)	2000	327	6.5	36 (08/16)	24 (11/22)
DEQ# 21638 EPA # 410610117	2001	337	6.7	34 (01/06)	23 (11/07)
	2002	333	7.3	43 (12/05)	27 (01/28)
✶Moved to LAS –12/03	2003	104	✶	25 (11/05)	18 (09/03)
Ash Street (LAS)	2003	7	6.3*	19 (12/11)	19 (12/11)
DEQ# 26448 EPA # 410610119	2004	102	7.4	26 (01/16)	21 (02/21)
* averaged with LTI	2005	107	8.8	41 (12/12)	31 (12/15)
	2006⚐	54	9.3	35 (09/08)	34 (12/19)
	2006✶	53	8.6	34 (12/19)	32 (09/26)
⚐ ***forest fire data included***	2007	60	6.4	24 (01/24)	15 (09/15)
✶ ***forest fire flagged data removed***	2008	59	6.7	19 (12/20)	15 (11/20)
	2009	60	7.8	30 (12/03)	23(11/03)

⚐ Forest Fire Impact.

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN†	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Ladd Marsh-Foothills Rd (LLM)	2000	47	6.7	39 (08/16)	39 (08/16)
DEQ# 10147 EPA # 410619103	2001	51	4.7	16 (01/19)	14 (08/17)
Discontinued 12/02	2002	57	5.2	24 (12/04)	14 (07/13)
Lakeview	2000	320	7.3	51 (12/29)	37 (12/07)
Center and M Street (LCM)	2001	351	7.2	37 (01/31)	29 (01/18)
DEQ# 10123 EPA # 410370001	2002⚐	347	9.0	78 (07/31)	40 (08/19)
⚐ *forest fire data included*	2002✶	339	8.0	41 (02/04)	30 (08/01)
✶ *forest fire flagged data removed*	2003	51	*	29 (01/09)	*
*Discontinued 10/03	2007	86	8.1	44 (01/24)	38 (01/18)
	2008⚐	118	11.2	72 (12/17)	44 (12/11)
	2008✶	114	10.6	72 (12/17)	44 (12/11)
	2009	121	10.6	62 (01/13)	43 (12/09)
Grange Hall (LGH)	2000	58	2.7	8 (08/22)	7 (06/29)
DEQ# 10122 EPA # 410370003	2001	61	3.0	12 (09/10)	11 (08/11)
⚐ *forest fire data included*	2002⚐	60	5.3	57 (07/31)	46 (07/25)
✶ *forest fire flagged data removed*	2002✶	58	3.9	21 (07/19)	19 (08/06)
Lebanon	2003	70	*	34 (09/02)	NA
Fire Station (LFS)	2004	29	*	12 (09/03)	NA
DEQ# 18331 EPA # 410411004	2005	71	*	11 (09/27)	NA
*Summer Field Burning Site only	2006	67	*	22 (09/02)	NA

⚐ Forest Fire Impact.

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN†	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Medford	2000	120	5.6	23 (11/23)	19 (01/07)
Dodge Road (MDR)	2001	117	5.2	16 (11/18)	13 (01/07)
4035 Dodge Road	2002⚐	110	8.9	69 (07/28)	50 (08/09)
DEQ# 10106 EPA # 410291001	2002✶	103	6.7	29 (08/15)	23 (08/24)
⚐ ***forest fire data included***	2003	60	5.2	17 (08/31)	15 (01/09)
✶ ***forest fire flagged data removed***	2004	61	5.9	22 (12/05)	19 (11/17)
	2005	60	5.2	13 (11/18)	12 (11/24)
	2006	51	5.5	17 (12/07)	14 (11/01)
	2007	57	5.0	17 (11/14)	13 (02/05)
	2008⚐	55	5.9	41 (06/29)	26 (11/08)
	2008✶	52	4.4	26 (11/08)	9 (10/27)
	2009	58	5.0	26 (11/09)	14 (09/28)
Grant & Belmont (MGB)	2000	347	11.4	56 (12/09)	40 (12/28)
902 Grant Ave.	2001	347	10.6	45 (01/06)	32 (11/09)
DEQ# 20448 EPA # 410290133	2002⚐	348	14.0	64 (07/29)	45 (11/21)
⚐ ***forest fire data included***	2002✶	328	12.4	60 (11/15)	41 (12/05)
✶ ***forest fire flagged data removed***	2003	116	11.1	45 (01/09)	32 (11/14)
	2004	119	10.8	38 (12/05)	35 (11/29)
	2005	116	10.1	50 (11/21)	36 (12/15)
	2006	102	10.0	45 (11/10)	32 (12/19)
	2007	231	9.7	38 (01/27)	30 (11/16)
	2008⚐	351	10.0	51 (08/07)	33 (08/06)
	2008✶	333	8.8	33 (11/25)	28 (01/17)
	2009⚐	173	10.0	54 (09/25)	38 (11/30)
	2009✶	172	9.6	43 (12/12)	33 (01/22)
Welch & Jackson (MWJ)	2000	331	11.4	52 (12/29)	44 (07/04)
711 Welch St.	2001	356	10.2	46 (01/06)	33 (01/16)
DEQ# 10113 EPA # 410292129	2002⚐	348	13.8	64 (11/15)	48 (08/12)
⚐ ***forest fire data included***	2002✶	327	12.1	64 (11/15)	38 (11/26)
✶ ***forest fire flagged data removed***	2003	121	11.3	47 (01/18)	39 (11/14)

⚐ Forest Fire Impact.

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN†	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Provolt BLM Seed Orch (PSO)	2003	51	7.4*	22 (01/16)	*
DEQ# 18432 EPA # na	2004	53	6.7*	22 (02/21)	*
Oakridge	2000	362	13.1	74 (01/29)	52 (02/07)
Willamette Cntr. (OAK)	2001	355	13.8	96 (01/07)	60 (01/27)
47674 School St.	2002	353	14.1	80 (11/01)	55 (03/02)
DEQ# 18733 EPA # 410392013	2003	362	12.3	69 (01/11)	53 (02/25)
	2004	362	12.0	69 (02/12)	46 (02/21)
	2005	237	12.8	73 (12/15)	58 (02/03)
	2006	118	11.1	47 (12/07)	39 (02/22)
	2007	118	10.5	53 (02/02)	43 (01/24)
	2008	182	11.5	44 (01/22)	39 (12/06)
	2009	121	11.0	44 (12/12)	41 (01/16)
Pendleton	2000	327	8.9	42 (11/19)	34 (11/14)
McKay Creek Park (PMC)	2001	302	8.7	40 (11/27)	25 (08/15)
3745 SW Marshall Place	2002	308	9.3	52 (11/04)	40 (11/26)
DEQ# 10146 EPA # 410590121	2007	6	*7.8	*29 (11/08)	*22 (10/27)
**Incomplete 1st Quarter data set*	2008	119	8.3	34 (11/23)	30 (10/30)
	2009	84	7.8	23 (12/09)	22 (12/15)
Prineville					
Davidson Park	2009	82	9.0	32 (01/22)	28 (01/10)
DEQ# 31000 EPA # 410130100					
Portland Area	2000	117	8.6	42 (11/23)	28 (12/08)
Beaverton Highland Park Sch (BHP)	2001	119	7.6	29 (11/09)	24 (10/28)
	2002	116	7.9	56 (12/01)	28 (10/26)
3745 SW Marshall Place	2003	59	6.7	23 (01/21)	18 (03/04)
DEQ# 20481 EPA # 410670111	2004	58	9.0	35 (01/10)	30 (11/11)
Hillsboro (HFO)	2000	111	9.7	38 (12/05)	32 (10/15)
15th & Oak St.	2001	117	8.9	47 (11/09)	31 (01/28)
DEQ# 21639 EPA # 410671003	2002	111	10.5	66 (12/01)	38 (07/04)
	2003	110	8.3	38 (01/21)	23 (12/20)
Hillsboro (HHF)					
Hare Field	2007	57	8.2	34 (11/26)	31 (02/05)
DEQ# 31967 EPA # 410670004	2008	65	8.9	32 (12/05)	30 (01/16)
	2009	69	8.7	35 (01/16)	33 (02/03)

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN†	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
N.E. Portland (PNR)	2000	353	9.5	46 (07/04)	29 (10/31)
24 N. Emerson (N. Roselawn)	2001	351	8.8	50 (09/19)	23 (01/12)
DEQ# 21889 EPA # 410510246	2002	350	8.5	36 (11/15)	26 (10/26)
	2003	117	8.1	28 (10/27)	21 (09/03)
	2004	125	8.8	34 (11/08)	28 (11/11)
	2005	119	8.8	49 (02/03)	25 (02/09)
	2006	120	7.8	28 (10/26)	19 (10/14)
	2007	86	7.4	24 (01/18)	21 (02/05)
	2008	121	7.7	27 (10/30)	25 (11/17)
	2009	86	6.8	20 (01/10)	20 (02/06)
N.W. Portland (PNW)					
1706 NW 24th St.	2000	336	9.2	36 (11/12)	28 (02/18)
(Forest Heights PO)	2001	359	8.3	30 (12/07)	22 (01/10)
DEQ# 18399 EPA # 410510244	2002	348	7.9	32 (11/15)	23 (11/26)
S.E. Portland (SEL)	2000	351	9.6	104 (07/04)	27 (12/19)
5824 SE Lafayette	2001	347	8.6	35 (12/07)	25 (01/31)
DEQ# 10139 EPA # 410510080	2002	348	8.4	45 (12/01)	28 (10/25)
	2003	114	8.2	26 (10/27)	23 (09/03)
	2004	115	9.3	47 (11/08)	33 (11/11)
	2005	116	9.2	34 (02/03)	26 (02/12)
	2006	56	9.8	39 (01/23)	38 (10/26)
	2007	116	8.1	40 (01/21)	29 (01/24)
	2008	118	8.4	34 (01/16)	27 (12/15)
	2009	116	7.6	22 (01/10)	22 (11/24)
Sauvie Island (SIS)	2000	118	7.0	19 (11/17)	18 (11/20)
Social Security Beach	2001	116	6.2	20 (11/12)	13 (03/23)
DEQ# 14152 EPA # 410090004	2002	118	6.4	24 (12/01)	18 (11/28)
	2003	57	5.6	14 (03/04)	13 (02/08)
	2004	54	6.9	21 (11/23)	19 (11/11)
Salem					
Salem General Hospital (SGH)	2000	121	8.9	33 (11/20)	29 (12/08)
867 Medical Center Drive	2001	122	8.2	49 (11/09)	33 (01/16)
DEQ# 20480 EPA # 410470040	2002	117	8.2	39 (11/04)	35 (12/01)

APPENDIX 1A
$PM_{2.5}$ Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	ARITHMETIC MEAN†	24-HOUR AVERAGES MAXIMUM (date)	98th Percentile (date)†
Between Salem & Portland					
Butteville -Schultz Road (MBC)					
DEQ# 21251 EPA # 410470110	2000	119	7.1	29 (12/08)	24 (10/27)
*Butteville & N Marion High	2001	120	6.7	28 (11/09)	18 (11/12)
combined for annual average.	2002	121	6.6	28 (12/01)	21 (01/11)
Springfield	2000	352	8.8	37 (11/18)	29 (10/25)
Springfield High Sch. (SHS)	2001	349	8.6	52 (12/06)	27 (11/08)
875 N 7th	2002	364	8.2	35 (11/28)	26 (11/02)
DEQ# 18734 EPA # 410391061	2003	120	7.8	28 (11/08)	23 (11/14)
Springfield City Hall (SCH)	2004	51	7.8	21 (11/11)	21 (11/05)
255 N 5th	2005	61	8.0	32 (01/16)	25 (02/03)
DEQ# 18538 EPA# 410391009	2006	61	7.4	30 (11/01)	28 (12/07)
⚐ ***forest fire data included***	2007	59	6.8	39 (02/05)	18 (01/30)
✶ ***forest fire flagged data removed***	2008⚐	61	6.9	32 (06/29)	24 (01/25)
	2008✶	60	6.4	24 (01/25)	18 (10/27)
	2009	60	6.8	22 (12/09)	18 (01/19)
The Dalles	2000	53	9.9	36 (11/20)	30 (01/07)
Cherry Heights (TDC)	2001	61	7.4	42 (11/09)	19 (11/03)
1112 Cherry Heights Rd	2002	59	7.7	30 (11/04)	28 (11/03)
DEQ# 21252 EPA # 410650007	2003	52	6.6	22 (11/07)	19 (02/08)
	2004	54	7.7	36 (11/11)	33 (01/10)
White City - Post Office (WPO)					
751 Crater Lk Hwy	2005	103	9.1	32 (11/21)	24 (12/15)
DEQ# 10107 EPA# 410294001	2006	103	9.0	48 (11/10)	23 (12/31)

⚐ Forest Fire Impact.

APPENDIX 1B
PM_{10} Summary ($\mu g/m^3$)

PM_{10} Data Summary

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	ARITHMETIC MEAN	24-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGES 2ND HIGHEST (date)
Bend						
8th & Newport (BEN)	2000	149	1	27.4	159 (02/07)	114 (01/28)
794 NW Newport	2001	50	0	*	71 (02/14)	70 (01/01)
DEQ# 10099 EPA# 410170113	* Moved to BPS 3/01					
Pump Station (BPS)	2001	114	0	18.5	112 (11/09)	73 (01/01)
35 Portland Ave	2002	114	0	21.5	76 (02/04)	73 (10/29)
DEQ# 24172 EPA# 410170120	2003	61	0	19.9	59 (10/30)	53 (02/08)
	2004	54	0	15.7	65 (02/09)	47 (12/17)
	2005	59	0	17.6	62 (02/03)	52 (02/27)
	2006	53	0	17.3	60 (12/07)	52 (12/19)
	2007	54	0	17.3	68 (01/24)	41 (01/12)
Burns (BMS)	2000	145	0	21.9	54 (12/08)	54 (02/07)
267 E Madison Street	2001	116	0	20.8	64 (01/22)	54 (01/31)
DEQ# 10105 EPA# 410250002	2002	107	0	24.1	136 (11/16)	64 (07/13)
*Annual data incomplete	2003	56	0	17.4	38 (01/09)	36 (11/23)
	2004	55	0	18.4	52 (05/03)	49 (02/15)
	2005	30	0	*	*	*
	2006	32	0	*	*	*
Cottage Grove	2000	62	0	19.1	42 (11/28)	40 (11/23)
Harrison School	2001	61	0	17.0	42 (12/27)	37 (11/09)
S. 10th	2002	59	0	19.2	56 (11/04)	53 (03/03)
DEQ# 18515 EPA# 410399002	2003	59	0	15.6	43 (02/25)	40 (02/07)
	2004	58	0	14.0	38 (08/19)	32 (08/13)
	2005	61	0	14.9	38 (12/18)	37 (01/22)
	2006	61	0	14.8	42 (11/01)	41 (02/10)
Eugene	2000	60	0	18.7	48 (11/20)	47 (12/26)
Lane Comm College (LCC)	2001	60	0	18.2	51 (11/09)	35 (09/10)
1059 Willamette	2002	60	0	16.1	46 (08/12)	45 (09/11)
DEQ# 18320 EPA# 410390013	2003	58	0	14.5	32 (09/24)	29 (09/30)
	2004	56	0	13.9	36 (08/13)	35 (08/19)
	2005	62	0	15.4	42 (09/07)	40 (02/03)
	2006	61	0	14.4	44 (12/07)	38 (07/22)
	2007	59	0	13.3	65 (02/05)	39 (08/28)
	2008	61	0	13.1	42 (09/15)	38 (06/29)
	2009	61	0	12.4	37 (12/09)	37 (08/17)

APPENDIX 1B
PM_{10} Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	ARITHMETIC MEAN	24-HOUR AVERAGES	
					MAXIMUM (date)	2ND HIGHEST (date)
Key Bank (EKB)	2000	195	0	19.3	73 (03/30)	50 (11/22)
450 Pacific Hwy 99 N	2001	193	0	20.4	66 (11/09)	62 (11/10)
DEQ# 18522 EPA# 410390058	2002	204	0	19.1	67 (02/14)	63 (11/02)
	2003	144	0	19.1	45 (08/19)	45 (02/07)
	2004	118	0	18.7	64 (02/12)	44 (11/05)
	2005	119	0	18.1	51 (09/07)	48 (12/09)
	2006	122	0	20.2	69 (08/18)	57 (11/01)
	2007	118	0	16.2	78 (02/05)	70 (02/02)
	2008	120	0	17.6	56 (09/15)	53 (01/25)
	2009	108	0	16.1	80 (02/03)	55 (01/22)
Amazon Park (EAP)	2000	60	0	17.4	55 (11/20)	52 (12/26)
499 E 29th	2001	61	0	17.9	60 (11/09)	35 (10/04)
DEQ# 18524 EPA# 410390060	2006	32	0	14.8	41 (11/01)	35 (09/02)
	2007	44	0	16.5	63 (02/05)	38 (08/28)
	2008	58	0	14.5	47 (09/15)	41 (01/25)
Grants Pass						
Sewage Treatment Plant (GPS)	2000	107	0	15.8	40 (11/21)	40 (12/27)
1200 SW Greenwood Ave.	2001	144	0	15.7	55 (11/12)	50 (11/09)
DEQ# 18508 EPA# 410330107	2002	76	0	*	41 (03/30)	37 (01/17)
* Moved to GPP 7/02						
Parkside School (GPP)	2002⚑	40	0	18.9*	45 (11/09)	44 (08/12)
	2003	87	0	13.7	56 (11/14)	49 (11/23)
	2004	76	0	16.4	36 (02/12)	32 (02/21)
DEQ# 28859 EPA # 410330114	2005	57	0	16.4	48 (07/27)	38 (02/03)
** GPS & GPP combined*	2006	59	0	15.7	39 (12/31)	38 (11/19)
	2007	55	0	13.5	41 (02/05)	39 (01/30)
⚑ ***forest fire impacted***	2008	57	0	15.2	49 (09/15)	42 (06/29)
Hermiston						
Pump Station (HPS)	2001	124	0	23.0	55 (10/04)	52 (05/19)
DEQ# 24735 EPA# na						
Klamath Falls	2000	146	0	19.3	94 (12/06)	93 (12/07)
Peterson School (KFP)	2001	146	0	18.3	82 (01/03)	62 (01/04)
4856 Clinton St	2002⚑	151	0	28.5	145 (07/31)	121 (08/18)
DEQ# 10118 EPA# 410350004	2003	87	0	20.6	110 (03/13)	63 (11/23)
	2004	81	0	22.1	76 (01/13)	70 (01/22)
	2005	59	0	21.7	85 (01/22)	76 (12/12)
	2006	60	0	20.3	71 (12/31)	56 (07/04)
⚑ ***forest fire impacted***	2007	58	0	22.2	89 (01/18)	72 (01/24)
	2008	55	0	20.7	77 (02/12)	72 (02/18)
	2009	58	0	20.6	87 (10/04)	75 (12/09)

APPENDIX 1B
PM_{10} Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	ARITHMETIC MEAN	24-HOUR AVERAGES	
					MAXIMUM (date)	2ND HIGHEST (date)
La Grande						
Willow Street (LWS)	2000	133	0	22.2	87 (01/18)	71 (12/05)
1601 N Willow	2001	142	0	20.7	82 (01/06)	76 (02/03)
DEQ# 10148 EPA# 410610006	2002	110	0	22.0	90 (01/28)	72 (01/29)
	2003	81	0	20.5	57 (02/11)	54 (10/27)
	2004	74	0	23.6	61 (12/23)	54 (02/09)
	2005	61	0	22.3	50 (02/03)	48 (11/18)
Ash Street (LAS)	2006	58	0	27.5	87 (07/22)	76 (08/27)
DEQ# 26448 EPA # 410610119	2007	59	0	21.0	150 (05/12)	53 (08/16)
	2008	51	0	14.5	29 (07/11)	29 (09/15)
	2009	54	0	16.1	53 (09/28)	34 (07/18)
Lakeview	2000	153	0	18.5	106 (12/29)	101 (12/28)
Center & M (LCM)	2001	86	0	*	94 (01/03)	94 (01/04)
DEQ# 10123 EPA# 410370001	2002⚑	117	0	22.3	104 (07/31)	84 (02/04)
*No data for Oct – Dec, 2001	2003	87	0	17.4	49 (02/11)	46 (01/09)
	2004	74	0	19.4	71 (01/22)	71 (01/14)
⚑ ***forest fire impacted***	2005	59	0	18.1	78 (01/22)	77 (12/06)
	2006	57	0	14.8	61 (12/19)	46 (06/10)
Medford	2000	151	0	23.1	72 (11/18)	68 (11/20)
Welch & Jackson (MWJ)	2001	140	0	21.8	64 (01/03)	63 (01/04)
DEQ# 10113 EPA # 410292129	2002⚑	119	0	25.0	80 (07/31)	73 (08/12)
⚑ ***forest fire impacted***	2003	78	0	21.4	58 (11/14)	57 (01/18)
	2004	77	0	23.2	52 (01/22)	49 (11/17)
	2005	60	0	22.1	52 (02/03)	51 (11/18)
	2006	61	0	20.2	65 (12/07)	62 (11/01)
	2007	67	0	22.0	94 (02/05)	78 (01/24)
	2008⚑	61	0	18.6	53 (08/16)	46 (01/19)
	2009	61	0	16.4	49 (01/19)	46 (12/09)
Dodge Road (MDR)	2000	145	0	11.2	29 (10/24)	29 (12/31)
4035 Dodge Road	2001	148	0	10.5	23 (01/06)	21 (01/04)
DEQ# 10106 EPA # 410291001	2002⚑	113	0	15.2	66 (08/18)	63 (08/12)
⚑ ***forest fire impacted***	2003	90	0	9.0	30 (08/31)	27 (10/03)
	2004	71	0	13.5	28 (11/17)	25 (08/19)
Grant and Belmont (MGB)						
Grant Ave.	2008⚑	60	0	16.6	59 (06/29)	58 (08/16)
DEQ# 20448 EPA # 410290133	2009	59	0	15.2	43 (11/09)	39 (12/09)
⚑ ***forest fire impacted***						

APPENDIX 1B
PM_{10} Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	ARITHMETIC MEAN	24-HOUR AVERAGES	
					MAXIMUM (date)	2ND HIGHEST (date)
Oakridge	2000	207	0	19.4	85 (01/29)	69 (12/06)
Willamette Center Trailer (OAK)	2001	207	0	18.7	104 (01/07)	75 (12/27)
DEQ# 18733 EPA# 410392013	2002	208	0	21.0	89 (11/01)	80 (02/13)
	2003	147	0	17.5	73 (01/11)	60 (02/08)
	2004	117	0	18.0	80 (02/12)	53 (01/13)
	2005	115	0	18.0	83 (12/15)	76 (02/18)
	2006	110	0	16.4	56 (12/07)	50 (02/10)
	2007	114	0	14.5	60 (02/02)	60 (01/30)
	2008	109	0	16.7	52 (02/18)	48 (01/25)
	2009	117	0	14.8	47 (02/21)	45 (12/12)
Pendleton	2000	136	0	17.5	47 (11/20)	45 (11/18)
McKay Creek (PMC)	2001	144	0	19.0	51 (02/01)	46 (10/04)
3745 SW Marshall	2002	103	0	19.8	52 (10/26)	49 (10/17)
DEQ# 10146 EPA # 410590121	2003	55	0	19.8	65 (10/30)	54 (09/30)
	2004	54	0	20.7	64 (04/27)	48 (01/10)
	2005	60	0	18.8	42 (02/27)	37 (10/25)
	2006	59	0	21.2	60 (09/02)	56 (07/04)
	2007	43	0	*22.3	*56 (08/16)	*49 (11/08)
Incomplete 1st Quarter data set	2008	59	0	16.6	39 (01/25)	38 (09/15)
	2009	60	0	18.9	64 (0712)	40 (04/25)
Portland						
SE Lafayette (SEL)	2000	150	0	16.6	52 (02/18)	45 (07/05)
SE Lafayette at 58th	2001	183	0	15.4	45 (02/01)	44 (12/07)
DEQ# 10139 EPA# 410510080	2002	116	0	14.5	48 (01/15)	35 (10/26)
	2003	57	0	13.2	27 (09/06)	25 (09/30)
	2004	59	0	17.1	47 (11/05)	42 (11/11)
	2005	56	0	17.2	44 (02/03)	38 (12/12)
- Not enough sampling days	2006	5	-	-	-	-
	2007	90	0	13.4	46 (01/24)	40 (11/02)
	2008	120	0	14.3	45 (01/16)	44 (02/15)
	2009	121	0	13.1	29 (01/31)	29 (12/12)

APPENDIX 1B
PM_{10} Summary ($\mu g/m^3$)

STATION LOCATION AND NUMBER	YEAR	SAMPLE DAYS	DAYS >150	ARITHMETIC MEAN	24-HOUR AVERAGES	
					MAXIMUM (date)	2ND HIGHEST (date)
Transcon Terminal (TTT)	2000	58	0	23.0	48 (02/18)	42 (04/12)
3182 NW 26th	2001	60	0	19.8	45 (10/04)	43 (02/12)
DEQ# 10140 EPA# 410510009	2002	59	0	20.0	86 (11/04)	67 (11/16)
	2003	57	0	17.5	33 (09/30)	32 (10/06)
	2004	64	0	25.2	125 (01/22)	66 (01/16)
	2005	59	0	24.2	101 (02/03)	57 (12/12)
	2006	59	0	21.3	48 (10/26)	47 (12/19)
	2007	58	0	20.7	81 (01/24)	48 (10/09)
	2008	60	0	20.1	49 (03/07)	43 (01/25)
	2009	56	0	18.1	63 (02/12)	43 (05/01)
N.E. Portland (PNR)	2004	58	0	18.6	44 (11/05)	40 (11/11)
24 N. Emerson (N. Roselawn)	2005	61	0	16.0	73 (02/03)	37 (02/09)
DEQ# 21889 EPA # 410510246	2006	77	0	14.3	43 (01/23)	43 (10/26)
	2007	72	0	13.5	36 (11/02)	32 (07/11)
	2008	56	0	13.7	34 (06/29)	31 (09/11)
	2009	59	0	14.4	41 (09/10)	35 (09/22)
Salem						
State Hospital (SSH)						
23rd NE and D St.	2009	57	0	15.3	58 (08/17)	43 (09/22)
DEQ# 31929 EPA# 410470041						
Springfield	2000	60	0	19.6	55 (08/22)	45 (11/20)
City Hall (SCH)	2001	60	0	17.0	43 (11/09)	38 (09/10)
255 N 5th	2002	60	0	16.5	52 (11/16)	51 (09/11)
DEQ# 18538 EPA# 410391009	2003	56	0	14.8	39 (09/24)	34 (10/30)
White City	2000	151	0	28.4	73 (11/20)	67 (03/31)
Post Office (WPO)	2001	149	0	27.3	89 (01/02)	80 (01/03)
751 Crater Lk Hwy	2002[1]	118	0	32.0	90 (08/12)	89 (07/31)
DEQ# 10107 EPA# 410294001	2003	83	0	22.9	68 (01/09)	59 (11/14)
	2004	72	0	27.5	58 (08/13)	53 (03/16)
[1] *forest fire impacted*	2005	60	0	24.5	70 (02/03)	53 (02/15)
	2006	56	0	23.7	90 (11/01)	64 (02/10)
	2007	59	0	24.1	93 (02/05)	69 (01/24)
	2008	60	0	20.5	58 (06/29)	54 (09/15)
	2009	57	0	18.1	58 (01/19)	46 (09/22)

APPENDIX 1C
Carbon Monoxide Summary (ppm)

Carbon Monoxide Data Summary

STATION LOCATION AND NUMBER	YEAR	Oct-Apr Average	1-HOUR AVERAGES		TIMES** >9ppm	8-HOUR AVERAGES	
			MAXIMUM	2ND HIGH		MAXIMUM (date)	2ND HIGHEST (date)
Bend	2000	1.45	8.2	7.9	0	4.4 (01/21)	4.2 (11/22)
934 NE 3rd (BCO)	2001	1.08	9.7	7.8	0	4.5 (12/28)	3.1 (12/10)
DEQ# 10098 EPA# 410170002	2002	1.06	7.5	6.7	0	3.9 (12/09)	3.5 (01/02)
	2003	0.80	6.2	5.2	0	2.9 (12/19)	2.9 (01/07)
	2004	0.78	7.4	7.3	0	5.3 (01/08)	3.3 (01/13)
	2005	0.74	6.7	6.4	0	3.0 (12/19)	2.5 (11/30)
Eugene	2000	1.25	6.0	5.7	0	3.6 (11/22)	3.5 (11/16)
Lane Comm Coll. (LCC)	2001	1.20	5.7	5.3	0	3.6 (11/09)	3.6 (01/10)
1059 Willamette	2002	1.06	5.1	4.6	0	3.3 (11/05)	2.9 (11/06)
DEQ# 18320 EPA# 410390013	2003	0.93	5.4	3.7	0	3.4 (12/04)	2.8 (01/17)
	2004	0.87	7.7	6.8	0	3.1 (01/09)	2.6 (02/12)
	2005	0.73	4.1	3.8	0	2.5 (12/19)	2.3 (12/20)
	2006	0.66	4.3	3.3	0	2.1 (01/24)	2.0 (11/01)
	2007	0.64	3.2	3.1	0	2.2 (02/02)	2.1 (02/06)
	2008	0.53	2.4	2.2	0	1.7 (01/23)	1.7 (12/05)
	2009	0.49	2.1	2.1	0	1.6 (02/05)	1.6 (12/11)
Sacred Heart Hosp (SHH)	2000	1.32	7.8	6.6	0	4.4 (11/17)	4.3 (11/16)
12555 Hilyard	2001	1.30	6.1	5.5	0	4.2 (11/08)	4.1 (01/10)
DEQ# 18735 EPA# 410392062	2002	1.20	6.7	5.6	0	4.3 (10/15)	4.2 (11/04)
	2003	0.99	5.9	5.4	0	3.4 (12/04)	3.4 (01/17)
	2004	0.92	6.4	5.9	0	3.6 (01/09)	3.4 (02/12)
	2005	0.74	5.3	4.9	0	2.8 (02/11)	2.7 (12/10)
Grants Pass	2000	1.50	8.4	6.6	0	4.5 (11/21)	4.3 (12/27)
Wing Bldg (GPW)	2001	1.53	7.7	7.7	0	5.5 (01/05)	4.7 (11/09)
215 SE 6th	2002	1.45	7.4	6.4	0	4.6 (11/27)	4.5 (11/05)
DEQ # 10114 EPA # 410330006	2003	1.30	7.0	6.7	0	3.9 (01/06)	3.9 (01/07)
	2004	1.17	5.4	5.3	0	4.0 (11/03)	3.5 (12/08)
	2005	1.11	4.4	4.1	0	3.9 (03/22)	3.0 (12/21)
Klamath Falls	2000	1.23	6.7	6.7	0	4.6 (12/07)	4.5 (12/06)
2306 Hope St (KFH)	2001	0.92	6.3	5.9	0	3.9 (01/05)	3.5 (01/04)
DEQ # 10119 EPA # 410350006	2002	1.05	7.5	6.3	0	5.2 (10/22)	3.9 (12/03)
	2003	0.88	4.9	4.8	0	3.2 (01/24)	2.9 (12/03)
	2004	0.79	4.9	4.7	0	3.3 (12/03)	3.0 (12/16)

*Parts per million
**Non-overlapping 8-hour averages which exceed 9 ppm when rounded to nearest whole ppm.

APPENDIX 1C
Carbon Monoxide Summary (ppm)

STATION LOCATION AND NUMBER	YEAR	Oct-Apr Average	1-HOUR AVERAGES		TIMES** >9ppm	8-HOUR AVERAGES	
			MAXIMUM	2ND HIGH		MAXIMUM (date)	2ND HIGHEST (date)
Medford	2000	1.65	24.8	18.8	1	9.9 (06/17)	4.0 (01/07)
Brophy Building (MBB)	2001	1.53	9.9	8.3	0	4.3 (01/03)	4.0 (01/05)
10 N Central	2002	1.45	8.5	8.3	0	4.4 (12/06)	4.1 (11/27)
DEQ # 10111 EPA # 410290009	2003	1.41	8.8	6.1	0	4.1 (01/10)	4.0 (01/08)
	2004	1.27	7.5	6.1	0	3.2 (12/04)	3.1 (01/22)
Rogue Valley Mall (MRM)	2000	1.57	8.4	8.2	0	4.8 (12/26)	4.7 (12/28)
1502 N Riverside	2001	1.34	8.6	7.3	0	4.8 (01/05)	4.6 (11/09)
DEQ # 10112 EPA # 410290018	2002	1.41	8.9	8.7	0	5.9 (11/27)	5.5 (11/20)
	2003	1.29	7.0	6.4	0	5.0 (01/19)	4.7 (01/08)
	2004	1.25	6.1	5.6	0	4.0 (12/19)	4.0 (01/12)
	2005	1.14	6.4	6.2	0	4.4 (12/16)	3.8 (11/18)
	2006	0.94	4.7	4.7	0	2.9 (01/06)	2.8 (01/25)
	2007	0.85	4.7	4.1	0	3.1 (02/06)	2.7 (01/19)
	2008	0.74	3.6	3.5	0	2.6 (01/18)	2.4 (12/06)
	2009	0.67	3.7	3.4	0	2.4 (12/11)	2.4 (01/18)
Portland							
4th & Alder (PFA)	2000	1.14	9.3	8.4	0	5.4 (11/17)	4.0 (04/11)
DEQ # 10137 EPA # 410510078	2001	1.04	6.3	5.9	0	3.6 (08/09)	3.5 (05/31)
SE Lafayette (SEL)	2000	0.59	6.3	5.0	0	4.1 (02/08)	3.8 (11/02)
SE Lafayette at 58th	2001	0.65	3.9	3.9	0	3.3 (02/13)	3.2 (03/01)
DEQ # 10139 EPA # 410510080	2002	0.68	6.1	4.4	0	3.1 (11/15)	2.9 (11/14)
	2003	0.65	3.7	3.6	0	3.4 (03/30)	3.1 (03/02)
	2004	0.64	4.9	4.7	0	4.0 (11/08)	3.7 (11/06)
	2005	0.60	3.2	3.1	0	2.6 (11/08)	2.5 (03/08)
	2006	0.47	3.8	3.4	0	2.9 (02/16)	2.7 (02/20)
	2007	0.46	4.1	3.5	0	3.1 (01/25)	2.7 (02/03)
	2008	0.44	3.4	3.3	0	3.1 (12/06)	2.4 (11/18)
	2009	0.39	3.2	3.1	0	2.5 (11/26)	2.3 (11/03)

*Parts per million
**Non-overlapping 8-hour averages which exceed 9 ppm when rounded to nearest whole ppm.

APPENDIX 1C
Carbon Monoxide Summary (ppm)

STATION LOCATION AND NUMBER	YEAR	Oct-Apr Average	1-HOUR AVERAGES		TIMES** >9ppm	8-HOUR AVERAGES	
			MAXIMUM	2ND HIGH		MAXIMUM (date)	2ND HIGHEST (date)
Portland	2000	1.43	6.3	6.0	0	3.7 (02/18)	3.6 (01/25)
Old Postal Bldg (PPB)	2001	1.21	5.4	4.9	0	3.4 (02/01)	3.4 (02/14)
510 SW 3rd	2002	1.09	7.1	5.1	0	3.4 (10/17)	3.1 (10/27)
DEQ # 10141 EPA # 410510087	2003	1.10	5.1	5.0	0	3.4 (12/05)	3.3 (09/03)
	2004	0.97	14.4	8.6	0	3.8 (03/17)	3.2 (03/08)
	2005	0.82	4.5	4.1	0	2.7 (02/03)	2.3 (12/21)
	2006	0.85	10.6	9.4	0	3.6 (10/11)	3.4 (07/10)
	2007	0.82	4.1	3.7	0	2.9 (08/29)	2.5 (01/23)
	2008	0.62	7.2	2.9	0	2.2 (12/06)	2.0 (11/17)
	2009	0.65	4.4	4.1	0	3.0 (02/02)	2.0 (11/26)
82nd & Division (PED)	2000	1.34	6.2	5.6	0	5.3 (11/12)	4.4 (01/06)
DEQ# 10142 EPA# 410510243	2001	1.19	6.0	5.3	0	4.2 (03/01)	3.9 (02/28)
	2002	1.20	7.1	5.4	0	4.5 (11/15)	4.5 (11/14)
	2003	1.10	5.9	5.2	0	4.0 (02/04)	4.0 (03/29)
	2004	1.02	5.3	5.1	0	4.5 (11/08)	3.9 (11/06)
	2005	0.97	4.5	4.5	0	3.2 (02/03)	3.1 (03/09)
Salem	2000	1.41	8.5	8.4	0	5.5 (11/16)	5.4 (01/18)
Market & Lancaster (SML)	2001	1.19	7.5	7.2	0	6.0 (11/09)	5.1 (11/10)
1685 Lancaster NE	2002	1.18	7.6	7.3	0	5.6 (11/26)	5.2 (11/03)
DEQ# 10131 EPA# 410470039	2003	0.94	7.1	6.9	0	5.2 (01/07)	4.9 (01/07)*
*AM and PM on same day but	2004	1.00	5.6	5.4	0	4.2 (11/06)	3.8 (11/05)
not same 8 hr average.	2005	0.97	7.5	6.1	0	4.9 (11/06)	3.7 (11/23)

*Parts per million
**Non-overlapping 8-hour averages which exceed 9 ppm when rounded to nearest whole ppm.

APPENDIX 1D
Ozone Summary (ppm)

Ozone Data Summary

STATION LOCATION AND NUMBER	Year	SUMMER AVERAGE	1-HOUR MAXIMUM (date)	# OF DAYS >0.125 ppm	8-HOUR AVERAGE MAXIMUM	4TH HIGHEST 8-HOUR AVERAGE	# OF DAYS >Std**	3 YEAR AVG OF 4TH HIGH
Eugene Area	2000	0.018	0.056 (06/26)	0	0.050 (06/27)	0.047 (07/16)	0	0.058
Amazon Park (EAP)	2001	0.022	0.090 (08/09)	0	0.074 (08/09)	0.061 (05/26)	0	0.054
DEQ# 18524 EPA# 410390060	2002	0.023	0.092 (07/10)	0	0.070 (08/13)	0.067 (08/12)	0	0.058
	2003	0.023	0.088 (06/05)	0	0.076 (06/05)	0.071 (07/29)	0	0.066
	2004	0.021	0.082 (07/23)	0	0.069 (07/23)	0.064 (08/13)	0	0.067
	2005	0.020	0.092 (07/27)	0	0.077 (07/27)	0.064 (07/18)	0	0.066
	2006	0.024	0.098 (06/25)	0	0.084 (06/26)	0.076 (07/21)	0	0.068
	2007	0.022	0.092 (07/10)	0	0.079 (07/10)	0.059 (08/01)	0	0.066
	2008	0.022	0.081 (08/16)	0	0.067 (07/12)	0.059 (07/08)	0	0.064
	2009	0.022	0.086 (08/19)	0	0.068 (07/28)	0.063 (07/29)	0	0.060
Saginaw (SAG)	2000	0.022	0.084 (06/20)	0	0.072 (06/28)	0.064 (08/08)	0	0.068
79980 Delight Valley	2001	0.021	0.086 (08/09)	0	0.075 (08/09)	0.066 (07/09)	0	0.070
School Road	2002	0.022	0.079 (07/09)	0	0.074 (08/13)	0.065 (07/10)	0	0.066
DEQ# 18315 EPA# 410391007	2003	0.025	0.098 (09/02)	0	0.084 (07/30)	0.079 (07/28)	0	0.065
	2004	0.020	0.085 (07/23)	0	0.076 (07/23)	0.068 (08/13)	0	0.070
	2005	0.020	0.099 (07/27)	0	0.084 (07/27)	0.071 (07/18)	0	0.070
	2006	0.022	0.099 (07/21)	0	0.074 (06/26)	0.070 (08/19)	0	0.072
	2007	0.020	0.083 (08/29)	0	0.064 (05/31)	0.060 (05/30)	0	0.069
	2008	0.022	0.080 (08/14)	0	0.068 (07/14)	0.059 (08/16)	0	0.063
	2009	0.022	0.091 (08/19)	0	0.067 (07/02)	0.066 (08/19)	0	0.061
Bend Road Dept. (BRD) DEQ# 31007 EPA# 410170121 *Forest Fire Impact	2009	0.034	0.075(09/28)*	0	0.064 (09/28)*	0.060 (07/22)	0	-

*Parts per million
**The 8 hr standard is the 3-year average of the 4th highest value.
Standard dropped from 0.085 to 0.075 in 2008.

APPENDIX 1D
Ozone Summary (ppm)

STATION LOCATION AND NUMBER	Year	SUMMER AVERAGE	1-HOUR MAXIMUM (date)	# OF DAYS >0.125 ppm	8-HOUR AVERAGE MAXIMUM	4TH HIGHEST 8-HOUR AVERAGE	# OF DAYS >Std**	3 YEAR AVG OF 4TH HIGH
Hermiston								
Municipal Airport (HMA)	2007*	0.031	0.082 (04/05)	0	0.069 (06/02)	0.066 (06/03)	0	-
DEQ # 31000 EPA # 410591003	2008	0.028	0.081 (07/01)	0	0.074 (07/01)	0.064 (08/08)	0	-
* Operated Feb thru Dec	2009	0.030	0.073 (07/31)	0	0.064 (08/01)	0.061 (07/03)	0	0.063
Medford Area	2000	0.034	0.080 (08/03)	0	0.070 (08/03)	0.067 (06/29)	0	0.072
Talent (TAL)	2001	0.033	0.090 (07/03)	0	0.076 (07/03)	0.064 (09/22)	0	0.065
7112 Rapp Lane	2002	0.035	0.102 (08/14)	0	0.083 (08/15)	0.076 (07/31)	0	0.069
DEQ# 10109 EPA# 410290201	2003	0.037	0.095 (06/06)	0	0.079 (09/02)	0.072 (06/04)	0	0.070
	2004	0.033	0.095 (08/13)	0	0.076 (08/13)	0.069 (08/11)	0	0.072
	2005	0.033	0.097 (07/27)	0	0.076 (07/27)	0.068 (08/04)	0	0.070
	2006	0.036	0.100 (06/26)	0	0.079 (07/20)	0.068 (07/26)	0	0.068
	2007	0.031	0.083 (07/10)	0	0.067 (08/01)	0.066 (08/02)	0	0.067
	2008	0.034	0.094 (08/15)	0	0.076 (08/15)	0.070 (07/08)	1	0.068
	2009	0.034	0.084 (08/19)	0	0.067 (07/29)	0.065 (08/26)	0	0.067
Salem Area	2000	0.020	0.075 (07/30)	0	0.064 (07/30)	0.059 (06/26)	0	0.067
Cascade Jr High (CJH)	2001	0.021	0.087 (08/09)	0	0.068 (07/03)	0.057 (08/12)	0	0.060
10226 Marion Rd. SE	2002	0.023	0.097 (07/10)	0	0.072 (07/12)	0.063 (08/13)	0	0.059
Turner	2003	0.028	0.096 (09/04)	0	0.080 (09/03)	0.072 (07/30)	0	0.064
DEQ# 10130 EPA# 410470004	2004	0.021	0.086 (08/11)	0	0.068 (08/11)	0.062 (07/24)	0	0.065
	2005	0.023	0.100 (08/04)	0	0.080 (08/04)	0.063 (05/27)	0	0.065
	2006	0.027	0.101 (07/21)	0	0.087 (07/21)	0.075 (06/25)	1	0.066
	2007	0.023	0.074 (09/11)	0	0.066 (07/10)	0.057 (06/02)	0	0.065
	2008	0.023	0.116 (08/15)	0	0.085 (08/15)	0.066 (08/05)	2	0.066
	2009	0.025	0.091 (07/29)	0	0.082 (07/29)	0.069 (07/03)	1	0.064

*Parts per million

**The 8 hr standard is the 3-year average of the 4th highest value.
Standard dropped from 0.085 to 0.075 in 2008.

APPENDIX 1D
Ozone Summary (ppm)

STATION LOCATION AND NUMBER	Year	SUMMER AVERAGE	1-HOUR MAXIMUM (date)	# OF DAYS >0.125 ppm	8-HOUR AVERAGE MAXIMUM	4TH HIGHEST 8-HOUR AVERAGE	# OF DAYS >Std**	3 YEAR AVG OF 4TH HIGH
Portland Area	2000	0.025	0.086 (06/28)	0	0.071 (06/03)	0.065 (07/30)	0	0.072
Carus (SPR)	2001	0.025	0.099 (08/09)	0	0.080 (08/09)	0.069 (06/20)	0	0.068
13575 Spangler Road	2002	0.025	0.101 (07/22)	0	0.085 (07/10)	0.063 (07/21)	1	0.065
Canby	2003	0.029	0.097 (07/29)	0	0.084 (09/03)	0.075 (07/28)	0	0.069
DEQ# 10093 EPA# 410050004	2004	0.025	0.105 (07/24)	0	0.084 (07/24)	0.067 (08/11)	0	0.068
	2005	0.025	0.093 (08/04)	0	0.079 (08/04)	0.064 (07/27)	0	0.068
	2006	0.029	0.127 (07/21)	1	0.106 (07/21)	0.072 (06/26)	1	0.067
	2007	0.024	0.082 (05/30)	0	0.070 (05/30)	0.058 (06/02)	0	0.064
	2008	0.027	0.107 (08/15)	0	0.084 (08/15)	0.066 (06/30)	3	0.065
	2009	0.029	0.090 (07/31)	0	0.080 (08/19)	0.069 (09/12)	0	0.064
Milwaukie	2000	0.018	0.085 (06/04)	0	0.068 (06/04)	0.056 (08/23)	0	0.056
St. Johns Church **(MSJ)**	2001	0.018	0.082 (08/10)	0	0.066 (08/10)	0.059 (08/12)	0	0.055
DEQ# 23306 EPA# 410052002	2002	0.020	0.116 (07/22)	0	0.082 (07/22)	0.063 (08/13)	0	0.059
Site moved to Sherwood in 2008	2003	0.021	0.091 (06/07)	0	0.068 (06/06)	0.061 (07/28)	0	0.061
	2004	0.017	0.094 (07/24)	0	0.077 (07/24)	0.054 (08/15)	0	0.059
	2005	0.016	0.083 (05/27)	0	0.063 (05/27)	0.050 (08/14)	0	0.055
	2006	0.022	0.091 (07/21)	0	0.071 (06/26)	0.068 (06/25)	0	0.057
	2007	0.020	0.102 (07/11)	0	0.062 (07/11)	0.056 (05/30)	0	0.058
Sherwood (SLR)								
DEQ#31009 EPA#410671004	2008*	-	0.087 (08/16)	0	0.073 (08/16)*	0.053(08/23)*	0	-
*Site started Aug 2008	2009	0.25	0.088 (08/19)	0	0.069 (08/19)	0.065 (07/29)	0	-

*Parts per million
**The 8 hr standard is the 3-year average of the 4th highest value.
Standard dropped from 0.085 to 0.075 in 2008.

APPENDIX 1D
Ozone Summary (ppm)

STATION LOCATION AND NUMBER	Year	SUMMER AVERAGE	1-HOUR MAXIMUM (date)	# OF DAYS >0.125 ppm	8-HOUR AVERAGE MAXIMUM	4TH HIGHEST 8-HOUR AVERAGE	# OF DAYS >Std**	3 YEAR AVG OF 4TH HIGH
SE Lafayette	2003	*	0.098 (07/10)	0	0.068 (07/29)	0.060 (08/14)	0	-
SE Lafayette at 58th **(SEL)**	2004	0.020	0.087 (08/09)	0	0.072 (07/24)	0.056 (08/15)	0	-
DEQ# 10139 EPA# 410510080	2005	0.017	0.084 (05/27)	0	0.062 (05/27)	0.051 (07/21)	0	0.055
* Sampling started 07/03	2006	0.023	0.098 (07/21)	0	0.079 (07/21)	0.064 (06/25)	0	0.057
	2007	0.021	0.096 (07/11)	0	0.060 (07/11)	0.056 (07/10)	0	0.057
	2008	0.021	0.083 (08/15)	0	0.072 (08/15)	0.060 (08/05)	0	0.060
	2009	0.023	0.105 (08/19)	0	0.080 (08/19)	0.061 (07/02)	0	0.059
Sauvie Island	2000	0.022	0.080 (06/04)	0	0.066 (06/27)	0.054 (06/03)	0	0.056
Social Security Beach **(SIS)**	2001	0.025	0.089 (08/10)	0	0.068 (08/10)	0.056 (05/10)	0	0.053
DEQ# 14152 EPA# 410090004	2002	0.025	0.084 (07/10)	0	0.067 (08/13)	0.061 (06/12)	0	0.057
	2003	0.025	0.088 (09/03)	0	0.073 (09/03)	0.069 (07/28)	0	0.062
	2004	0.023	0.074 (07/24)	0	0.061 (07/23)	0.058 (07/22)	0	0.062
	2005	0.023	0.080 (08/04)	0	0.065 (08/04)	0.055 (08/14)	0	0.060
	2006	0.025	0.089 (07/21)	0	0.075 (07/21)	0.063 (06/25)	0	0.058
	2007	0.022	0.086 (07/11)	0	0.064 (07/10)	0.056 (05/30)	0	0.058
	2008	0.022	0.080 (08/15)	0	0.065 (08/15)	0.059 (06/28)	0	0.059
	2009	0.027	0.094 (08/19)	0	0.072 (08/19)	0.060 (07/27)	0	0.058
Mt. Hood Wilderness								
DEQ # 10094 EPA # 410050102	2005	0.034	0.085 (08/04)	0	0.077 (08/05)	0.063 (08/26)	0	-
Mt. Jefferson Wilderness	2001	0.034	0.068 (08/10)	0	0.061 (07/04)	0.057 (08/14)	0	-
DEQ # 10125 EPA # 410430103	2002	0.035	0.082 (07/21)	0	0.068 (08/15)	0.067 (08/14)	0	-

*Parts per million
**The 8 hr standard is the 3-year average of the 4th highest value.
Standard dropped from 0.085 to 0.075 in 2008.

APPENDIX 1E
Oxides of Nitrogen Summary (ppm)

Oxides of Nitrogen Data Summary

STATION LOCATION AND NUMBER	YEAR	VALID DAYS	ANNUAL ARITHMETIC MEAN	MAXIMUM 1 HOUR AVERAGE	98th PERCENTILE OF DAILY MAXIMUM
NITROGEN DIOXIDE					
Portland					
SE Lafayette at 58th	2000[a]	-	-	0.067 (06/03)	-
(SEL)	2001[a]	-	-	0.052 (05/31)	-
DEQ # 10139	2002[a]	-	-	0.046 (05/24)	-
EPA # 410510080	2003[a]	-	-	0.061 (09/02)	-
	2004[a]	-	-	0.040 (06/16)	-
	2005[a]	-	-	0.057 (08/25)	-
	2006[a]	-	-	0.060 (09/02)	-
*New 2010 NAAQS	2007[a]	-	-	0.053 (08/29)	-
98th Percentile >0.1ppm	2008	-	0.011	0.062 (09/16)	-
	2009	344	0.010	0.055 (08/19)	0.040 (03/06)*
Hermiston					
Municipal Airport(HMA)	2007[a]		0.008[b]	0.047 (09/01)	
DEQ # 31000					
EPA # 410591003					
NITRIC OXIDE					
Portland					
SE Lafayette at 58th	2000[a]	-	-	0.232 (09/27)	-
(SEL)	2001[a]	-	-	0.165 (09/28)	-
DEQ # 10139	2002[a]	-	-	0.165 (09/18)	-
EPA # 410510080	2003[a]	-	-	0.116 (05/01)	-
	2004[a]	-	-	0.134 (09/10)	-
	2005[a]	-	-	0.125 (09/22)	-
	2006[a]	-	-	0.212 (09/28)	-
	2007[a]	-	-	0.229 (12/13)	-
	2008	-	0.010	0.235 (01/16)	-
	2009	344	0.009	0.234 (01/10)	0.194 (11/27)
Hermiston					
Municipal Airport(HMA)	2007[a]		0.011[b]	0.100 (11/02)	
DEQ # 31000					
EPA # 410591003					

*Parts per million

a Summer data only

b Annual average from Mar 2007 to Feb 2008

APPENDIX 1F
Sulfur Dioxide Summary (ppm)

Sulfur Dioxide Data Summary

STATION LOCATION AND NUMBER	YEAR	NUMBER of DAYS	3 HOUR AVER. MAXIMUM	24 HOUR AVER. MAXIMUM	ANNUAL AVERAGE
SULFUR DIOXIDE					
Portland					
SE Lafayette at 58th	2005	317	0.018	0.007	*
(SEL)	2006	363	0.016	0.008	0.0015
DEQ # 10139	2007	365	0.010	0.005	0.0013
EPA # 410510080	2008	330	0.007	0.004	0.0010
*Started 2/05	2009	363	0.010	0.004	0.0016
Toledo					
Sewage Treatment Plant	2004	140	0.029*	0.012*	0.002
DEQ # 30937					
*Sampled from 1/1/05 to 5/19/05					
TOTAL REDUCED SULFUR					
Toledo					
Sewage Treatment Plant	2004	182	0.165*	0.054*	0.006
DEQ # 30937					
*Sampled from 7/3/05 to 12/31/05					
Hermiston					
Municipal Airport (HMA)	2007/08	364	0.007	0.002	0.001
DEQ # 31000 EPA#410591003					
*Sampled from Mar 07 to Feb 08					

ppm = Parts per million

Light Scattering Data Summary

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Albany	2004	*	7.1 (11/20)	2.7 (11/11)
Calapooia School (ACS)	2005	0.66	8.3 (12/13)	4.0 (12/11)
830 SE 24th	2006	0.58	12.1 (05/20)	2.0 (02/06)
DEQ# 21886 EPA# 410430009	2007	0.63	6.5 (11/23)	2.9 (01/15)
*Started 05/04	2008	0.59	6.3 (01/23)	2.1 (12/06)
	2009	0.62	8.9 (07/04)	2.9 (12/10)
Applegate Valley	2000	0.51	3.4 (12/01)	2.0 (11/19)
Provolt Seed Orchard (PSO)	2001	0.51	6.0 (11/11)	3.1 (11/11)
DEQ# 18432 EPA# 410330011	2002	0.60	16.6 (08/05)	4.2 (08/05)
	2003	0.55	8.4 (07/22)	3.1 (09/28)
	2004	0.50	3.3 (10/28)	1.5 (11/10)
	2005	0.51	6.6 (08/26)	2.0 (08/26)
	2006	0.47	5.3 (07/02)	1.5 (11/12)
	2007	0.44	3.8 (11/27)	1.5 (10/29)
	2008	0.53	7.4 (06/29)	4.4 (08/17)
	2009	0.51	7.6 (12/11)	3.3 (12/12)
Bend				
Kenwood School (BKS)	2000	0.52	4.9 (07/04)	2.3 (11/16)
701 NW Newport	2001	0.46	4.6 (11/18)	3.5 (01/06)
DEQ# 10097 EPA# 410170003	2002	*	5.0 (01/01)	1.6 (01/01)
Pump Station	2002	*	4.2 (11/03)	1.2 (11/27)
Portland Ave (BPS)	2003	0.52	10.2 (06/29)	2.2 (08/24)
DEQ# 24172 EPA# 410170120	2004	0.44	6.9 (04/11)	1.6 (11/10)
*Site moved in 2002	2005	0.51	6.5 (10/18)	2.0 (11/08)
	2006	0.51	9.1 (07/28)	1.9 (09/03)
	2007	0.44	8.0 (09/02)	1.7 (09/03)
	2008	0.46	4.9 (08/18)	2.5 (07/02)
	2009	0.45	12.8 (09/28)	2.7 (09/28)
Baker City	2000	0.60	6.0 (01/02)	2.1 (08/17)
US Forest Service (BCT)	2001	0.64	7.1 (02/19)	2.7 (02/03)
10th Street	2002	0.67	6.1 (07/13)	2.4 (12/04)
DEQ #10088 EPA# 410010003	2003	0.82	7.2 (11/09)	2.9 (11/09)
	2004	0.64	7.2 (11/09)	2.9 (11/09)
	2005	0.61	7.6 (10/19)	3.2 (10/25)
US Forest Service (BFS)	2006	0.59	5.4 (11/17)	2.4 (09/07)
3285 11th St	2007	0.60	4.6 (11/23)	1.7 (01/08)
DEQ #32758 EPA# 410010004	2008	0.65	6.1 (11/07)	2.4 (11/07)
	2009	0.60	4.9 (01/05)	2.0 (01/23)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

STATION LOCATION AND NUMBERS	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Burns	2000*	0.95	9.2 (01/01)	2.5 (01/05)
E Madison St. (BMS)	2001*	0.81	8.1 (01/27)	2.6 (12/28)
DEQ# 10105 EPA# 410250002	2002	0.70	10.4 (07/18)	4.2 (17/17)
*Oct - March	2003	0.57	8.7 (11/13)	2.1 (12/02)
	2004	0.55	21.9 (05/02)	3.9 (05/02)
	2005	0.66	6.9 (12/24)	2.6 (12/21)
	2006	0.69	14.3 (10/13)	4.0 (10/13)
	2007	0.70	22.8 (07/12)	5.1 (07/12)
	2008	0.78	11.7 (11/18)	3.8 (01/18)
	2009	0.66	7.8 (11/05)	2.2 (11/26)
Union High School				
DEQ# 10105 EPA# 410250002	2000*	0.34	5.1 (08/06)	1.4 (08/29)
*April - Sept	2001*	0.36	4.3 (08/14)	1.6 (08/14)
Canby	2000	0.48	3.4 (10/24)	1.7 (11/19)
Carus (SPR)	2001	0.47	5.3 (08/21)	1.9 (11/11)
13575 Spangler Rd	2002	0.45	4.1 (11/15)	2.3 (11/15)
DEQ# 10093 EPA# 410050004	2003	0.47	3.6 (02/14)	1.6 (09/03)
	2004	0.48	5.3 (05/11)	2.5 (11/07)
+Jan through Oct only	2005+	-	2.1 (10/12)	1.7 (02/26)
* Summer only	2006*	-	1.7 (09/01)	0.9 (09/02)
	2007*	-	1.4 (07/04)	0.5 (07/11)
	2008*	-	1.5 (07/01)	1.1 (07/01)
	2009*	-	1.5 (08/06)	1.2 (08/08)
Cave Junction-Illinois Valley	2000	0.43	12.7 (11/01)	3.8 (11/01)
Illinois Valley Airport (IVA)	2001	0.44	3.8 (11/05)	1.7 (11/11)
DEQ# 21068 EPA# 410330010	2002	0.78	39.7 (08/03)	1.8 (12/01)
	2003	0.45	7.3 (09/27)	3.3 (09/28)
	2004	0.45	9.9 (11/05)	2.1 (11/23)
	2005	0.49	5.2 (12/11)	2.2 (12/11)
	2006	0.44	5.4 (12/06)	2.3 (12/06)
	2007	0.41	4.5 (01/24)	1.2 (01/24)
	2008	0.51	11.0 (08/17)	4.8 (06/29)
	2009	0.43	6.5 (10/11)	2.2 (09/26)
Corvallis	2004	0.43	7.3 (07/04)	2.1 (11/11)
Intermediate School (CCB)	2005	0.49	5.2 (12/11)	2.2 (12/11)
DEQ# 20478 EPA# 410030013	2006	0.47	6.2 (08/25)	1.8 (12/05)
	2007	0.52	4.5 (11/25)	2.3 (02/05)
	2008	0.50	3.8 (06/30)	1.8 (06/30)
	2009	0.52	4.1 (07/04)	1.9 (12/12)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Cottage Grove CityShops**(CGC)**	2008	0.58	6.6 (06/16)	2.4 (01/23)
DEQ# 31004 EPA# 410399004	2009	0.63	9.5 (08/03)	2.4 (12/11)
Cove - City Hall (CCH)	2008	0.55	11.9 (11/30)	1.8 (11/24)
DEQ# 31003 EPA# 410610120	2009	0.52	10.3 (01/11)	1.4 (10/09)
Crater Lake (CLM)	2006	*	36.2 (08/21)	8.4 (08/23)
DEQ# 25634 EPA# 410351002	2007	*	3.5 (07/15)	1.4 (07/15)
	2008	*	13.0 (09/23)	2.4 (09/23)
*** Summer only**	2009	*	27.0 (09/24)	10.3 (09/24)
Eagle Cap Wilderness (MTF)	2007	*	3.2 (07/15)	1.7 (09/15)
Mt. Fanny	2008	*	2.9 (09/26)	1.0 (0819)
DEQ# 31002 EPA# 410610121	2009	*	2.8 (08/04)	0.9 (09/25)
Enterprise	2000	0.55	12.7 (08/29)	4.3 (08/29)
Forest Service Station (EFS)	2001	0.51	4.5 (02/18)	2.1 (01/24)
DEQ# 10162 EPA# 410630001	2002	0.53	5.1 (09/23)	1.6 (10/26)
⋆Started 03/99	2003	0.48	3.5 (01/05)	1.5 (11/15)
	2004	0.49	4.6 (01/14)	1.7 (01/14)
	2005	0.51	4.4 (12/12)	2.2 (12/12)
	2006	0.50	6.9 (10/30)	2.9 (09/08)
	2007	0.52	7.5 (07/16)	3.2 (07/17)
	2008	0.50	3.7 (01/01)	1.7 (01/23)
	2009	0.50	3.7 (03/13)	1.5 (11/04)
Eugene	2000	0.49	3.2 (11/18)	2.0 (11/19)
Lane Comm College (LCC)	2001	0.47	2.9 (11/11)	2.0 (11/11)
1059 Willamette	2002	0.47	5.8 (08/19)	1.5 (11/29)
DEQ# 18320 EPA# 410390013	2003	0.48	2.9 (09/02)	1.5 (09/03)
	2004	0.45	2.2 (02/11)	1.8 (11/07)
	2005	0.45	2.3 (01/02)	1.4 (01/16)
	2006	0.43	3.0 (12/03)	1.6 (12/08)
	2007	0.42	2.9 (11/23)	1.8 (02/05)
	2008	0.46	3.1 (06/30)	2.1 (06/29)
	2009	0.52	5.0 (09/23)	2.4 (12/11)
Amazon Park (EAP)	2001	0.55	4.4 (11/08)	2.2 (11/10)
499 E 29th	2002	0.56	5.8 (08/19)	2.3 (11/28)
DEQ# 18524 EPA # 410390060	2003	0.51	4.3 (01/12)	1.8 (09/03)
	2004	0.49	3.2 (01/12)	2.1 (11/07)
	2005	0.55	6.4 (07/04)	2.6 (12/11)
	2006	0.49	4.2 (01/25)	1.9 (12/03)
	2007	0.48	4.0 (01/01)	2.2 (11/24)
	2008	0.52	4.5 (12/17)	2.4 (06/29)
	2009	0.56	5.3 (09/23)	3.0 (12/11)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

APPENDIX 1G
Light Scattering (BScat)

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Florence				
Department of Forestry (FDF)	2008	-	9.7 (10/26)	1.4 (10/25)
DEQ# 31017 EPA# 410390100	2009	0.4*	2.4 (09/13)	1.1 (08/06)
*Oct 08 to Sep 09 Average				
Grants Pass				
Sewage Treatment Plant (GPS)	2000	0.71	6.6 (11/21)	3.5 (11/12)
1200 SW Greenwood	2001	0.75	10.3 (11/11)	6.7 (11/11)
DEQ# 18508 EPA# 410330107	2002	*	8.7 (02/06)	3.3 (02/06)
Parkside School (GPP)	2002[a]	0.76*	11.6 (07/31)	3.3 (11/14)
DEQ# 28859 EPA # 410330114	2003	0.70	10.6 (07/22)	5.3 (09/28)
	2004	0.55	4.7 (04/11)	2.6 (11/10)
** GPS&GPP avg together –*	2005	0.61	4.7 (01/05)	1.9 (02/12)
Started 7/02	2006	0.71	6.8 (11/14)	2.5 (11/19)
	2007	0.68	4.6 (01/27)	2.3 (11/25)
	2008	0.73	8.3 (05/11)	3.1 (08/17)
	2009	0.71	16.5 (07/04)	2.7 (12/12)
Hermiston				
Municipal Airport (HMA)	2007	0.45	4.6 (09/01)	1.5 (10/29)
DEQ# 31000 EPA# 410591003				
John Day	2004	0.64	6.7 (02/22)	2.8 (12/22)
Blue Mtn. School (JBM)	2005	0.60	9.5 (01/12)	2.5 (12/13)
DEQ# 10103 EPA# 410230001	2006	0.59	8.6 (11/28)	2.1 (12/17)
	2007	0.63	20.5 (03/03)	5.4 (07/16)
	2008	0.62	14.8 (04/08)	2.4 (04/09)
	2009	0.66	11.3 (01/11)	2.6 (01/21)
Klamath Falls	2000	0.60	7.4 (11/17)	2.9 (12/07)
Petersen School (KFP)	2001	0.51	6.5 (12/12)	2.3 (12/12)
4856 Clinton St	2002[a]	1.20	32.8 (08/01)	13.4 (08/02)
DEQ# 10118 EPA# 410350004	2003	0.64	7.3 (1/19)	2.9 (11/23)
	2004	0.53	5.5 (01/03)	4.1 (12/03)
	2005	0.72	11.1 (07/29)	3.1 (01/12)
	2006	0.78	9.3 (12/02)	3.6 (10/28)
	2007	0.83	12.0 (12/22)	3.4 (12/21)
	2008	0.91	13.0 (10/30)	4.1 (01/18)
	2009	0.73	18.0 (09/25)	5.8 (09/24)
Klamath Falls Background (KFB)				
Stateline Road	2009	0.33	3.4 (08/04)	1.1 (08/04)
DEQ# 3 EPA# 41035				

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
[a] Forest Fire Smoke Impact

APPENDIX 1G
Light Scattering (BScat)

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
La Grande	2000	0.52	14.5 (08/16)	2.7 (08/16)
3rd and I Street (LTI)	2001	0.50	3.4 (01/30)	2.1 (01/06)
DEQ# 21638 EPA# 410610117	2002	0.53	5.5 (07/26)	2.7 (12/05)
	2003	0.52	3.6 (11/05)	2.1 (11/06)
Ash Street (LAS)	2003	⋆	3.3 (12/10)	1.3 (12/11)
DEQ# 26448 EPA# 410610119	2004	0.51	4.1 (10/26)	2.4 (11/10)
⋆ Moved from LTI to LAS 12/03	2005	0.62	14.0 (08/12)	3.5 (08/12)
* Prescribed burn near La Grande	2006	0.69	19.0 (09/27)*	6.7 (09/27)*
	2007	0.50	13.9 (01/19)	1.9 (12/23)
	2008	0.52	9.0 (12/05)	1.6 (12/05)
	2009	0.57	10.6 (02/03)	2.0 (12/12)
Lakeview	2000	0.73	7.9 (12/30)	3.3 (12/04)
Center & M St (LCM)	2001	0.53	6.1 (12/08)	2.4 (12/08)
DEQ# 10123 EPA# 410370001	2002[⚑]	0.73	14.0 (08/02)	6.1 (07/31)
	2003	0.51	8.9 (12/18)	2.5 (12/18)
	2004	0.47	7.1 (01/17)	2.3 (01/12)
	2005	0.62	12.7 (12/15)	3.8 (12/15)
	2006	0.56	8.2 (12/06)	3.3 (12/05)
	2007	0.58	10.6 (01/24)	2.9 (01/23)
	2008	0.77	11.5 (12/10)	5.0 (01/18)
	2009	0.76	17.7 (01/15)	5.5 (01/15)
Lyons	2005	0.45*	5.4 (09/14)	1.5 (09/14)
Maryilynn School	2006	0.51*	4.2 (08/21)	1.4 (09/02)
DEQ# 10126	2007	0.43*	3.9 (08/30)	1.2 (08/30)
*Summer Only	2008	0.63*	3.9 (09/08)	1.8 (06/30)
	2009	0.53*	3.4 (09/02)	1.3 (08/06)
Madras				
Westside School (MWS)	2009	0.59	5.1 (12/10)	2.0 (02/02)
DEQ # 31006 EPA # 410310007				
Medford	2000	0.82	7.3 (07/12)	3.5 (12/09)
Grant & Belmont (MGB)	2001	0.75	5.4 (01/07)	2.7 (01/06)
DEQ # 20448 EPA # 410290133	2002[⚑]	1.01	29.7 (07/31)	5.1 (07/29)
	2003	0.77	12.7 (07/22)	2.8 (01/18)
	2004	0.62	4.1 (07/04)	2.7 (12/04)
	2005	0.72	6.2 (11/22)	3.5 (11/23)
	2006	0.68	5.2 (12/23)	3.0 (12/07)
	2007	0.71	11.3 (07/04)	2.4 (01/19)
	2008	0.76	11.7 (06/29)	4.2 (08/07)
	2009	0.73	8.1 (09/25)	4.9 (09/26)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
[⚑] Forest Fire Smoke Impact

APPENDIX 1G
Light Scattering (BScat)

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
McMinnville				
Newby School (MNS)	2009	0.47	4.1 (10/16)	2.2 (10/16)
DEQ # 31005 EPA # 410711002				
Mt. Hood	2006	*	26.5 (08/18)	4.0 (08/18)
Multopor (MUL)	2007	*	14.6 (08/11)	2.0 (08/11)
DEQ # 10094 EPA # 410050102	2008	*	1.7 (09/18)	0.7 (09/26)
*Summer Only	2009	*	2.5 (09/01)	0.8 (08/31)
Mt. Jefferson	2006	*	11.7 (07/31)	3.7 (07/31)
Big Lake (BIG)	2007	*	39.0 (09/03)	9.9 (09/03)
DEQ # 10125 EPA # 410430103	2008	*	4.4 (09/17)	1.2 (09/28)
*Summer Only	2009	*	5.1 (09/23)	1.9 (09/23)
Oakridge	2000	0.71	8.0 (01/31)	3.2 (01/29)
Willamette Center (OAK)	2001	0.78	8.9 (01/06)	4.4 (01/07)
Trailer Park	2002	0.81	10.7 (02/15)	3.7 (11/01)
DEQ # 18733 EPA # 410392013	2003	0.71	8.4 (07/25)	3.2 (01/11)
	2004	0.58	6.9 (01/13)	3.1 (02/12)
	2005	0.73	7.3 (02/16)	2.9 (12/15)
	2006	0.60	5.9 (02/11)	2.4 (12/08)
	2007	0.61	7.7 (01/28)	2.6 (01/28)
	2008	0.73	7.4 (12/04)	2.3 (06/30)
	2009	0.80	14.6 (09/23)	3.9 (01/18)
Pendleton	2000	0.82	5.5 (01/01)	2.4 (11/19)
McKay Creek (PMC)	2001	0.92	5.5 (11/04)	2.6 (11/27)
3745 SW Marshall	2002	0.92	5.8 (02/06)	2.4 (11/04)
DEQ # 10146 EPA # 410590121	2003	0.67	5.4 (11/09)	2.6 (11/09)
	2004	0.57	9.7 (07/04)	3.5 (11/10)
	2005	0.64	8.8 (07/04)	3.1 (12/11)
	2006	0.58	7.2 (07/04)	1.9 (09/03)
	2007	0.59	12.8 (10/26)	3.8 (10/26)
	2008	0.63	6.5 (12/07)	2.8 (11/24)
	2009	0.63	14.6 (07/04)	2.1 (12/14)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

APPENDIX 1G
Light Scattering (BScat)

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Portland				
Central Fire Station (CFS)	2000	0.60	3.1 (11/11)	2.1 (11/12)
55 SW Ash	2001	0.53	2.6 (02/01)	1.5 (12/07)
DEQ # 10136 EPA # 410510015				
Beaverton Highland Park (BHP)	2005	0.61	7.5 (07/04)	2.7 (12/13)
3745 SW Marshall Place	2006	0.56	5.6 (07/04)	2.8 (12/18)
DEQ# 20481 EPA # 410670111	2007	0.62	4.9 (02/03)	3.0 (02/03)
*Started 4/04	2008	0.61	14.0 (07/04)	2.7 (12/06)
	2009	0.56	6.0 (07/04)	2.3 (02/02)
Hillsboro (HHF)	2005	0.72	7.9 (12/14)	3.5 (12/12)
Hare Field – 1149 NE Grant St.	2006	0.64	8.3 (02/20)	3.4 (02/20)
DEQ# 31967 EPA # 410670004	2007	0.71	9.6 (01/01)	4.1 (11/25)
	2008	0.68	30.3 (07/04)	3.2 (12/06)
	2009	0.74	7.7 (01/15)	3.4 (12/10)
N.E.Portland (PNR)	2002	0.54	3.7 (07/04)	1.8 (11/15)
24 N Emerson (N. Roselawn)	2003	0.49	4.2 (08/15)	1.3 (10/01)
DEQ# 21889 EPA# 410510246	2004	0.56	3.4 (07/04)	2.3 (11/07)
	2005	0.62	4.2 (07/04)	2.4 (02/03)
	2006	0.52	4.7 (12/17)	2.4 (12/18)
	2007	0.57	3.3 (12/13)	2.2 (12/13)
	2008	0.56	6.9 (07/04)	2.2 (12/06)
	2009	0.57	4.1 (02/01)	2.5 (02/02)
SE Lafayette (SEL)	2000	0.64	9.8 (07/04)	3.3 (11/12)
5824 SE Lafayette	2001	0.58	5.1 (02/13)	2.0 (12/07)
DEQ # 10139 EPA # 410510080	2002	0.59	6.4 (11/15)	2.6 (11/15)
	2003	0.57	4.1 (11/03)	1.7 (11/03)
	2004	0.56	4.3 (10/24)	1.4 (10/28)
	2005	0.60	5.1 (01/23)	2.1 (01/24)
	2006	0.57	6.4 (10/28)	2.5 (02/20)
	2007	0.62	6.2 (01/01)	3.2 (02/03)
	2008	0.64	14.8 (07/04)	2.9 (12/06)
	2009	0.58	6.4 (05/16)	2.4 (02/02)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

APPENDIX 1G
Light Scattering (BScat)

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Sauvie Island (SIS)	2000 [a]	-	1.9 (08/04)	1.0 (08/04)
Social Security Beach	2001 [a]	-	1.8 (08/12)	1.2 (08/12)
DEQ # 14152 EPA # 410090004	2002 [a]	-	1.2 (07/23)	0.9 (08/13)
	2003 [a]	-	1.6 (09/30)	1.0 (09/03)
	2004 *		3.5 (09/23)	1.8 (11/22)
	2005**	-	2.4 (12/13)	1.8 (12/12)
*May Thru Dec monitoring only	2006	0.48	2.7 (12/18)	1.5 (02/21)
**No Feb thru Apr monitoring	2007	0.52	3.7 (12/14)	2.1 (01/17)
	2008	0.50	2.3 (07/05)	1.7 (01/17)
	2009	0.50	2.8 (12/13)	1.5 (12/13)
Prineville				
Davidson Park (PDP)	2009	0.69	9.0 (12/11)	3.0 (12/30)
DEQ # 31008 EPA # 410130100				
Sweet Home				
Fire Department (SFD)	2007	0.69	8.4 (05/06)	2.4 (02/05)
DEQ # 31001 EPA # 410432002	2008	0.74	10.0 (11/07)	2.6 (11/07)
	2009	0.83	13.6 (10/28)	4.4 (10/28)
Riddle				
1ST and Main St. (RFM)	2005	⋆	3.4 (12/16)	1.8 (11/09)
DEQ # 32590 EPA # 410190003	2006	⋆	3.8 (01/05)	1.6 (01/05)
⋆Operated 10/05 to 04/06				
Roseburg	2005	⋆	3.8 (09/26)	1.5 (11/09)
NW Garden Valley Blvd(RGV)	2006	0.55	4.4 (01/05)	2.1 (12/08)
DEQ # 32529 EPA # 410190002	2007	0.53	3.0 (01/30)	1.9 (02/03)
⋆Started 8/05	2008	0.56	4.4 (09/23)	2.3 (06/29)
	2009	0.53	8.6 (07/29)	2.3 (12/12)
Salem				
Market/Lancaster (SML)	2000	0.72	8.5 (11/18)	4.0 (11/16)
1685 Lancaster NE	2001	0.61	7.4 (11/08)	3.4 (11/10)
DEQ # 10131 EPA # 410470039				
General Hospital (SGH)				
867 Medical Center Dr	2002	0.62*	4.3 (11/06)	2.7 (11/06)
DEQ# 20480 EPA# 410470040	2003	0.54	3.3 (01/07)	1.8 (01/21)
*Started 05/02, Ended 11/04	2004	0.52	3.1 (01/09)	2.5 (11/07)
State Hospital (SSH)	2005	0.59	5.7 (12/11)	2.8 (10/27)
23rd NE and D St.	2006	0.53	5.1 (12/03)	2.1 (12/08)
DEQ# 31929 EPA# 410470041	2007	0.52	4.3 (10/16)	2.5 (02/04)
	2008	0.55	5.8 (10/28)	2.0 (12/06)
	2009	0.58	4.4 (12/05)	2.2 (12/05)

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

STATION LOCATION AND NUMBER	YEAR	ANNUAL AVERAGE	1-HOUR AVERAGES MAXIMUM (date)	24-HOUR AVERAGE MAXIMUM (date)
Ruch	1999	*	5.0 (11/16)	2.6 (10/04)
Fire Station (RAR)	2000	0.47	4.7 (12/14)	1.7 (11/17)
DEQ # 21067 EPA #	2001	0.47	9.1 (08/12)	2.0 (08/12)
*Started 6/99, Discontinued 7/05	2002	0.65	15.7 (08/05)	4.3 (08/05)
	2003	0.54	6.8 (02/24)	2.1 (01/16)
	2004	0.50	6.3 (03/17)	2.7 (03/17)
	2005	*	1.7 (02/03)	5.4 (02/03)
Shady Cove	2001	*	3.6 (08/14)	1.0 (12/10)
37 School House Lane (SCS)	2002	0.94	31.1 (08/01)	14.4 (08/01)
DEQ# 25161 EPA#410290019	2003	0.47	4.9 (11/19)	2.3 (11/19)
*Started 3/01	2004	0.55	15.9 (08/21)	4.3 (08/21)
*Jan thru March data invalid	2005*	-	4.5 (11/04)	1.2 (11/05)
	2006	0.47	5.3 (02/25)	2.3 (11/10)
	2007	0.47	7.8 (12/01)	2.7 (11/15)
	2008	0.57	6.2 (08/07)	3.5 (06/30)
	2009	0.53	12.5 (09/25)	7.6 (09/25)
Springfield	2000	0.53	3.5 (11/18)	2.0 (11/20)
City Hall (SCH)	2001	0.51	2.8 (11/11)	2.1 (11/11)
255 North 5th St	2002	0.51	3.5 (08/19)	1.5 (11/29)
DEQ # 18538 EPA # 410391009	2003	0.49	3.1 (09/02)	1.7 (09/03)
	2004	0.47	4.1 (09/09)	1.5 (11/10)
	2005	0.49	3.4 (12/09)	1.5 (01/16)
	2006	0.45	2.6 (12/16)	1.5 (12/08)
	2007	0.43	3.1 (02/05)	1.7 (02/05)
	2008	0.46	3.3 (06/30)	2.1 (06/29)
	2009	0.50	4.8 (09/23)	2.0 (12/12)
The Dalles	2004	*	3.8 (11/07)	2.8 (11/10)
Cherry Heights (TDC)	2005	0.53	3.0 (01/18)	2.3 (01/18)
1112 Cherry Heights Rd	2006	0.52	5.9 (11/03)	3.9 (11/04)
DEQ# 21252 EPA # 410650007	2007	0.56	3.3 (11/16)	2.1 (02/06)
*Started 6/04	2008	0.51	3.4 (01/27)	2.1 (01/26)
	2009	0.54	3.1 (08/30)	1.8 (02/06)
White City				
Post Office (WPO)	2005	0.67	5.0 (11/22)	2.0 (11/21)
751 Crater Lk Hwy	2006	0.62	5.1 (11/10)	3.1 (11/10)
DEQ# 10107 EPA# 410294001				

* Reported as Scattering Coefficient (ßscat)
[a] Seasonal data only
⚐ Forest Fire Smoke Impact

APPENDIX 1H
Air Toxics (ug/m^3)

Air Toxics Data Summary

Pollutant (µg/m3)		Acetaldehyde		Formaldehyde		Benzene		1,3-butadiene		Perchloroethylene		Arsenic[4]		Chromium (VI) TSP		Lead[4]		Nickel[4]	
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
Portland	99-00	**51**	**2.5**	**51**	**3.2**	**48**	**2.1**	29	<0.2	**49**	**<0.7**	56	<0.0025	--	--	*56*	*0.0194*	53	<0.0016
NE Portland (PNR)	2001	**60**	**2.1**	**60**	**2.6**	**59**	**1.5**	**59**	**<0.2**	**59**	**<0.7**	57	<0.001	--	--	**53**	**0.0098**	**57**	**<0.0008**
N Roselawn	2002	**62**	**1.9**	**62**	**2.8**	**61**	**1.6**	**61**	**<0.2**	**61**	**<0.7**	**61**	**<0.001**	**61**	**0.00026**	51	0.0124	**61**	**<0.0008**
24 N Emerson	2003	**57**	**2.0**	**57**	**4.2**	**58**	**1.5**	**58**	**<0.2**	***58***	**<0.7**	**54**	**<0.001**	--	--	**48**	**0.0093**	54	**<0.0008**
	2004	**59**	**1.7**	**59**	**2.9**	**58**	***1.6***	**59**	**<0.2**	**59**	**<0.5**	**56**	**0.0018**	--	--	**56**	**0.0088**	**56**	*0.0021*
	2005	**55**	**1.5**	**58**	**2.2**	*	*	**59**	**<0.2**	**59**	**<0.7**	**59**	**0.0017**	**49**	**<0.000042**	**59**	**0.0116***	**59**	**<0.0008**
	2006	**57**	**1.5**	**54**	**1.9**	**56**	***1.2***	**61**	**<0.2**	**61**	**<0.7**	**35**	**0.0014**	--	--	**45**	**0.0068**	**61**	**<0.001**
	2007	**53**	**1.4**	**52**	**2.0**	**56**	***1.2***	**57**	**<0.4**	**57**	**<0.7**	**56**	**0.0014**	--	--	**57**	**0.0074**	**53**	**<0.001**
	2008	**45**	***1.4***	**52**	***1.9***	**49**	***0.8***	**50**	**<0.2**	**50**	**<0.7**	**55**	**0.0011**	**27**	<0.000035	**56**	***0.0050***	**56**	***0.0017***
	2009	**61**	**1.4**	**61**	**2.1**	**42**	*1.1*	**45**	**<0.2**	**50**	**<0.4**	**56**	***0.0009***	**42**	<0.000035	**57**	**0.0051**	**57**	***0.0011***
NW Portland (PNW)	99-00	**59**	**2.1**	**59**	**2.4**	**57**	**1.8**	30	<0.2	**55**	**2.0**	27	<0.0022	--	--	*26*	*0.0064*	*26*	*0.0040*
Forest Heights P.O.	2001	**56**	**1.9**	**56**	**2.8**	**58**	**1.5**	**58**	**<0.2**	**58**	**2.3**	--	--	--	--	--	--	--	--
1706 NW 24th	2003	**28**	**0.7**	**28**	**1.9**	**26**	**1.3**	**26**	**<0.2**	**26**	***2.6***	--	--	28	0.00018	--	--	--	--
	2004	**43**	**1.7**	**52**	**2.7**	***58***	***1.5***	**58**	**<0.2**	**58**	**<0.5**	44	0.0011	--	--	44	0.0070	*44*	*0.0037*
	2005	**55**	**1.7**	**56**	**2.4**	*	*	**54**	**<0.2**	**54**	**<0.7**	**59**	**0.0009**	**49**	**<0.000042**	**59**	***0.0066***	**59**	***0.0034***
ODEQ Benchmarks			**0.45**		**3.0**		**0.13**		**0.03**		**35**		**0.0002**		**0.00008**		**0.5**		**0.002**
EPA Benchmarks			**0.45**		**0.077**		**0.13**		**0.033**		**0.17**		**0.00023**		**0.000083**		**0.083**		**0.0021**

1. Values in italics when some but not all measurements are less than the minimum detection level of the analysis method.
2. Bolded values have >75% data completion. Non-bolded values have <75%data completion.
3. The Health Benchmark is the concentration in which an individual has a one in a million chance of getting cancer.
4. 1999, 2000 – PM2.5, 2001-2004 – TSP, 2005 – 2009 PM10

* Not enough valid days for average

Air Toxics H

APPENDIX 1H
Air Toxics (ug/m^3)

Pollutant (µg/m^3)		Acetaldehyde		Formaldehyde		Benzene		1,3-butadiene		Perchloro ethylene		Arsenic 1999, 2000 – PM$_{2.5}$ 2001-2004 – TSP 2005 – 2009 PM10		Chromium (VI) TSP		Lead 1999, 2000 – PM$_{2.5}$ 2001-2004 – TSP 2005 – 2009 PM10		Nickel 1999, 2000 – PM$_{2.5}$ 2001-2004 – TSP 2005 – 2009 PM10	
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
SE Portland (SEL)	99-00	**54**	**2.0**	**54**	**2.7**	**51**	**2.6**	27	<0.2	**51**	**<0.7**	36	<0.002	--	--	36	<0.005	36	<0.005
5824 SE Lafayette	2003	23	1.3	23	2.3	*23*	*1.3*	23	<0.2	23	<0.5	--	--	--	--	--	--	--	--
	2004	**56**	**1.4**	**56**	**2.4**	**52**	**1.5**	**52**	**<0.2**	**52**	**<0.5**	**50**	**0.0016**	--	--	**50**	**0.006**	**50**	***0.001***
	2005	**55**	**1.6**	**57**	**2.2**	*54*	*1.6*	**56**	**<0.2**	**56**	**<0.7**	**60**	**0.0013**	**46**	**<0.000042**	**60**	**0.0057**	**60**	**0.001**
Beaverton (BHP)	99-00	**56**	**1.9**	**56**	**1.9**	**53**	**1.4**	**30**	**<0.2**	**53**	**<0.7**	25	0.0016	--	--	*25*	*0.0035*	25	0.0013
3745 SW Marshall Place	2005	**48**	**1.3**	**52**	**1.6**	*	*	**49**	**<0.2**	**49**	**<0.7**	**55**	**0.0011**	**49**	**<0.000042**	**55**	*0.0025*	**55**	**<0.001**
SW Portland (PKC) SW Kelly & Curry	2005	**49**	**1.5**	**52**	**2.2**	*	*	**49**	**<0.2**	**49**	**<0.7**	**57**	**0.0011**	**50**	**<0.000042**	**57**	***0.0059***	**57**	**<0.001**
Vancouver (VKT) Kauffman & W 27th	2005	**52**	**1.5**	**53**	**2.0**	*	*	**48**	**<0.2**	**48**	**<0.7**	**55**	**0.0011**	**49**	**<0.000042**	**55**	***0.004***	**55**	**<0.001**
SW Portland (CFS) Central Fire, 55 SW Ash	99-00	**58**	**2.3**	**58**	**2.8**	**55**	**1.85**	**28**	<0.2	**55**	<0.7	12	<0.0021	--	--	12	0.0064	*12*	*0.0022*
Sauvie Island (SIS) Background site	4/07-3/08	**52**	***0.6***	**45**	***1.2***	49	<0.3	**52**	**<0.2**	**52**	**<0.7**	**57**	***0.0008***	--	--	**57**	***0.0027***	**57**	***0.0011***
Salem State Hosp.(SSH)	*2008	**22**	1.4	**24**	2.0	**24**	*1.4*	**25**	<0.2	**20**	*<0.3*	**29**	0.0007	**19**	<0.000035	**29**	0.003	**29**	*<0.001*
*Started in July	2009	**61**	**1.1**	**61**	**1.5**	**35**	*1.5*	**42**	<0.2	**45**	*<0.3*	**57**	0.0008	**50**	**<0.000035**	**56**	0.003	**55**	<0.001
ODEQ Benchmarks			**0.45**		**3.0**		**0.13**		**0.03**		**35**		**0.0002**		**0.00008**		**0.5**		**0.002**
EPA Benchmarks			**0.45**		**0.077**		**0.13**		**0.033**		**0.17**		**0.00023**		**0.000083**		**0.083**		**0.0021**

1. *Values in italics when some but not all measurements are less than the minimum detection level of the analysis method.*
2. Bolded values have >75% data completion. Non-bolded values have <75%data completion.
3. The Health Benchmark is the concentration in which an individual has a one in a million chance of getting cancer.
4. 1999, 2000 – PM2.5, 2001-2004 – TSP, 2005 – 2009 PM10

* Not enough valid days for average

APPENDIX 1H
Air Toxics (ug/m^3)

Pollutant (µg/m^3)		Acetaldehyde		Formaldehyde		Benzene		1,3-butadiene		Perchloro ethylene		Arsenic 1999, 2000 – $PM_{2.5}$ 2001-2004 – TSP 2005 – 2009 PM10		Chromium (VI) TSP		Lead 1999, 2000 – $PM_{2.5}$ 2001-2004 – TSP 2005 – 2009 PM10		Nickel 1999, 2000 – $PM_{2.5}$ 2001-2004 – TSP 2005 – 2009 PM10	
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
Eugene	2002	**60**	**1.6**	**60**	**2.5**	**58**	**1.6**	**58**	**<0.2**	**58**	**<0.7**	**58**	**<0.002**	--	--	**58**	**<0.0036**	**58**	**<0.002**
Amazon Park (EAP)	2003	**52**	**1.4**	**52**	**4.3**	**45**	**1.1**	**45**	**<0.2**	**45**	**<0.7**	**53**	**<0.002**	--	--	**53**	**0.0037**	**53**	**<0.0018**
Errata: The 2008	2004	**57**	**1.3**	**57**	**2.8**	**57**	***1.4***	**57**	**<0.2**	**57**	**<0.5**	**44**	**0.0007**	--	--	44	***0.0026***	**44**	**<0.0004**
Benzene value of 1.7	2005	**27**	**1.5**	**28**	**1.9**	**28**	*1.6*	**28**	**<0.2**	**28**	**<0.7**	**31**	*0.0007*	--	--	**31**	*0.0022*	**31**	**<0.0002**
initial published was	2006	**27**	**1.4**	**27**	**1.8**	**28**	*1.0*	**28**	**<0.2**	**28**	**<0.7**	**30**	*0.0008*	--	--	**30**	**<0.001**	**30**	**<0.001**
incorrect and is now	2007	**38**	**1.6**	**33**	**1.5**	**39**	***1.1***	**41**	**<0.4**	**41**	**<0.7**	**45**	***0.0006***	--	--	**45**	**<0.001**	**45**	**<0.001**
correct as 0.8.	2008	**50**	**1.2**	**54**	**1.5**	**47**	***0.8***	**52**	**<0.2**	**47**	**<0.3**	**58**	***0.0006***	--	--	**58**	***0.002***	**58**	**<0.001**
La Grande	2004	**51**	**1.7**	**51**	**3.2**	**50**	***0.6***	**50**	**<0.2**	**50**	**<0.5**	**47**	**0.00033**	--	--	**47**	***0.0015***	**47**	**<0.0004**
Ash St. (LAS)	2005	**52**	**1.8**	**56**	**2.6**	**55**	**<0.3**	**55**	**<0.2**	**55**	**<0.7**	**60**	*0.00033*	--	--	**60**	*0.0015*	**60**	**<0.0001**
	2006	**53**	**1.8**	**52**	**2.7**	**57**	**<0.3**	**58**	**<0.2**	**58**	**<0.7**	**58**	*0.00023*	50	<0.00004	**58**	*0.0030*	**58**	**<0.001**
	2007	**53**	**1.4**	**52**	**2.1**	**53**	***0.8***	**54**	**<0.4**	**54**	**<0.7**	**60**	***0.00019***	**58**	**<0.00004**	**60**	**<0.001**	**60**	**<0.001**
	2008	**48**	**1.3**	**51**	**1.7**	**50**	***0.6***	**54**	**<0.4**	**54**	**<0.7**	**51**	***0.00021***	**20**	**<0.00004**	**51**	***0.0011***	**51**	**<0.001**
	2009	**58**	**1.4**	**58**	**1.8**	**40**	***0.8***	**47**	**<0.4**	**49**	**<0.3**	**53**	***0.00014***	**47**	**<0.00004**	**53**	**<0.001**	**53**	**<0.001**
Medford	2008	**48**	**1.8**	**53**	**2.4**	**50**	***1.3***	**55**	**<0.2**	**55**	***0.5***	**54**	**0.00054**	--	--	**54**	***0.002***	**54**	**<0.001**
Grant & Belmont (MGB)	2009	**59**	**1.8**	**59**	**2.2**	**45**	***1.5***	**47**	**<0.2**	**44**	***0.8***	**60**	**0.00059**	--	--	**60**	**0.002**	**60**	**<0.001**
Dodge Road (MDR) (Background)	08-09	**35**	1.4	**40**	1.8	**38**	*0.2*	**44**	<0.2	**44**	*0.5*	**37**	*0.00028*	--	--	**37**	*0.0013*	**37**	<0.001
ODEQ Benchmarks			**0.45**		**3.0**		**0.13**		**0.03**		**35**		**0.0002**		**0.00008**		**0.5**		**0.002**
EPA Benchmarks			**0.45**		**0.077**		**0.13**		**0.033**		**0.17**		**0.00023**		**0.000083**		**0.083**		**0.0021**

1. *Values in italics when some but not all measurements are less than the minimum detection level of the analysis method.*
2. Bolded values have >75% data completion. Non-bolded values have <75%data completion.
3. The Health Benchmark is the concentration in which an individual has a one in a million chance of getting cancer.
4. 1999, 2000 – PM2.5, 2001-2004 – TSP, 2005 – 2009 PM10

* Not enough valid days for average

APPENDIX 1I
Frequency of Visibility Impairment
9 AM - 9 PM, July 1 - September 15 (Visibility Protection Period)

Visibility Data Summary

IMPAIRMENT (From man made or natural sources)		PERCEPTIBLE 0.60-0.79 Bscat		MODERATE 0.80-1.29 Bscat		HEAVY >1.30 Bscat		All >0.60Bscat
Site	Year	Hours	%[1]	Hours	%[1]	Hours	%[1]	%[1]
Mt. Hood Wilderness	2000	52	3	22	1	7	0	4
Multopor (MUL)	2001	92	16	15	3	4	1	19
DEQ# 10094	2002	30	3	10	1	1	0	5
EPA# 410050102	2003	52	5	53	5	31	3	14
	2004	39	4	28	3	3	0	8
	2005	2	0	1	0	0	0	0
	2006	72	6	58	5	32	3	14
	2007	22	2	7	1	10	1	4
	2008	0	0	3	0.4	9	1	2
	2009	2	0.2	33	3	76	8	11
Mt. Jefferson	2000	116	6	30	2	3	0	5
Big Lake (BIG)	2001	62	7	38	4	8	1	12
DEQ# 10125	2002[2]	92	10	76	8	50	5	23
EPA# 410430103	2003[3]	46	8	19	3	31	5	16
Monitor evacuated due to fire.[3]	2004	100	11	43	5	13	1	17
	2005	59	6	32	3	8	1	10
	2006	136	14	139	14	83	8	36
	2007	101	10	51	5	26	3	18
	2008	25	4	39	6	49	7	16
	2009	100	10	47	5	18	2	17
Crater Lake National Park	2000	8	0	6	0	2	0	1
	2001	46	6	24	3	7	1	9
Rim Village (CLM)	2002[2]	55	6	65	7	374	39	51
DEQ# 10117	2003	41	5	19	2	24	3	10
EPA# 410351001	2004	31	4	23	3	16	2	8
	2005	12	1	10	1	1	0	3
	2006	110	12	70	8	142	15	35
	2007	19	2	16	2	7	1	4
	2008	131	15	85	9	59	7	30
	2009	28	3	23	3	38	4	10
Eagle Cap Wilderness	2003	63	12	95	18	27	5	36
Mt. Harris (MTH)	2004	44	5	41	4	1	0	9
DEQ 30722 EPA 410610118	2005	29	3	21	2	11	1	6
Mt. Fanny (MTF)	2007	84	8	64	6	46	4	18
DEQ 31002 EPA 410610121	2008	6	1	24	5	12	2	8
	2009	2	0.3	12	2	55	8	10

1 Percent of impaired hours
2 Forest Fire Smoke Impact
3 B&B Complex fire forced the removal of the monitor on 8/22 to end of season.

Appendix 2 Oregon Air Quality Surveillance Network

The following tables and sampling location maps describe the Air Quality Surveillance Networks operational during 2009. Appendix 2A lists all of the ambient air quality sampling locations in the Oregon Surveillance Network. Map 1 shows all the Oregon Ambient Air Monitoring Location, EPA visibility sites (IMPROVE), and the National Atmospheric Deposition Sites. Map 2 shows monitoring in the Portland Metro Area.

The following abbreviations are used in the network location tables and maps:

SO_2	Sulfur dioxide
CO	Carbon monoxide
NO_2	Nitrogen dioxide
O_3	Ozone
VIS/PMest	Visibility/PM2.5 estimate (continuous particulate monitor)
HAPS	Air Toxics (Hazardous Air Pollutants)
PM_{10}	Fine particulate (10 micron)
$PM_{2.5}$	Fine particulate (2.5 micron)
$PM_{2.5}$ Spec	PM2.5 chemically speciated
WS/WD	Wind direction and speed
Temp	Temperature
DT	Delta temperature (inversion indicator)
BP	Barometric pressure
RH	Relative humidity
SR	Solar radiation
IMPROVE	EPA visibility program
NADP	National Atmospheric Deposition Program

Table 16. Oregon Ambient Air Monitoring Network.

City	Address	Site Code	DEQ#	SO_2	CO	NO_2	O_3	VIS/PM est	HAPS	PM_{10}	$PM_{2.5}$	$PM_{2.5}$ Spec	WS/WD	Temp	DT	BP	RH	SR
Albany	Calapooia School	ACS	21886					X										
Bend	Bend Pump Station	BPS	24172					X			X							
	Road Department	BRD	31007				X						X	X		X	X	X
Burns	E Madison St.	BMS	10105					X			X					X		
	Washington St.	BWS	31016					X			X		X	X		X		
Corvallis	Intermediate School	CCB	20478					X										
CottageGrove	City Shops	CGC	31004					X			X							
Eugene	Lane Community College	LCC	18320		X			X		X								
	Pacific Hwy99N	EKB	18522							X	X							
	E 29th Amazon Park	EAP	18524				X	X	X	X	X	X						
(Saginaw)	Delight Vly Sch Rd	SAG	18315				X											
Florence	Dept Forestry	FDF	31017					X										
Grants Pass	Parkside School	GPP	28859					X			X		X	X		X		
Hermiston	Municipal Airport	HMA	31000				X						X	X				
	Pump Station	HPS	24735								X[2]							
Klamath Falls	Peterson School	KFP	10118					X		X	X	X	X	X	X	X	X	
	Background Site	KFB	31015					X					X					
La Grande	Ash Street	LAS	26448					X	X		X		X	X	X	X	X	
Lakeview	Center & M Streets	LCM	10123					X			X	X[1]	X	X		X		
Madras	Westside School	MWS	31006					X										
McMinnville	Newby School	MNS	31005					X					X	X		X	X	X
Medford	Rogue Valley Mall	MRM	10112		X													
	Welch & Jackson	MWJ	10113							X								
	Grant and Belmont	MGB	20448					X	X	X	X	X[2]						
	7112 Rapp Rd Talent	TAL	10109				X											
	1440 Rossanley Drive	MTV	10108										X	X	X	X	X	X
	4035 Dodge Road	MDR	10106						X[2]	X[2]	X							

1. Started monitoring in 2008
2. Stopped monitoring in 2008

APPENDIX 2
Oregon Ambient Air Monitoring Network

City	Address	Site Code	DEQ#	SO_2	CO	NO_2	O_3	VIS/PM est	HAPS	PM_{10}	$PM_{2.5}$	$PM_{2.5}$ Spec	WS/WD	Temp	DT	BP	RH	SR
Oakridge	47674 School Street	OAK	18733					X		X	X	X[1]	X					
Pendleton	3745 SW Marshall Pl	PMC	10146					X		X	X		X	X		X		
Portland	SW Miller - KPTV tower	KPTV	10132											X	X			
	5824 SE Lafayette	SEL	10139	X	X	X	X	X		X	X	X	X	X	X	X	X	X
	3182 NW 26th - Transcon	TTT	10140							X								
	510SW Third Street	PPB	10141		X													
	N Roselawn	PNR	21889					X	X		X							
	Jefferson High School	PJH	25606										X					
(Beaverton)	Highland Prk School	BHP	20481					X										
(Carus)	Spangler Road	SPR	10093				X	X					X	X				
(Hillsboro)	1149 NE Grant St.	HHF	31967					X			X							
(Sauvie Is)	Rt 1 Box 442	SIS	14152				X	X					X	X				
Sherwood	17180 SW Lasich Lane	SLR	31009				X						X	X		X	X	X
Prineville	SE Court St.	PDP	31008					X			X		X	X		X	X	X
Roseburg	777 NW Garden Valley Blvd	RGV	32529					X										
Salem	Salem State Hospital	SSH	31929					X	X	X								
(Turner)	Cascade Jr. High,	CJH	10130				X						X	X				
Springfield	City Hall	SCH	18538					X			X		X					
Sweet Home	Fire Dept	SFD	31001					X			X							
The Dalles	Cherry Heights	TDC	21252					X										
White City	751 Crater Lake Hwy	WPO	10107							X								

1. Started monitoring in 2008
2. Stopped monitoring in 2008

APPENDIX 2

Oregon Ambient Air Monitoring Network

Table 17. Oregon's Visibility & Smoke Monitoring Network.

Region	Location	DEQ # / IMPROVE CODE	Neph	IMPROVE	$PM_{2.5}$	O_3	WS/WD
Visibility Sites							
Crater Lake NP	Diamond Peak	10117 / CRLA	X	X			X
Eagle Cap Wild.	Mt. Fanny	31002	X				X
Eagle Cap Wild.	Strawberry Mt.	STAR		X			
Kalmiopsis Wild.	Kalmiopsis	KALM		X			
Mt Hood Wild.	Multopor	10094 / MOHO	X	X			X
Mt Jefferson Wild.	Big Lake	10125	X				X
Three Sisters Wild.	Three Sisters	THIS		X			
Forest Health Sites							
Wallolla-Whitman NF	Baker City	10088	X				
Malheur & Ochoco NF	Burns	10105	X				
Wallolla-Whitman NF	Enterprise	10162	X				
Siskiyou NF	Grants Pass	28859	X				
Siskiyou NF	Illinois Valley	21068	X				
Malheur NF	John Day	10103	X				
Winema, Fremont NF	Klamath Falls	10118	X				
Siskiyou NF	Provolt	18432	X				
	Roseburg	32529	X				
Rogue River NF	Shady Cove	25161	X				
Ag Burning Sites							
Willamette Valley	Carus, Spangler Road	10093	X				X
Willamette Valley	Corvallis	20478	X				
Willamette Valley	Halsey/Water Bureau	10128					X
NE Oregon	Cove	31003	X				X
Willamette Valley	Lyons/Marilynn School	10126	X				
Willamette Valley	Salem State Hosp.	31929	X				
Willamette Valley	Sweet Home	31001	X		X		

1. Started monitoring in 2008
2. Stopped monitoring in 2008

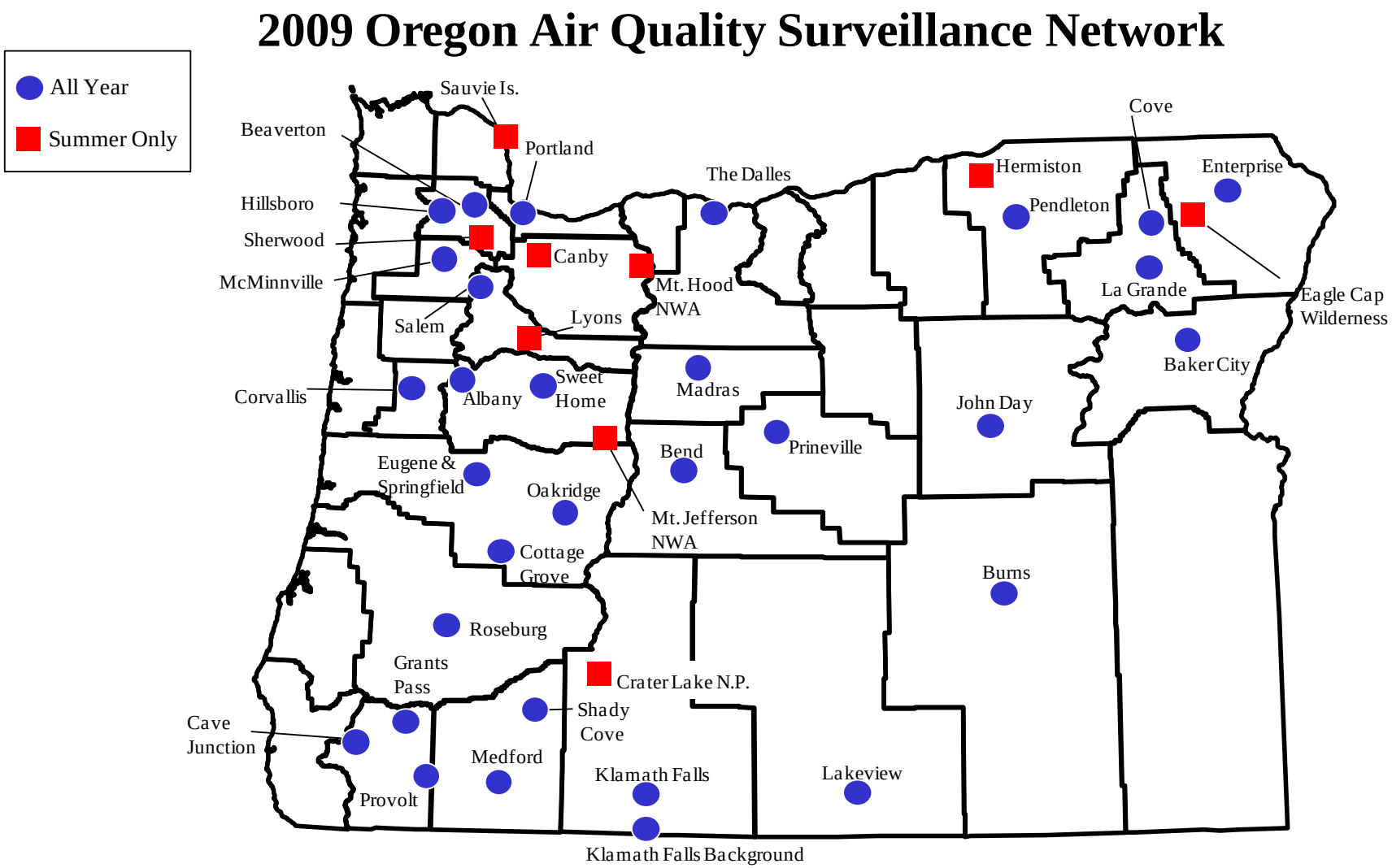


Figure 66. 2009 Ambient Air Monitoring Network.

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 data base which is 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 a system audit is conducted 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. These assessments are reported 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.

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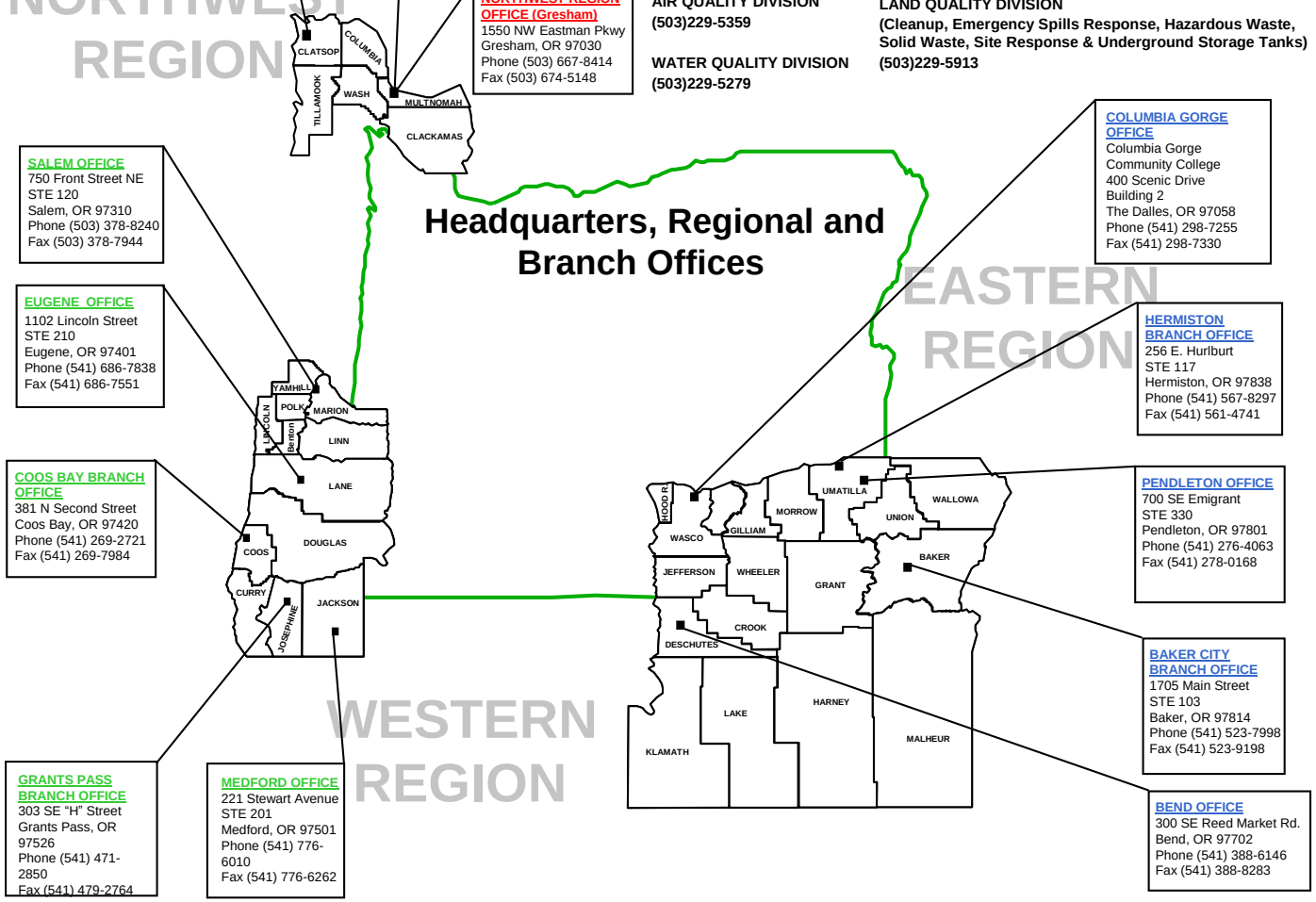

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Open Burning - Contact the DEQ Regional Office nearest you. See map (page 1) for locations and phone numbers.

Title V Permits and ACDP Permits - Contact the DEQ Regional Office nearest you. See map (page 1) for locations and phone numbers.

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