AIR QUALITY

CLEAN AIR ACT

The Clean Air Act requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. The Clean Air Act requires periodic review of the science upon which the standards are based and the standards themselves. EPA has set NAAQS for six principal pollutants, which are called "criteria" pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, lead, and particulate matter.

In Oregon, the Environmental Protection Agency (EPA) has delegated authority to the Department of Environmental Quality (DEQ) to enforce air quality standards. The mission of DEQ's Air Quality Program is to preserve and enhance Oregon's air quality to support healthy, clean air for all Oregonians.

The main pollutant of concern in rural areas such as Pendleton is fine particulate matter. Fine particulate matter (PM) comes mostly from windblown dust and smoke from power plants, vehicle exhaust, and fuel combustion, such as wood stove smoke and open burning. There are harmful effects from breathing particles measuring less than 10 microns in diameter, known as PM_{10}. Most recent research indicates that even smaller particles, those measuring less than 2.5 microns in diameter ($PM_{2.5}$) may be responsible for the most significant health effects, like premature mortality, hospital admissions, and respiratory illness. Fine particle air pollution in the size range of PM_{10} and $PM_{2.5}$ is of great concern because these particles 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 2006, the Clean Air Act standards for PM_{10} and $PM_{2.5}$ were revised. The previous standard and the new standard are shown in the table below.

	Previous Standards		**2006 Standards**	
	Annual	**24-hour**	**Annual**	**24-hour**
$PM_{2.5}$ (Fine Particulates)	15 µg/m3 Annual Average	65 µg/m3 98th percentile	15 µg/m3 Annual Average	35 µg/m3 98th percentile
PM_{10} (Coarse Particulates)	50 µg/m3 Annual Average	150 µg/m3 1 expected exceedance	Revoked	150 µg/m3 1 expected exceedance

Note: µg/m3 is micrograms per cubic meter

An area that meets the national primary or secondary ambient air quality standard for a given pollutant is classified as an **Attainment Area**. Any area that does not meet the national primary or secondary ambient air quality standard for a given pollutant is classified as a **Nonattainment Area.** Most areas of Oregon meet the NAAQS.

PENDLETON AIR QUALITY

The Pendleton Air Quality Commission (AQC) was established in January of 1991 to address air quality issues in Pendleton. The main purpose of the AQC has been to educate the public, with a focus on: 1) Health Issues; 2) Quality of Life Issues; and 3) Meeting Federal Clean Air Act Standards. The City of Pendleton and the AQC have worked hard to ensure that Pendleton remains an attainment area under the CAA.

Air quality parameters are monitored by DEQ at various sites throughout Oregon. DEQ had an air monitoring station at the State Office Building in Pendleton where it monitored PM_{10} from 1997 through 1999. DEQ also has an air monitoring station in the McKay area of Pendleton where it has monitored PM_{10} from 1997 through 2008 and $PM_{2.5}$ from 1999-2002 and continuously from 2007 to present. In addition to particulate matter, the McKay site also measures barometric pressure, temperature, wind speed, and wind direction. Particulate measure is measured both by the standard federal reference method of filtration and by a nephelometer, which is a light scattering device.

The graph below (Fig. 29c), which was taken from the "*2007 Oregon Air Quality Data Summaries*," demonstrates that Pendleton showed improvement in PM_{10} since highs in 1991 and 1993. Pendleton has no exceedances for PM_{10} for 1998 through 2007; monitoring for PM_{10} ended in 2008. We believe this improvement is largely due to education efforts by the City of Pendleton and the AQC.

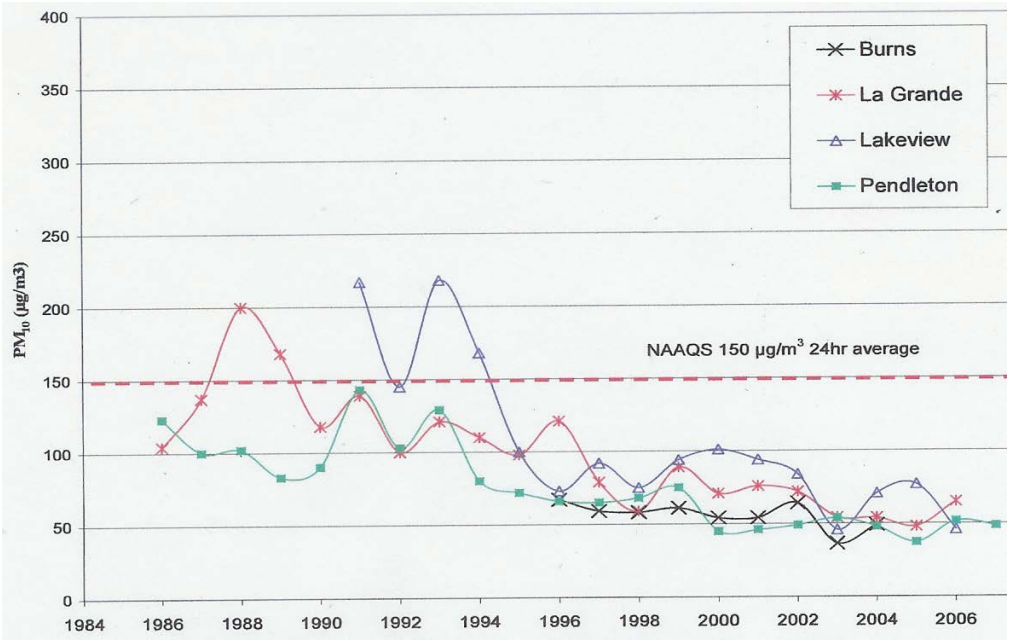

Figure 29c. PM_{10} trend for Eastern Oregon cities using the second highest 24-hour average.

Pendleton continually meets the annual $PM_{2.5}$ standard of 15 µg/m3, as shown in Figure 55, below, from the *2010 Oregon Air Quality Data Summaries*. However, the change in the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 has presented a number of challenges for cities throughout the nation and Oregon, including Pendleton. As shown in the graph below, Pendleton had an exceedance of the new 24-hour $PM_{2.5}$ standard in 2002. Since compliance is based on a 3-year average and official $PM_{2.5}$ monitoring has been incomplete in Pendleton, we are still in compliance for $PM_{2.5}$. Improvements are seen in 2008-2010.

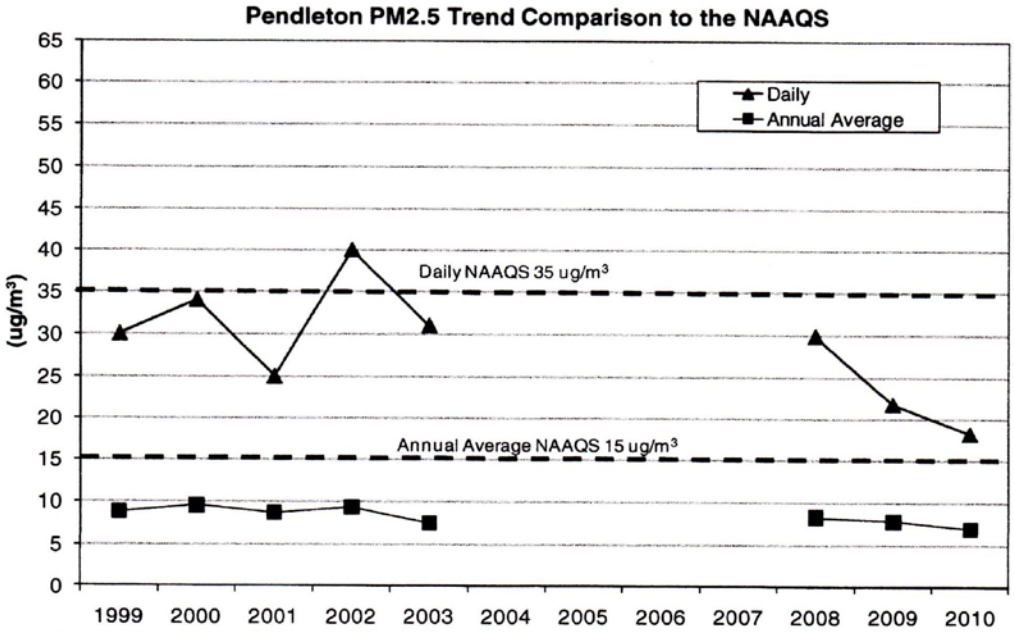

Figure 55. Pendleton Oregon $PM_{2.5}$ Trends.

Figure 26 below shows the 2010 Pendleton Air Quality Index. Note that the winter months are the time when the city has the highest readings and, therefore, the greatest chance of exceeding federal air quality standards.

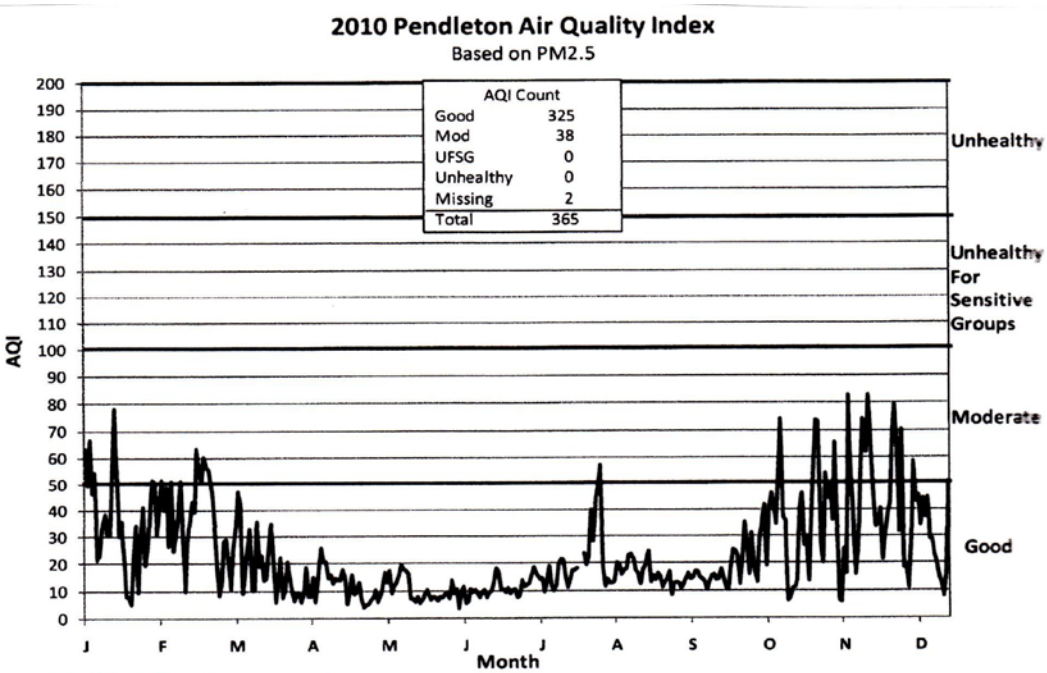

Figure 26. 2010 Pendleton Air Quality Summary.

Figure 57 below shows the 2008-2010 values for cities throughout Oregon. Looking at a three-year average using a surrogate measure of $PM_{2.5}$, i.e. a nephelometer, the average $PM_{2.5}$ value in Pendleton is just below 25 µg/m^3. Nonetheless, Pendleton remains at risk of violating the federal air quality standards and slipping into Non-Attainment status. This could have a negative impact on economic development in the area.

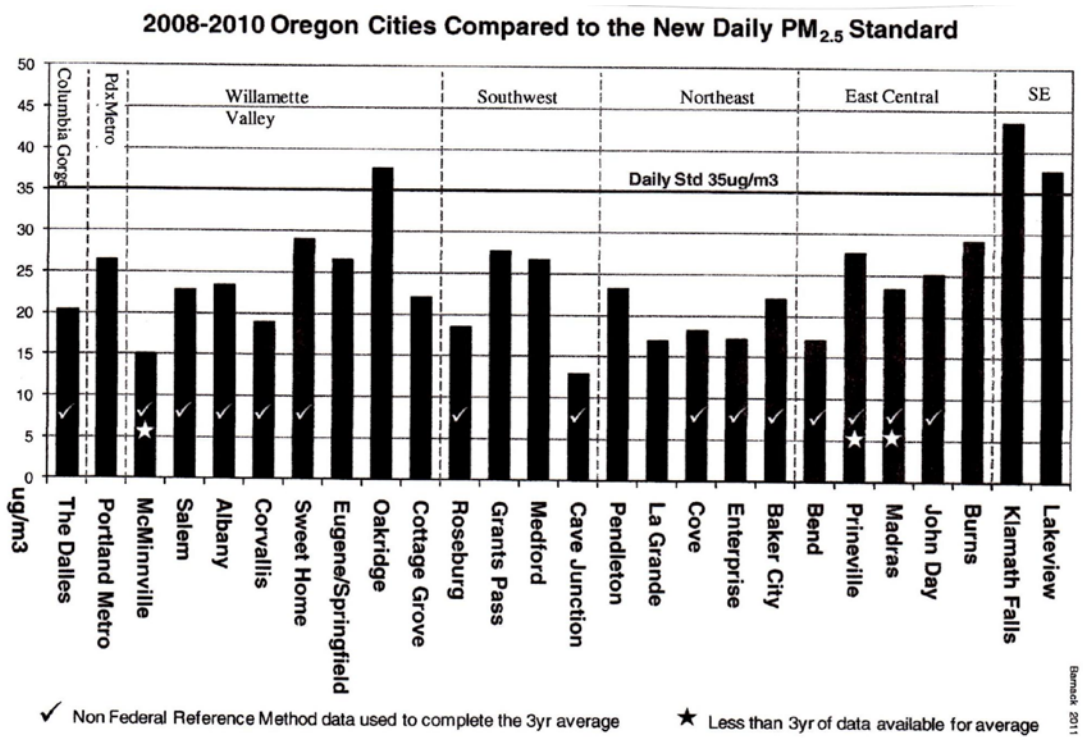

Figure 57. Oregon Cities 2008-2010 $PM_{2.5}$ Comparison.
Chart uses the three year average 98th percentile (the daily standard is 35ug/m^3).

WOOD STOVE REPLACEMENT PROGRAM

City of Pendleton and the Pendleton AQC have implemented a number of programs to improve air quality in Pendleton. Foremost among those programs is the City's Wood Stove Replacement Program. The program provides residents with a no-interest loan, to be paid back over five years, to replace an old wood stove or wood stove insert.

City of Pendleton has had three Wood Stove Replacement Programs, which will be designated as Phase 1, Phase 2, and Phase 3. Phase 1 began in 2000 and ended in 2002. During Phase 1, there were 93 stoves replaced, and approximately $238,000 was loaned to participants. Phase 1 of the program was considered very successful because of the number of stoves replaced and the amount of money loaned. It was a huge benefit to the homeowners, local contractors, and to improved air quality.

Phase 2 of the Wood Stove Replacement Program began in 2004 and ended in 2006. During Phase 2, only 13 stoves were replaced, and approximately $34,000 was loaned.

Phase 3 of the Wood Stove Replacement Program began in 2007 and is on-going. As of July, 2012, we have changed out another 70 wood stoves. The City intends to continue the program on a limited basis in the future.

It is difficult to prove that the Wood Stove Replacement Program improved air quality in Pendleton even though we have seen a significant improvement in PM_{10} from 1996 to 2010. Air quality is largely dependent on weather patterns. Inversions play a major role in Pendleton's air quality. When cold air masses settle and become trapped in the low-lying valleys of Pendleton, particulates begin to accumulate in the valleys. Particulates accumulate and increase when these inversions last several days, and that is primarily when high levels of both PM_{10} and $PM_{2.5}$ occur.

Air inversion in the McKay valley, Pendleton, OR. *Photo courtesy Joe Solomon, NWS.*

Although the City cannot affect changes in the weather, the City is concerned about the location of DEQ's McKay Creek monitoring station. The monitoring station is located in a residential area adjacent to several homes with wood stoves. The City has approached DEQ several times and requested they move the station, but they are unwilling to do so unless the City can prove that the site does not meet EPA standards.

PENDLETON AIR POLLUTION CONTROL ORDINANCE

In 2008, the AQC, the Pendleton Fire Department, and the City worked through a number of issues and developed and later passed the *Pendleton Air Pollution Control Ordinance*, Ordinance 3766, in June, 2008. The ordinance governs both wood stove burning and open burning within the City of Pendleton. It requires the City to determine and issue a daily Air Quality Forecast from October 1 through June 15 the following year. The forecast is made available to the public on a dedicated Burn Line and on the City's website. The ordinance requires any person who conducts open burning or residential burning in a wood burning stove within the City of Pendleton to contact the Burn Line and comply with the forecast restrictions. The Ordinance also prohibits the open burning of any restricted materials, and burn barrels are prohibited inside the City limits.

Data from the National Weather Service and data from DEQ's air monitoring station are utilized to determine the daily Air Quality Forecast, which has three possible designations. A GREEN DAY allows the use of wood burning stoves and open burning, but hours of open burning may be restricted. On a YELLOW DAY, no open burning is allowed and wood stove burning is restricted to DEQ- or EPA- approved wood stoves. On a RED DAY, no open burning is allowed and no wood burning stoves are allowed unless they are the sole source of heat for the household. Daily Air Quality Forecasts began October 1, 2008. As a result of these changes, there have been fewer days when open burning is allowed in Pendleton, and wood stove use has been further restricted.

AIR EDUCATION PROGRAMS

The City has educational material available at City Hall or upon request that provide information about good wood burning practices to help citizens burn cleaner and more efficiently and to reduce air pollution.

The AQC has a number of education programs to inform citizens about air quality issues. One such program is the Good Neighbor Program. If you have a neighbor whose wood stove smoke is bothering you or a member of your family, you can request that the AQC send a "Good Neighbor Packet" to the neighbor. The packet includes information about good wood burning practices.

In fall, 2008, the AQC began an Air Education Program at Sunridge Middle School with three seventh grade science classrooms. Students learned about a variety of air quality issues such as health issues, air quality monitoring, criteria pollutants, and air pollution sources. The students kept track of the daily air quality forecast for one month and were asked to write an essay on air quality at the end of the program. Students with the three best essays were honored by the AQC. The teacher and students thought the program was very successful, so it have been continued each year. Students currently compete by creating colorful Air Education posters, and students with the best posters receive prizes and have their posters featured on the City's website.

IF YOU USE A WOOD STOVE, BURN SMART

If you utilize a wood stove, follow these tips to burn cleaner and more efficiently and to reduce air pollution.

1. If at all possible, **don't burn wood when the air quality is poor**. For local air quality information, contact the Air Quality Forecast at 541-966-0327.

2. **Consider switching** to a cleaner, and possibly cheaper fuel to heat your home, or consider switching to a new, certified wood stove. The City's Wood Stove Replacement Program can assist you in replacing older, uncertified wood stoves and wood stove inserts.

3. **Burn only seasoned, dry firewood**. That means no garbage, plastics, rubber, paint or oil, no painted or treated wood, particleboard, plywood, coal or charcoal briquettes, and no glossy or colored paper. Burning things like that can produce fumes that may be toxic and can foul your catalytic converter, your flue, and cause serious health problems for you, your family and your neighbors.

4. **Build small, hot fires** instead of large, smoldering ones. Don't damper down your fire because that causes inefficient burning and creates lots of smoke.

5. **Watch those smoke signals.** If you are sending up a lot of smoke, that means your fire is burning inefficiently and you are producing air pollution.

FOR MORE INFORMATION

If you would like additional information about the Pendleton Air Quality Commission, the next AQC meeting, the Good Neighbor Packet, the daily Air Quality Forecast, or the Wood Stove Replacement Program, please **contact Karen King at 541-966-0249 or Karen.King@ci.pendleton.or.us.**

For additional information about state of Oregon air quality programs, visit the Oregon Department of Environmental Air Quality website at: http://www.oregon.gov/DEQ/AIR.

For additional information about federal air quality programs, visit the U.S. Environmental Protection Agency (EPA) website at **http://yosemite.epa.gov/R10/AIRPAGE.NSF/homepage/Air+Quality**

Additional websites of interest:

AIRPACT
http://lar.wsu.edu/airpact-3

Wildfire Air Quality
www.deq.state.or.us/aqi/wildfire/index.htm