



DEPARTMENT OF
ECOLOGY
State of Washington



Report to the Legislature: Achieving Attainment with National Ambient Air Quality Standards

December 2016
Publication no. 16-02-028

Publication and Contact Information

This report is available on Ecology's website at <https://fortress.wa.gov/ecy/publications/SummaryPages/1602028.html>

For more information, contact:

Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600
(360) 407-6800

Washington State Department of Ecology - www.ecy.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Yakima 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

To request ADA accommodation, call Ecology at (360) 407-6800, 711 (relay service), or (877) 833-6341 (TTY).

Report to the Legislature: Achieving Attainment with National Ambient Air Quality Standards

Joint Report by
Washington State Department of Ecology
and Puget Sound Clean Air Agency

This page intentionally left blank.

Table of Contents

	<u>Page</u>
List of Figures	iv
Executive Summary	v
Progress in achieving attainment	v
Implementation tools needed.....	vi
Background	1
Progress Toward Achieving Attainment.....	3
Additional Implementation Tools.....	5
Conclusion	6
Next Steps	6

List of Figures

	<u>Page</u>
Figure 1: Map of Fine Particle Maintenance Area in Tacoma and Pierce County	2
Figure 2: Fine Particle Levels at the Tacoma South L Street Monitoring Site.....	4
Figure 3: Number of Days in Tacoma-Pierce County with Cold, Stagnant Weather (Average temperature $\leq 35^{\circ}\text{F}$, and wind speed ≤ 1 mile per hour)	5

Executive Summary

Ecology and Puget Sound Clean Air Agency developed this report to satisfy a requirement in RCW 70.94.605. The report outlines the approach and tools implemented in Tacoma and Pierce County to reduce wood smoke and meet the daily fine particle (PM_{2.5}) National Ambient Air Quality Standard (NAAQS, or standard).

RCW 70.94.605

Report to the legislature — Achieving attainment for areas of nonattainment. (Expires January 1, 2019.)

(1) The department of ecology and local air pollution control authorities shall report back to the appropriate standing committees of the legislature by December 31, 2014, and every two years thereafter, on progress toward achieving attainment for areas of nonattainment that the revised burn ban and prohibition requirements contained in RCW 70.94.473 and 70.94.477 were enacted to address, as well as whether other implementation tools are necessary to achieve attainment.

(2) This section expires January 1, 2019.

Progress in achieving attainment

Washington currently meets health-based National Ambient Air Quality Standards. However, in 2009, EPA designated the Tacoma-Pierce County area as not meeting the 2006 standard for daily PM_{2.5} pollution. The primary cause of poor air quality was residential wood burning during winter evenings with cold temperatures and low wind speeds.

The Tacoma-Pierce County area came back into compliance with the daily PM_{2.5} standard because of significant efforts to reduce wood smoke. Puget Sound Clean Air Agency worked closely with a task force and the community. Together, they revised burn ban requirements, raised awareness about the bans, and introduced a prohibition of uncertified wood stoves. Text alerts, emails, media notifications, and increased enforcement actions were used to increase awareness and improve compliance with burn bans.

In addition to raising awareness of burn bans, wood stove incentive programs were put in place. Since 2012, over 3,000 residents have taken advantage of incentive programs. The programs focused on removing uncertified wood stoves and replacing them with less polluting heating options. Many participants in the programs cite Puget Sound Clean Air Agency's 2015 uncertified wood stove removal rule as a motivator for their participation.

As a result of these efforts, air quality improved measurably and the area now has fewer days with elevated PM_{2.5} pollution. As of March 12, 2015, EPA designated the Tacoma-Pierce County area in attainment for the daily PM_{2.5} standard. EPA also approved a 10-year maintenance plan providing for continued compliance from 2015 through 2025. This

maintenance plan covers the first 10 years of a 20-year planning cycle to ensure that PM_{2.5} pollution in the area remains below the NAAQS threshold.

Implementation tools needed

To remain in attainment status, the Tacoma-Pierce County area does not need implementation tools beyond those authorized in RCW 70.94.473 and 70.94.477. Although air quality has improved, PM_{2.5} pollution remains a health concern and researchers continue to find serious health effects at levels lower than the current NAAQS. If EPA adopts more stringent NAAQS in the future, new strategies may be needed in the Tacoma-Pierce County area.

Background

In 2012, the Legislature revised requirements in RCW 70.94.473 and 70.94.477 to protect air quality in areas highly impacted by wood smoke from home heating devices.¹ The statutory changes allow for more protective burn ban thresholds for areas not meeting National Ambient Air Quality Standards (NAAQS, or standards) and areas at risk of nonattainment. The revisions also allow Ecology and local clean air agencies to prohibit old, uncertified wood stoves in nonattainment areas.

RCW 70.94.605 requires Ecology and local clean air agencies to report to the Legislature by December 31, 2014 and every two years thereafter on:

- Progress toward achieving compliance with the NAAQS for nonattainment areas where revised burn ban and prohibition requirements in RCW 70.94.473 and 70.94.477 were enacted to address air quality.
- Other implementation tools necessary to achieve attainment.

In 2012, the only nonattainment area in the state was the Tacoma-Pierce County area shown in Figure 1. EPA classified this location as a nonattainment area for daily fine particle (PM_{2.5}) pollution in 2009. The primary cause of poor air quality was residential wood burning during winter evenings with cold temperatures and low wind speeds.

Fine particle pollution is linked to many adverse health effects, including:

- Worsening asthma and chronic bronchitis symptoms
- Increased heart attacks
- Stroke
- Premature death²

The consequences of nonattainment for Tacoma-Pierce County included:

- Exposure of citizens to high levels of pollution
- Pollution control requirements for industry that make the area less attractive to new business
- Cost to clean up the pollution and prevent future recurrences
- Stigma of being the only community in the state that did not meet the National Ambient Air Quality Standards

Puget Sound Clean Air Agency was able to work with residents to improve air quality in the former nonattainment area because of statutory changes to burn bans and prohibition requirements. After significant efforts to improve air quality by reducing wood smoke in Tacoma-Pierce County, the area came into compliance with the NAAQS.³ The area is now considered to be a maintenance area and is following the first of two required 10-year plans to maintain healthy air quality.⁴



Figure 1: Map of Fine Particle Maintenance Area in Tacoma and Pierce County

Progress toward Achieving Attainment

Tacoma-Pierce County area residents are applying the tools in RCW 70.94.473 and 70.94.477, resulting in improved air quality in their communities. These tools allow Puget Sound Clean Air Agency to:

- Call burn bans at levels lower than the PM_{2.5} NAAQS in nonattainment areas and at-risk areas to prevent PM_{2.5} levels from exceeding the NAAQS
- Prohibit old, uncertified wood stoves in the Tacoma-Pierce County area

Tacoma-Pierce County residents are more aware of burn bans through email alerts and text message notifications, and compliance has increased. Residents are also taking advantage of incentive programs and replacing older, more polluting wood stoves with cleaner heating options. Since 2012, over 3,000 residents have removed old, uncertified wood stoves. Many participants in the programs cite the Puget Sound Clean Air Agency's 2015 uncertified wood stove removal rule as a motivator for their participation. Those who qualify as low-income participants enjoy a new, more efficient heating system with the full cost of the devices covered by these programs. A portion of the cost of the devices is covered for program participants that do not qualify as low-income. Partial funding for these programs comes from the Legislature's Wood Smoke Reduction Grants.

The Puget Sound Clean Air Agency's outreach and education campaigns, including the airsafepiercecounty.org website, continue to promote incentive programs, enhanced burn ban enforcement, and the uncertified wood stove removal rule.

To protect public health and prevent violations of the NAAQS, the Puget Sound Clean Air Agency may call air quality burn bans at more protective levels than the NAAQS. They have enhanced enforcement of air quality burn bans, which increases compliance with the bans. Analysis shows that less than 10 percent of people ticketed re-violate during subsequent bans. Residents whose wood stove is their only adequate source of heat may obtain an exemption from burn bans and may continue to use older, uncertified stoves.

These combined programs have reduced harmful wood smoke emissions and improved air quality. EPA approved Ecology's request to designate the area to attainment in March 2015, as well as a maintenance plan that provides for continued compliance for the next 10 years.

Figure 2 shows how PM_{2.5} pollution levels at the monitoring site located on South "L" Street in Tacoma have improved since 2009, when levels exceeded the daily PM_{2.5} standard. The dashed black line shows the daily PM_{2.5} NAAQS. The blue diamonds on the figure

The daily PM_{2.5} NAAQS is **35 micrograms per cubic meter** (µg/m³), measured as the 3-year rolling average of the annual 98th percentiles.

In determining compliance with this standard, EPA excludes monitoring data from several days (2 percent of the days) each year with the highest 24-hour average values.

show 98th percentile levels for individual years, while the red line shows the design value for the Tacoma South “L” Street monitoring site. The design value is the three-year rolling average of the annual 98th percentiles.

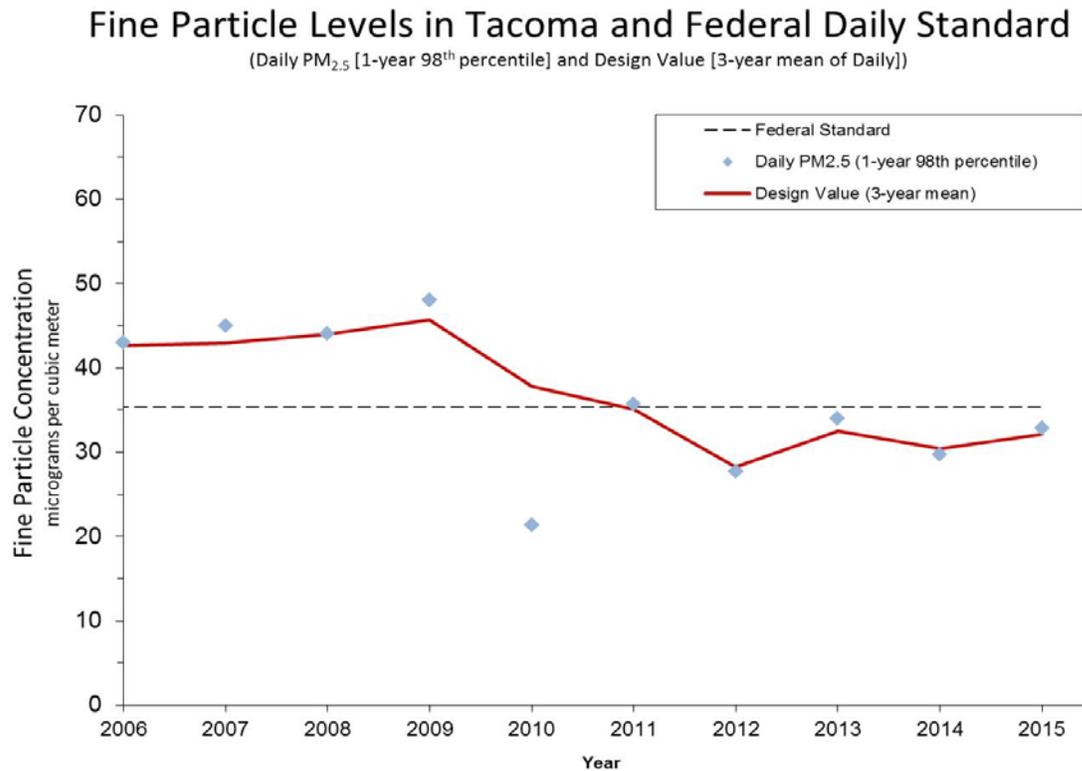


Figure 2: Fine Particle Levels at the Tacoma South L Street Monitoring Site¹

We have seen improvement in Tacoma’s air quality over the last several years. Typically, we would expect to see higher PM_{2.5} levels on very cold days when people are more likely to use their wood stoves and when low wind speeds limit smoke dispersion.

We looked at the temperature and wind speed to see if milder temperatures and breezy conditions were responsible for the reduction in PM_{2.5} levels. We see, however, that weather does not explain the improvement. We think that the improvements are the result of implementing programs to increase awareness of burn bans, enhancing burn ban enforcement, and removing old, uncertified wood stoves.

Figure 3 shows the number of days with cold temperatures and low wind speeds. In 2006 – 2009, the area had fewer days where we would expect to see high levels of PM_{2.5}. However, the area exceeded the NAAQS each year. In 2010, the area did not have any days with cold, stagnant weather and air quality improved significantly. In 2011 – 2015, PM_{2.5} pollution levels

¹ The daily PM_{2.5} NAAQS is 35 micrograms per cubic meter (µg/m³), measured as the three year rolling average of the annual 98th percentiles. The design value is a metric used to determine NAAQS compliance, and represents the actual three year rolling average of the annual 98th percentiles.

remained below the NAAQS, despite more days of cold, stagnant weather. We can attribute this success to implementation of programs described earlier.

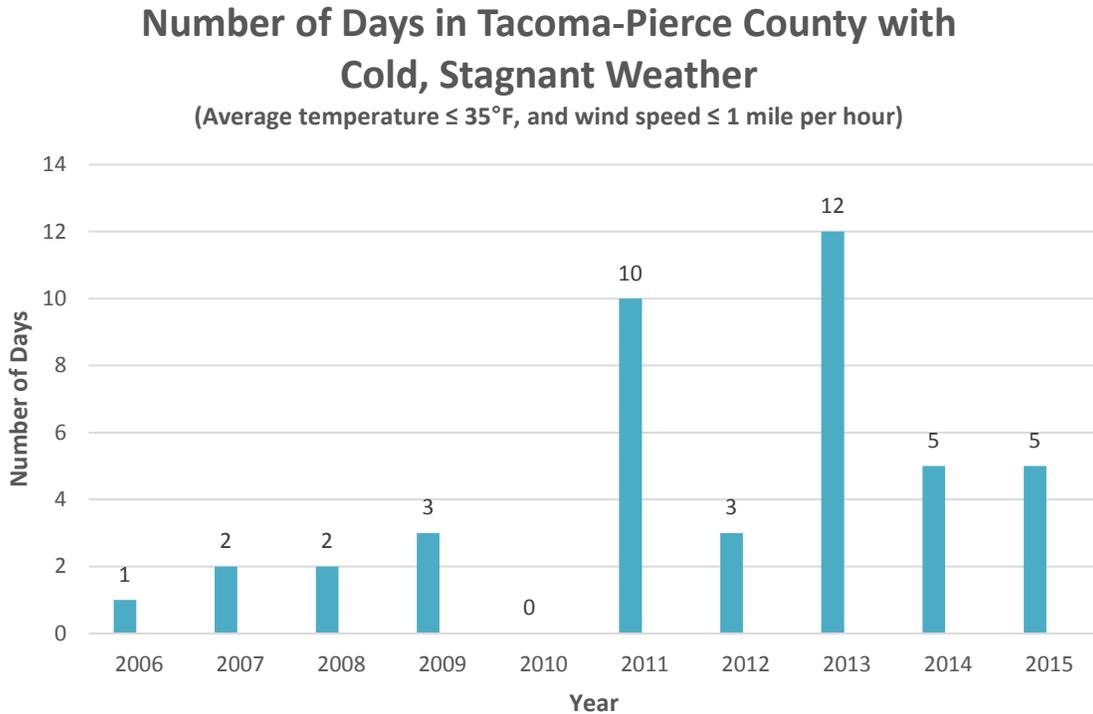


Figure 3: Number of Days in Tacoma-Pierce County with Cold, Stagnant Weather (Average temperature $\leq 35^{\circ}\text{F}$ and wind speed ≤ 1 mile per hour)

We have made immense progress. However, the Puget Sound Clean Air Agency will need to continue to work with local jurisdictions and residents to ensure compliance with air quality burn bans and continued removal of old, uncertified wood stoves.⁵ The removal incentive programs have already motivated many to participate. Puget Sound Clean Air Agency’s 2015 uncertified wood stove removal rule is needed to offset future emissions from long-term growth in the area.

These programs, based on RCW 70.94.473 and 70.84.477, will allow us to continue to meet the NAAQS and improve air quality.

Additional Implementation Tools

To stay in attainment with the daily $\text{PM}_{2.5}$ NAAQS, the Tacoma-Pierce County area does not currently need implementation tools beyond those authorized in RCW 70.94.473 and 70.94.477. These tools are included in the EPA-approved maintenance plan. Though air quality has measurably improved, $\text{PM}_{2.5}$ pollution remains a health concern and researchers continue to find serious health effects at levels lower than the current NAAQS. EPA reviews the NAAQS every 5 years. If EPA adopts more stringent NAAQS in the future, the area may need new strategies.

Conclusion

The Tacoma-Pierce County area came back into compliance with the daily PM_{2.5} NAAQS as a result of significant efforts to improve air quality by reducing wood smoke. The revised burn ban and prohibition of uncertified wood stoves authorized by the Legislature, and included in the EPA-approved maintenance plan, are critical tools to help the area stay in attainment with the standard. These tools proved sufficient to bring the area back into compliance with the PM_{2.5} NAAQS. Additional implementation tools beyond those authorized in RCW 70.94.473 and 70.94.477 are not needed at this time.

Ecology and local clean air agencies are working to reduce pollution in several other communities at risk of nonattainment. Preventing nonattainment is critical to protect public health, prevent economic consequences, and avoid expensive federal requirements.

Next Steps

EPA approved the first 10-year maintenance plan for the Tacoma-Pierce County area in 2015. It covers the first 10 years of a 20-year planning cycle designed to ensure that PM_{2.5} pollution in the area remains below the standard.

As outlined in the maintenance plan, Ecology and Puget Sound Clean Air Agency will continue to monitor PM_{2.5} levels in the maintenance area and verify that the area continues to meet the standard. The maintenance plan includes requirements for the agencies to adopt and implement additional measures if a violation of the standard occurs.

¹ Substitute House Bill 2326, Chapter 219, Laws of 2012.

² Environmental Protection Agency, Health and Environmental Effects of Particulate Matter (PM), <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm> (accessed 8/31/2016).

³ Federal Register Vol. 80, No. 27, February 10, 2015, 7347, <https://www.gpo.gov/fdsys/pkg/FR-2015-02-10/pdf/2015-02619.pdf> (accessed 8/31/2016).

⁴ Washington Department of Ecology, Proposed State Implementation Plan Revision: Tacoma-Pierce County PM_{2.5} Redesignation Request and Maintenance Plan, October 2014, Publication 14-02-021, <https://fortress.wa.gov/ecy/publications/documents/1402021.pdf> (accessed 8/31/2016).

⁵ Puget Sound Clean Air Agency, Regulation 1, Article 13, Section 07: Prohibitions on Wood Stoves that are not Certified Wood Stoves (adopted 10/25/12), <http://www.pscleanair.org/library/Documents/1-13.pdf> (accessed 8/31/2016).