

# Attachment C

**Oregon State Implementation Plan Revision Addressing the  
Interstate Transport of Nitrogen Dioxide, Sulfur Dioxide,  
Lead and Fine Particulate Matter**

**Clean Air Act Section 110(a)(2)(D)**

**May 12, 2015**

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State of Oregon  
**Department of  
Environmental  
Quality**

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# Addressing Interstate Pollutant Impacts under the Clean Air Act

## Overview

Some amount of air pollution routinely moves across all state borders and across all regions of the country. This document addresses the effect of Oregon air emissions transporting to neighboring states. Based on the information summarized in the sections that follow, the Oregon Department of Environmental Quality concludes that air emissions of nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), and fine particulate matter (PM 2.5) from Oregon sources do not significantly contribute to violations of National Ambient Air Quality Standards in other states, or interfere with other states' efforts to meet air quality standards, prevention of significant deterioration (PSD), or protect visibility. DEQ's conclusions are based on its understanding of air pollution problems in adjacent states, and the emission sources, meteorology (weather patterns), and topographic features (mountain ranges, etc.) that influence air quality problems in these states.

DEQ will collaborate with air agencies in Washington, Idaho, Nevada, California and other states whenever necessary to evaluate case-specific air quality problems that may involve regional movement of air pollution. DEQ's Clean Air Act section 110 infrastructure SIP provides the framework and legal mechanism for DEQ to act as needed to reduce any Oregon emissions found to significantly contribute to air quality problems in other states.

The map below (Figure 1) illustrates the significant distances and mountain ranges that in many areas separate Oregon from communities in Washington, California, Idaho, and Nevada and can help limit the long range transport of air pollution.

**Figure 1: Map of Oregon and major mountain ranges**



# I. Introduction

The interstate transport provision in the CAA section 110(a)(2)(D)(i) (also called “the good neighbor” provision) requires each state to submit a State Implementation Plan (SIP) that prohibits emissions that will have certain adverse air quality effects in other states. This SIP submittal is due within three years after the Environmental Protection Agency adopts a new or revised NAAQS.

## II. Background

### EPA Promulgated NAAQS

- Nitrogen Dioxide (NO<sub>2</sub>): EPA first set standards for NO<sub>2</sub> in 1971; setting both a primary standard (to protect health) and a secondary standard (to protect the public welfare) at 53 parts per billion (ppb), averaged annually. EPA reviewed the standards in 1985 and 1996, deciding to retain the standards at the conclusion of each review. In 2005, EPA began another review, resulting in the January 22, 2010, rulemaking to establish an additional primary NO<sub>2</sub> standard at 100 ppb, averaged over one hour (75 FR 6474).
- Sulfur Dioxide (SO<sub>2</sub>): Primary standards for SO<sub>2</sub> were first set in 1971, at 0.14 parts per million (ppm) averaged over a 24-hour period, not to be exceeded more than once per year, and 0.030 ppm, annual arithmetic mean. EPA subsequently reviewed the primary standards and determined to retain them in 1996. More recently, on June 2, 2010, EPA adopted a revised primary SO<sub>2</sub> standard at 75 ppb, based on a three-year average of the annual 99<sup>th</sup> percentile of one-hour daily maximum concentrations (75 FR 35520).
- Lead (Pb): On October 15, 2008, the EPA revised the level of the primary and secondary Pb NAAQS from 1.5 micrograms per cubic meter (µg/m<sup>3</sup>) to 0.15 µg/m<sup>3</sup>.
- Fine Particulate Matter (PM 2.5): On December 14, 2012 EPA adopted a revised annual NAAQS for fine particulate matter (PM 2.5) from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup>.

Section 110(a)(2)(D)(i) of the CAA identifies four distinct requirements related to the impacts of air pollutants transported across state lines. It requires that each SIP for a new or revised NAAQS contain adequate provisions prohibiting any source or other type of emissions activity within the state from emitting air pollutants that may:

1. Contribute significantly to nonattainment of the applicable NAAQS in any other state;
2. Interfere with maintenance of the applicable NAAQS in any other state;
3. Interfere with measures required to be included in the applicable implementation plan for any other state to prevent significant deterioration of air quality; and
4. Interfere with measures required to be included in the applicable implementation plan for any other state to protect visibility.

Section III below addresses elements 1 and 2 above, contributions to nonattainment of applicable NAAQS, and interference with maintenance of applicable NAAQS. Regarding element 3 above (prevention of significant deterioration), DEQ's air permitting rules for industrial sources require analysis for the PSD which ensures that air quality impacts from new or modified industrial sources will not cause or contribute to violations of a NAAQS in Oregon or neighboring states, or cause significant visibility impairment in federal Class-I areas. EPA most recently approved revisions to Oregon's PSD program on December 27, 2011 (76 FR 80747). Regarding element 4 above (visibility protection), Oregon's federally approved regional haze plan provides the mechanism for ensuring emission reductions necessary to achieve visibility improvement in Oregon and in neighboring states. EPA approved the first element of the Oregon Regional Haze Plan (SIP) including the requirements for best available retrofit technology (BART) (76 FR 38997) on July 5, 2011. EPA approved the remaining elements of the Oregon Regional Haze SIP on August 22, 2012 (77 FR 50611).

### III. Air Quality Data and Attainment Status within Oregon and Surrounding States

- a. **Surrounding contiguous states:** Oregon is bordered by Washington to the north, the Pacific Ocean to the west, California and Nevada to the south, and Idaho to the east. The Snake River separates the state from part of Idaho. The Columbia River forms most of the state's northern border. There are six major sources in Oregon within 5 km of contiguous Washington State and one major source within 5 km of Idaho. The sources are listed in Tables 5 and 6 below (page 29).
- b. **Designation of all areas within the state and in each surrounding state (attainment, nonattainment, and unclassifiable), including maintenance areas in adjacent states:**
- **Nitrogen Dioxide (NO<sub>2</sub>):** On January 20, 2012 EPA designated all areas of the country as "unclassifiable/attainment" for the 2010 NO<sub>2</sub> NAAQS, including all areas within the states of Idaho, California, Nevada, and Washington. The available air quality data show that all monitored areas in the country meet the 2010 NO<sub>2</sub> NAAQS for 2008-2010. No state or tribe recommended an area be designated "nonattainment" during the federal designation process.
  - **Sulfur Dioxide (SO<sub>2</sub>):** According to EPA, designations for the entire state of Oregon, Washington, Idaho, California, and Nevada will be addressed in a future action. See proposed Consent Decree, *Sierra Club v. McCarthy*, No. 3:13-CV-3953-SI (N.D. Cal.), issued March 2, 2014, 70 Fed. Reg. 31,325, June 2, 2014 found at:

<https://federalregister.gov/a/2014-12693>

<http://content.sierraclub.org/environmentallaw/sites/content.sierraclub.org/environmentallaw/files/SO2%20Consent%20Decree.pdf>

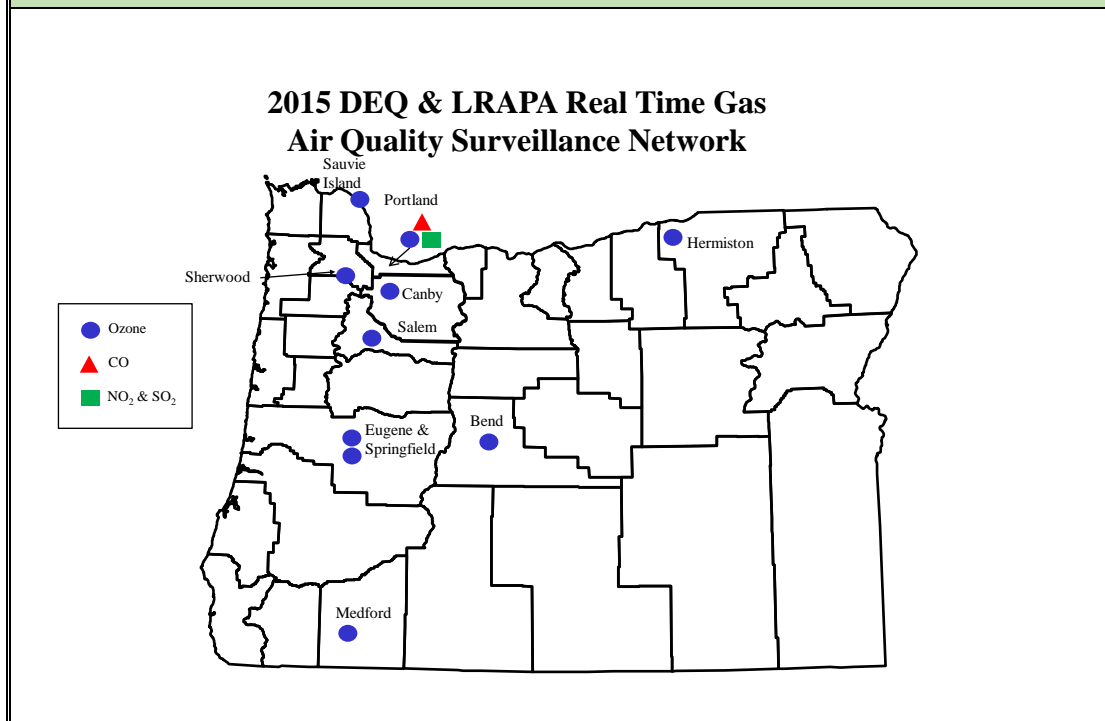
EPA's review of the monitored air quality data from 2009-2011 showed no violations of 2010 1-hr SO<sub>2</sub> standard in any of these states. According to the latest available 2013

Oregon Air Quality Data Summaries Report, the downward trend in SO<sub>2</sub> emissions continues with the highest 2012 and 2013 1-hr concentrations under 25 ppb.

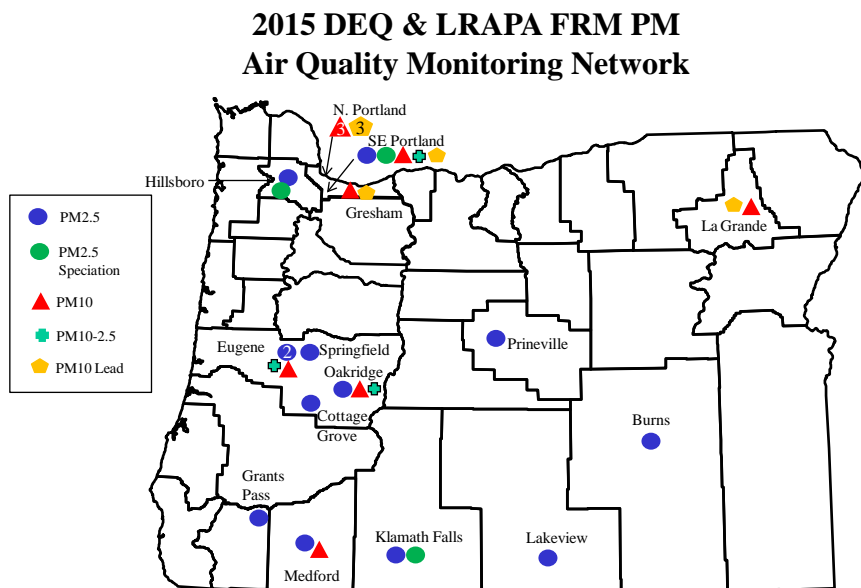
- Lead (Pb): In 2008 EPA designated all areas in the states of Oregon, Idaho, Nevada, and Washington as “unclassifiable/attainment.” In California, Los Angeles County South Coast Air Basin is classified as “nonattainment.” The rest of the state is designated “unclassifiable/attainment.”
- Fine Particulate Matter (PM 2.5): Shoshone County in Idaho, and Imperial, Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties in California are designated in nonattainment of the 2012 annual PM<sub>2.5</sub> standard. There are no nonattainment areas for the annual PM<sub>2.5</sub> standard in Oregon, Washington, Idaho, or Nevada. There have been no annual PM<sub>2.5</sub> NAAQS violations in SW Washington during the most recent three-year period (2012-2014). The monitoring network for NO<sub>2</sub> and SO<sub>2</sub> is presented in Figure 2. The monitoring network for PM<sub>2.5</sub> and Pb is presented in Figure 3.

c. Monitoring networks for pollutants within the state and surrounding states:

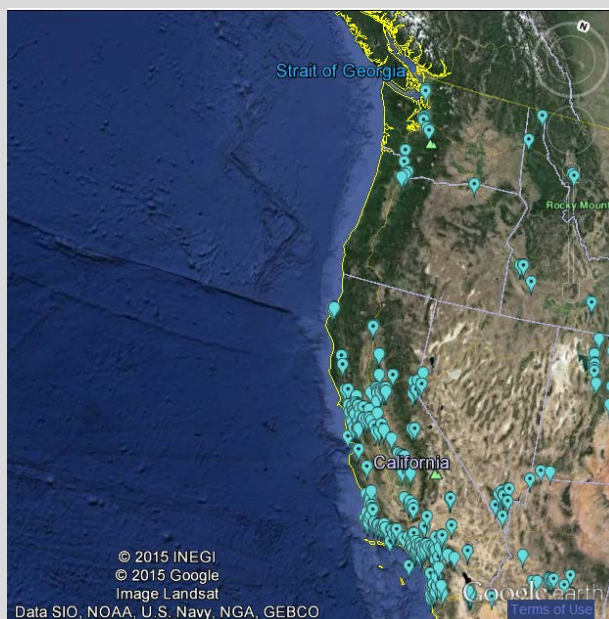
**Figure 2: Monitoring network that includes for NO<sub>2</sub>, and SO<sub>2</sub>, in Oregon**



**Figure 3: Monitoring network that includes PM 2.5 and Lead in Oregon**

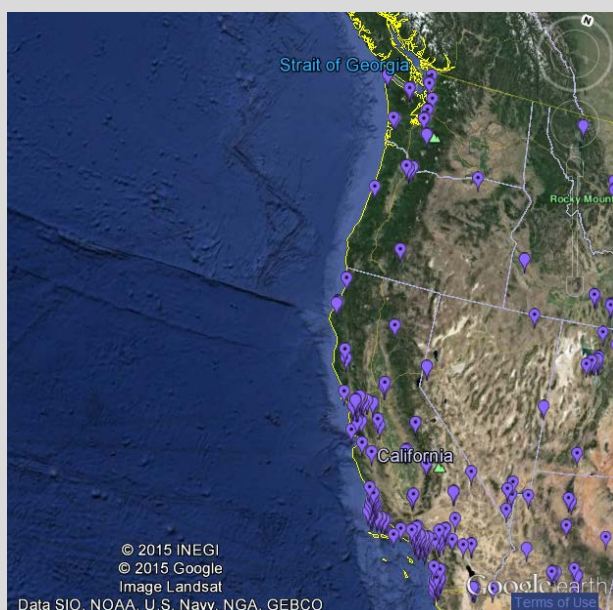


**Figure 4: Monitoring networks for NO<sub>2</sub> in Washington, Idaho, California and Nevada**

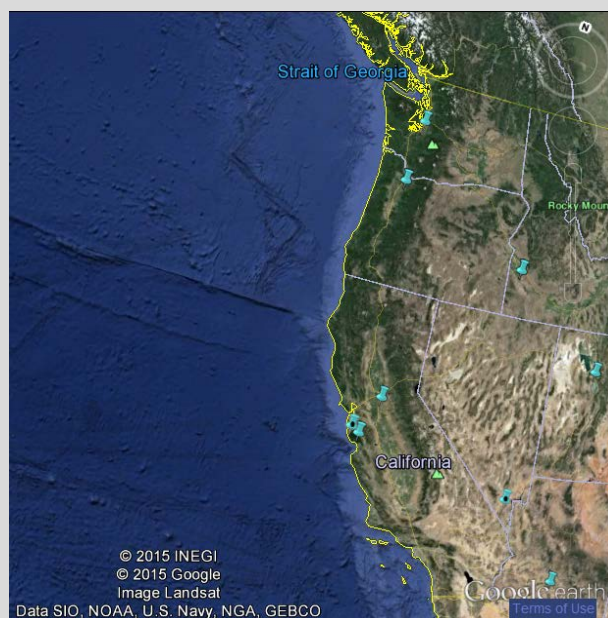




**Figure 5: Monitoring networks for SO<sub>2</sub> in Washington, Idaho, California and Nevada**

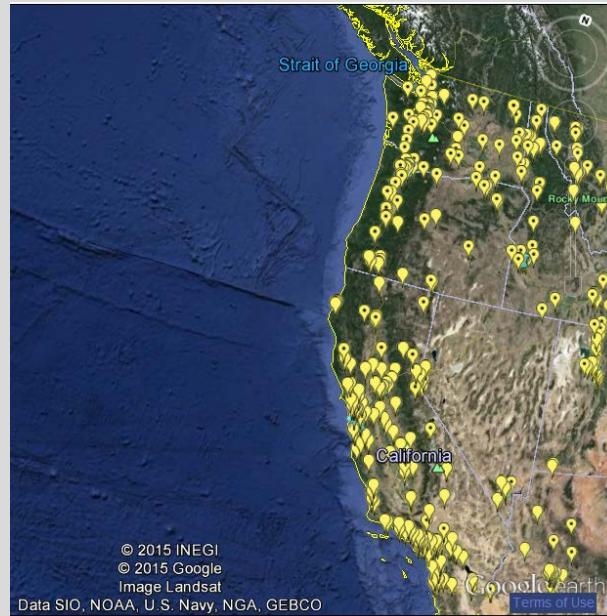


**Figure 6: Monitoring networks for Pb in Washington, Idaho, California and Nevada**





**Figure 7: Monitoring networks for PM 2.5 in Washington, Idaho, California and Nevada**



- d. Ambient data, including the ‘design value’ for pollutants of interest, at each monitoring site and trends over the last 5-10 years.

**Nitrogen Dioxide (NO<sub>2</sub>):**

The level of the hourly NAAQS for NO<sub>2</sub> is 100 ppb based on the 98th percentile value from three consecutive years of data. The design values shown here are computed for the latest design value period using Federal Reference Method or equivalent data reported to EPA by States, Tribes, and local agencies. The 2011-2013 design values for NO<sub>2</sub> are presented in Table 1. Daily maximum 1-hr NO<sub>2</sub> 2000-2013 trends at monitoring stations in Oregon, Washington, California, Idaho, and Nevada are in Figures 8-11.

Table 1: County-Level Design Value Concentrations for NO <sub>2</sub> 1-Hour NAAQS			
State	County	Site	2011-2013 1-hr Design Value (ppb)
California	Alameda	060010011	50
California	Butte	060070008	37
California	Contra Costa	060131004	40
California	Imperial	060250005	64
California	Kern	060296001	46
California	Kings	060311004	46
California	Los Angeles	060371701	64

Table 1: County-Level Design Value Concentrations for NO <sub>2</sub> 1-Hour NAAQS			
State	County	Site	2011-2013 1-hr Design Value (ppb)
<b>California</b>	Marin	060410001	45
<b>California</b>	Monterey	060531003	35
<b>California</b>	Napa	060550003	39
<b>California</b>	Placer	060610006	50
<b>California</b>	Riverside	060655001	39
<b>California</b>	Sacramento	060670002	43
<b>California</b>	San Bernardino	060712002	62
<b>California</b>	San Diego	060732007	73
<b>California</b>	San Francisco	060750005	68
<b>California</b>	San Joaquin	060771002	53
<b>California</b>	San Luis Obispo	060798001	38
<b>California</b>	San Mateo	060811001	45
<b>California</b>	Santa Barbara	060831008	36
<b>California</b>	Santa Clara	060850005	51
<b>California</b>	Solano	060950004	42
<b>California</b>	Sutter	061010003	47
<b>California</b>	Tulare	061072002	52
<b>California</b>	Ventura	061112002	37
<b>California</b>	Yolo	061130004	34
<b>Oregon</b>	Multnomah	410510080	34
<b>Nevada</b>	Washoe	320310016	56

**Figure 8: Trends - Concentrations for NO<sub>2</sub> 1-Hour NAAQS - Washington**

Daily Max 1-hour NO<sub>2</sub> Concentrations from 01/01/00 to 12/31/13

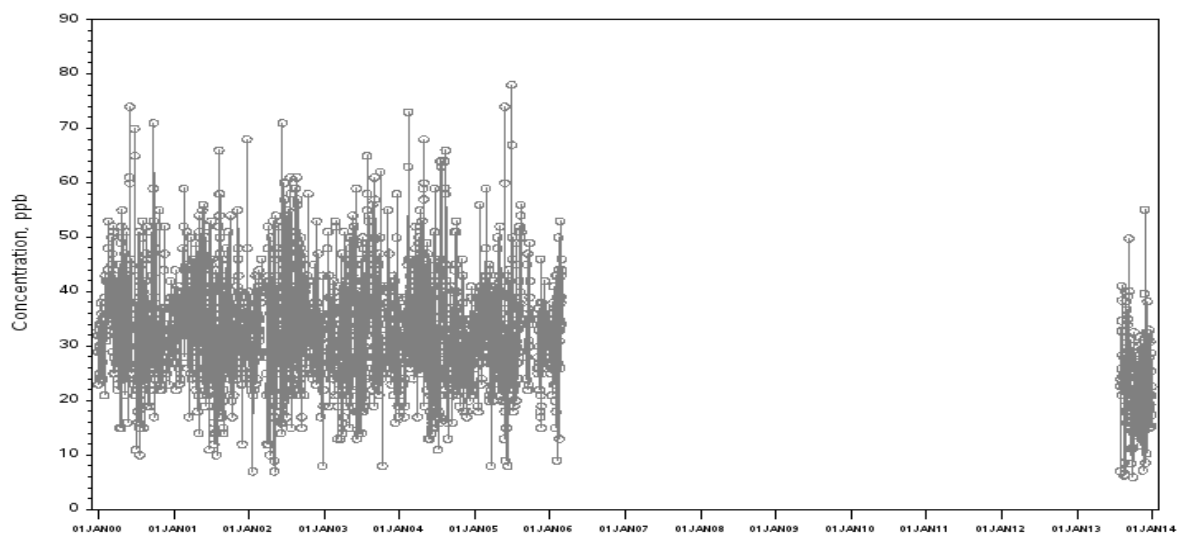
Parameter: Nitrogen dioxide (NO<sub>2</sub>) (Applicable standard is 100 ppb)

CBSA: Seattle-Tacoma-Bellevue, WA

County: King

State: Washington

AQS Site ID: 53-033-0080, poc 1



Source: U.S. EPA AirData <<http://www.epa.gov/airdata>>  
Generated: March 11, 2015

**Figure 9: Trends - Concentrations for NO<sub>2</sub> 1-Hour NAAQS - California**

Daily Max 1-hour NO<sub>2</sub> Concentrations from 01/01/00 to 12/31/13

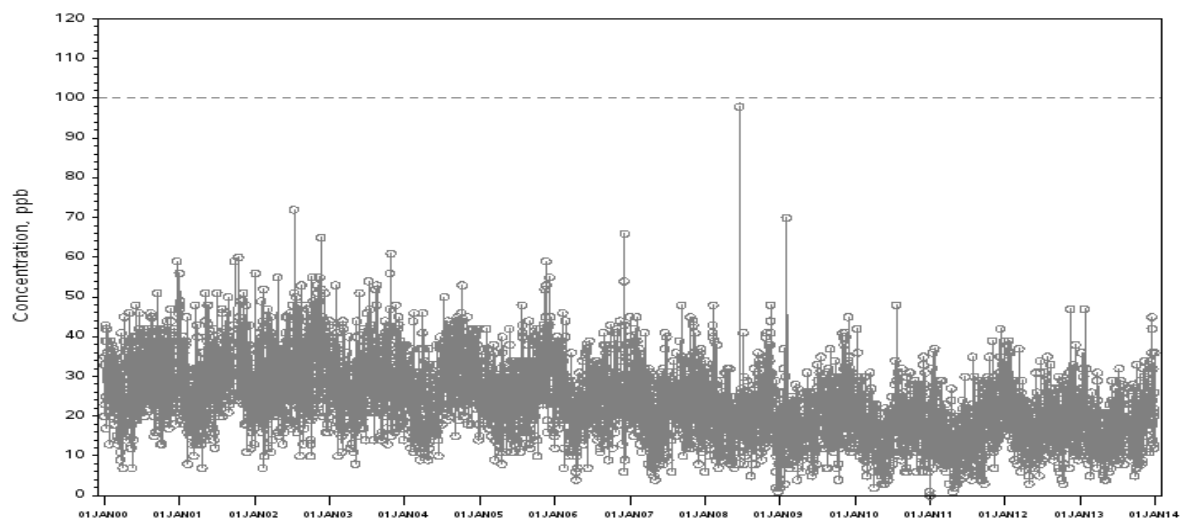
Parameter: Nitrogen dioxide (NO<sub>2</sub>) (Applicable standard is 100 ppb)

CBSA: Bakersfield, CA

County: Kern

State: California

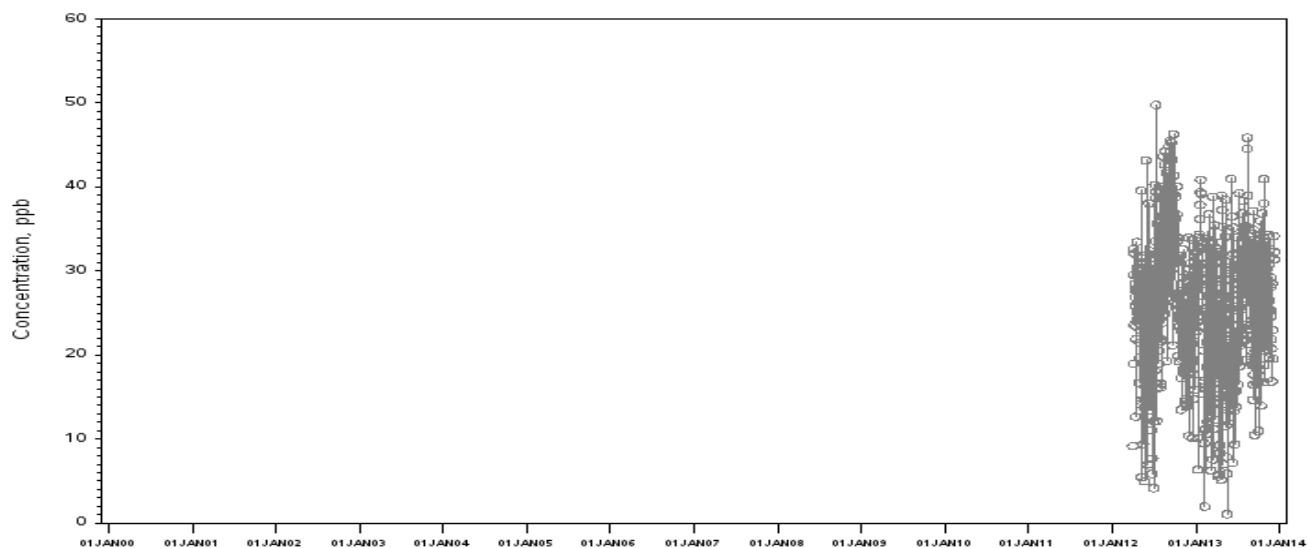
AQS Site ID: 06-029-0007, poc 1



Source: U.S. EPA AirData <<http://www.epa.gov/airdata>>  
Generated: March 11, 2015

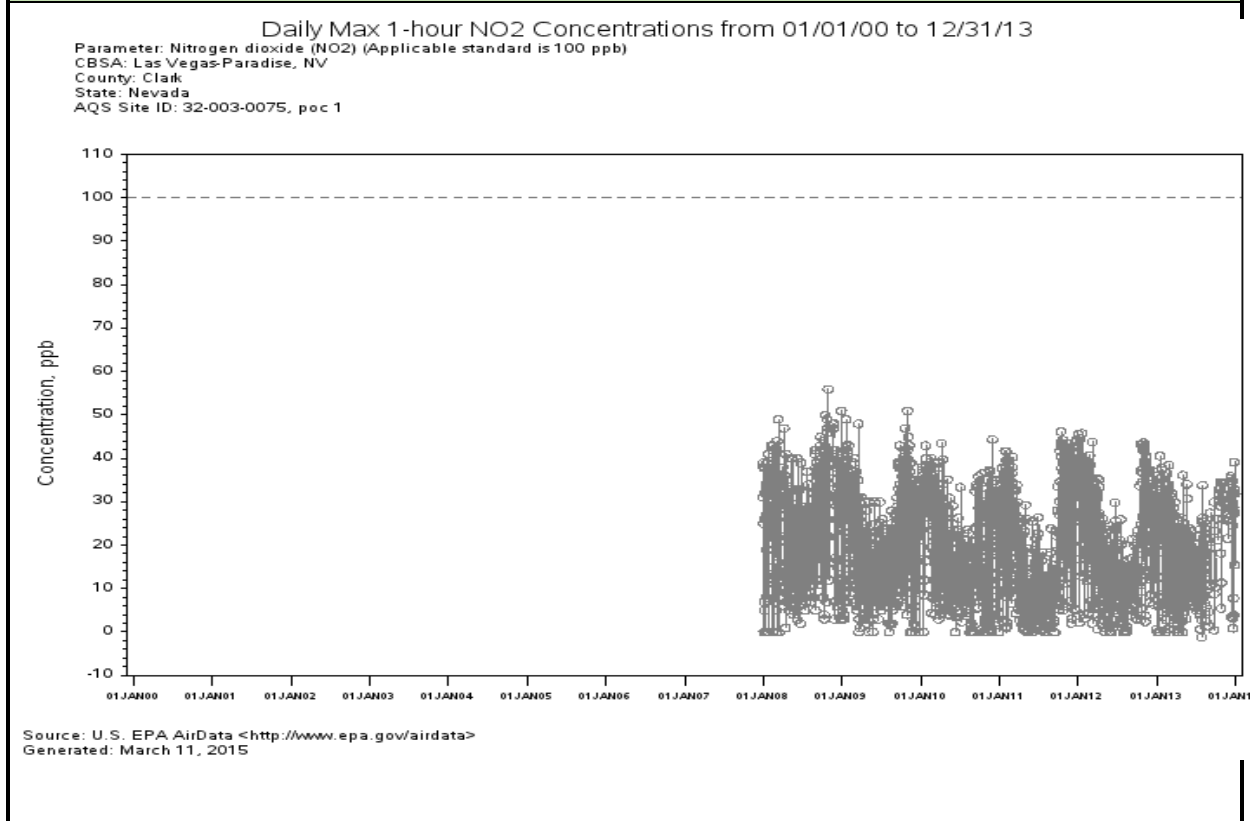
**Figure 10: Trends - Concentrations for NO<sub>2</sub> 1-Hour NAAQS - Idaho**

Daily Max 1-hour NO<sub>2</sub> Concentrations from 01/01/00 to 12/31/13  
Parameter: Nitrogen dioxide (NO<sub>2</sub>) (Applicable standard is 100 ppb)  
CBSA: Boise City-Nampa, ID  
County: Ada  
State: Idaho  
AQ5 Site ID: 16-001-0023, poc 1



Source: U.S. EPA AirData <<http://www.epa.gov/airdata>>  
Generated: March 11, 2015

**Figure 11: Trends – Concentrations for NO<sub>2</sub> 1-Hour NAAQS - Nevada**



### **Sulfur Dioxide (SO<sub>2</sub>)**

The level of the 1-hour NAAQS for SO<sub>2</sub> is 75 ppb calculated as the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations. The 2011-2013 design values also calculated as the 3-year average of the annual distribution of daily maximum 1-hr average concentrations for SO<sub>2</sub> are presented in Table 2. Daily maximum 1-hr SO<sub>2</sub> 2000-2013 trends at monitoring stations in Oregon, Washington, California, Idaho, and Nevada are in Figures 12-16.

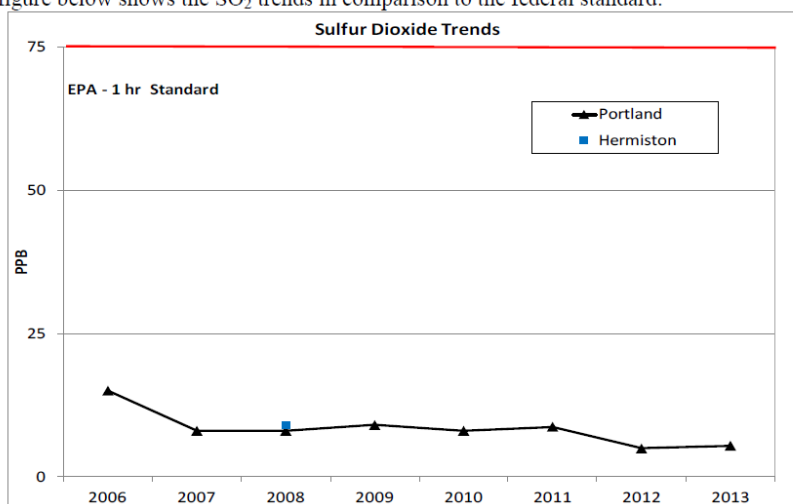
Table 2: County-Level Design Value Concentrations for SO<sub>2</sub> 1-Hour NAAQS

State	County	2011-2013 1-Hour Design Value (ppb)
CA	Alameda	15
CA	Contra Costa	14
CA	Riverside	3
CA	Sacramento	2
CA	San Bernardino	5
CA	San Diego	1
CA	San Luis Obispo	21
CA	Santa Barbara	36
CA	Santa Clara	13
CA	Solano	4
ID	Caribou	40
NV	Clark	8
NV	Washoe	6
OR	Multnomah	6
WA	Clallam	1

**Figure 12: Trends – SO<sub>2</sub> 1-hour NAAQS concentrations – Umatilla County, Oregon**

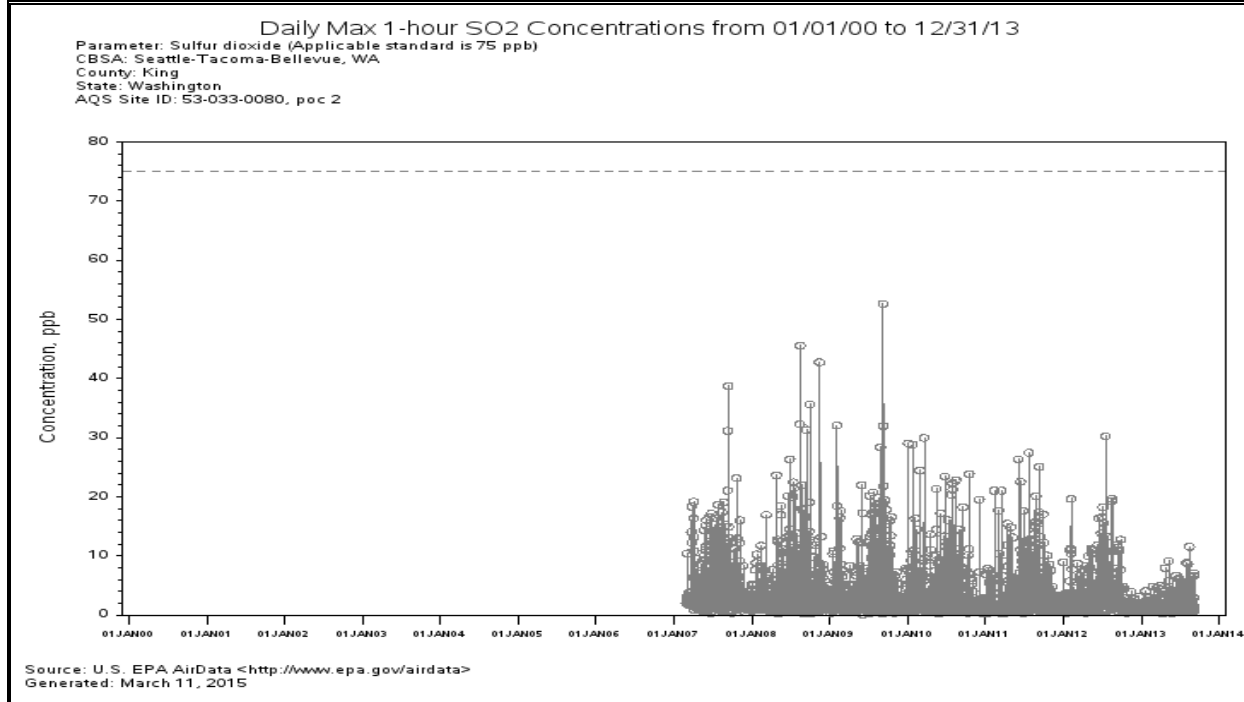
#### Sulfur Dioxide Trends

The figure below shows the SO<sub>2</sub> trends in comparison to the federal standard.

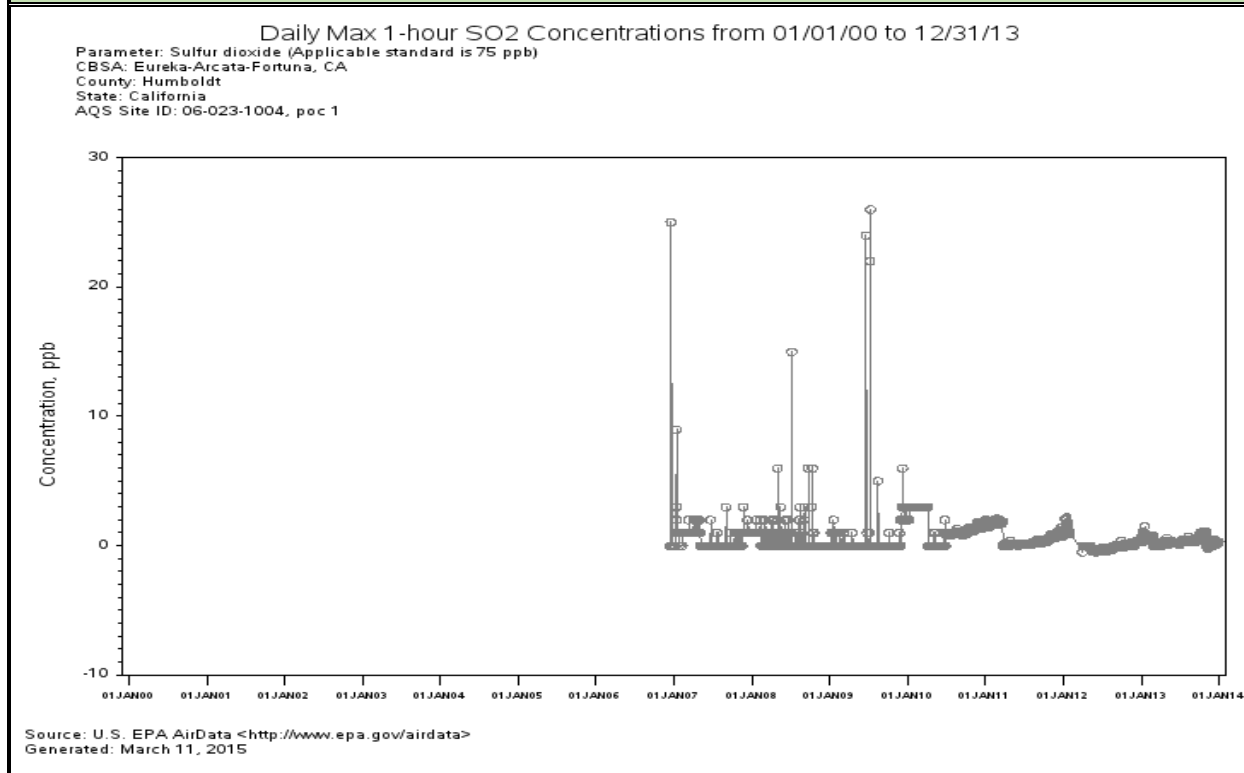




**Figure 13: Trends – SO<sub>2</sub> 1-hour NAAQS concentrations - Washington**

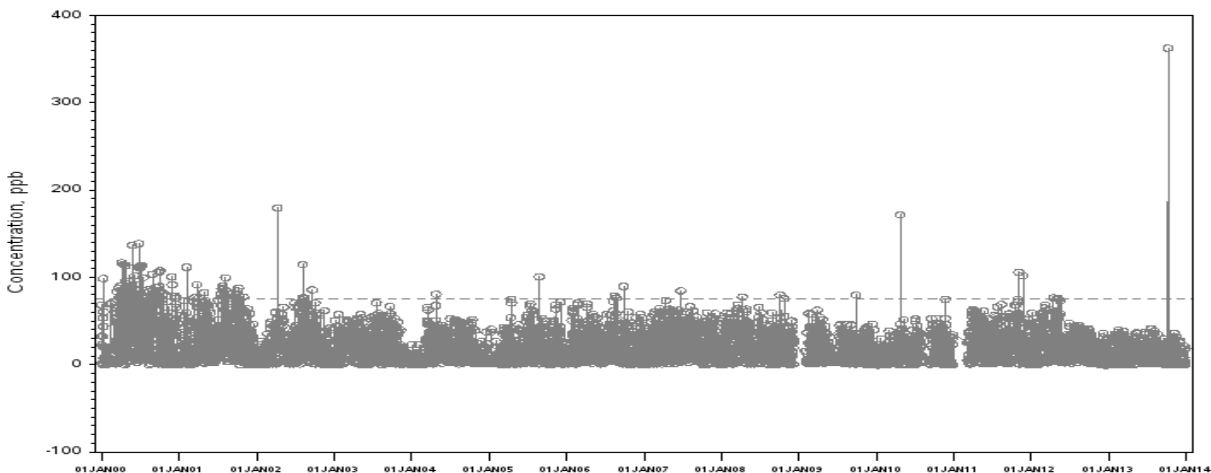


**Figure 14: Trends – SO<sub>2</sub> 1-hour NAAQS concentrations - California**



**Figure 15: Trends – SO<sub>2</sub> 1-hour NAAQS concentrations - Idaho**

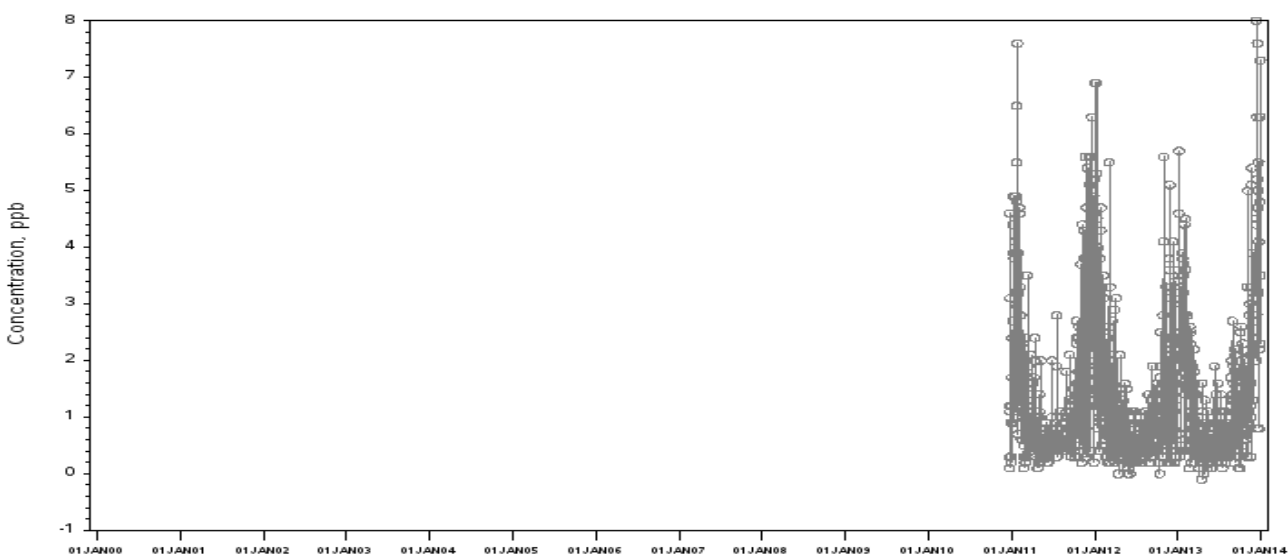
Daily Max 1-hour SO<sub>2</sub> Concentrations from 01/01/00 to 12/31/13  
Parameter: Sulfur dioxide (Applicable standard is 75 ppb)  
CBSA: Pocatello, ID  
County: Bannock  
State: Idaho  
AQ5 Site ID: 16-005-0004, poc 2



Source: U.S. EPA AirData <<http://www.epa.gov/airdata>>  
Generated: March 11, 2015

**Figure 16: Trends – SO<sub>2</sub> 1-hour NAAQS concentrations - Nevada**

Daily Max 1-hour SO<sub>2</sub> Concentrations from 01/01/00 to 12/31/13  
Parameter: Sulfur dioxide (Applicable standard is 75 ppb)  
CBSA: Reno-Sparks, NV  
County: Washoe  
State: Nevada  
AQ5 Site ID: 32-031-0016, poc 1



Source: U.S. EPA AirData <<http://www.epa.gov/airdata>>  
Generated: March 11, 2015

### **Lead (Pb):**

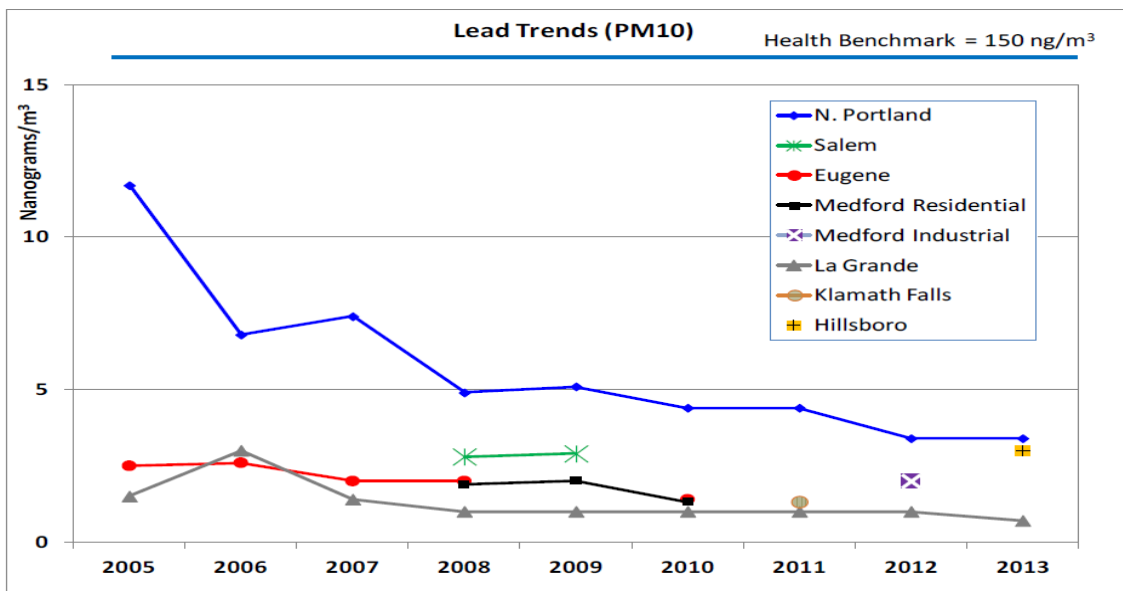
The level of the 2008 NAAQS for lead is 0.15 µg/m<sup>3</sup> not to be exceeded in any 3-month period. The 2011-2013 available design values for Pb are presented in Table 3. Daily maximum 1-hr Pb 1990-2013 trends at monitoring stations in Oregon, California, and Idaho are in Figures 17-19.

Table 3. Site-Level Maximum Design Value Concentrations for 2008 Lead NAAQS, 2011-2013			
<b><u>State</u></b>	<b><u>County</u></b>	<b><u>AQS Site ID</u></b>	<b><u>2011- 2013 Design Value (µg/m<sup>3</sup>)</u></b>
California	Imperial	060250005	0.03
California	Los Angeles	060371103	0.01
California	Los Angeles	060371403	0.11
California	Los Angeles	060371405	<b>0.46</b>
California	Los Angeles	060371406	0.07
California	Los Angeles	060371602	0.01
California	Riverside	060651003	0.01
California	Riverside	060658001	0.01
California	San Bernardino	060711004	0.01
California	San Diego	060731020	<b>0.17</b>
California	San Mateo	060812002	<b>0.33</b>
Oregon	Yamhill	410711702	0.05

The design values in bold in Table 3 exceed the 2008 Pb NAAQS. The monitoring site in California is 800 miles from the Oregon border. Given the great distances involved and the nature of lead transport, Oregon emissions are not expected to have any effect on lead levels measured in California.

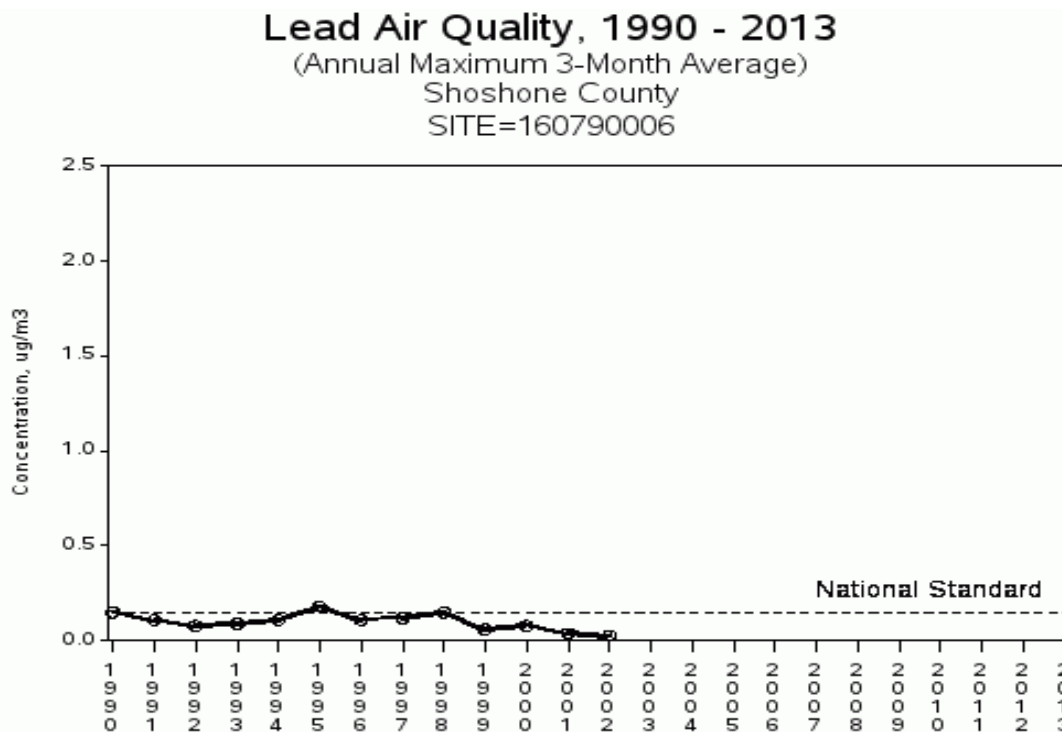
Figure 17 below shows local 2005-2013 Pb trends in Oregon. Figures 18-20 show Pb trends in Idaho, California and Washington. According to EPA requirements, the lead emissions monitoring threshold is 0.50 tons per year (tpy). Air quality monitoring agencies are advised to use this threshold to determine if an air quality monitor is required to be placed near a facility emitting lead. There are no Pb trends for Nevada because Nevada did not conduct ambient monitoring for Pb. The figures show Pb trends in Oregon and its neighboring states are going down.

**Figure 17: Annual Maximum 3-Month Average Pb - Oregon**

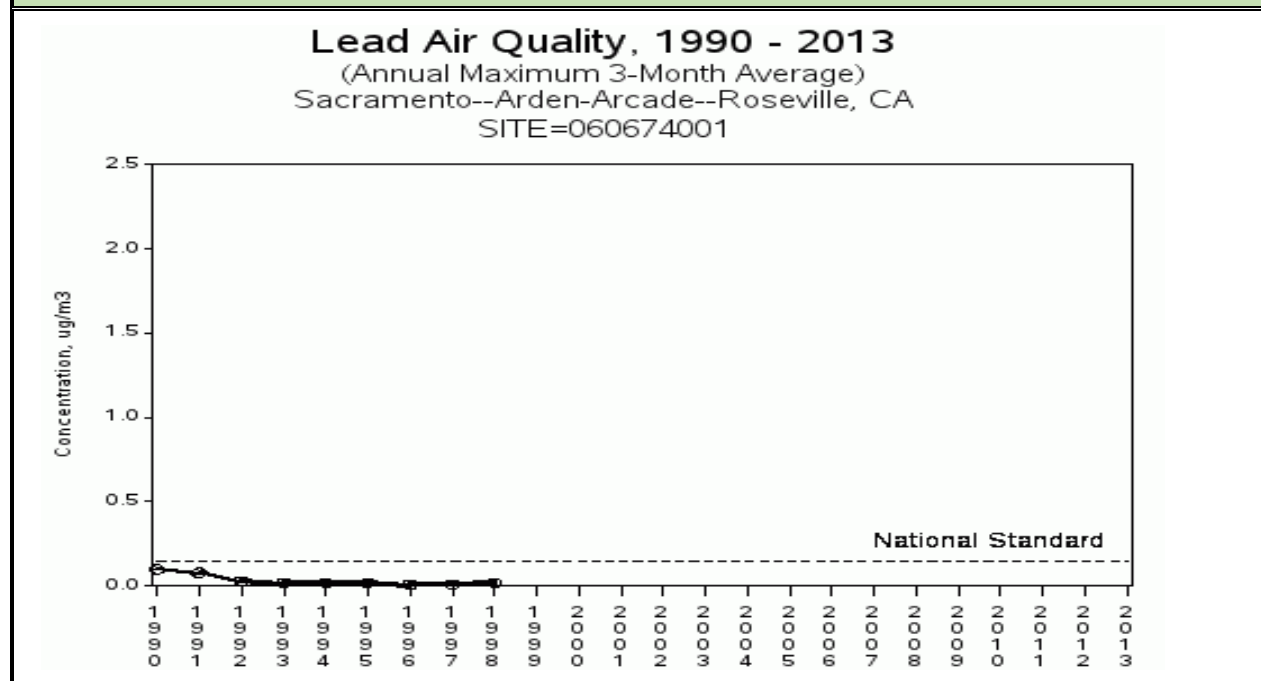


Lead NAAQS is 0.15 mg/m<sup>3</sup> which equals 150 ng/m<sup>3</sup>

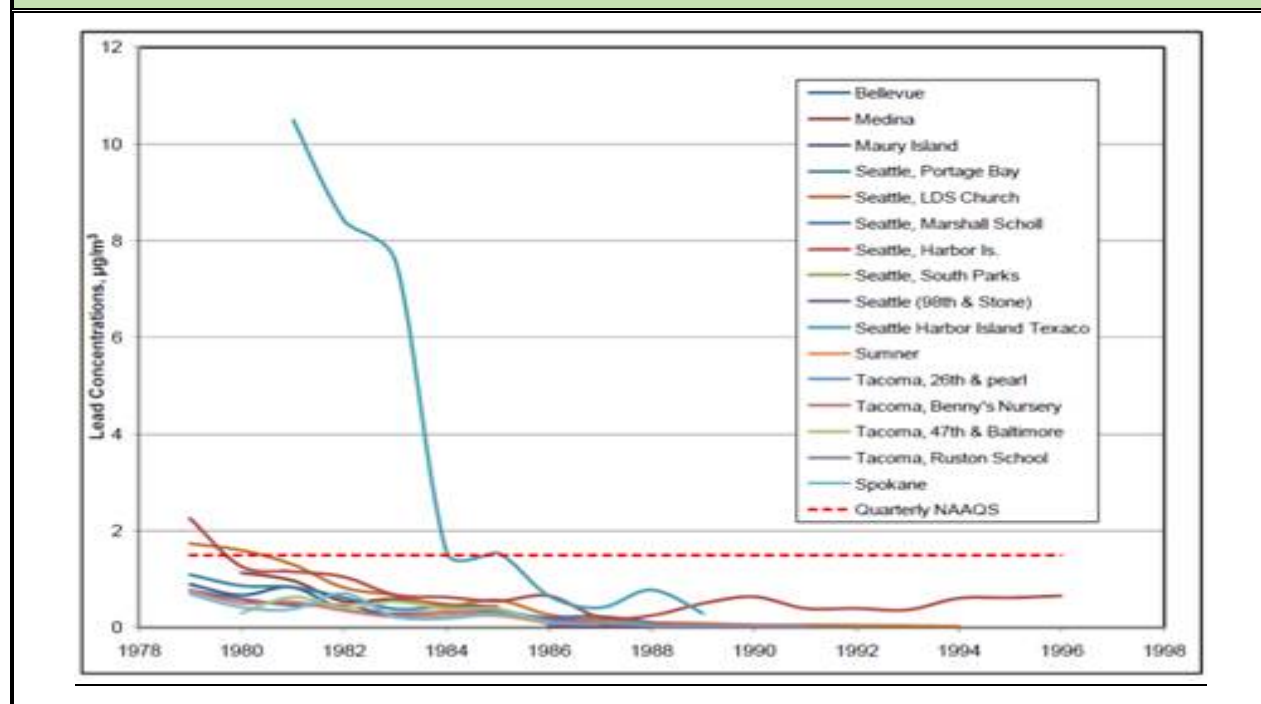
**Figure 18: Annual Maximum 3-Month Average Pb - Idaho**



**Figure 19: Annual Maximum 3-Month Average Pb - California**



**Figure 20: Quarterly Maximum Concentrations Pb – Washington**



**Fine Particulate Matter (PM 2.5):**

The level of the 2012 NAAQS for PM 2.5 is 12 ug/m<sup>3</sup> calculated as a 3-year average of the annual arithmetic mean. Table 4 presents the 2011-2013 design values for PM<sub>2.5</sub>. Figures 5-10 present annual PM<sub>2.5</sub> 2000-2013 trends at monitoring stations in Oregon, Washington, California, Idaho and Nevada.

<b>Table 4 PM<sub>2.5</sub> Site Listing, 2011-2013</b>			
<b>State</b>	<b>County</b>	<b>Site ID</b>	<b>2011-2013 Annual Design Value (µg/m<sup>3</sup>)</b>
<b>California</b>	Alameda	060010007	7.6
<b>California</b>	Alameda	060010009	10.0
<b>California</b>	Butte	060070008	10.1
<b>California</b>	Calaveras	060090001	8.4
<b>California</b>	Colusa	060111002	7.1
<b>California</b>	Contra Costa	060130002	7.4
<b>California</b>	Fresno	060190011	<b>15.4</b>
<b>California</b>	Fresno	060192009	7.8
<b>California</b>	Fresno	060195001	<b>16.4</b>
<b>California</b>	Fresno	060195025	<b>14.7</b>
<b>California</b>	Humboldt	060231002	6.2
<b>California</b>	Imperial	60250005	<b>14.3</b>
<b>California</b>	Imperial	060250007	7.5
<b>California</b>	Imperial	060251003	7.4
<b>California</b>	Inyo	060271003	7.5
<b>California</b>	Kern	060290014	<b>16.4</b>
<b>California</b>	Kern	060290016	<b>17.3</b>
<b>California</b>	Kings	060311004	<b>17.0</b>
<b>California</b>	Lake	060333001	3.8
<b>California</b>	Los Angeles	060370002	11.2



Table 4 PM2.5 Site Listing, 2011-2013			
State	County	Site ID	2011-2013 Annual Design Value (µg/m3)
California	Los Angeles	060371002	12.8
California	Los Angeles	060371103	13.0
California	Los Angeles	060371201	10.2
California	Los Angeles	060371302	12.2
California	Los Angeles	060371602	12.0
California	Los Angeles	060374002	11.1
California	Los Angeles	060374004	11.0
California	Madera	060392010	18.1
California	Marin	060410001	9.5
California	Merced	060470003	13.3
California	Merced	060472510	11.1
California	Monterey	060531003	6.1
California	Nevada	060570005	4.6
California	Nevada	060571001	7.0
California	Orange	060590007	10.7
California	Orange	060592022	8.2
California	Placer	060610006	7.5
California	Plumas	060631006	10.2
California	Plumas	060631009	12.2
California	Plumas	060631010	12.8
California	Riverside	060650009	7.7
California	Riverside	060651003	11.5
California	Riverside	060652002	7.7
California	Riverside	060655001	6.4
California	Riverside	060658001	13.4

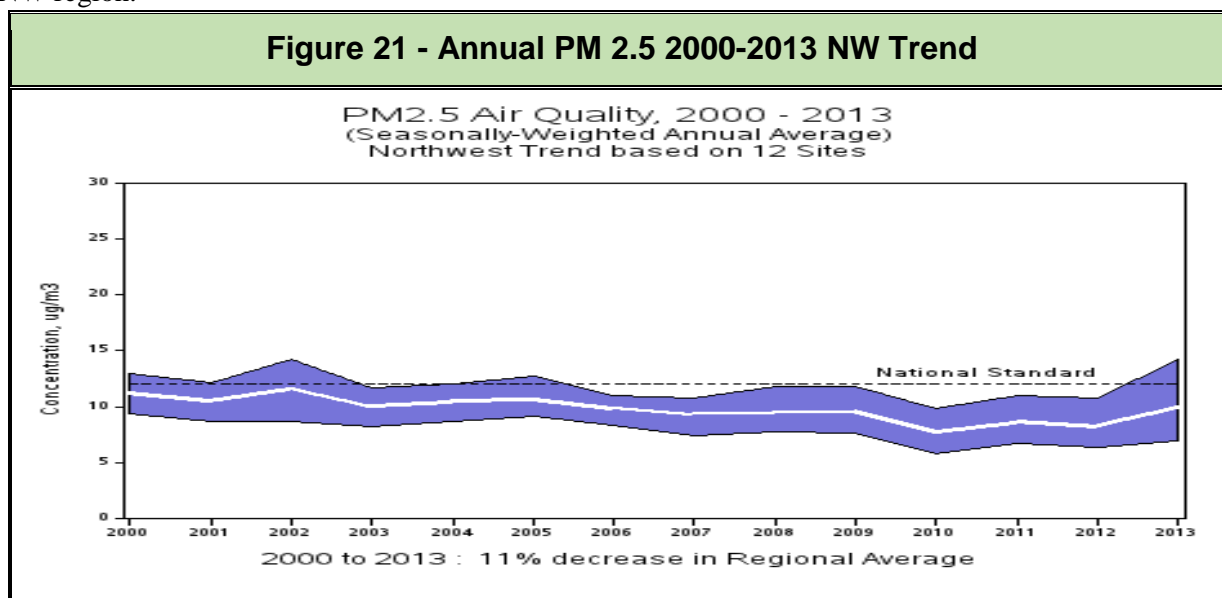
Table 4 PM2.5 Site Listing, 2011-2013			
State	County	Site ID	2011-2013 Annual Design Value (µg/m3)
California	Riverside	060658005	15.1
California	Sacramento	060670006	10.4
California	Sacramento	060670010	9.5
California	Sacramento	060674001	9.3
California	San Benito	060690002	5.5
California	San Bernardino	060710025	12.6
California	San Bernardino	060712002	12.6
California	San Bernardino	060718001	8.7
California	San Bernardino	060719004	11.8
California	San Diego	060730001	9.9
California	San Diego	060730003	10.6
California	San Diego	060731002	10.7
California	San Diego	060731010	10.8
California	San Diego	060731016	8.7
California	San Francisco	060750005	9.2
California	San Joaquin	060771002	13.8
California	San Joaquin	060772010	10.2
California	San Luis Obispo	060792004	8.7
California	San Luis Obispo	060792006	6.6
California	San Luis Obispo	060792007	11.3
California	San Luis Obispo	060798001	7.0
California	San Mateo	060811001	9.3
California	Santa Barbara	060830011	9.5
California	Santa Barbara	060831008	7.6
California	Santa Clara	060850002	8.0

Table 4 PM2.5 Site Listing, 2011-2013			
State	County	Site ID	2011-2013 Annual Design Value (µg/m3)
California	Santa Clara	060850005	10.3
California	Santa Cruz	060870007	6.3
California	Shasta	060890004	5.7
California	Shasta	060893004	6.2
California	Siskiyou	060932001	6.3
California	Solano	060950004	9.6
California	Sonoma	060970003	8.4
California	Stanislaus	060990005	13.6
California	Stanislaus	060990006	15.7
California	Sutter	061010003	7.7
California	Tehama	061030006	8.1
California	Tulare	061072002	16.6
California	Ventura	061110007	9.1
California	Ventura	061110009	8.1
California	Ventura	061112002	9.1
California	Ventura	061113001	9.0
California	Yolo	061131003	7.2
Idaho	Ada	160010010	9.1
Idaho	Bannock	160050020	7.7
Idaho	Benewah	160090010	9.9
Idaho	Canyon	160270002	10.8
Idaho	Franklin	160410001	8.0
Idaho	Lemhi	160590004	12.0
Idaho	Shoshone	160790017	12.8
Nevada	Clark	320030540	8.1

Table 4 PM2.5 Site Listing, 2011-2013			
State	County	Site ID	2011-2013 Annual Design Value (µg/m3)
Nevada	Clark	320030561	8.8
Nevada	Clark	320031019	4.6
Nevada	Washoe	320310016	7.6
Oregon	Crook	410130100	9.8
Oregon	Harney	410250003	9.5
Oregon	Jackson	410290133	10.9
Oregon	Josephine	410330114	8.8
Oregon	Klamath	410350004	11.6
Oregon	Lake	410370001	11.1
Oregon	Lane	410390060	7.0
Oregon	Lane	410391009	5.8
Oregon	Lane	410392013	9.1
Oregon	Lane	410399004	7.1
Oregon	Multnomah	410510080	8.1
Oregon	Umatilla	410590121	7.6
Oregon	Washington	410670004	8.2
Washington	King	530330057	10.1
Washington	King	530330080	6.1
Washington	King	530332004	7.1
Washington	Pierce	530530029	7.8
Washington	Snohomish	530610005	5.9
Washington	Snohomish	530610020	6.9
Washington	Snohomish	530611007	7.7
Washington	Spokane	530630021	8.0
Washington	Yakima	530770009	9.1

There are design values that exceed the annual PM 2.5 NAAQS in neighboring states at monitoring sites located hundreds of miles away from Oregon. Oregon's PM 2.5 emissions are unlikely to significantly contribute to those levels.

Figure 20 shows annual PM 2.5 2000-2013 NW trends at monitoring stations in Oregon, Washington, California, Idaho, and Nevada. The trend shows an 11% regional decrease in PM 2.5 emissions across the NW region.



Consultation with Neighboring States: In March 2015, DEQ contacted the air quality agencies in neighboring states via email - Adele Malone (Nevada), Mike Edwards (Idaho), Sylvia Vanderspek (California), and Paul Mairose (Washington) - regarding the potential transport of air emissions (NO<sub>2</sub>, SO<sub>2</sub>, Pb and PM<sub>2.5</sub>) across state boundaries. They informed DEQ that emissions from Oregon do not appear to be impacting their states in a significant way. Specifically, other than wildfires, California is not aware of any Oregon air emissions that affect Northern California. Washington's recent interstate transport report indicates Oregon's emissions are not significantly affecting Washington. Idaho reported that since they do not have a lead, NO<sub>2</sub> or SO<sub>2</sub> non-attainment area, they do not believe Oregon is affecting Idaho. Due to the lack of any nonattainment or maintenance areas for the listed pollutants, Nevada concludes that emissions from Oregon are not currently affecting air quality in any significant way.

## IV. Nature and Extent of Expected Pollutant Transport

NO<sub>2</sub> and SO<sub>2</sub> and Pb normally do not transport over long distances. As NO<sub>2</sub> and SO<sub>2</sub> can also react in the atmosphere to become nitrate and sulfate particulate, both NO<sub>2</sub> and SO<sub>2</sub> will most likely either disperse in the atmosphere or chemically react to form a secondary pollutant within a few miles of the source. Pb would most likely be deposited within a few miles of a source. Based on monitoring data and DEQ's discussion with other state air agencies, DEQ concludes that direct emissions of Pb, NO<sub>2</sub> and SO<sub>2</sub> do not

cause or contribute to exceedances of the NAAQS. Any impacts from those pollutants as well as PM<sub>2.5</sub> are addressed through DEQ's PSD rules and through the Regional Haze program.

*Nitrogen Dioxide:* NO<sub>2</sub> is one of a group of highly reactive gasses known as "oxides of nitrogen," or "nitrogen oxides (NO<sub>x</sub>)." Other nitrogen oxides include nitrous acid and nitric acid. EPA's NAAQS uses NO<sub>2</sub> as the indicator for the larger group of nitrogen oxides. NO<sub>2</sub> forms quickly from emissions from cars, trucks and buses, power plants and off-road equipment. In addition to contributing to the formation of ground-level ozone, and fine particle pollution, NO<sub>2</sub> is linked with a number of adverse effects on the respiratory system.

EPA first set standards for NO<sub>2</sub> in 1971, setting both a primary standard (to protect health) and a secondary standard (to protect the public welfare) at 0.053 parts per billion (ppb), averaged annually. EPA reviewed the standards twice since that time, but chose not to revise the annual standards at the conclusion of each review. In January 2010, EPA established an additional primary standard at 100 ppb, averaged over one hour. Concentrations of NO<sub>2</sub> emitted into the atmosphere will decrease during transport through three mechanisms: deposition, chemical transformation, and dispersion. Interstate transport of NO<sub>2</sub> is not a concern for Oregon due to the distances involved for large stationary sources and large concentrations of area source emissions in western Oregon.

*Sulfur Dioxide:* SO<sub>2</sub> is one of a group of highly reactive gasses known as "oxides of sulfur." Generally the largest sources of SO<sub>2</sub> emissions are from fossil fuel combustion at power plants (73%) and other industrial facilities (20%). Smaller sources of SO<sub>2</sub> emissions include industrial processes such as extracting metal from ore, and burning high sulfur containing fuels in locomotives, large ships, and non-road equipment. SO<sub>2</sub> is linked with a number of adverse effects on the respiratory system. The emission inventory for Oregon demonstrates a similar source distribution.

EPA first set standards for SO<sub>2</sub> in 1971. EPA set a 24-hour primary standard at 140 ppb and an annual average standard at 30 ppb (to protect health). EPA also set a 3-hour average secondary standard at 500 ppb (to protect the public welfare). In 1996, EPA reviewed the SO<sub>2</sub> NAAQS and chose not to revise the standards. In 2010, EPA revised the primary SO<sub>2</sub> NAAQS by establishing a new 1-hour standard at a level of 75 ppb. EPA revoked the two existing primary standards because they would not provide additional public health protection.

Concentrations of SO<sub>2</sub> emitted into the atmosphere decreases during transport through three mechanisms: deposition, chemical transformation, and dispersion. Interstate transport of SO<sub>2</sub> is not a concern for Oregon due to the distances involved for large stationary sources and large concentrations of area source emissions in western Oregon.

*Lead:* As noted in the EPA's October 14, 2011 Pb infrastructure guidance, the physical properties of Pb prevent emissions from experiencing the same travel or formation phenomena as fine particulate matter or ozone. More specifically, there is a sharp decrease in Pb concentrations, at least in the coarse fraction, as the distance from a Pb source increases. Accordingly, while it may be possible for a source in a state to emit Pb in a location and in quantities that may contribute significantly to nonattainment in, or interfere with maintenance by, any other state, EPA anticipates that this would be a rare situation (e.g., where large sources are in close proximity to state boundaries). EPA's experience with initial Pb designations suggests that sources that emit less than 0.5 tons per year or that are located more than two miles from a state border generally appear unlikely to contribute significantly to nonattainment in another state. All sources of Pb emissions in Oregon are below 0.5 tons per year and are located greater than two miles



from the state border. Therefore, it is unlikely that sources in Oregon will significantly contribute to nonattainment or interfere with maintenance of the 2008 Pb NAAQS in any other state.

***Fine Particulate Matter:*** DEQ's consultation with air agencies in adjacent states suggests that high PM 2.5 levels in their respective communities are driven largely by local pollution sources during air stagnation events. Local air stagnation events would generally preclude interstate air pollution transport as a significant contributor to high PM 2.5 levels jeopardizing NAAQS compliance.

## V. Sources of Pollutant Emissions Near the State Boundary and Expected Impacts in Neighboring States

This section addresses sources and emissions for pollutants (specifically major point or area source emissions and their proximity to the state boundary) and the likelihood that emissions from these sources would transport across the state boundary to contribute significantly to nonattainment or interfere with maintenance of any applicable NAAQS in any other state.

There are six Title V Oregon sources (major industrial sources that have a potential to emit a 100 tons per year of any criteria pollutant) in close proximity to the Washington border and one source in close proximity to the Idaho border.

**Table 5: Closest Sources within 5 km of Washington Border**

Source Name	City	2011 Actual Emissions (tpy)				Washington (km)
		NOX	PB	PM25	SO2	
Georgia-Pacific Consumer Products LP	CLATSKANIE	1,062.2	0.0	951.4	706.7	1
Owens-Brockway Glass Container Inc.	PORTLAND	406.5	0.0	47.6	119.0	4
Cascades Tissue Group-Oregon	SAINT HELENS	247.3	0.0	9.1	2.1	1
EVRAZ Inc, NA	PORTLAND	192.9	0.1	24.5	4.1	3
Portland General Electric Company Beaver Plant/Port Westward I Plant	CLATSKANIE	91.9	0.0	35.6	13.6	1
Portland General Electric Company Coyote Springs Plant	BOARDMAN	79.9	0.0	13.8	3.1	1

**Table 6: Closest Sources within 5 km of Idaho Border but NOX emissions less than 100 tons**

Source Name	City	2011 Actual Emissions (tpy)				Idaho (km)
		NOX	PB	PM25	SO2	
The Amalgamated Sugar Company LLC	NYSSA	1.0	0.0	0.0	1.0	1

Georgia-Pacific Consumer Products LP, Cascades Tissue Group-Oregon, Portland General Electric Company Beaver Plant/Port Westward I Plant, and Portland General Electric Company Coyote Springs Plant all went through PSD analysis, were issued PSD permits and thus demonstrated that their emissions do not cause or contribute to a violation of any applicable NAAQS.

Owens-Brockway Glass Containers and Evraz were evaluated as part of the competing sources inventory during both Port Westward and Troutdale Energy Center's PSD analyses and thus demonstrated that their emissions considered in conjunction with the emissions from other sources in the area do not cause or contribute to a violation of any applicable NAAQS.

A PSD permit applicant must conduct an air quality analysis of the ambient impacts associated with the construction and operation of a proposed new source or modification. The purpose of the air quality analysis is to demonstrate that new emissions from a proposed major stationary source or major modification, in conjunction with other applicable emissions from existing sources (including secondary emissions), will not cause or contribute to a violation of any applicable NAAQS.

Portland General Electric's coal-fired power plant is located in Boardman, Oregon, 14 km south of Washington's border. It is the only coal fired power plant in Oregon. In December 2010, the Environmental Quality Commission approved DEQ's proposed revisions to air pollution control rules for this plant. Based on the adopted rules, Boardman has a federally enforceable shutdown date of December 31, 2020. The rules also require PGE Boardman to use dry sorbent injection controls to meet federal regulations for sulfur dioxide control and a more stringent sulfur dioxide limit from 2018-2020. DEQ concluded that the proposed BART controls, when combined with the permanent closure of plant no later than December 31, 2020, meet federal requirements and provide a significant environmental and public health benefit.

Based on the analysis discussed above, it is reasonable to conclude that emissions from sources in Oregon do not significantly contribute to PM<sub>2.5</sub> and NO<sub>2</sub> concentrations in any other state.

Regional Work with Western Regional Air Partnership (WRAP): In late 2010, WRAP initiated the *West-wide Jump-start Air Quality Modeling Study (WestJumpAQMS)*. The goal of the study was to develop the next generation of regional air quality modeling databases for ozone, PM<sub>2.5</sub>, visibility and deposition planning in the western U.S and to provide information on the role of interstate and international transport to ozone and PM<sub>2.5</sub> under current and potential future NAAQS. The study looked at PM<sub>2.5</sub> annual source apportionment but did not look at the transport of lead, NO<sub>2</sub> or SO<sub>2</sub>. DEQ reviewed Appendix E, *State Contributions to Modeled Annual PM 2.5 Concentrations in 2008 by Monitoring Site*, and the total annual PM<sub>2.5</sub> modeled concentrations in all the counties in the state of Washington, California, Idaho, Nevada, and as far away as Wyoming. Clark and Skamania counties in Washington may be impacted by Oregon's PM<sub>2.5</sub> emissions from Georgia Pacific Consumer Products located in Clatskanie. However, Washington does not have an annual PM<sub>2.5</sub> nonattainment area and has not had any violations of the PM<sub>2.5</sub> NAAQS in the past 3 years. Any potential impact does not result in Oregon's contribution to nonattainment or violations of annual PM<sub>2.5</sub> standard in the state of Washington. The impacts by Oregon to other neighboring states were insignificant.

## VI. Conclusion

In general air pollution from all sources transport across state boundaries. Based on the information described above (Oregon's emissions inventory, air monitoring data and consultation with neighboring state air agencies), DEQ finds no evidence to suggest that Oregon emission of NO<sub>2</sub>, SO<sub>2</sub>, Pb and PM<sub>2.5</sub> significantly contribute to exceedances or violations of NAAQS, or cause adverse effects in the neighboring states. Additionally, Oregon's PSD program requires NAAQS and visibility analysis for any new or modified industrial sources.

In conclusion, Oregon's SIP complies with CAA Section 110(a)(2)(D)(i)(I). The current Oregon SIP contains adequate provisions prohibiting any source or other type of emissions activity within the State from emitting any air pollutant in amounts that will contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard.