State of Oregon
Department of Environmental Quality
Air Quality Division

State Implementation Plan for Particulate Matter (PM_{10}) in the Medford-Ashland Air Quality Maintenance Area

A Plan for Meeting and Maintaining The National Ambient Air Quality Standards For PM_{10}

December 10, 2004

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(SIP Volume III)

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"When I first came here in the 1970's the furnace was shooting fire 100 feet in the air".

- Gary Grimes, former Medford DEQ Air Quality Manager

Without the efforts of numerous individuals in state and local governments and private entities who are dedicated to healthy air; this supplement to the State of Oregon Air Quality Implementation Plan would not have been possible. Special appreciation goes to :

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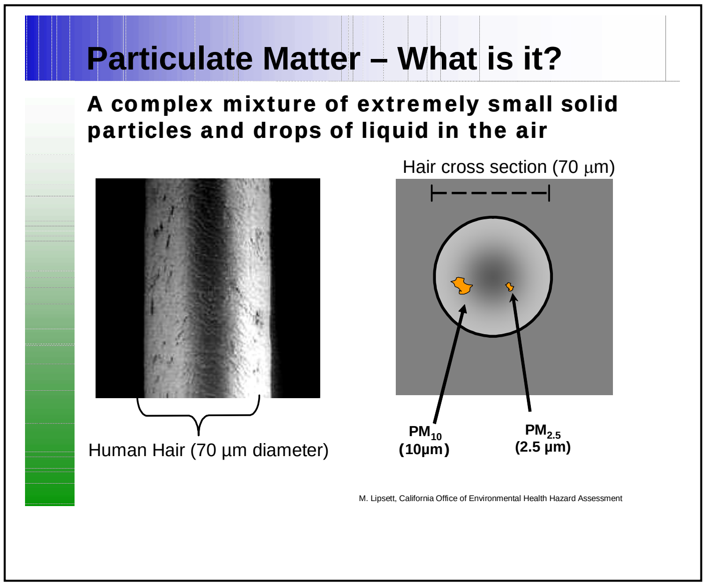
Executive Summary

The U.S. Environmental Protection Agency (EPA) adopted National Ambient Air Quality Standards (NAAQS) for PM_{10} on July 1, 1987. The acronym "PM_{10}" stands for particulate matter of a size less than or equal to 10 micrometers (μm) in diameter, or about 1/7th the diameter of a human hair. Exposure to high levels of PM_{10} is considered a risk to human health due to the body's inability to effectively filter out particles of this size. These particles can become lodged in the lungs aggravating chronic respiratory diseases such as asthma, bronchitis, and heart disease. Populations especially at risk include children, the elderly, and those with existing health problems. There is both a daily standard for PM_{10} (based on a 24-hour average), and an annual average standard. The daily PM_{10} standard is 150 micrograms per cubic meter (ug/m^3), and the annual average standard is 50 ug/m^3.



Compliance with the daily standard is evaluated by looking at the number of times the standard is exceeded in any three year-period (at the same location). If the average number of exceedances in any three-year period is 1.0 or less, the area is in compliance. If the average number of exceedances is 1.1 or more, the area is in violation of standards[1]. The annual PM_{10} standard is violated if the three-year average of annual average values exceeds 50 ug/m^3. In Oregon, the daily PM_{10} standard has been the more difficult to meet. Under the Clean Air Act, an area that violates standards is designated as "nonattainment", and must adopt emission reduction measures to bring the area back into compliance.

The Medford-Ashland Air Quality Maintenance Area (AQMA) is the designated PM_{10} nonattainment boundary for the greater Medford area. The AQMA encompasses much of the Rogue Valley of Southwest Oregon, and includes the communities of Ashland, Talent, Phoenix, Medford, Central Point, Jacksonville, White City, Eagle Point, and the intervening lands of Jackson County. The AQMA was established in the 1970's as the planning boundary that best describes the common airshed shared by Rouge Valley citizens. The Figure below shows the planning boundary for the Medford-Ashland AQMA, as well as the boundary for the local metropolitan planning organization.

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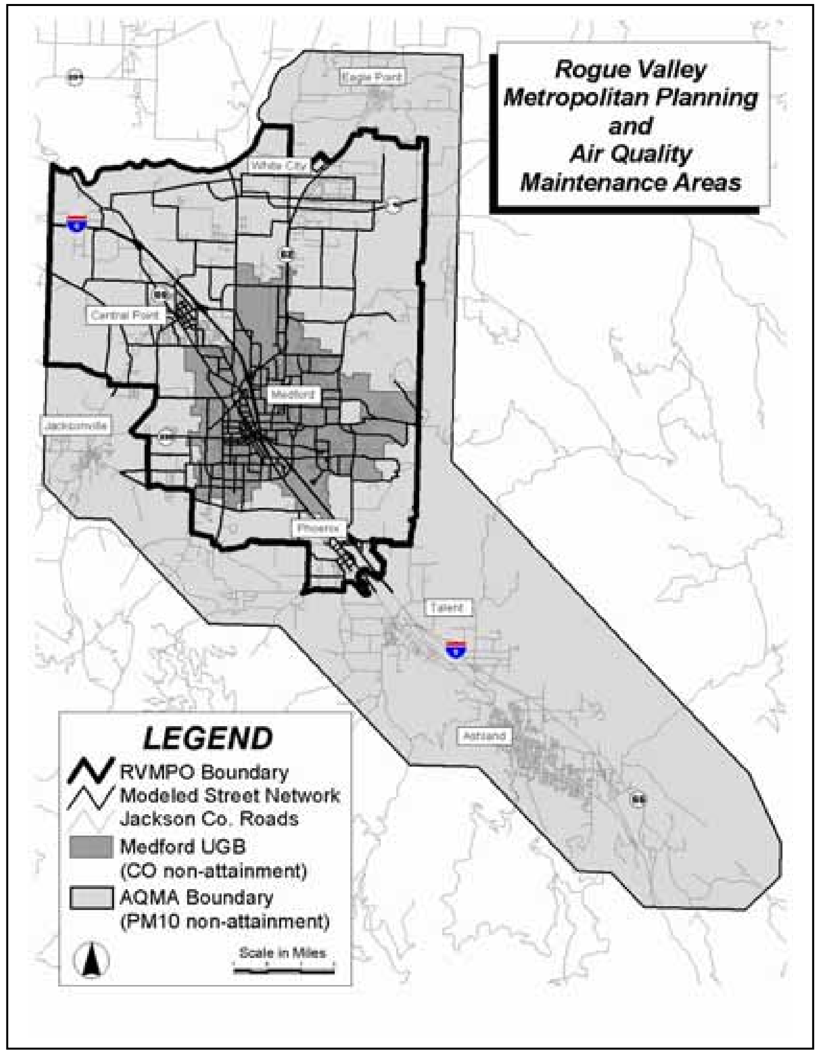
[1] For example, if 3 exceedances occurred in a three-year period, then the average number of exceedances will be 1.0 (i.e. 3 exceedances divided by 3 years = 1.0). If 4 exceedances occurred in the three-year period, the average number of exceedances would be 1.3 (violation).

PM$_{10}$ measurements taken in the AQMA in the mid to late 1980's showed that the 24-hour PM$_{10}$ health standard was exceeded an average of 20-25 days per year during the winter months. During this time, the maximum 24-hour PM$_{10}$ concentration measured in Medford was over 300 $\mu g/m^3$ as compared to the 24-hr average PM$_{10}$ standard of 150 ug/m^3. Annual average PM$_{10}$ concentrations in Medford during the 1980's ranged from about 58 to 68 $\mu g/m^3$ compared to the average annual PM$_{10}$ standard of 50 $\mu g/m^3$.



Because of these measured violations, the Medford-Ashland AQMA was initially listed by EPA as a Group 1 PM$_{10}$ planning area[2], leading to a nonattainment area designation under the 1990 Clean Air Act Amendments. The Clean Air Act requires states to develop and adopt State Implementation Plan (SIP) revisions to assure that areas exceeding standards are brought into compliance within the time frames prescribed by the Clean Air Act. Once the area has returned to compliance, states must prepare an additional plan ensuring continued compliance with standards for at least ten years.

There have been several PM$_{10}$ plans developed for the Medford-Ashland AQMA. The initial ***Attainment Plan*** adopted in 1991 contained a suite of emission reduction strategies that brought the area into compliance with PM$_{10}$ standards by the required Clean Air Act deadline of December 31, 1994. The Attainment Plan was updated in 1998, and is updated again here in this 2004 Attainment Plan. This document also includes a PM$_{10}$ ***Maintenance Plan*** for the AQMA. The maintenance plan continues the successful PM$_{10}$ strategies for the AQMA, and provides an air quality analysis to ensure continued compliance with PM$_{10}$ standards through at least the year 2015.

[2] "Group 1" areas were those areas known to violate PM$_{10}$ standards, and were identified for designation to nonattainment status when the Clean Air Act was amended in 1990.

The attainment and maintenance plan *(the plan*) will be submitted for approval to the Environmental Protection Agency (EPA) along with a request that the legal status of the Medford-Ashland AQMA be revised from nonattainment to attainment for PM_{10}.

Air Quality Trends

Emission reduction strategies adopted in the AQMA have been very successful in reducing daily and annual PM_{10} values to levels that are well below federal standards. Figures 1 and 2 show the trend in daily and annual average PM_{10} values measured at the key monitoring sites of Welch & Jackson Streets (Medford) and the White City Post Office.

Figure 1: Daily and Annual Average PM_{10} Trend Medford (Welch & Jackson Site)

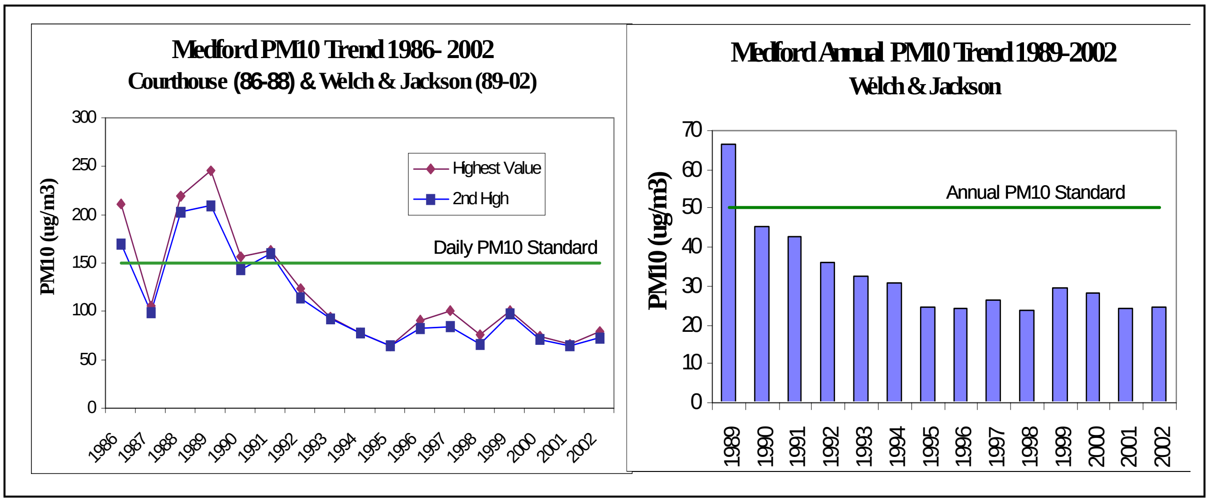
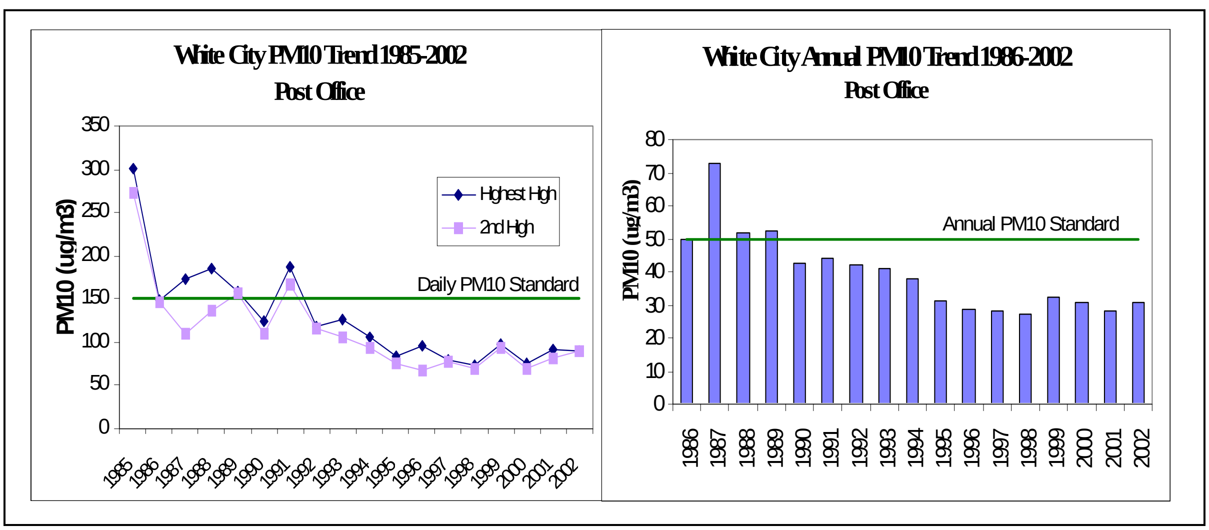


Figure 2: Daily and Annual Avg. PM_{10} Trends for White City (Post Office Site)



Summary of Attainment and Maintenance Analysis Approach

The Clean Air Act required that the Medford-Ashland AQMA demonstrate compliance with PM_{10} standards by no later than December 31, 1994. The initial PM_{10} attainment plan submitted in 1991 adopted the emission reduction measures necessary to bring the area into compliance by the Clean Air Act deadline. Ambient monitoring at both the Welch & Jackson and White City monitoring sites show that PM_{10} levels have been well below standards since 1992.

In order for EPA to redesignate the AQMA to attainment, the Department must demonstrate that: a) PM_{10} standards are currently being met in the AQMA; b) standards would continue to be met even under worst-case conditions (i.e. worse-case emissions and meteorology); and c) that the AQMA will continue in compliance with standards for at least the next 10 years. This demonstration involves three analysis approaches:

1. Current Compliance (Actual Conditions): Monitoring data reflects actual maximum PM_{10} levels measured in the AQMA, and shows that the AQMA has been in compliance with standards since approximately 1992. Monitoring data demonstrates that the AQMA met the 1994 Clean Air Act attainment deadline, and has continued in compliance with PM_{10} standards ever since.

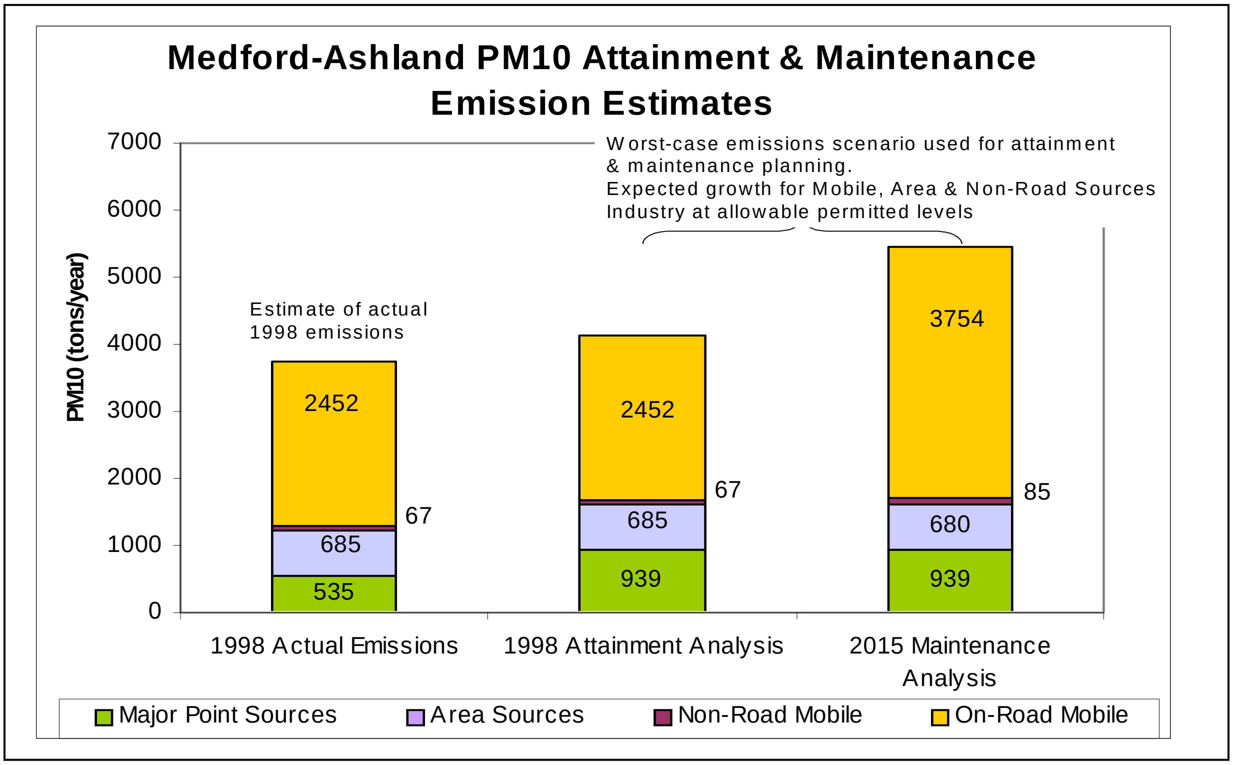
2. Attainment Demonstration (Modeling Analysis of Current Potential PM_{10} Levels): The attainment analysis must evaluate the current potential for PM_{10} levels to increase under worst-case conditions. Emissions used in the attainment analysis reflect actual 1998 emissions from all source categories, except major industry. For the worst-case analysis approach, EPA requires that major industrial emissions be considered at legally allowable (maximum permitted) levels, not their actual 1998 emission levels. The Department selected 1998 for the attainment analysis because the emissions inventory for that year provides the most accurate estimate of PM_{10} emissions currently available in the AQMA. The analysis also includes the air stagnation meteorology routinely experienced in the AQMA. The worst-case analysis approach provides an estimate of PM_{10} concentrations that could potentially occur in the AQMA.

3. Maintenance Demonstration (Modeling Analysis of Future Potential PM_{10} Levels): The maintenance analysis is based on an emissions projection to the year 2015. The emissions forecast reflects anticipated emissions growth since 1998 resulting from changes in population, housing, employment, motor vehicle travel, and other factors. Again, major industrial sources in the maintenance analysis are evaluated at their maximum allowable levels. The 2015 analysis also uses stagnation meteorology.

AQMA Emission Estimates and Emissions Forecast

The emissions inventory (EI) and emissions forecast groups emission sources into four main categories: **Area Sources** (such as woodstoves and open burning), **Mobile Sources** (cars & trucks), **Non-Road Mobile** (construction equipment, small engines, etc.), and **Major Point Sources** (Major Industry). The 1998 attainment EI and 2015 emissions forecast are shown in Figure 3. The largest emissions growth is expected in the mobile source category. Modest growth is expected for Non-Road sources; Area Sources are expected to decrease somewhat due to the continued replacement of older, high polluting woodstoves. Growth in the major industry category reflects the difference between actual 1998 reported emissions and maximum allowable permitted emissions.

Figure 3: AQMA PM_{10} Emissions Inventory (1998) and Emissions Forecast (2015)



Compliance Analysis (Summary of Attainment and Maintenance Air Quality Modeling)

The attainment and maintenance demonstrations rely on an air quality dispersion modeling analysis that estimates potential PM_{10} concentrations throughout the AQMA. Both the attainment analysis and maintenance analysis demonstrate compliance with PM_{10} standards, and show that no additional PM_{10} emission reduction strategies are currently needed in the AQMA.

Figures 4 through 7 show the model predicted PM_{10} levels (ranked highest to lowest) for the attainment and maintenance analysis (annual avg. and daily PM_{10}). Again, there are no predicted violations of either the annual average or daily (24-hr avg.) PM_{10} standards. The highest predicted (worst-case) annual average PM_{10} levels are 49.2 ug/m^3 in 1998 and 49.3 ug/m^3 in 2015. The highest predicted (worst-case) daily compliance levels (4th highest) are 149.4 ug/m^3 in 1998 and 147.8 ug/m^3 in 2015. The highest predicted PM_{10} levels occur within the core of the White City industrial area. Peak PM_{10} levels in this area are very similar in both the attainment and maintenance analysis because maximum allowable industrial emissions were used in both cases. PM_{10} concentrations decrease very quickly with distance from the core industrial center, and are substantially below standards in adjoining commercial and residential areas.

The attainment and maintenance modeling analysis is described further in sections 4.14.6.0 and 4.14.6.2

Figure 4: Attainment Analysis: Worst-Case Annual Avg. PM_{10} Levels (1998)

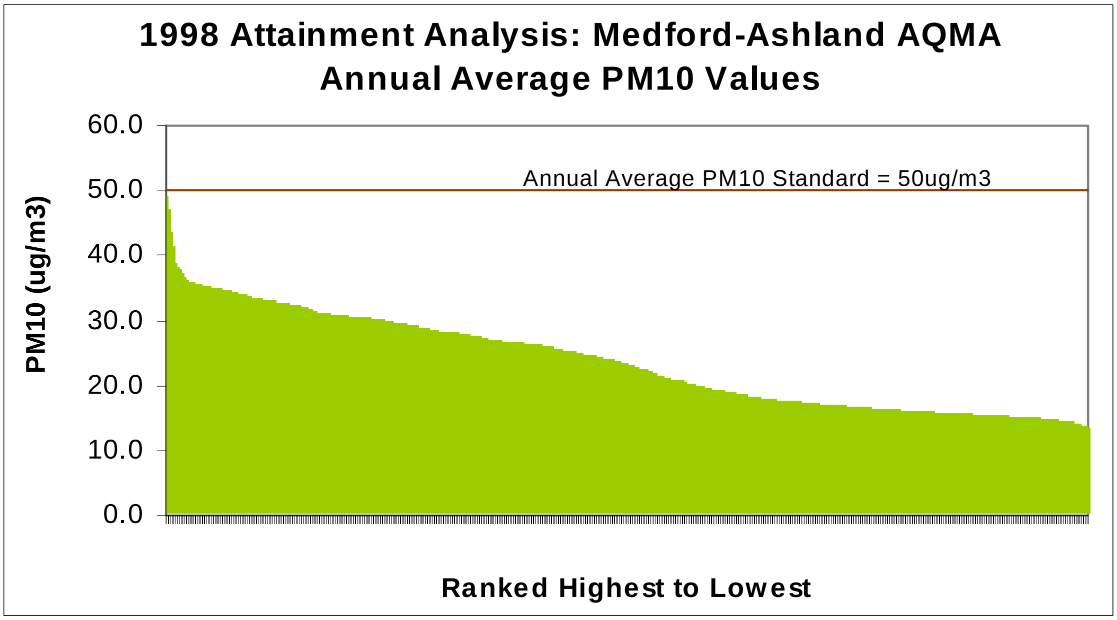


Figure 5: Attainment Analysis: Worst-Case Daily PM_{10} Levels (1998)

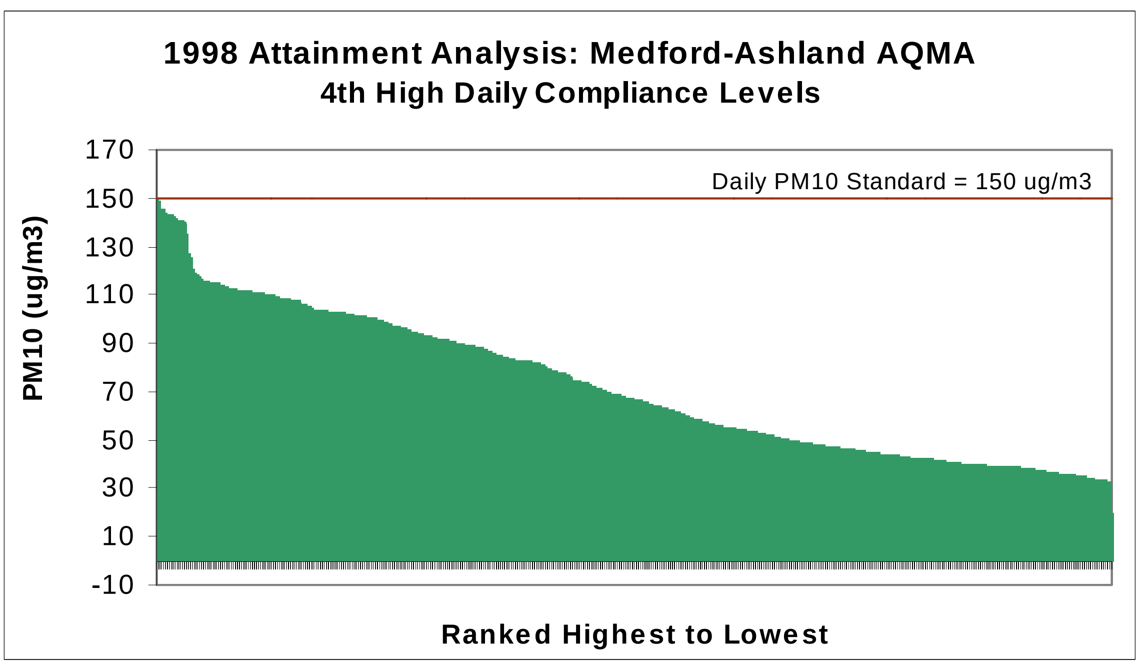


Figure 6: Maintenance Analysis: Worst-Case Annual PM_{10} Levels (2015)

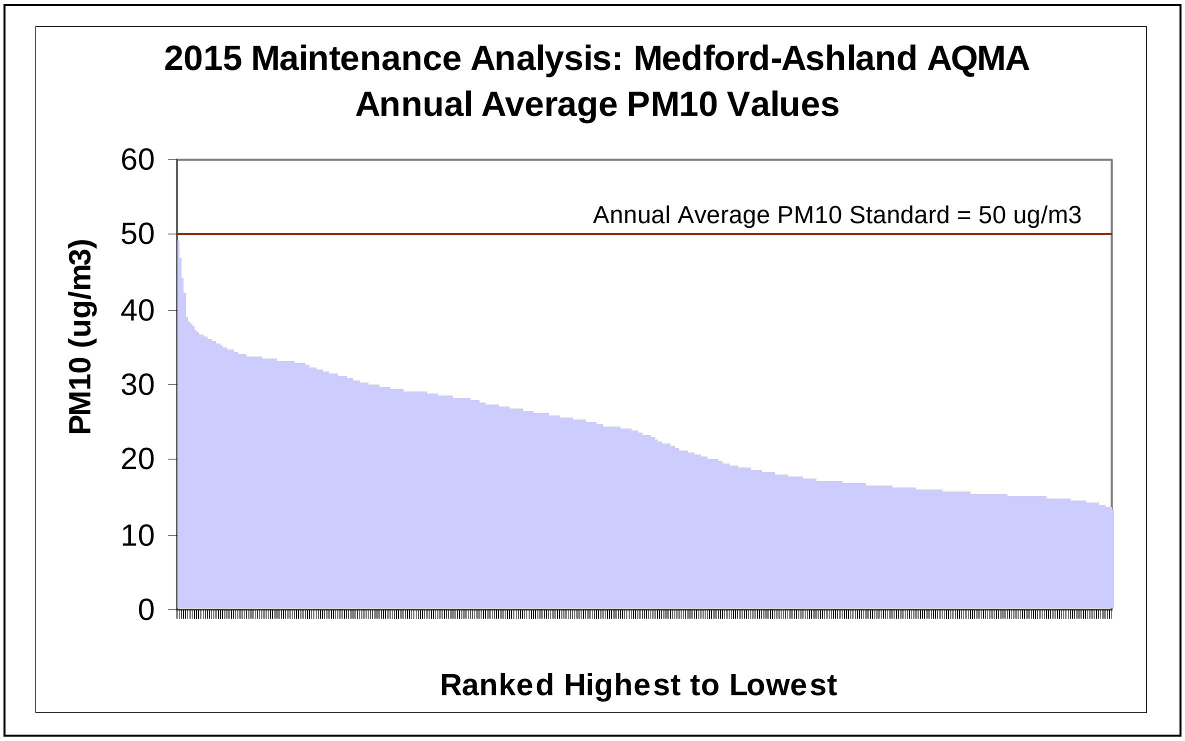
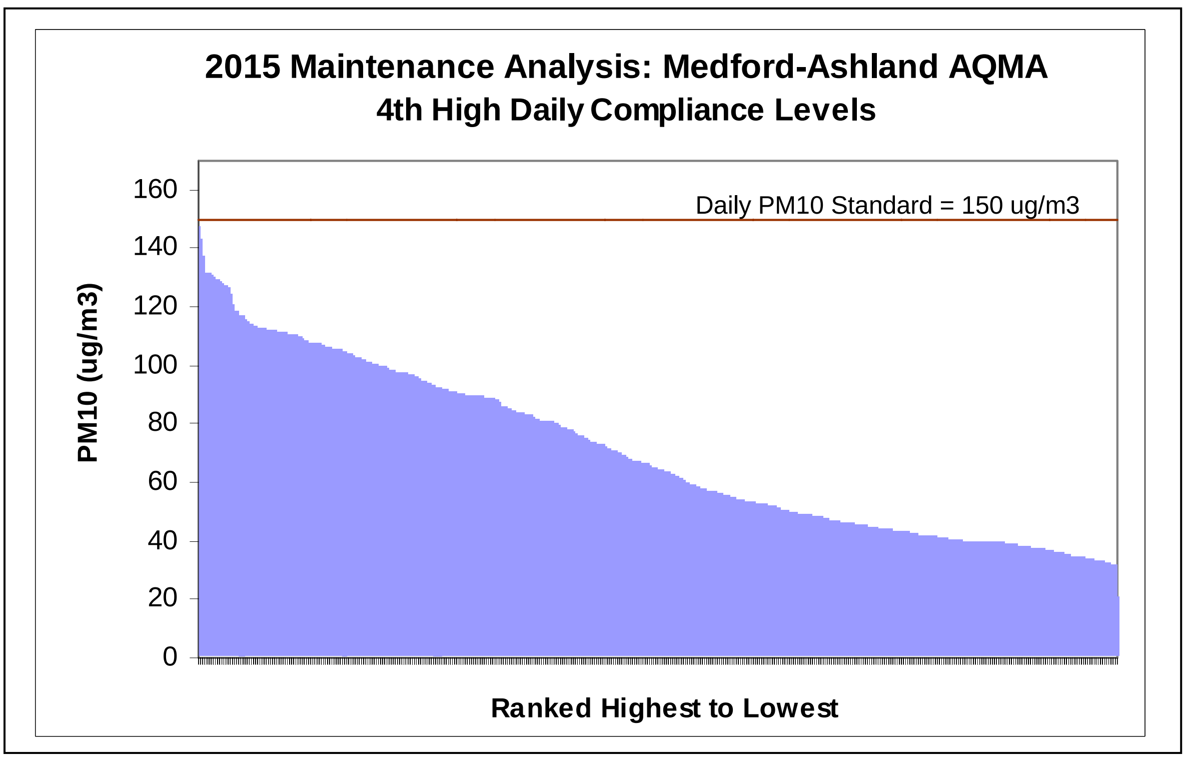


Figure 7: Maintenance Analysis: Worst-Case Daily PM_{10} Levels (2015)



Air Quality Strategies for PM_{10}

The plan continues all of the PM_{10} strategies that have been so successful in reducing emissions in the Valley. These include:

- A mandatory woodstove curtailment program.
- Emission limit standards for existing industrial processes.
- Local open burning ordinances.
- Enhanced road cleaning program in Medford and White City.
- Management of prescribed forestry burning year round, and special protection for the Rogue Valley during the winter months.

The plan also continues the strictest requirements for managing emissions growth from future new and expanding major industry under the New Source Review (NSR) program. These include:

- a very low emission threshold level (5 tons/year) for triggering NSR,
- the requirement to install state-of-the-art emission control technology, and
- the requirement to obtain emission offsets and demonstrate an air quality benefit (20% improvement in air quality).

The New Source Review requirements are discussed further is Section 4.14.8.0.

The attainment and maintenance plan also provides an air quality analysis demonstrating current and continued compliance with PM_{10} standards in all locations in the AQMA though at least the year 2015.

Transportation Conformity

The maintenance plan establishes a cap on future motor vehicle PM_{10} emissions, called the "emissions budget". The budget is used as part of the Transportation Conformity program which ensures that emissions from motor vehicles (both now and in the future) do not jeopardize air quality standards. The conformity program and emissions budget is described in more detail in Section 4.14.4.0

PM_{10} Contingency Plan

The maintenance plan establishes a process to prevent or correct any measured violation of PM_{10} standards. This process of investigation and (if needed) corrective action is called the "contingency plan". The contingency plan establishes early warning action levels for both daily and annual average PM_{10} levels (120 ug/m^3 (24-hr avg.) and 40 ug/m^3 (annual average). PM_{10} levels measured above these early warning thresholds will trigger a process to investigate the cause of the event and assess the risk to PM_{10} standards. The Air Quality Advisory Committee could also be convened to assist the Department in its investigation. The contingency plan is described further in Section 4.14.9.0

Conclusion

Monitoring data shows that the Medford-Ashland AQMA successfully met the Clean Air Act attainment deadline of December 31, 1994, and has remained in compliance with standards as of late 2004. The attainment modeling analysis shows that even under worst-case meteorology and maximum allowable emissions for major industry, the AQMA would be in compliance with PM_{10} standards. The maintenance analysis shows that the AQMA will continue to be in compliance through at least 2015 (even under worst-case conditions). The analysis demonstrates that no new emission reduction strategies are needed to maintain compliance. However, relatively high predicted PM_{10} levels support the need to continue the existing PM_{10} strategies. These strategies will also help avoid violations of the new federal fine particulate standards (known as $PM_{2.5}$).

On-Going Prevention-Future Air Quality Work

The Department will continue to work with Rogue Valley communities to address important air pollution issues, particularly in the areas of air toxics, growth in motor vehicle travel, prescribed forestry burning, and emissions from heavy-duty diesel vehicles.

State Implementation Plan for PM_{10}
Medford-Ashland Air Quality Maintenance Area (AQMA)

4.14.1.0 Introduction

On July 1, 1987, the U.S. Environmental Protection Agency (EPA) promulgated federal ambient air quality standards for particles less than or equal to 10 micrometers in aerodynamic diameter (PM_{10}) to replace the Total Suspended Particulate (TSP) standard[1]. The standard became effective 30 days later on July 31, 1987. On August 7, 1987, EPA classified the Medford-Ashland Air Quality Maintenance Area as a Group I PM_{10} nonattainment area (52 FR 29383). Group I areas were those which had a greater than 95 percent probability of exceeding the PM_{10} National Ambient Air Quality Standards (NAAQS). Air monitoring in the mid 1980's showed that air quality within the Medford-Ashland AQMA violated PM_{10} standards (NAAQS).

Section 110 of the federal Clean Air Act required States to adopt and submit plans (State Implementation Plans or SIPs) to EPA within nine months after the effective date of the standard. The plan must provide for attainment of the standard as expeditiously as practicable, but no later than the Clean Air Act deadline of December 31, 1994[2].

The initial Medford-Ashland PM_{10} Attainment Plan was developed in the late 1980's and submitted to EPA in 1991. It adopted a suite of emission reduction strategies that have been successful in brining air quality into compliance with PM_{10} standards by the Clean Air Act deadline. Strategies were developed jointly by the Department and local Air Quality Advisory Committee, and included a mandatory residential woodsmoke curtailment program, restrictions on open burning, and lower emissions limits for major wood products industry. The plan was successful in bringing the AQMA into compliance by the Clean Air Act deadline. There has not been an exceedance of the 24-hr average or annual average PM_{10} standard in the Medford-Ashland Air Quality Maintenance Area (AQMA) area since 1991.

In 1996, the Department began working with a local advisory committee to update the attainment plan and develop the required maintenance plan that will allow EPA to revise the legal standing of the AQMA from nonattainment to attainment for PM_{10}. This document includes a PM_{10} attainment and maintenance plan for the Medford-Ashland AQMA. The plans will be submitted for approval to the Environmental Protection Agency (EPA) along with a request that the legal status of the Medford-Ashland AQMA be revised from nonattainment to attainment for PM_{10}.

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[1] A micrometer (um) is a unit of length equal to about 1/25,000 of an inch. For comparison, the thickness of a human hair is about 100 to 200 micrometers.

[2] Clean Air Act Section 188 (c)(1).

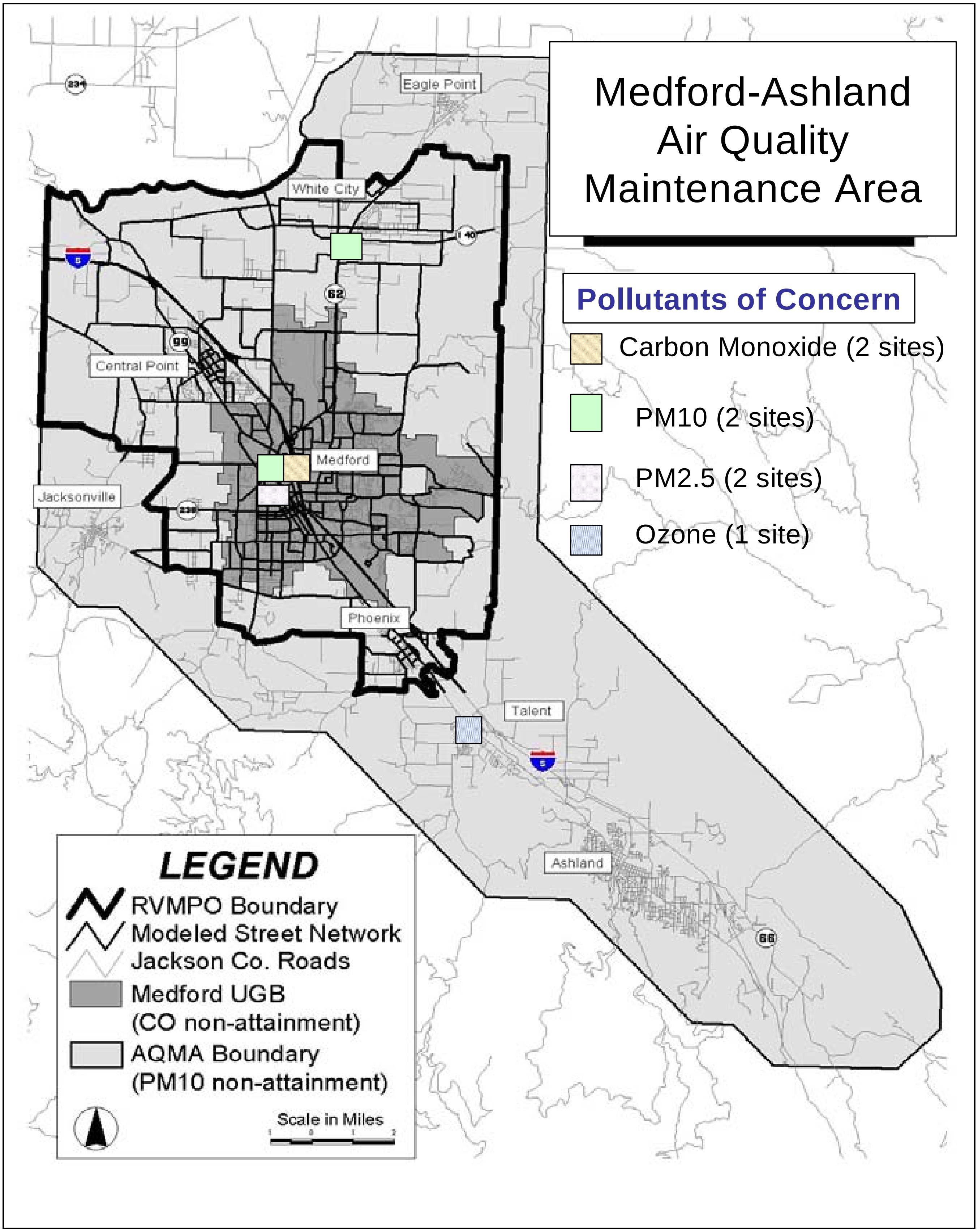
4.14.1.1 Area Description

The Medford-Ashland AQMA is located in a mountain valley formed by the Rogue River and one of its tributaries, Bear Creek. The major portion of the valley ranges in elevation from 1,300 to 1,400 feet above sea level. Mountains surround the valley on all sides: to the east, the Cascades, ranging up to 9,500 feet; to the south, the Siskiyous, ranging up to 7,600 feet; and to the west and north, the Coast Range and Umpqua Divide, ranging up to 5,500 feet above sea level.

The Medford-Ashland AQMA is outlined in Figure 8. The Figure also shows general monitoring locations for several criteria pollutants within the AQMA. The AQMA covers about 228 square miles and approximates the Bear Creek Basin. The area is also generally described as the Rogue Valley. The AQMA defines the current PM_{10} nonattainment area, and will continue to define the planning boundary for particulate control strategies adopted in this plan.

The PM_{10} nonattainment area must be large enough to include all of the local areas that may contribute to a violation of PM_{10} standards. The boundary must also be large enough to include potential future PM_{10} problem areas resulting from residential, industrial or transportation growth. The ambient monitoring network, as well as emission forecasts for the area indicate that the current AQMA boundary will continue to be the appropriate planning area for particulate in the Rogue Valley.

Figure 8: Map of Medford-Ashland AQMA



The AQMA boundary has been used for the special industrial air pollution control rules adopted in 1978, 1983 and 1989. The Department of Environmental Quality and Jackson County Health Department have also identified an area within the AQMA that is referred to as the critical PM_{10} control area. This area includes all of the PM_{10} problem areas, a significant portion of the AQMA population, and all the major industry in the AQMA.

Economy of the Rogue Valley.

The Rogue Valley's population and economy, once heavily dependant on natural resource-based industries has been undergoing substantial change[3]. The demographics of the Rogue Valley have been significantly influenced in recent years by in-migration from other areas in Oregon and from out of state. According to a 1999 Employment survey, the top three reasons for moving to the Rogue Valley were: (1) to be with family and friends, (2) quality of life, and (3) retirement. The valley's changing demographics has played a significant role in the changing local economy. The quality of life and retirement priorities of local citizens also highlights the value placed on the protection of air, water, and land quality.

Basic industries in the Rogue Valley include agriculture, manufacturing, and certain service-producing industries such as education, health care, tourism, and entertainment. These businesses support secondary industries, such as retail trade, services, construction, transportation, and others. After experiencing strong economic growth during most of the 1990's, SW Oregon has been experiencing an economic slowdown. Between 1990 and 2000, the lumber and wood products industry experienced a 29% decline in employment. However, during that same period employment in the rest of the manufacturing sector increased approximately 34%. In 2002, the wood products industry continued to decline while overall employment in other sectors of the economy has continued to grow.

Historically, the wood products industry has been one of the largest sources of particulate pollution in the AQMA. During the 1980 and 1990's, state-of-the art emission controls were installed in many facilities, significantly lowering air pollution from these sources. Emissions have continued to decrease somewhat in recent years as manufacturing processes improve and additional controls are brought on-line.

Growth in non-timber jobs, such as those in the service, retail, health care, trades, transportation, communications and technology sectors, has helped diversify the areas employment base, providing much more stability to the region's economy. The strongest growth is expected to continue in the trade and service sectors.

Population and employment growth generally leads to increased emissions as the area's mobility and commercial infrastructure expands. These trends are reflected in the 2015 PM_{10} emissions forecast and maintenance plan air quality modeling analysis.

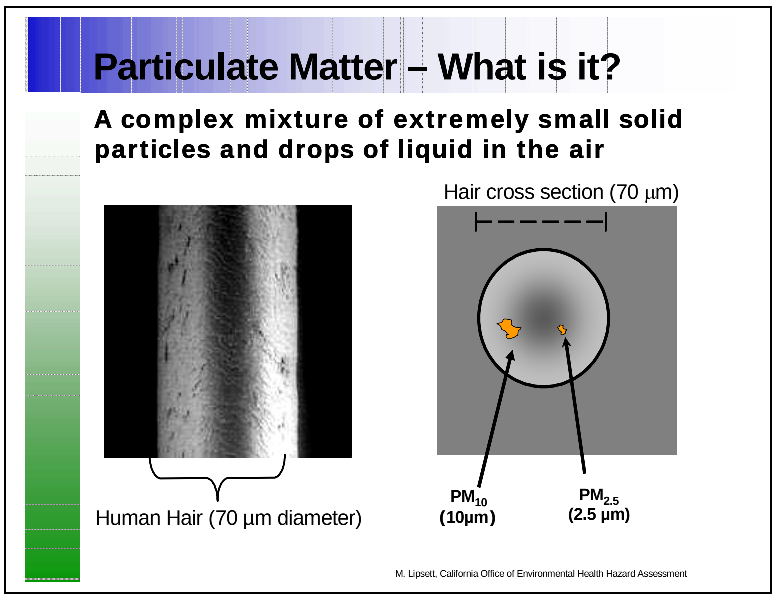
3 Local economic profile taken from Oregon Employment publication, 2002 Regional Economic Profile for Jackson and Josephine Counties.

4.14.1.2: Health Effects of PM_{10} and Woodsmoke

National ambient air quality standards are established by the U.S. Environmental Protection Agency (EPA) following extensive review by EPA's Clean Air Scientific Advisory Committee (CASAC) and the public. The Scientific Advisory Committee is a group of non-EPA scientists and medical experts that review the latest air quality studies and evaluate the health effects of particulate exposure. The CASAC then recommends air quality standards to EPA for protecting public health.

The CASAC's review of health effects information formed the basis for setting the PM_{10} standards in 1987 and the particulate standard review in 1997. Findings of the 1997 CASAC review, as well as other peer-reviewers on the health effects of particulate are listed in the document Review of National Ambient Air Quality Standards for Particulate Matter, Policy Assessment of Scientific and Technical Information, July, 1996, EPA-452\R-96-013. EPA and the CASAC are currently reviewing the latest studies on the health effects of particulate exposure. EPA intends to update the particulate standards for both PM_{10} and $PM_{2.5}$ in 2005.

"PM_{10}" (particulate matter measuring less than or equal to 10 micrometers-µm) is considered a risk to human health due to the body's inability to effectively filter out particles of this size. These particles can become lodged in the alveolar regions of the respiratory system where they trigger biochemical and morphological changes in the lungs.[4]



For example, constriction of air passages (i.e., reduced air flow) occurs rapidly upon exposure to PM_{10}. Episodic and continuous exposure aggravates chronic respiratory diseases such as asthma, bronchitis, and emphysema that in turn restrict the lung's ability to transfer oxygen into the bloodstream. Traditionally, children, the elderly, and cigarette smokers are the most susceptible to lung dysfunctions and are therefore at greatest risk from PM_{10} exposure.[5] Continuous exposure

[4] J. Koenig, T.V. Larson, P. Jenkins, D. Calvert, N. Maykut and W. Pierson, "Wood Smoke: Health Effects and Legislation," Health Effects of Woodsmoke, Northwest Center for Occupational Health and Safety, January 20, 1988.

[5] U.S. Environmental Protection Agency, Second Addendum to Air Quality Criteria for Particulate Matter and Sulfur Oxides (1982: Assessment of Newly Available Health Effects. EPA 600/8-86-020-F. NTIS # PB-87-176574.

can inhibit the body's defense mechanism thus increasing susceptibility to acute bacterial and viral infections. The increased stress on the pulmonary system caused by PM_{10} exposure is usually tolerable for those with healthy respiratory systems, however, it can lead to irreversible or fatal damage in people already suffering from cardiopulmonary disease, typically children, the elderly, the ill, and cigarette smokers.[8]

Among the sources of PM_{10} emissions, woodsmoke from residential heating is of particular concern in the Medford-Ashland AQMA because it is created at essentially ground level within residential areas. Woodsmoke particles are less than 1 μm in diameter and remain suspended in the air for long periods of time. Because of their small size and their ability to remain airborne, they are easily inhaled and lodged in the alveolar region of the lungs. These particles can also act as carriers for toxic chemicals that are transported deep into the respiratory system. Some of these toxic substances are then absorbed into the bloodstream.

Woodsmoke contains fourteen carcinogenic compounds including benzo(a)pyrene, benzo(a)anthracene, and other polycyclic organic materials.[6] Additionally, woodsmoke contains several other hazardous compounds such as aldehydes, phenols, carbon monoxide and volatile organic vapors. These compounds can cause or contribute to illness ranging from neurological dysfunctions and headaches to lung cancer. Because woodsmoke concentrations can be high in residential areas, a large segment of the population is routinely exposed to woodsmoke pollution in the winter months.

Other significant sources of particulate emissions in the Valley include some industrial processes and motor vehicle exhaust.

More information on the recent medical research and new particulate standards can be found at the following EPA Internet site: http://cfpub1.epa.gov/ncea/cfm/partmatt.cfm

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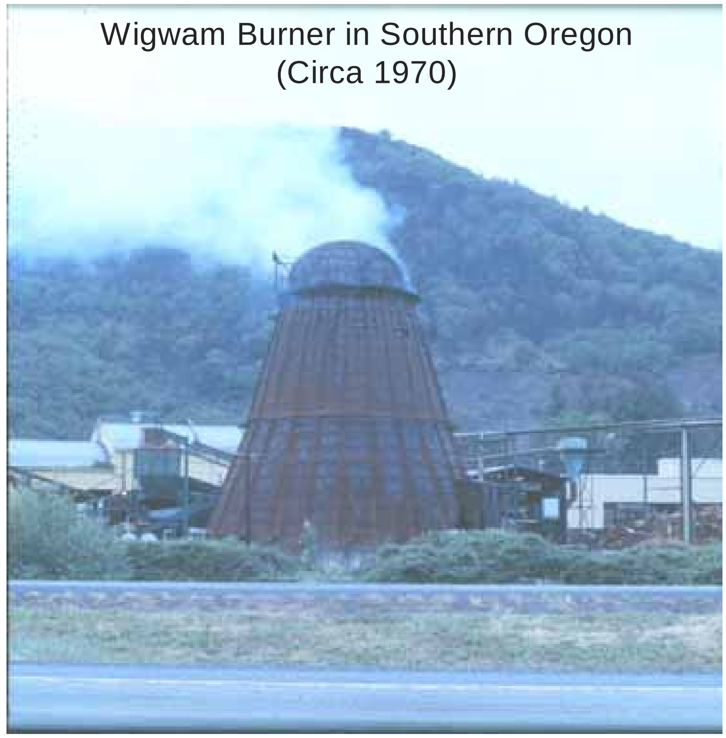
[6]P.G. Jenkins, Washington Wood Smoke: Emissions, Impacts and Reduction Strategies, Washington of Ecology, Olympia, Washington. December, 1986.

4.14.1.3 Brief History of Improving Air Quality in Rogue Valley Communities

Air quality in the AQMA has improved tremendously over the past several decades. The list below chronicles just some of the air quality accomplishments in the Rogue Valley (courtesy of the Jackson County air quality program staff).



<u>1959-1960</u>: The Medford City Council authorizes a joint study with DEQ (then the Oregon State Sanitary Authority) to investigate air quality conditions in Medford. The study confirms that Medford has a severe air pollution problem during certain periods. Orchard smudge pots, cinders from mills, automobiles, open burning, air stagnation, and other factors are cited as contributing to the problem.

<u>1970's</u>: Oregon Department of Forestry implements the Smoke Management Program to reduce smoke impacts from forest slash burning. Rogue Valley's air pollution problems are mostly attributed to the wood-products industry. The international oil embargo increases energy prices and more Rogue Valley residents turn to an abundant and affordable wood supply to heat their homes. Residential wood smoke pollution increases. In 1977, Jackson County and DEQ appoint the Medford-Ashland Air Quality Advisory Committee to identify air pollution sources and develop strategies for improvement. In 1979, the Environmental Quality Commission adopts emission control measures for some major industries in the Rogue Valley.

1980-1985: In 1980, Total Suspended Particulate from smoke measures 449 micrograms per cubic meter, the highest level in the Rogue Valley since monitoring began in 1979. The highest PM_{10} reading ever recorded in the valley occurs on December 17th, 1985 (373 micrograms per cubic meter). In 1984-85, Jackson County implements a voluntary wood-burning ordinance designed to discourage residential wood-burning during air stagnation periods.

1986-1990: March 1988, DEQ and Jackson County work to obtain a $485,000 Community Development Block Grant to replace noncertified woodstoves in low income homes. Local programs provide $30,000 for weatherization. December 1988, Medford and Jackson County begin an updated voluntary wood heating curtailment program. In 1989, Medford and Central Point communities enact ordinances restricting residential open burning. Also in 1989, Medford and Central Point adopt the mandatory wood heating curtailment program. In 1990, grant funds continue to replace high polluting noncertified woodstoves in low income homes. Jackson County enacts an ordinance restricting residential woodheating on high pollution days. The program includes public education and outreach, compliance surveying, open burning and woodstove curtailment enforcement. Medford bans the installation of noncertified woodstoves. Jackson County Interagency Air Quality Team forms to focus on continued reductions in particulate pollution.

1991-2002: In 1991, the Oregon legislature bans the sale and installation of noncertified woodstoves statewide. A program is enacted linking agricultural burning to ventilation criteria. No burning is allowed on poor ventilation days. The Environmental Quality Commission adopts the Medford-Ashland PM_{10} Attainment Plan required under the Clean Air Act. The plan includes control strategies for open burning, residential woodheating, and major point sources that will attain and ensure compliance with PM_{10} standards. 1992 marks the first year since 1985 that Rogue Valley air quality does not violate federal PM_{10} air quality standards. Oxygenated fuels are first required in the Rogue Valley in 1993 to help comply with Carbon Monoxide (CO) standards. December 1994, the Rogue Valley accomplishes three consecutive years of clean air for PM_{10}, meeting the Clean Air Act compliance deadline. 1994-2002, PM_{10} and CO levels continue to decline in the Valley. In 1996, the Medford-Ashland Air Quality Committee is reformed to develop air quality plans for PM_{10} and CO that ensure long-term compliance with standards. EPA approval of these plans will change the legal status of the Rogue Valley from nonattainment (noncompliance) to attainment (in compliance).

4.14.1.4: PM_{10} Planning Process 1997-2003

In January, 1997, the Rogue Valley Council of Governments (RVCOG) completed an update to the Rogue Valley Regional Transportation Plan (RTP). The RTP defines the transportation systems for Medford, Central Point, Phoenix, White City, and that portion of Jackson County within the Metropolitan Planning Organization (MPO) boundary. The

RTP uses demographic information in conjunction with a travel-demand forecasting model to develop street network design options for regional automobile travel. Regional transportation plans in nonattainment and maintenance areas must also demonstrate that they will not conflict with air quality plans. This is accomplished through the transportation conformity program that ensures that future transportation emissions do not exceed the level of emissions allocated to the transportation sector during the air quality planning process. The RTP could not be adopted until transportation conformity was demonstrated.

During the conformity review process it was discovered that emission projections for the transportation planning horizon year of 2015 exceeded the emission projections for transportation identified in the 1991 PM_{10} Plan (in the 1991 plan transportation emissions were only projected to the year 2000). The RTP could therefore not demonstrate conformity under the applicable "emissions budget" test, and could not be adopted by the Rogue Valley Council of Governments.

It was agreed that the 1991 PM_{10} plan would be withdrawn from EPA[7] so that the attainment plan could be revised and a long term maintenance plan developed to ensure compliance with PM_{10} standards through the transportation planning horizon year of 2015. The temporary withdrawal of the plan allowed a different conformity test (Build/No-Build) to apply while the air quality plan was being revised. It also allowed the RTP to be adopted and for transportation funding to continue. The revised attainment and maintenance plan would re-establish an emissions budget for transportation conformity. Withdrawing the plan started a federal sanctions clock and imposed an 18 month deadline to resubmit a revised plan to EPA. The revised PM_{10} plan was due to EPA by December, 1998.

<u>Changes in EPA Planning Requirements</u>

While work on the revised plan was progressing, the EPA adopted new national ambient air quality standards (NAAQS) for particulate (July 18, 1997). EPA adopted new standards for particulate matter equal to or less than 2.5 microns in size (PM2.5), and also changed the method for determining compliance with the daily PM_{10} standard. EPA also issued new planning guidance for the implementation of the $PM_{2.5}$ and PM_{10} standards.

EPA's guidance (Interim Implementation Guidance - IIG) changed the long standing approach to PM_{10} planning in nonattainment areas. Under the policy, EPA no longer required that a long term maintenance plan be developed, or that compliance with PM_{10} standards be demonstrated through modeling. EPA's new policy allowed the AQMA's PM_{10} nonattainment area designation to be revoked once the Department submitted, and EPA concurred with, the following information: (1) monitored air quality data showing attainment for at least 3 years (1994-1996); (2) a letter from the Governor certifying that all of the control measures identified in the attainment plan are being implemented and

[7] All emission reduction strategies identified in the 1991 attainment plan were adopted by the state and implemented successfully. However, EPA did not take formal action to approve the 1991 plan. This allowed the plan to be administratively withdrawn from EPA in 1997.

will be continued; and (3) documentation verifying that DEQ has the authority and ability to implement the new and revised particulate standards.

After considering the planning options available under the guidance, the Medford Advisory Committee recommended that DEQ forego development of a formal maintenance plan, and re-submit the original 1991 PM_{10} control measures to EPA. The Committee also decided that additional control measures should be added to the plan to help protect future air quality. Submitting the original strategies was required to stop the plan withdrawal sanctions clock and as one of the necessary elements for redesignation to attainment. The additional measures focused on preventing future exceedances of the new PM_{10} and $PM_{2.5}$ NAAQS.

The original strategy measures identified in the 1991 PM_{10} plan include:

- A mandatory woodstove curtailment program.
- Control technology requirements for major wood products industry.
- Lower emission limits for select industrial processes.
- Local open burning ordinances.
- Use of cleaner road sanding materials and street cleaning program;
- Management of prescribed forestry burning year round and special protection for the nonattainment area during the winter months under the Oregon Smoke Management Program.
- Emission growth management requirements for new and expanding major industry under the New Source Review program.

Strategies adopted by the Committee in 1998 included:

- A unified mandatory woodstove curtailment ordinance. This applies consistent woodstove curtailment and open burning requirements in each town within the Jackson County woodstove curtailment area boundary.
- Targeted roadway paving projects in Medford and White City.
- An education program for orchard owners about reducing soil trackout onto roadways.
- Enhanced street cleaning program in White City; and,
- A commitment from a major wood products a facility (Timber Products) to reduce particleboard press emissions by at least 90 percent no later than November, 2003.

In addition to the new strategies above, Timber Products Co. agreed to temporarily “freeze” or “escrow” approximately 79 tons per year of allowable permitted PM_{10} emissions until particleboard press emissions at that facility are reduced by at least 90 percent.

A revised PM_{10} plan including these new strategies was submitted to EPA in August, 1998.

Revised Planning Approach

In 1998, EPA was sued by various interest groups on issues related to the adoption of the new $PM_{2.5}$ standards. An initial court ruling held that EPA had erred in setting the $PM_{2.5}$ standards and in relaxing the way in which PM_{10} compliance was determined. EPA has successfully defended the $PM_{2.5}$ standard in court (a process taking several years), but chose not to appeal the court ruling regarding the relaxation of the PM_{10} standard. EPA chose to reinstate the earlier compliance method for the PM_{10} standard and reinstate all previous planning guidance for PM_{10} areas. This means that a full maintenance plan, with air quality analysis of future PM_{10} levels, is required in order for EPA to redesignate the Medford-Ashland AQMA to attainment.

In 1999, the Department and Medford-Ashland Air Quality Committee began work again on a revised PM_{10} attainment and maintenance plan using EPA's final planning requirements. This new effort allowed the Department to update PM_{10} emission estimates for mobile sources (cars & trucks) by using a new travel-demand model developed for the Medford area by the Oregon Department of Transportation. The Department also took this opportunity to update the air quality dispersion model used to predict PM_{10} concentrations. The Department replaced the initial Oregon GRID model used in previous analysis with a state-of-the-art dispersion model (CalPuff). Of special importance is CalPuff's ability to better simulate particle deposition and the influence of air stagnation on wintertime PM_{10} levels. Several years have been required to develop and verify the new air quality dispersion model for use in the AQMA.

The revised PM_{10} attainment plan and PM_{10} maintenance plan were completed in 2003 and offered for public review and comment in the winter of 2003/2004.

4.14.1.5: PM_{10} Planning Requirements for the Medford-Ashland AQMA.

Summary of Attainment and Maintenance Analysis Approach

The Department must meet three planning and analysis requirements if the Medford-Ashland AQMA is to be redesignated to attainment status. First, the Department must demonstrate that the applicable Clean Air Act attainment deadline was successfully met. Secondly, EPA must approve an attainment analysis that evaluates contemporary PM_{10} levels under worst-case conditions in all locations in the AQMA[8]. Thirdly, EPA must approve a maintenance analysis that evaluates potential future PM_{10} levels in the AQMA, considering expected emissions growth. The maintenance analysis must evaluate emission growth for at least ten years beyond the time of EPA plan approval and redesignation. The Medford-Ashland PM_{10} Maintenance Plan uses the year 2015 for a future planning horizon.

The attainment and maintenance plan relies on both monitored PM_{10} data and modeling analysis to demonstrate current and future compliance with PM_{10} standards. Monitoring data at the two key monitoring locations (Welch & Jackson, and White City Post Office)

[8] The attainment and maintenance modeling analysis must show compliance with PM_{10} standards at all locations within the AQMA (not just the two hot-spot monitoring sites in Medford and White City).

show consistent compliance with PM_{10} standards since 1992. Section 4.14.2.0 summarizes PM_{10} monitoring trends in the AQMA. The attainment and maintenance modeling analysis demonstrate that the AQMA would remain in compliance, even under worst-case meteorology and worst-case emissions scenarios.

For the worst-case planning approach, the attainment and maintenance analysis must use maximum allowable permitted emission levels (not actual emissions) for major industry in order to reflect potential PM_{10} levels in the airshed. In addition, the analysis must evaluate airshed emissions under the extremely poor ventilation conditions often seen during winter air stagnation episodes.

The approach used to meet the three analysis requirements is summarized below:

1. Current Attainment (Actual Conditions): Monitoring data shows that the AQMA has been in compliance with PM_{10} standards since 1992, and demonstrates that the AQMA successfully met the 1994 Clean Air Act attainment deadline. The AQMA has continued in attainment to date.

2. Attainment Analysis Modeling (Current Worst-Case Potential): The attainment analysis must evaluate the current potential for PM_{10} impacts under "worst-case" conditions. The attainment analysis uses the 1998 emissions inventory, which is the Department's most accurate for the AQMA. Modeled emissions include legally allowable emissions from major industry (not actual emissions in 1998), and 1998, 1999, 2000 local meteorology (including stagnation events)[9]. The attainment modeling analysis (using worst-case conditions) shows that the Medford-Ashland area would be in compliance with PM_{10} standards at all locations in the AQMA even under worst-case conditions.

3. Maintenance Analysis Modeling (Future Worst-Case Potential): The maintenance analysis is based on an emissions projection to the year 2015. The emissions forecast reflects anticipated emissions growth resulting from changes in population, housing, employment, motor vehicle travel, and other factors. Again, major industrial sources are evaluated using their maximum allowable (permitted) emission levels. The 2015 analysis also uses the 1998-2000 worst-case stagnation meteorology.

Figure 9 shows estimated actual AQMA emissions for 1998, and the worst-case emission levels used in the attainment and maintenance analysis.

[9] Meteorology used in the modeling analysis reflects actual weather data measured in the AQMA in 1998, 1999, and 2000, and include several extended air stagnation episodes.

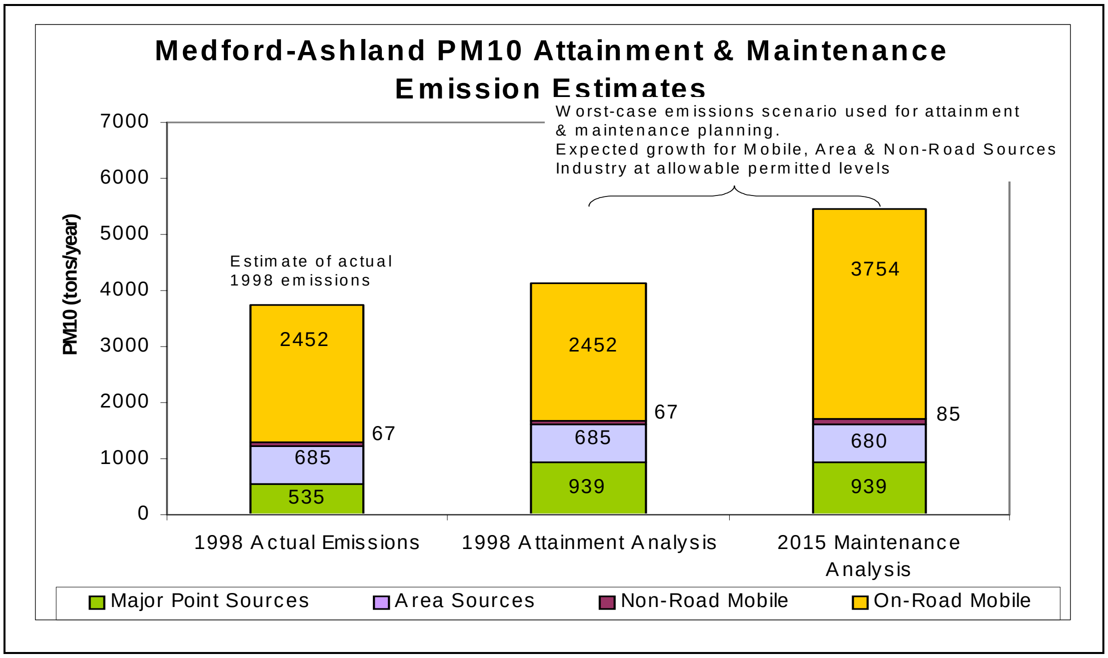


Figure 9: PM_{10} Emissions in the AQMA: Actual Emissions, Worst-Case Levels

- Major Point Sources: Are those industrial facilities with PM_{10} emissions greater than or equal to 5 tons per years.
- Area Sources: Include activities such as residential wood-heating, open burning, commercial space heating, etc.
- Non-Road Mobile Sources: Include sources such as small engines and construction equipment.
- On-Road Mobile Sources: Include cars and trucks, and reflects both exhaust (tailpipe) and road dust emissions.

4.14.1.6 Medford-Ashland Meteorology

The following description of climate and meteorology in the Medford-Ashland area is taken from the annual climatological summary prepared by the National Weather Service.[10]

Medford has a moderate climate of marked seasonal characteristics. Late fall, winter, and early spring months are damp, cloudy, and cool under the influence of marine air. Late spring, summer, and early fall are warm, dry, and sunny, due to the dry continental nature of the prevailing winds aloft that cross this area.

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[10] "Local Climatological Data, 1987 Annual Summary with Comparative Data, Medford, Oregon," National Oceanic and Atmospheric Administration, National Climatic Data Center, Ashville, North Carolina.

The rain shadow afforded by the Siskiyous and Coast Range results in a relatively light annual rainfall, most of which falls during the winter season. Summertime rainfall is brought by thunderstorm activity. Snowfall is quite heavy in the surrounding mountains during the winter. Valley snowfall is light. Individual accumulations of snow seldom last more than 24 hours and present little hindrance to transportation on the valley floor.

Few extremes of temperatures occur. High temperatures in the summer months average slightly below 90 degrees. High temperatures are always accompanied by low humidity, and hot days give way to cold nights as cool air drains down the mountain slopes into the valley. The length of the growing season is about 170 days, from late April to mid-October. The last date of 32 degrees in the spring normally occurs in mid-June and the first date of 32 degrees in the fall occurs in mid-September.

Valley winds are usually very light, prevailing from the north or northwest much of the year. Winds exceeding 10 mph during the winter months nearly always come from the southwest. Highest wind velocities are reached when a well-developed storm off the northern California coast causes a north or “Chinook” wind off the Siskiyou Mountains to the south; speeds to 50 mph are common and gusts to 70 mph have been recorded occasionally. Summer thunderstorms produce gusty winds to 40 or 50 mph that may come from any direction.

Fog often fills the lower portion of the valley during the winter and early spring months, when rapid clearing of the sky after a storm allows nocturnal cooling of the entrapped moist air to the saturation point. Duration of the fog is seldom more than three days. Geographical and meteorological conditions contribute to a potential smoke problem during the fall, winter, and early spring months. Smoke from local sources occasionally reduces visibility to 1 to 3 miles under stable conditions.

Air Stagnation-Worst-Case Conditions

Generally, the highest PM_{10} concentrations in the AQMA occur during the winter when air stagnation and temperature inversion events trap particulate pollution near the ground. These stagnation events can persist for several days and increase particulate concentrations as air pollution builds up over time. Stagnation events occur regularly in the Rogue Valley and the PM_{10} attainment and maintenance analysis must reflect these “worst-case” meteorological conditions. This provides a conservative analysis demonstrating that compliance with standards will not be jeopardized, even during air stagnation episodes.

Until recently it was thought that the meteorology of December 1985 represented the most severe stagnation event. However, a new evaluation of meteorology from 1985-2000 has shown that the air stagnation events occurring in 1998-2000, and particularly those of December 1999, reflect meteorology that is as conservative in most respects as that of December 1985. The newer meteorology also provides a more complete and accurate data record of meteorology than does the record for 1985. After deliberation, the advisory committee recommended that the Department use the 1998-2000 stagnation meteorology for the attainment and maintenance analysis.

See Section 4.14.5.2 for a more detailed discussion of the stagnation meteorology used in the attainment and maintenance modeling analysis.

4.14.2.0 Ambient Air Quality

4.14.2.1 PM_{10} Monitoring in the AQMA

Particulate monitoring began for Total Suspended Particulate (TSP) in 1969 at the Jackson County Courthouse near Oakdale and Main Streets in Medford. TSP monitoring began in White City near Agate Rd. in 1977. The Medford Aerosol Characterization Study (MACS) was conducted during 1979-81 and used various air quality modeling techniques (dispersion and chemical mass-balance) to help identify significant sources contributing to particulate impacts. Integrated nephelometry was added to the monitoring network in the late 1970's to provide information on hourly variation in particulate levels.

PM_{10} monitoring began in Medford in 1983 and in White City in 1985. Based on measured violations of the PM_{10} standard during 1983-86, the Medford AQMA was listed as a Group-I PM_{10} area (area in non-compliance) in August 1987. The AQMA was subsequently designated as nonattainment for PM_{10} under the 1990 Clean Air Act Amendments.

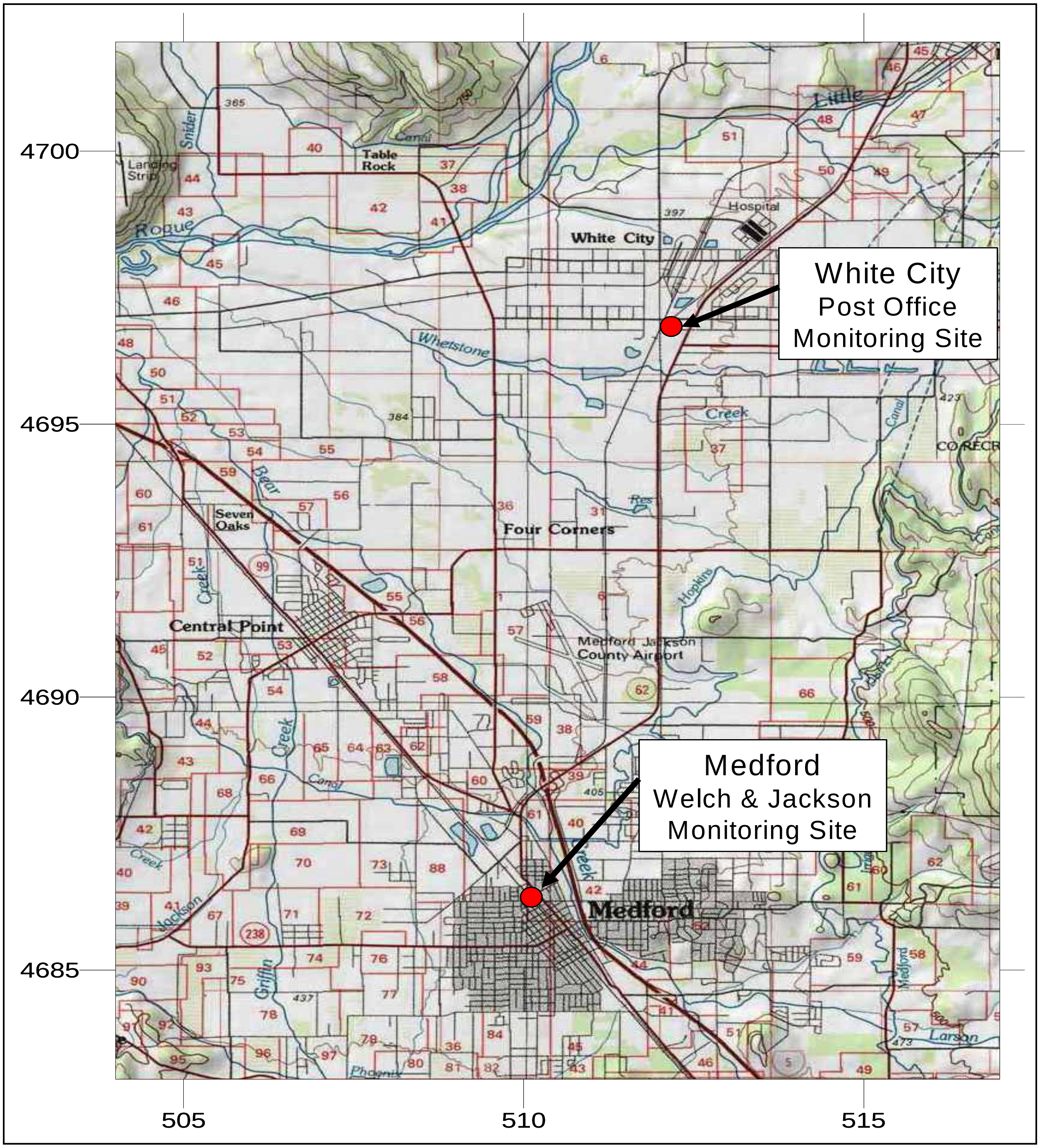
PM_{10} monitors are placed in the areas of highest PM_{10} concentration (PM_{10} hot-spots), with the expectation that if PM_{10} standards are met at these locations, air quality throughout the AQMA will also be in compliance. A particulate gradient study was conducted from September 1985 to February 1986 to better characterize PM_{10} concentrations throughout the AQMA, identify areas of high PM_{10} concentration, and determine if additional monitoring sites should be established. The gradient study captured the extended air stagnation events of December 1985 which resulted in the highest PM_{10} levels measured to date in the Medford area. The study showed that PM_{10} concentrations were highest at the Jackson County Courthouse site, the Oak & Taft Street site, and the area of Haven & Holly Streets. As a result of the study, additional PM_{10} monitoring sites were located in Medford at Oak & Taft Streets and Welch & Jackson Streets. In White City, the study showed the highest PM_{10} concentrations near the White City Post Office. EPA reference monitors were installed at all of the peak PM_{10} impact sites in Medford & White City by December 1987. A subsequent gradient study in the winter of 1994/95 confirmed the placement of the monitoring network in the areas of highest PM_{10} impacts.

The design of the next PM_{10} gradient study will be evaluated after EPA completes its review and update of federal particulate standards (PM_{10} and PM2.5).

<u>Monitoring Locations</u>

Two EPA reference monitors are currently located in the AQMA: Welch & Jackson Street (Medford) and the White City Post Office. Figure 10 shows the location of the PM_{10} monitoring network.

Figure 10: PM_{10} Monitoring Locations in the AQMA



Quality Assurance

Data quality is evaluated in several ways. Each month, a systems audit is conducted in which each monitoring site is visited to evaluate whether the site location still meets established citing criteria, whether procedures are being followed, and to ensure that documentation is complete. Data quality is evaluated for precision (repeatability), accuracy, and completeness. Accuracy and precision are evaluated by calibrating the PM_{10} monitor performance against standardized reference equipment.

Appendix A-1 offers a more detailed description of the PM_{10} monitoring network and methodologies.

4.14.2.2: PM_{10} Concentrations: Summary and Trends

Medford: Welch & Jackson (Primary Monitoring Site)

The Welch & Jackson monitor is the main reference PM_{10} sampling site for Medford. Official sampling began in August 1989. Figure 11 shows all daily PM_{10} data from 1989-2003. Figure 12 shows the trend in the four highest daily (24-hour average) PM_{10} concentrations from 1989-2003. Figure 13 shows the number of "*expected exceedances*", which is used to determine compliance with the daily PM_{10} NAAQS. The number of expected exceedances can not exceed 1.0. The last exceedance of the daily PM_{10} standard (150 ug/m^3) at Welch & Jackson was in 1991.

Figure 11: PM_{10} Trend at Welch & Jackson Monitoring Site (1989-2003)

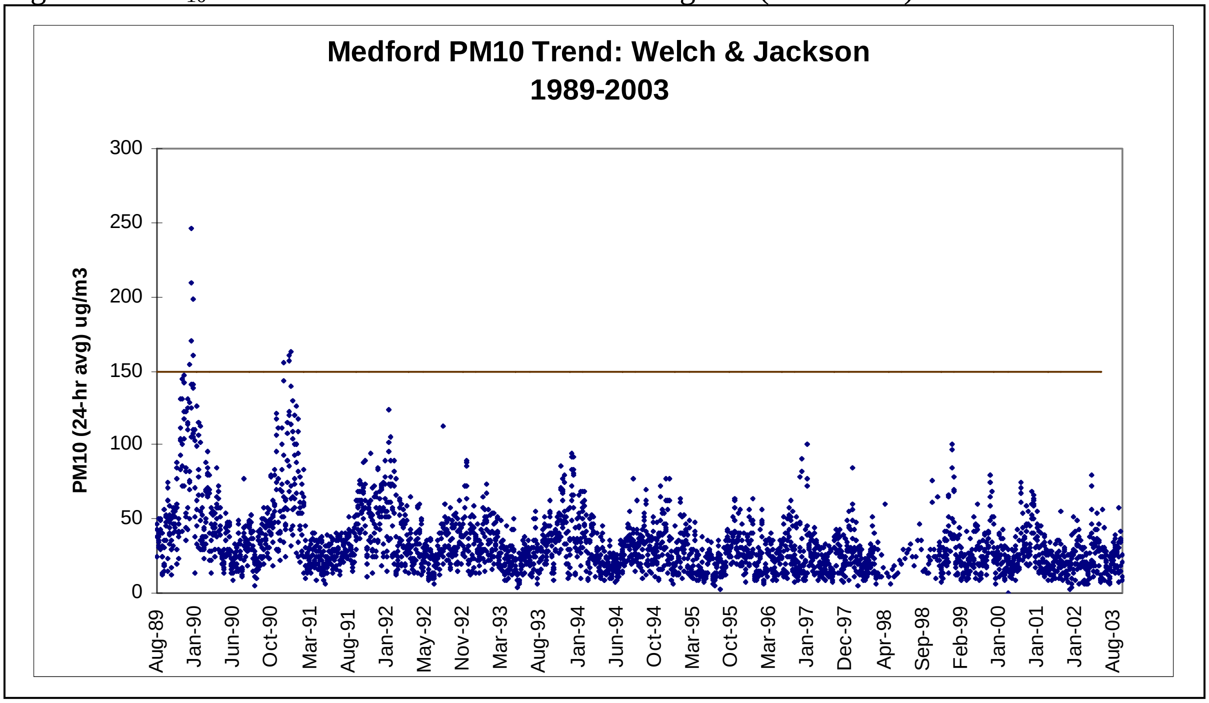


Figure 12: Trend in Peak Daily PM_{10} values 1989-2003

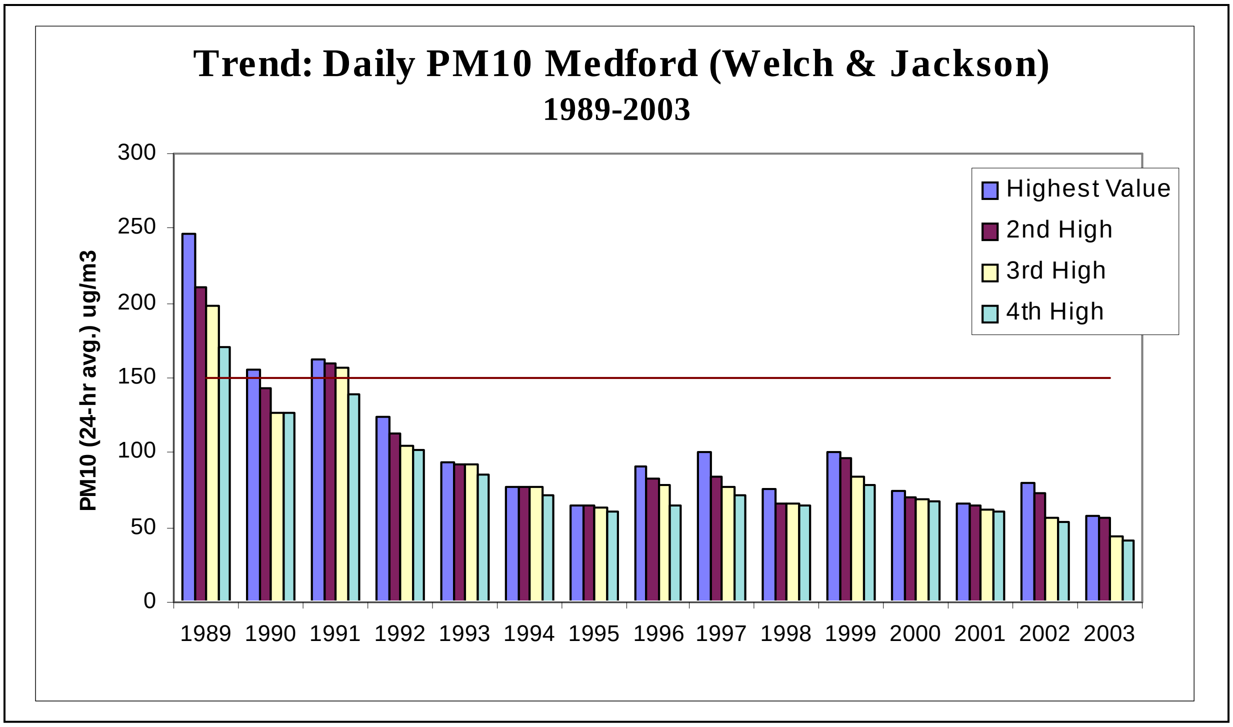


Figure 13: Number of Daily Exceedances & Expected Exceedances

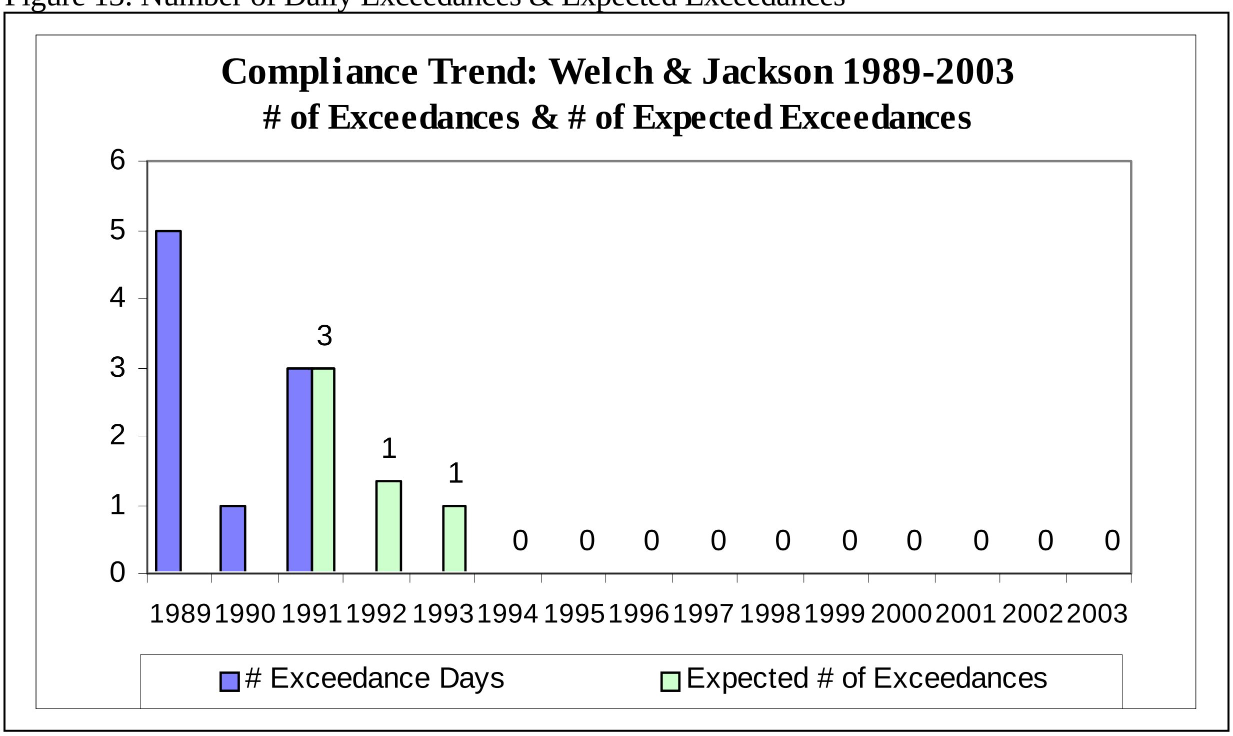
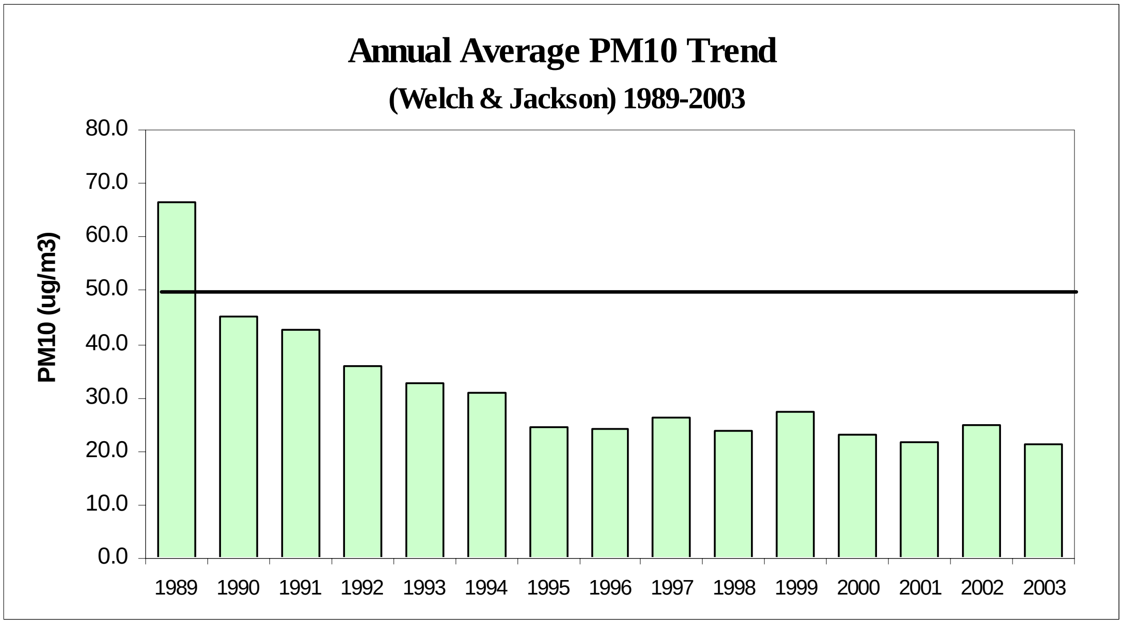


Figure 14 shows the trend in annual average PM_{10} concentrations from 1989-2003. The last exceedance of the annual average PM_{10} standard (50 ug/m^3) was in 1989.

Figure 14: Welch & Jackson. Annual Avg. PM_{10} Trend



<u>White City: Post Office (Primary Monitoring Site)</u>

The White City Post Office monitor is the main reference PM_{10} sampling site for the White City area. Official sampling began in fall 1985. Figure 15 shows all daily PM_{10} values from 1985-2003. Figure 16 shows the trend in the four highest daily (24-hour average) PM_{10} concentrations from 1985-2003. Figure 17 shows the number of expected exceedances, which is used to determine compliance with the daily PM_{10} NAAQS. The number of daily expected exceedances can not exceed 1.0. The last exceedance of the daily PM_{10} standard at White City occurred in 1991.

Figure 15: PM_{10} trend at White City Monitoring Site 1985-2002

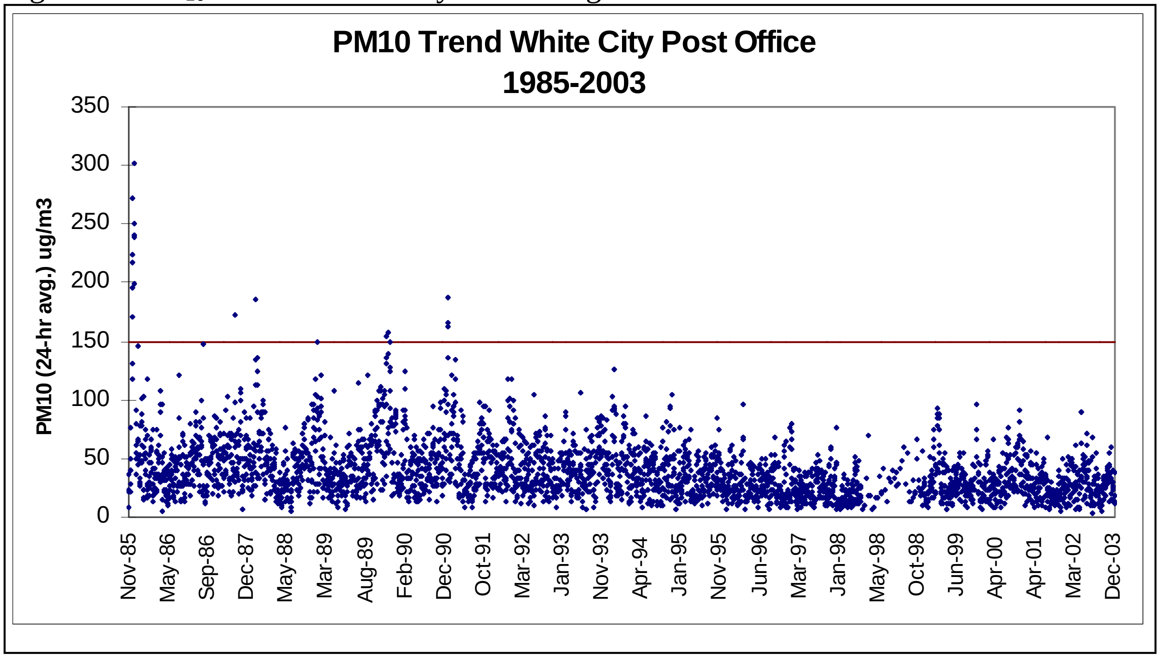


Figure 16: Trend in Peak Daily PM_{10} Values

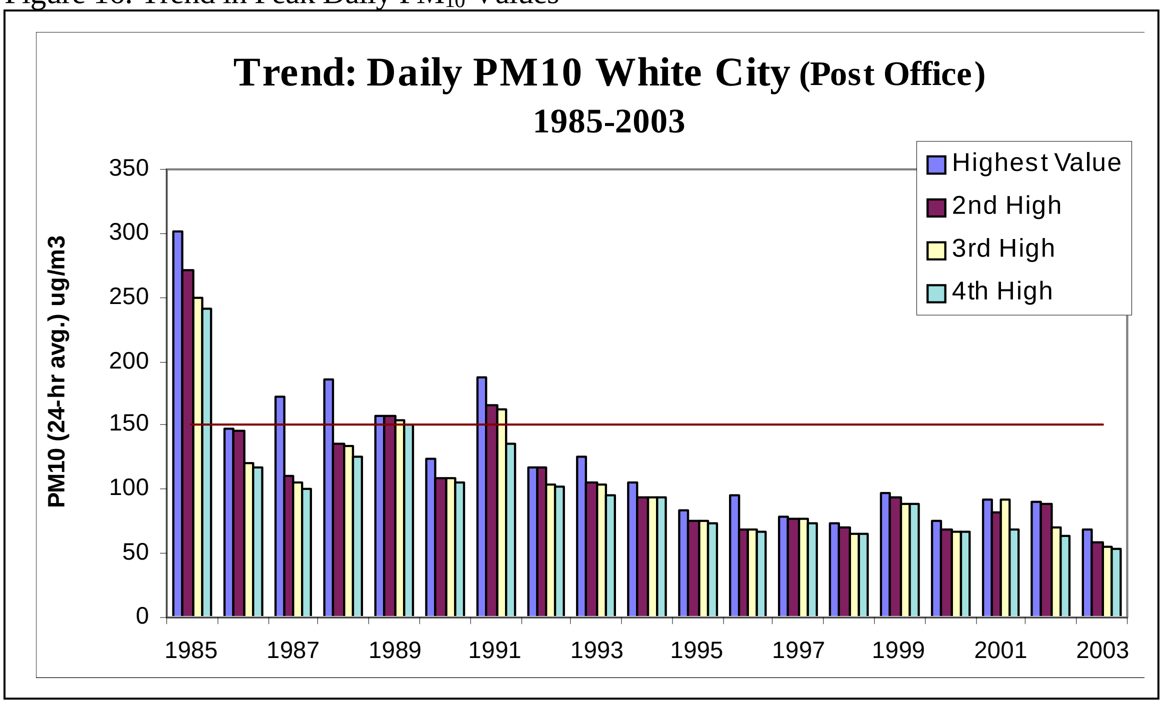


Figure 17: Number of Daily Exceedances & Expected Exceedances

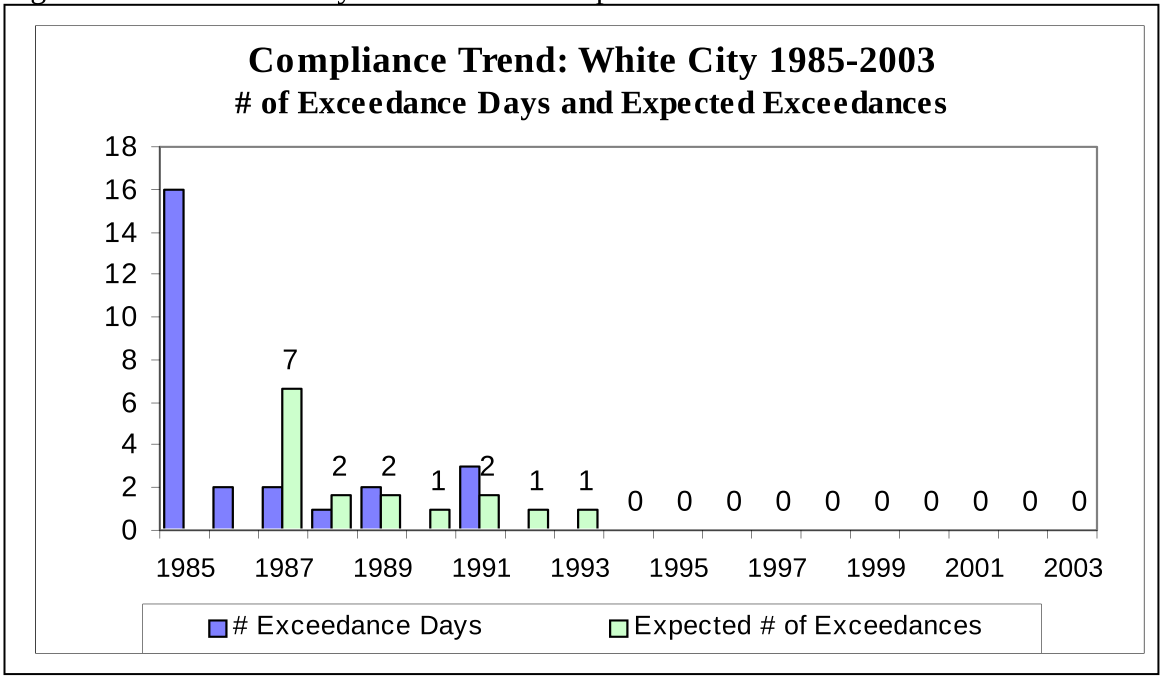
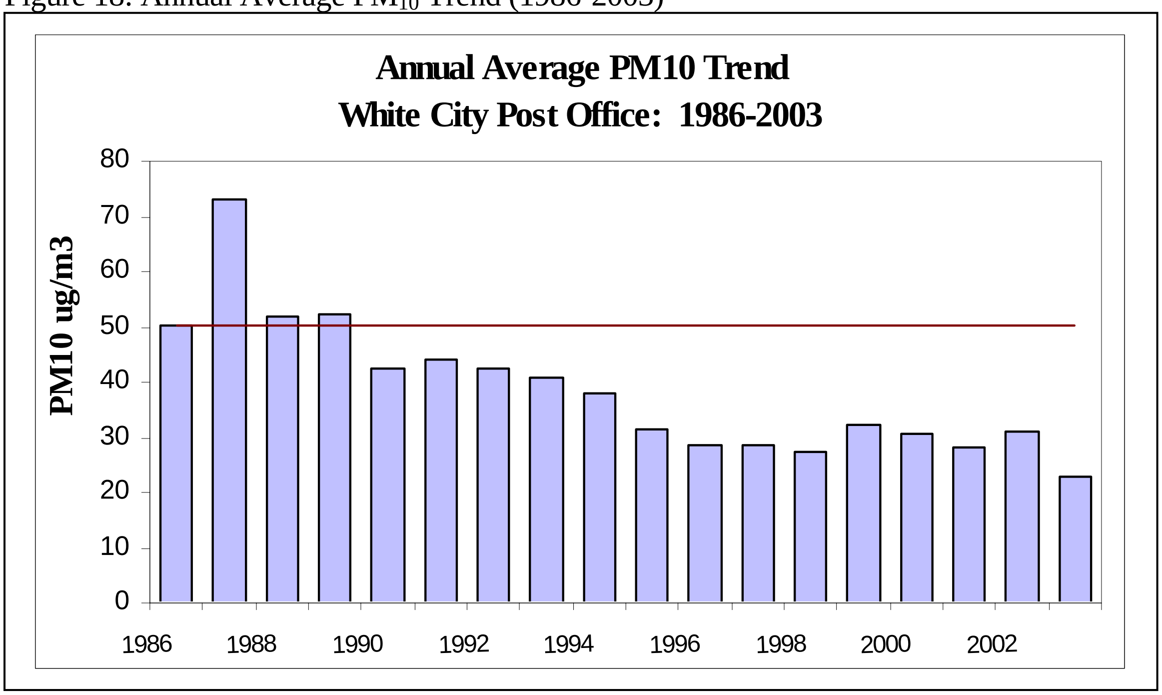


Figure 18 shows the trend in annual average PM_{10} concentrations from 1986-2003. The last exceedance of the annual average PM_{10} standard (50 ug/m^3) in White City was in 1989.

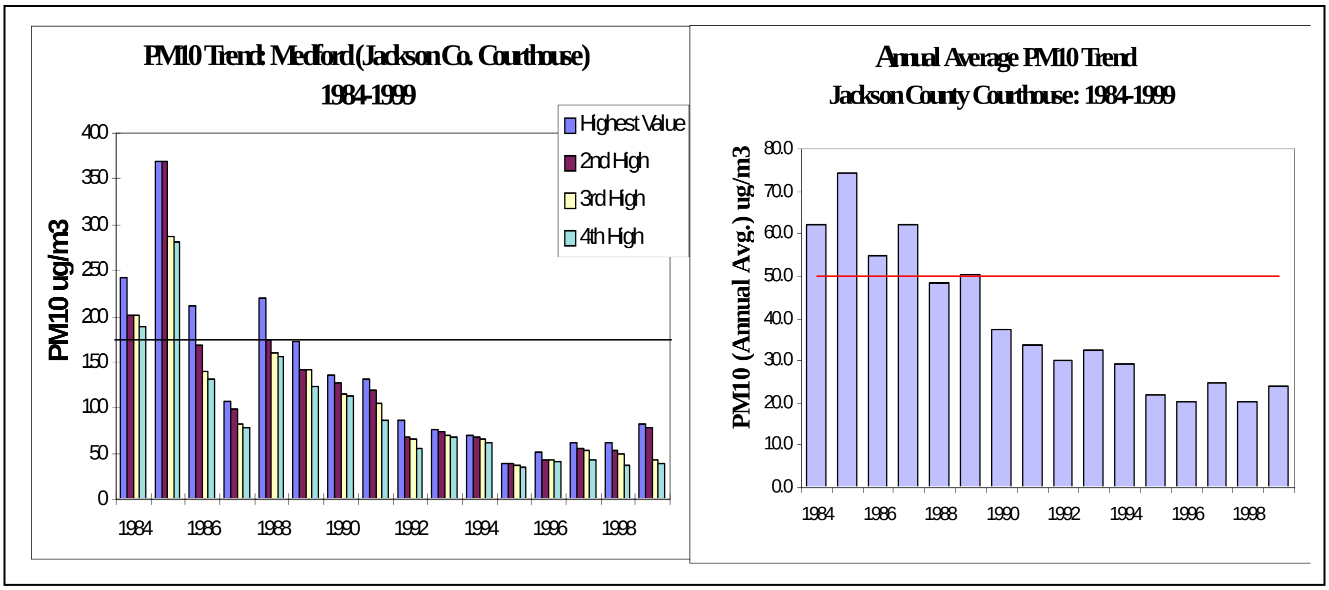
Figure 18: Annual Average PM_{10} Trend (1986-2003)



Jackson County Courthouse (Historic Monitoring Site)

The Jackson County Courthouse was one of the original particulate monitoring locations in Medford. PM_{10} values measured at the Courthouse were not as high as those measured at the Welch & Jackson site. Overtime, the Welch & Jackson site became the primary reference site for Medford, and the Courthouse site was discontinued in 1999 as part of DEQ and EPA's overall network reduction plan. Figure 19 shows the trend in the four highest daily (24-hour average) PM_{10} concentrations at the Courthouse from 1984-1999. The last exceedance of the daily PM_{10} standard (150 ug/m^3) at the Courthouse was in 1988. Figure 19 also shows the trend in annual average PM_{10} concentrations at the Courthouse from 1984-1999. The last exceedance of the annual average PM_{10} standard (50 ug/m^3) at the Courthouse was in 1987.

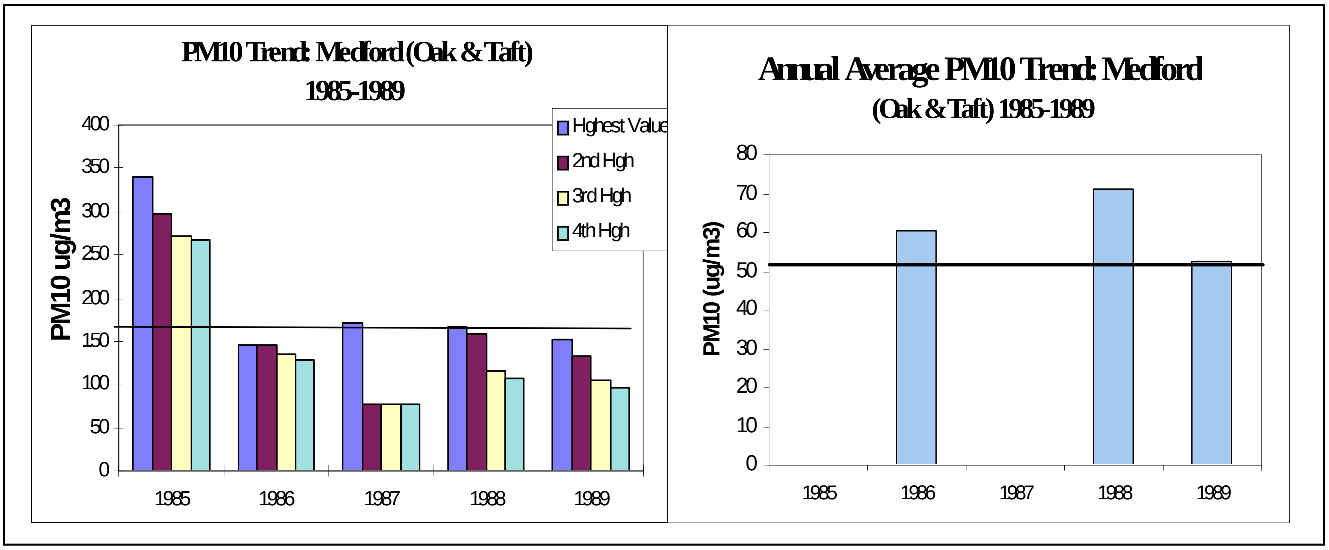
Figure 19: PM_{10} Trends at the Jackson Co. Courthouse Monitoring Site



Oak & Taft Street (Historic Monitoring Site)

The monitor at Oak & Taft Streets was part of the initial PM_{10} assessment of the Medford area in the mid-late 1980's. The site was discontinued in 1989 when Welch & Jackson became the official reference site for Medford. Figure 20 shows the trend in the four highest daily (24-hour average) PM_{10} concentrations at the Oak & Taft (1985-1989), and also the trend in annual average PM_{10} concentrations.

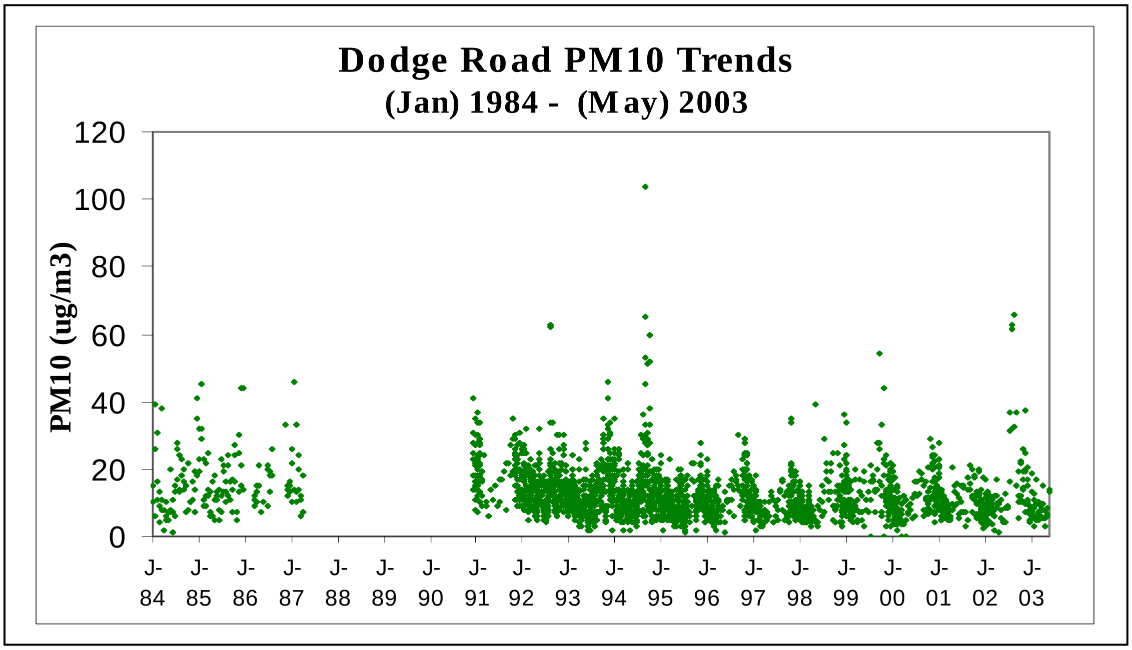
Figure 20: PM_{10} Trends at the Oak & Taft Monitoring Site



4.14.2.3: Background Air Quality

PM_{10} aerosols from sources outside the AQMA collectively contribute to measured PM_{10} levels in the Medford area when the regional airmass is transported into the Rogue Basin. Sources of air pollution such as wildfires, slash and agricultural burning, entrained fine soils, and some secondary aerosols are believed to be the principal contributors to background air quality. A background particulate monitor has been operated at Dodge Road in Sam's Valley (N-NW of the AQMA) since 1979. Figure 21 shows the trend in background PM_{10} concentrations since 1984. Generally, background PM_{10} values are quite low, commonly averaging about 12 ug/m^3. Occasional high values are documented and assigned a cause when known (such as wildfire impacts in 1994, 1999, 2002, etc.). Background PM_{10} values are used as part of the attainment and maintenance analysis. The use of background in the modeling analysis is discussed in more detail in Section 4.14.5.0, *Dispersion Modeling Analysis.* State budget reductions closed the Dodge Rd. monitoring site from April 1987 through December 1990.

Figure 21: PM_{10} Trend at the Dodge Road (Background) Monitoring Site



4.14.2.4: Reductions in peak PM_{10} levels since 1989

Air quality strategies adopted in the 1991 attainment plan were designed to reduce 24-hour concentrations of PM_{10} by at least 159 $\mu g/m^3$ (design value of 309 ug/m^3 - 150 $\mu g/m^3$) and the annual average by at least 18 $\mu g/m^3$ (design value of 68 ug/m^3 - 50 $\mu g/m^3$) by 1992. Emission reduction measures adopted in the attainment plan are legally enforceable; adequate to achieve the needed air quality improvements; and were designed to attain standards within the time frames prescribed by the Clean Air Act. Table 1 shows the affect of the strategy and the significant reduction in peak PM_{10} levels since 1989.

Table 1: Peak Levels: **24-Hour Average PM_{10} Particulate Summary ($\mu g/m^3$)**

	Welch & Jackson PM_{10} ($\mu g/m^3$)		White City PO PM_{10} ($\mu g/m^3$)	
Year	Maximum (date)	2nd Highest (date)	Maximum (date)	2nd Highest (date)
1989	246 (12/21)	210 (12/23)	158 (12/20)	157 (12/23)
1990	156 (12/09)	143 (12/08)	124 (02/27)	109 (02/24)
1991	163 (01/04)	160 (01/03)	188 (01/05)	166 (01/03)
1992	124 (01/15)	113 (08/05)	118 (01/15)	117 (01/24)
1993	94 (12/22)	92 (12/23)	126 (12/24)	106 (03/29)
1994	77 (08/12)	77 (12/09)	105 (12/23)	94 (02/03)
1995	64 (02/06)	64 (11/03)	84 (11/04)	76 (01/20)
1996	91 (12/19)	82 (12/18)	96 (02/13)	68 (02/12)
1997	101 (01/09)	85 (12/29)	78 (12/29)	77 (01/09)
1998	76 (10/20)	66 (12/23)	74 (12/23)	70 (12/22)
1999	98 (01/04)	93 (01/05)	89 (1/05)	84 (01/05)
2000	72 (11/18)	68 (11/20)	73 (11/20)	67 (11/17)
2001	64 (1/3)	63 (1/4)	89 (1/2)	80 (1/3)
2002	80 (7/31)	73 (8/12)	90 (8/12)	89 (7/31)
2003	58 (11/14)	57 (01/18)	68 (1/09)	59 (11/14)

Summary: Meeting the Clean Air Act Attainment Deadline and Redesignation To Attainment

Monitoring data demonstrates that the Medford-Ashland AQMA successfully met the 1994 Clean Air Act attainment deadline, and has continued in compliance since then. The *Attainment and Maintenance Modeling Analysis* demonstrate that the AQMA will continue in compliance with PM_{10} standards, even under worst-case conditions, through at least the year 2015.

These three demonstrations are sufficient for EPA to redesignate the Medford-Ashland AQMA to attainment for PM_{10}.

PM_{10} EMISSION ESTIMATES FOR THE
MEDFORD-ASHLAND AQMA

4.14.3.0: Overview

The analysis of ambient PM_{10} levels begins with an assessment of PM_{10} emissions occurring in the AQMA. Emissions are estimated for a wide variety of sources, and are summarized in four major categories.

- Major Point Sources: Are those industrial facilities with PM_{10} emissions greater than or equal to 5 tons per year.

- Area Sources: Include activities such as residential wood-heating, open burning, commercial space heating, etc.

- Non-Road Mobile Sources: Include sources such as small engines and construction equipment. As with Area Sources, the Non-Road Mobile category reflects many small individual sources that can collectively produce a significant amount of emissions in the airshed.

- On-Road Mobile Sources: Include cars and trucks, and reflects both exhaust (tailpipe) and road dust emissions.

PM_{10} emissions are estimated using many sources of information, including industrial permits, population, housing, and employment information, and estimates of motor vehicle travel in the AQMA. The PM_{10} attainment and maintenance analysis use emission estimates in three different ways. First, a "base-year" emissions inventory (EI) is created to estimate actual PM_{10} emissions occurring in the airshed. For the AQMA, the PM_{10} base-year EI is for 1998. The base-year EI serves as the foundation for the future emissions forecast, and was used in validating the performance of the air quality dispersion model. More information on the air quality dispersion modeling process can be found in Section 4.14.5.0

The *Attainment Analysis* uses a variation of the 1998 base-year EI to portray a worst-case emissions scenario for the airshed. The attainment analysis uses 1998 emissions for all source categories except major industry. For major industry, actual 1998 emissions are replaced with each facility's maximum allowable (permitted) emission level. This worst-case planning approach is required by EPA, and is designed to reflect the maximum potential for industrial PM_{10} impacts in the AQMA.

The *Maintenance Analysis* uses an emissions forecast to the year 2015, and also reflects major industry emissions at maximum allowable levels. Section 4.14.3.1 summarizes the 1998 Base-Year EI for the AQMA. The attainment analysis EI is discussed in Section 4.14.3.2. Growth factors used in the emissions forecast are summarized in section 4.14.3.3, and the maintenance analysis EI is summarized in section 4.14.3.4. The complete emissions inventory and forecast for the AQMA is included as Appendix A2.

4.14.3.1: Base Year Emissions Inventory: 1998 Actual Emissions

The 1998 Base Year Emissions Inventory estimates actual PM_{10} emissions that occurred within the AQMA from all source sectors, and serves as the basis for both the 1998 Attainment Analysis and the 2015 Maintenance Analysis.

Estimates are developed for both Annual and Daily PM_{10} emissions; annual in (tons of PM_{10} per year) and daily in (pounds of PM_{10} per day). Daily emissions are adjusted to reflect a worst-case season during the year. Typically, the worst-case season occurs in the winter (November through February). Historically, this is the time period when the daily PM_{10} standard is most likely to be exceeded.

Emissions from each source category were evaluated and adjusted accordingly to develop an appropriate inventory of winter season daily emissions. For example, emission estimates for Residential Wood Combustion were adjusted to reflect fluctuations in home heat demand during the winter. Not all emission source categories require adjustment. For example, production and emissions from major industry tend to be fairly constant throughout the year; therefore a seasonal adjustment from annual to a worst-case winter day is not needed. Some activities that occur during the summer months appear in the annual emission inventory but not in the worst-case (winter) daily emission inventory.

Another example of seasonal adjustment involves Mobile Sources. Daily emission estimates are based on annual average motor vehicle travel, adjusted for winter driving conditions and peak day commuter traffic volumes.

Summary: 1998 Emission Inventory (Actual Emissions)

Table 2 and Figures 22 through 25 show the emission inventory summary for the 1998 base-year. These reflect estimates of actual emissions in 1998, including reported actual emissions for major industry.

Table 2: 1998 Base-Year EI (Actual Emissions)

Medford-Ashland PM_{10} Emissions		
1998 Emissions	*Tons per Year*	*Pounds per Day*
Stationary Point Sources	535.4	3,274
Stationary Area Sources	685.0	13,504
Non-Road Mobile Sources	67.2	605
On-Road Mobile Sources	2,452.1	14,179
Total	3,739.8	31,561

Figure 22: Actual 1998 Annual Emissions (tons/year)

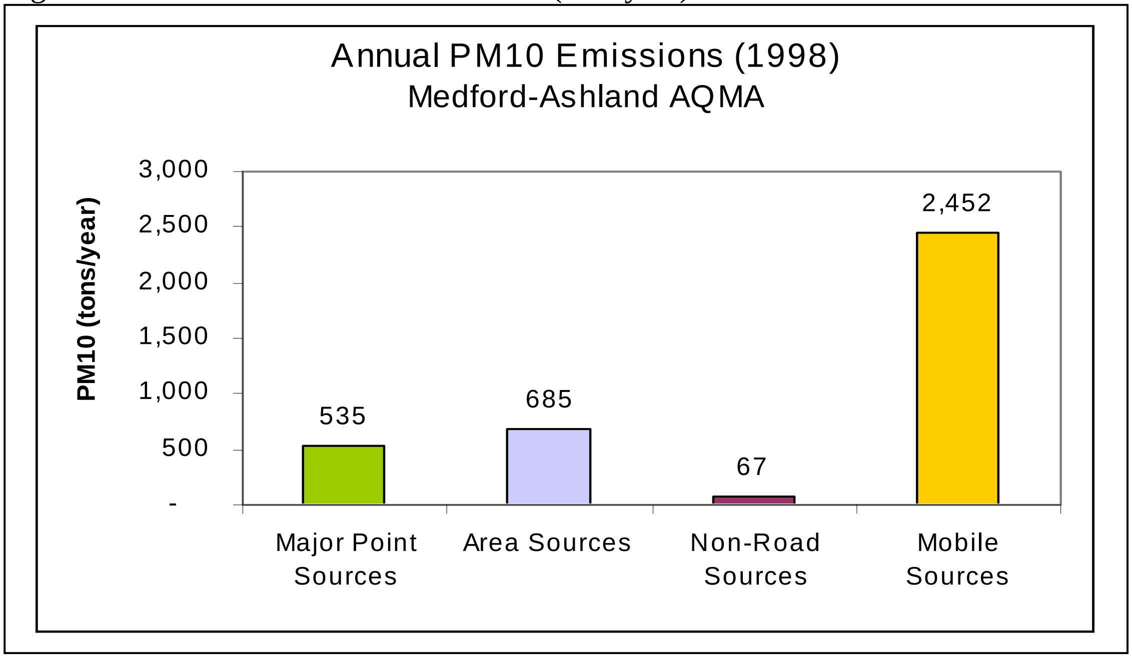


Figure 23: Percent Source Contributions (1998 Annual Emissions)

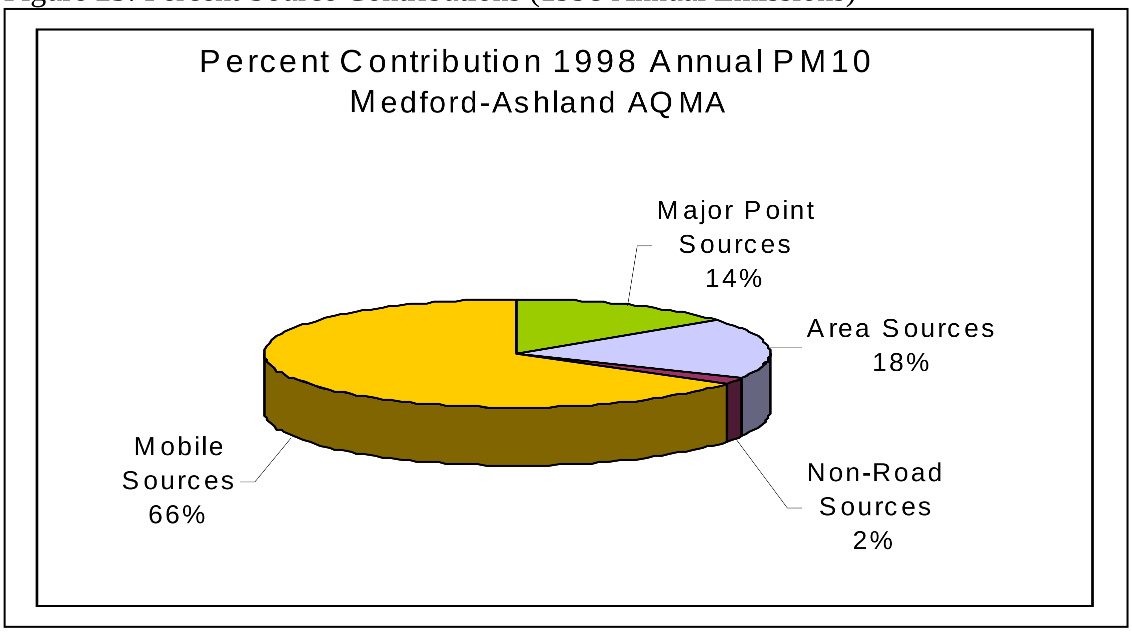


Figure 24: Actual 1998 Daily Emissions (lbs/day)

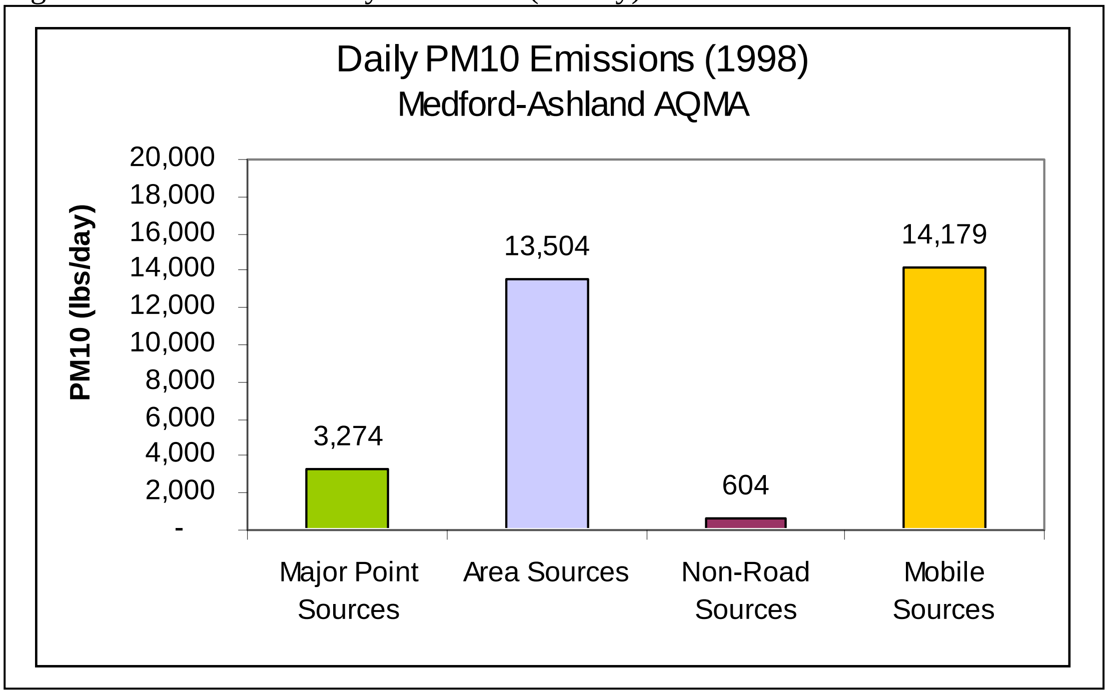
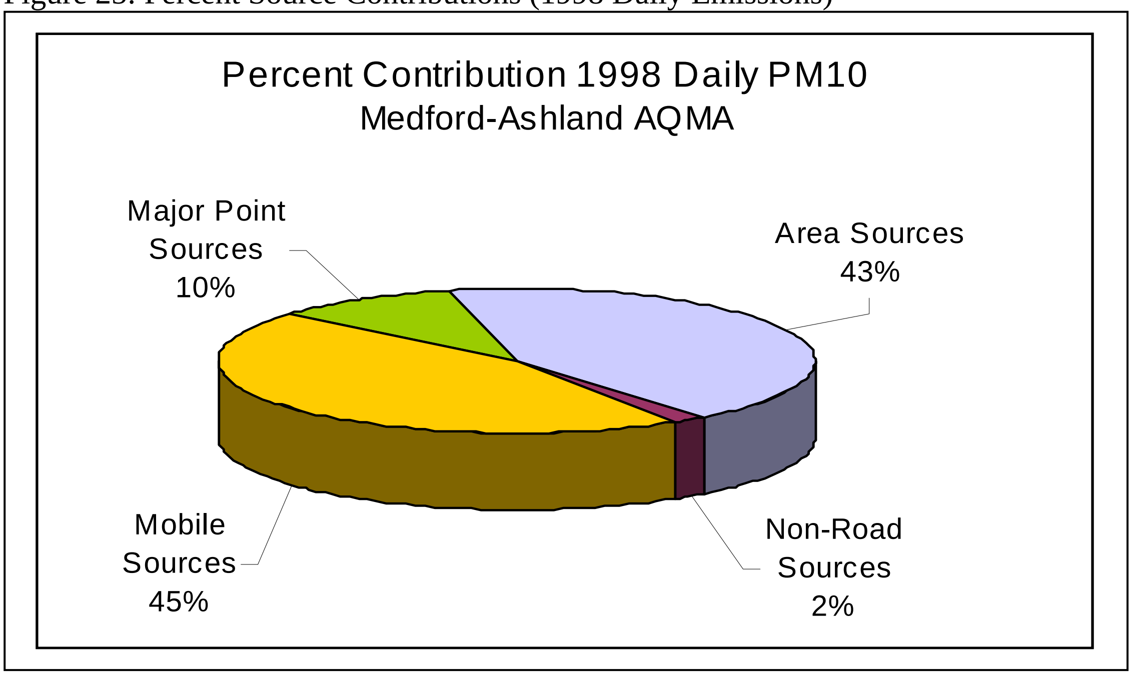


Figure 25: Percent Source Contributions (1998 Daily Emissions)



4.14.3.2: Attainment Analysis Emissions Inventory

The Attainment Analysis evaluates the current potential for impacts in the AQMA, under worst-case conditions. For this analysis, the Department used the 1998 inventory of actual emissions, substituting maximum permitted emission levels for major industry. These are the levels legally allowed in each facility's air quality permit. Figure 26 shows the difference between 1998 actual emission levels and allowable emission levels for major industry. Figures 27-30 summarize the attainment analysis EI.

Figure 26: Actual (1998) vs. Allowable Emission Levels for Major Industry.

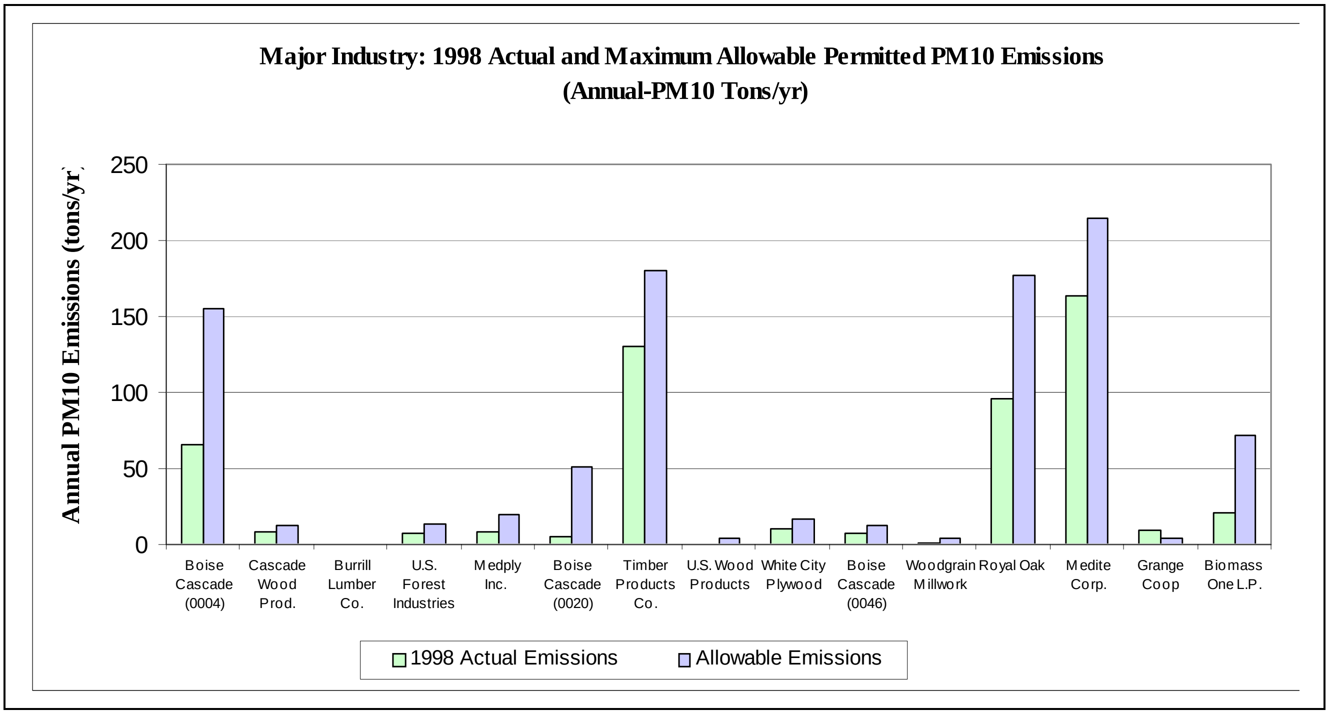


Figure 27: Attainment Analysis Emissions Estimate (Annual)

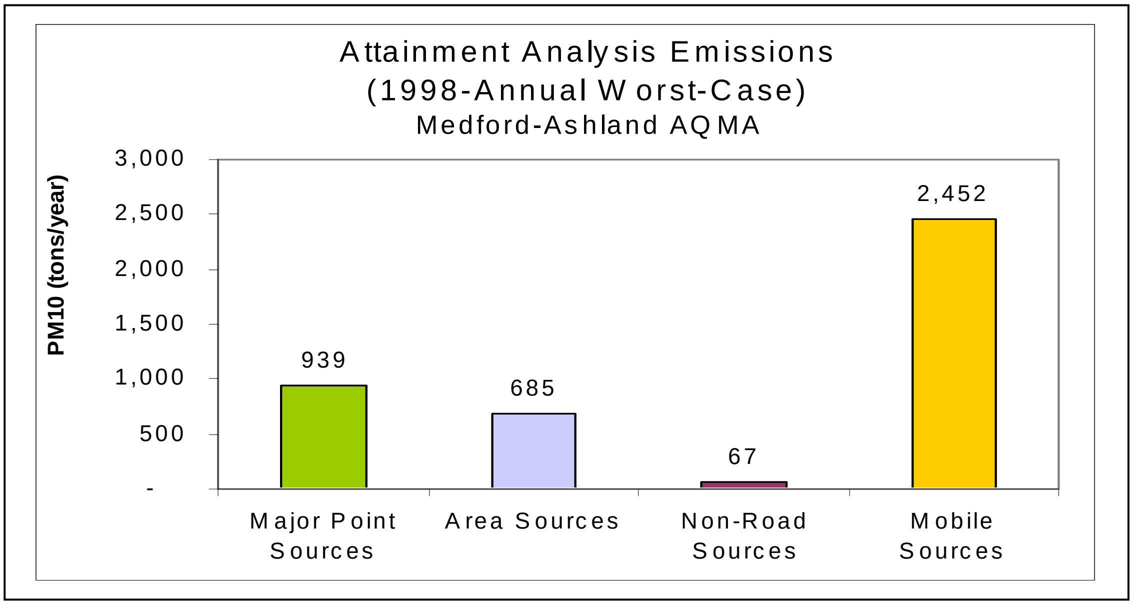


Figure 28: Percent Contribution by Source Category

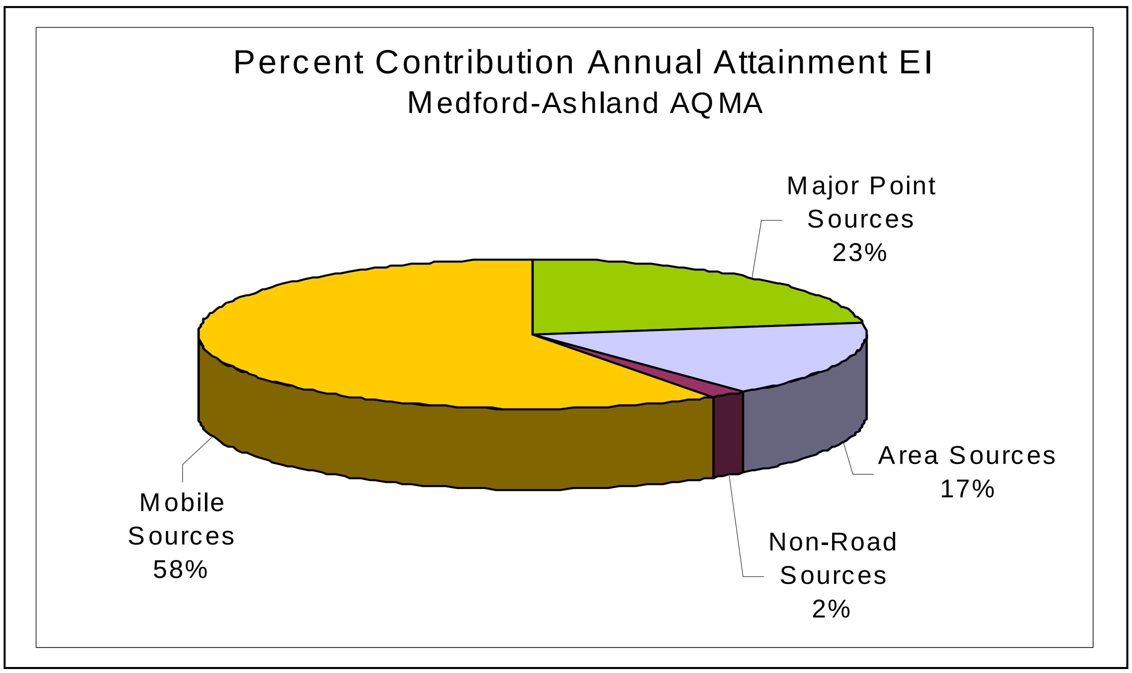


Figure 29: Attainment Analysis Emissions Estimate (Daily)

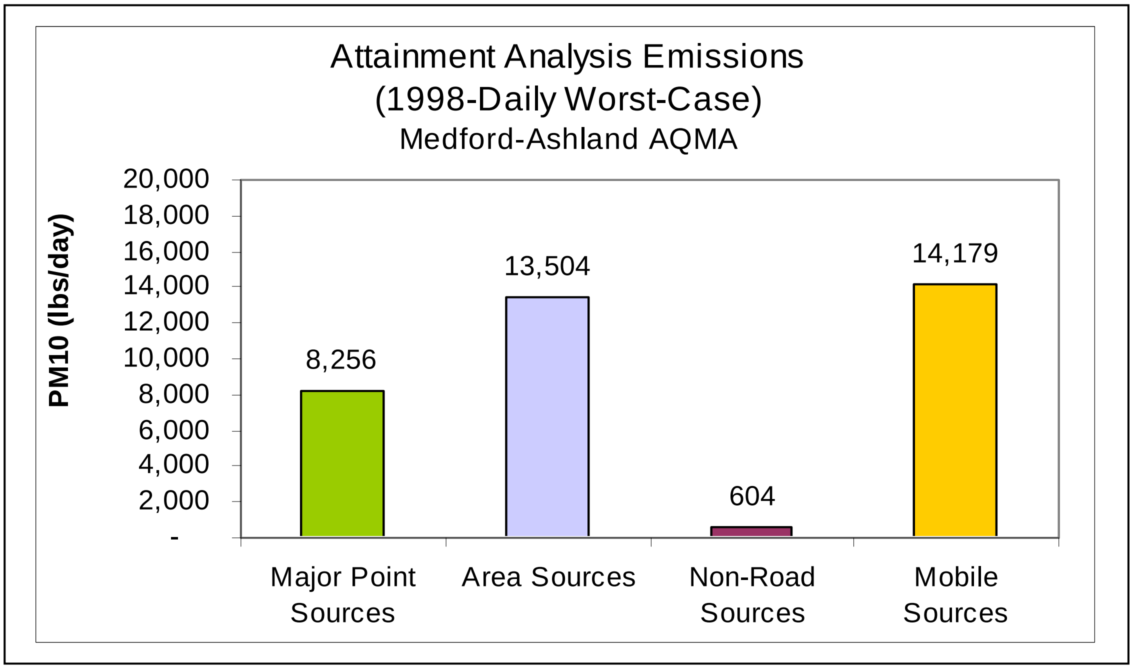
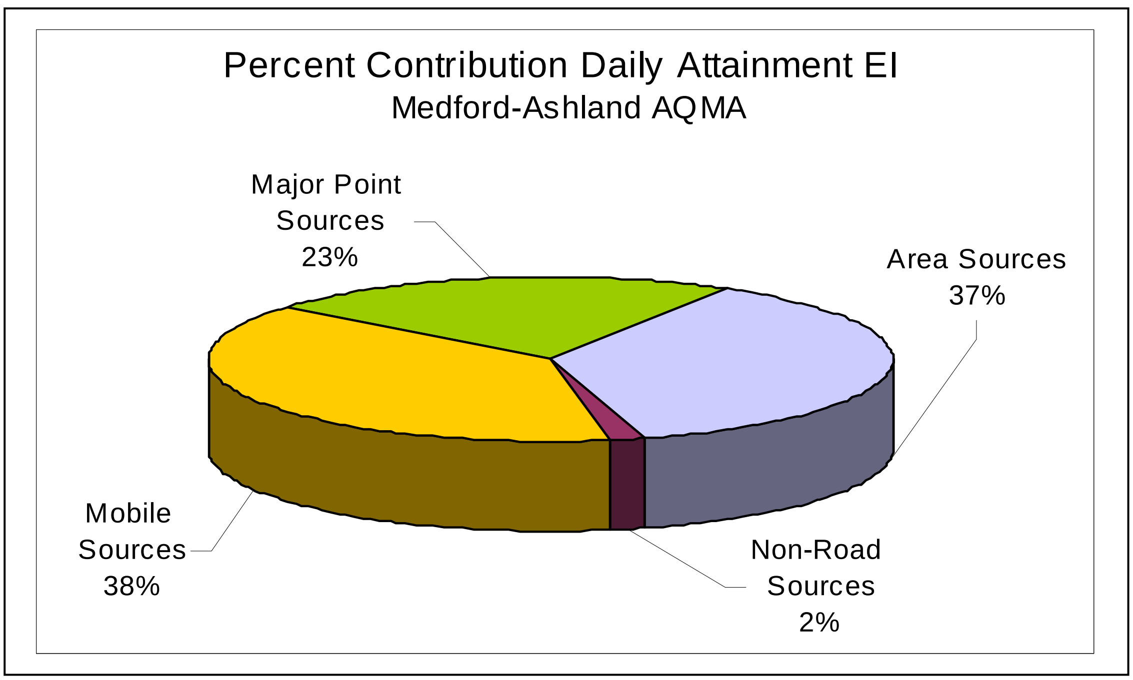


Figure 30: Percent Contribution by Source Category



4.14.3.3 Emissions Growth in the Medford-Ashland AQMA

Various growth factors were used to estimate future year PM_{10} emissions. Key indicators used in the emissions forecast include population growth, economic forecasts, increases in motor vehicle travel (vehicle-miles-traveled, or VMT) and permitted emissions for major industrial sources. By executive order from the Oregon governor, growth and economic forecasts used by state and local agencies for planning purposes must be consistent with projections from the Oregon Office of Economic Analysis (OEA). OEA met with city and county staff from Rogue Valley communities to arrive at agreed upon population and employment forecasts.

EPA requires that maintenance plans be updated every 8-10 years to account for the latest changes in growth patterns. When the Medford-Ashland PM_{10} Maintenance Plan is next updated, a new emissions projection will be done to reflect the latest population, employment, and motor vehicle travel forecast for the AQMA.

Population/Housing/Employment: Population, housing, and employment trends have been used to proportionally increase emissions from Area and Non-Road Mobile sources. Population, housing, and employment projections also influence the need for motor vehicle trips, and therefore influence the estimate of mobile emissions.

The Medford-Ashland AQMA includes both urban and rural areas, each growing at a different rate. Figure 31 illustrates the difference in average population growth rates between the urban and rural portions of the AQMA. The 20-year trend illustrated here (1976-1996) reflects an annual growth rate of approximately 2.6 percent per year for the incorporated areas of the AQMA, and a 0.5 percent per year rate in rural areas. The population of the AQMA in 1998 was estimated at 137,089 and projected to increase to approximately 173,564 by 2015. Housing units in the AQMA were estimated for 1998 at 53,837, and protected to increase to 64,101 by 2015. Table 3 shows average growth rates for key indicators in the AQMA. Figure 32 illustrates the average growth rate for AQMA population and housing.

The table and figures below reflect average growth rates for the AQMA. Each community in the AQMA has its own unique growth forecast. In developing the PM_{10} emission inventory and forecast, current and projected land use information (population and housing density, as well as VMT), was geographically allocated to each community and the rural portion of the AQMA by the Rogue Valley Council of Governments and Oregon Department of Transportation. These allocations were initially done as part of the local transportation planning process. The PM_{10} emissions inventory and forecast are consistent with this land use data.

Table 3: Key Growth Rates in the AQMA

Category	Annual Growth Rate (Linear, Non-Compounding)
Population	1.56% / year
Households	1.52%/ year
Total Employment	1.41% / year
Average AQMA Vehicle Miles Traveled	2.90% / year

Figure 31: Historic Growth Trend (Urban/Rural)

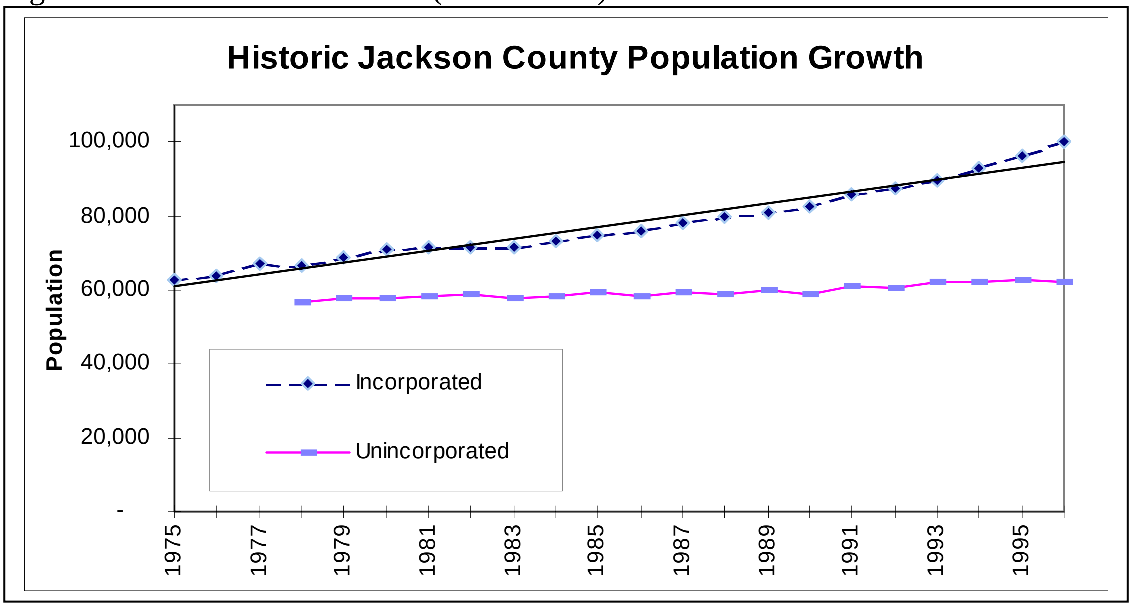
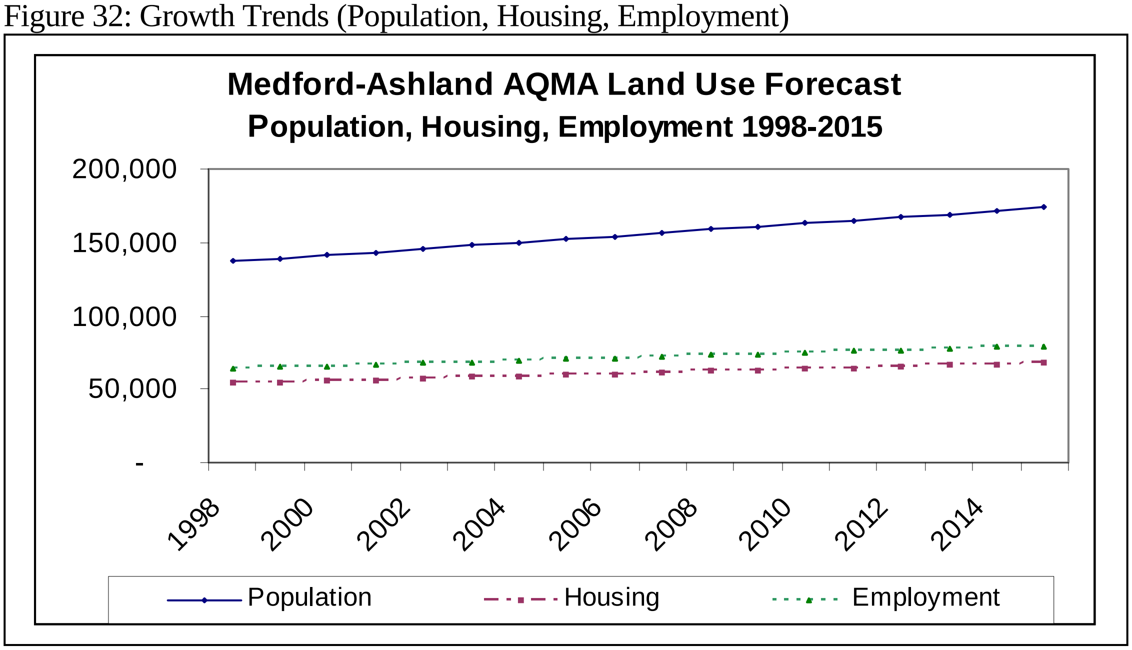


Figure 32: Growth Trends (Population, Housing, Employment)



4.14.3.4: Maintenance Analysis (2015 Emissions Forecast)

The Maintenance Analysis is based on the emissions forecast to 2015. The forecast reflects anticipated emissions growth resulting from changes in population, housing, employment, and motor vehicle travel. As in the Attainment Analysis, the Maintenance Analysis reflects major industry emissions at maximum allowable (permitted) levels.

Table 4 and Figures 33 through 36 show the maintenance emissions forecast.

Table 4: Summary of 2015 Emissions Forecast

2015 Emissions	*Tons per year*	*Pounds per Day*
Stationary Point Sources (allowable)	939	8,256
Stationary Area Sources	680	13,044
Non-Road Mobile Sources	85	765
Mobile Sources	3,754	20,999
Total	5,458	43,064

Figure 33: Maintenance Analysis Emissions Forecast (Annual)

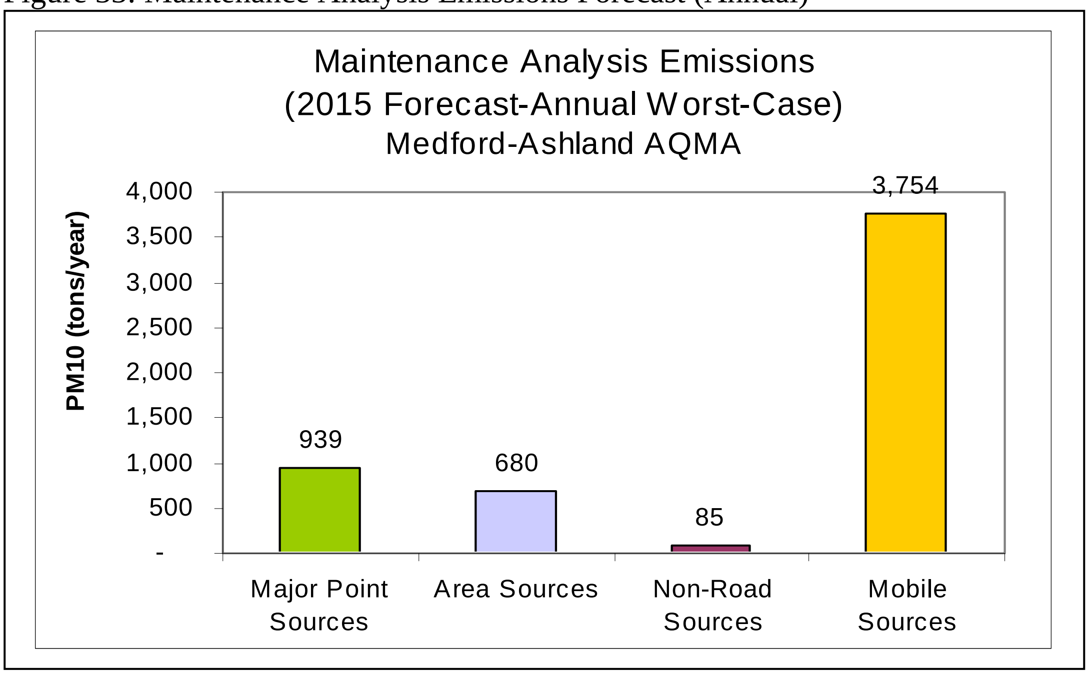


Figure 34: Percent Contribution by Source Category (Annual)

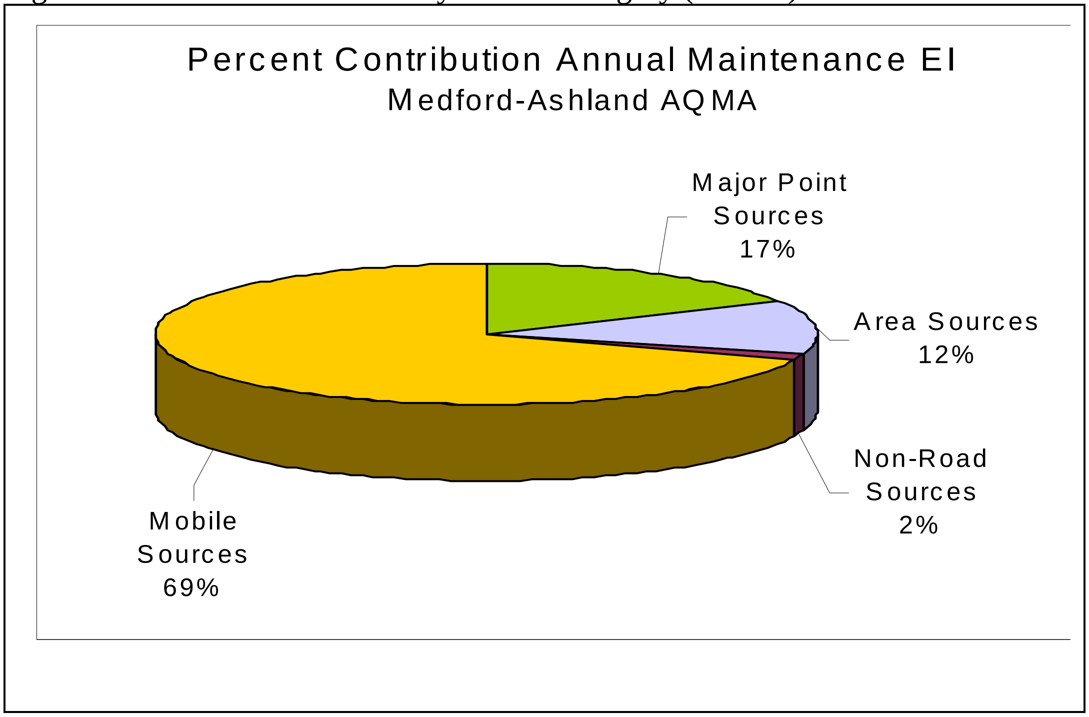


Figure 35: Maintenance Analysis Emissions Forecast (Daily)

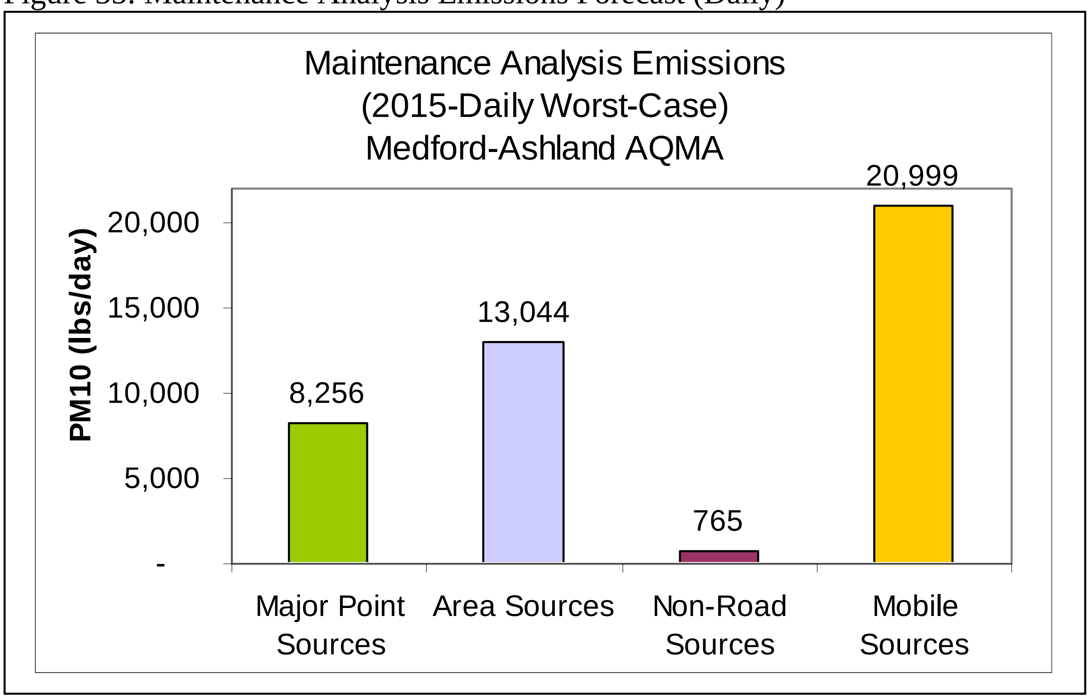
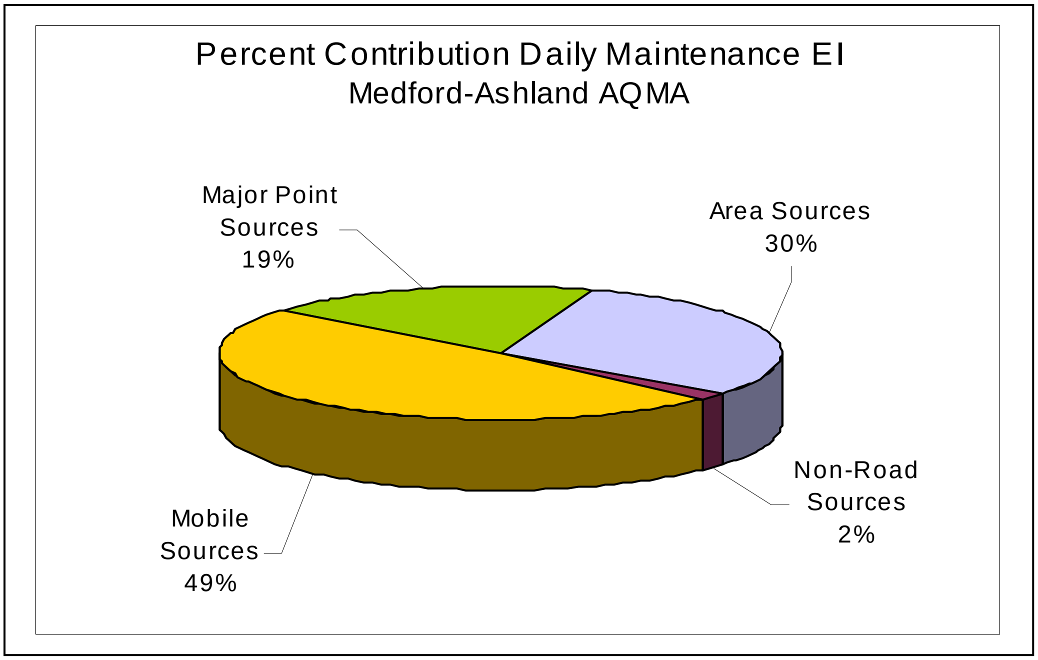


Figure 36: Percent Contribution by Source Category (Daily)



Comparison: 1998 Actual, Attainment Analysis (1998), 2015 Maintenance Analysis

Figures 37 and 38 below compare the three emission inventories used in the PM_{10} planning process (1998 base-year, 1998 worst-case attainment emissions and 2015 worst-case emissions forecast).

Figure 37: Emissions Comparison (Annual): Base year, Attainment EI, Maintenance EI

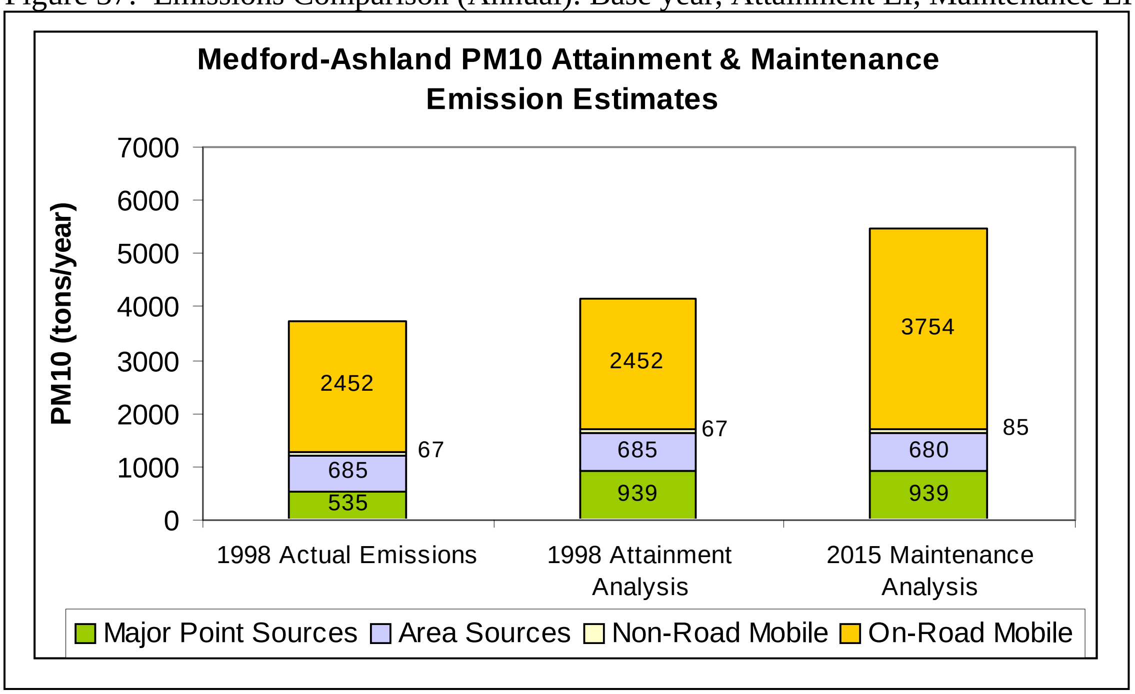
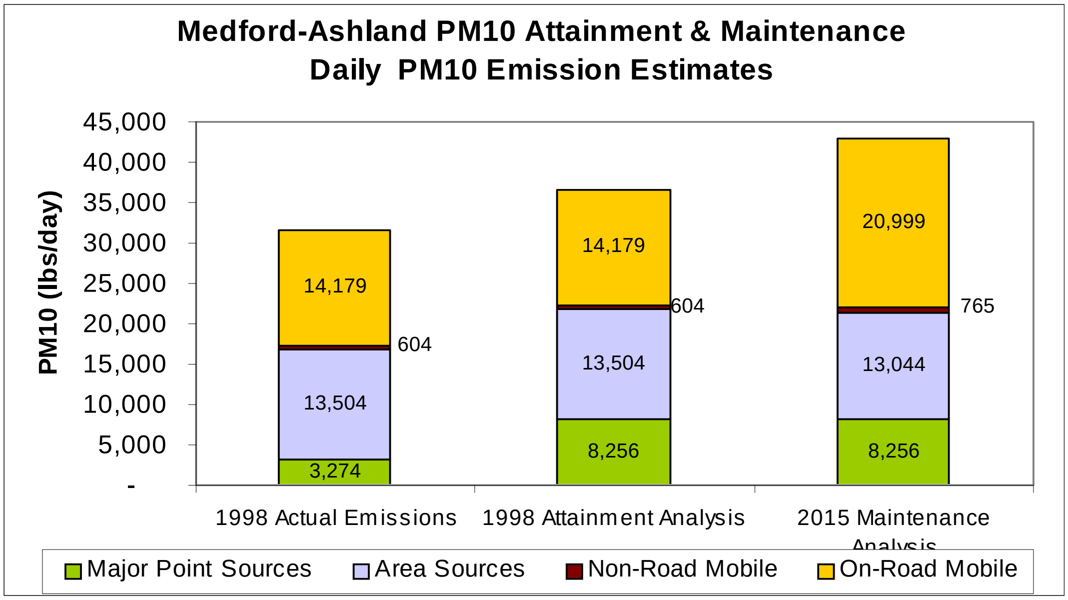


Figure38: Emissions Comparison (Daily): Base-year, Attainment EI, Maintenance EI



4.14.3.5 Geographic Distribution of Emissions (Spatial Allocation)

After emissions are estimated for each source category they are distributed geographically over the AQMA. The dispersion model uses a one-kilometer (1 Km) by one kilometer (1 Km) grid system to apportion emissions within the AQMA. Each grid is approximately 0.62 miles square. Each major industrial facility is assigned geographic coordinates using latitude and longitude information. Mobile source emissions are distributed to each grid based on road network and other information from the travel model. Area and Non-Road emissions are allocated to the grid system based on land use factors such as population, housing, and employment densities, as well as land use patterns (i.e. residential, commercial, and agriculturally zoned lands).

Figures 39 and 40 show an illustration of the spatial allocation of emissions for the 2015 maintenance analysis. The model uses these emission density maps together with meteorology to estimate ambient PM_{10} concentrations within the AQMA. The modeling analysis is discussed further in Section 4.14.5.0.

Figure 39: Medford-Ashland AQMA Boundary and Modeling Grid Domain

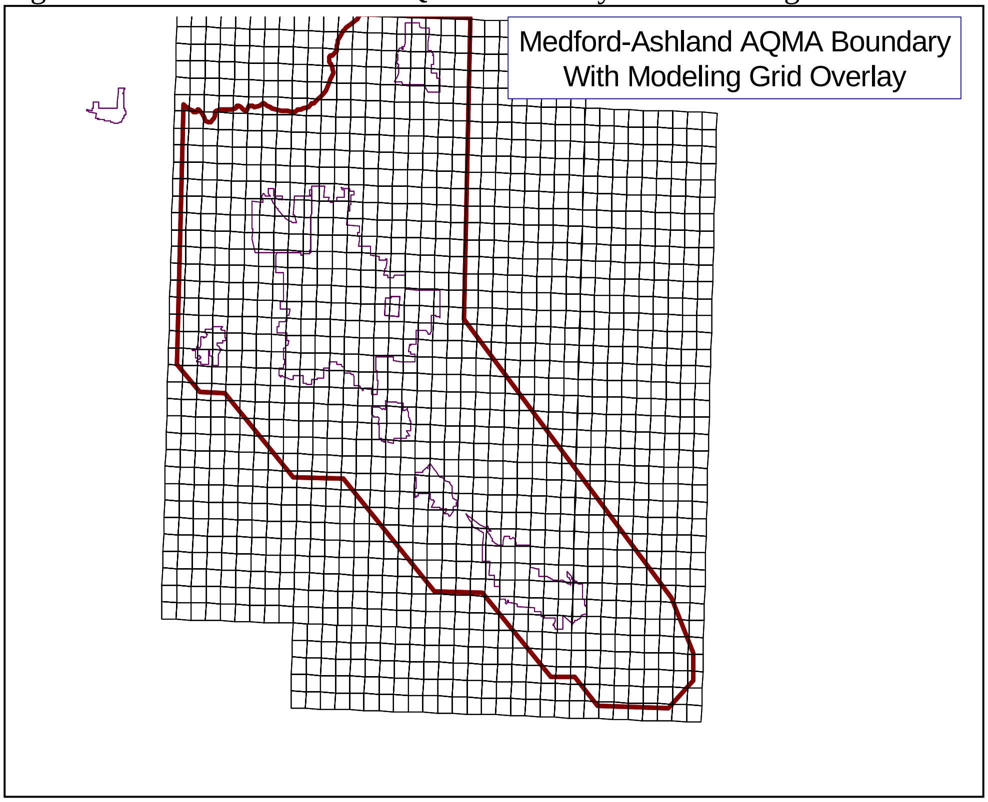
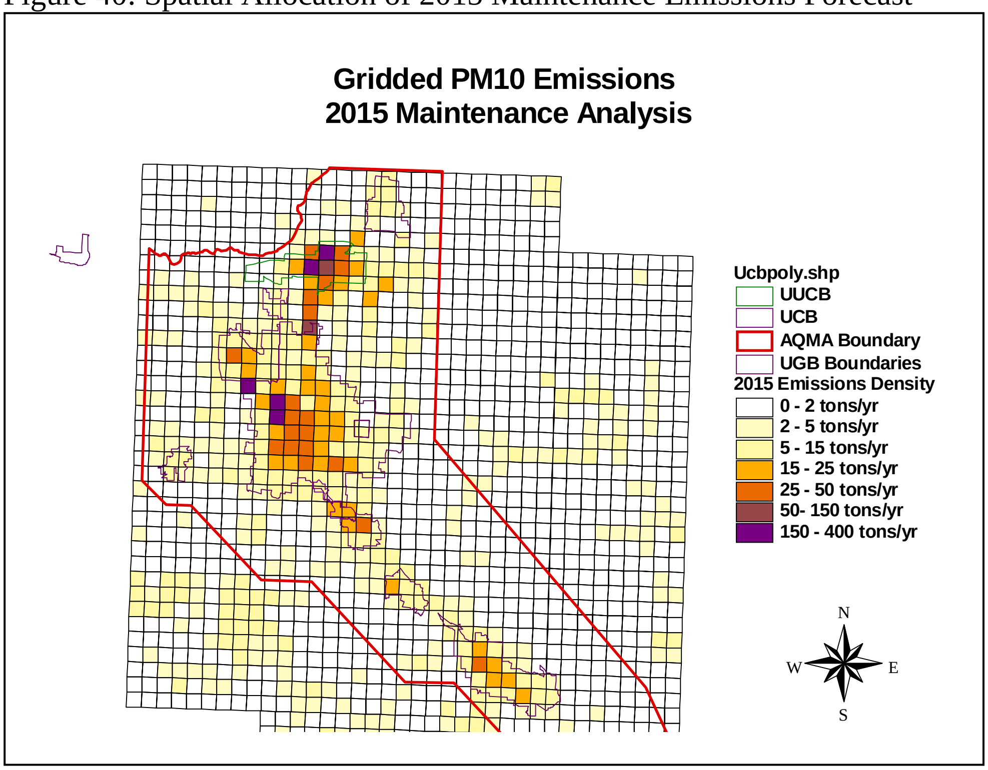
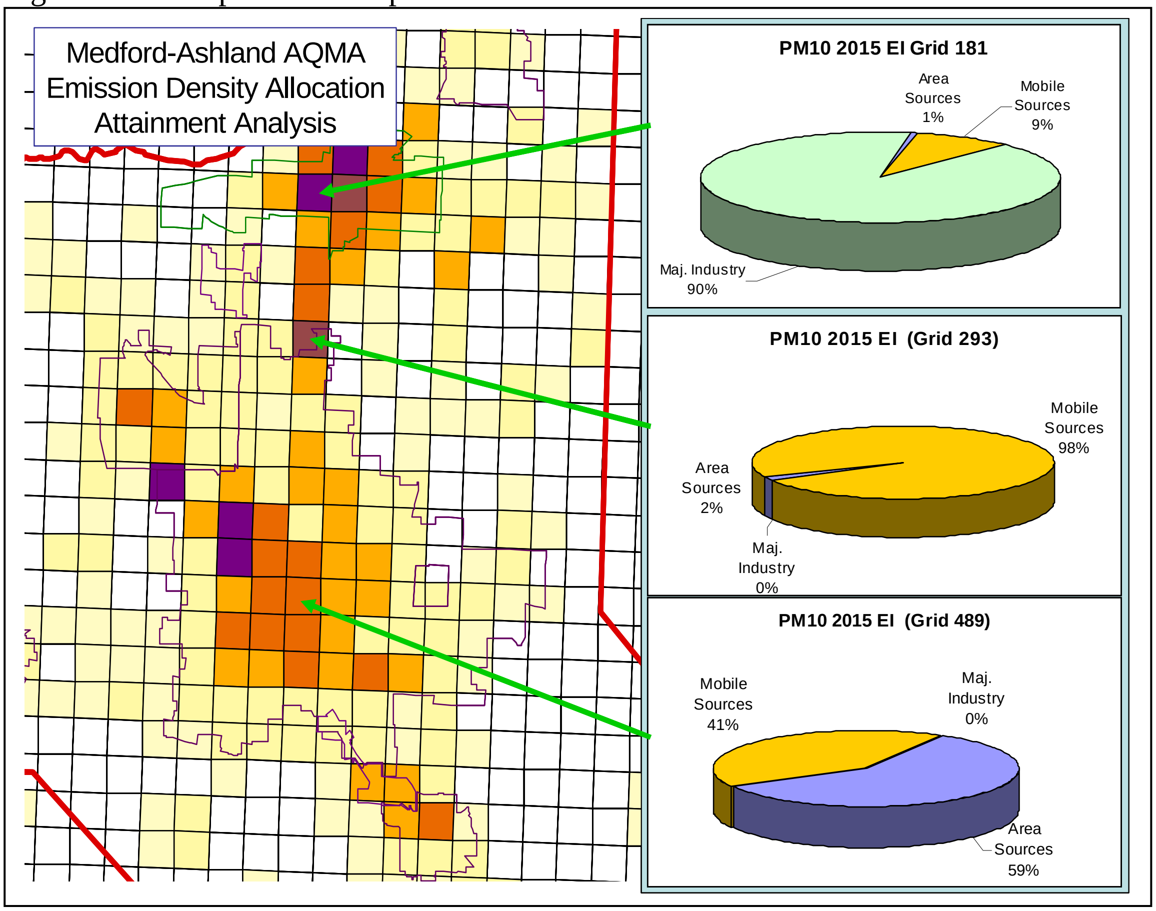


Figure 40: Spatial Allocation of 2015 Maintenance Emissions Forecast



The emission sources that most significantly contribute to ambient PM_{10} impacts can vary greatly depending upon location in the AQMA. Figure 41provides an example of three areas within the AQMA where different emission source categories play a key role in PM_{10} impacts.

Figure 41: Example of Area Specific Emissions Contributions



4.14.3.6: Source Category Emission Summaries

MAJOR INDUSTRY

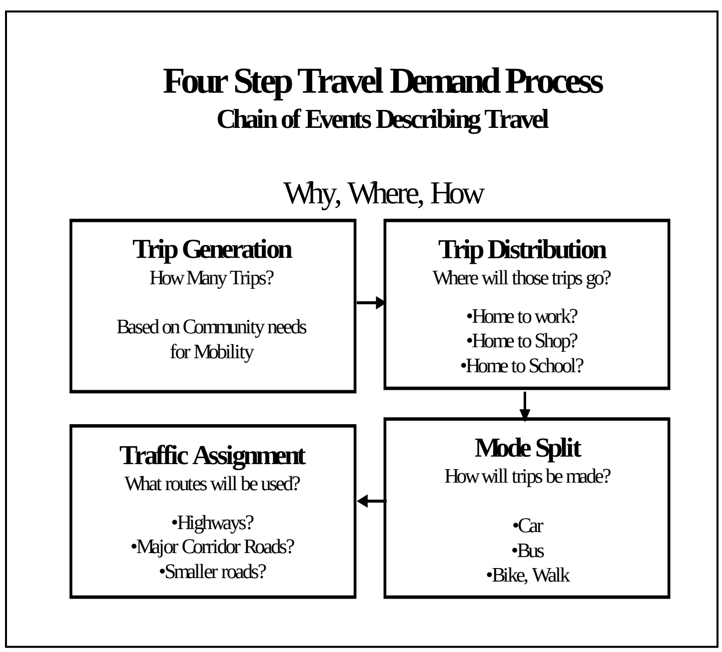
Within the Medford-Ashland AQMA, major point sources are defined as stationary industrial facilities emitting 5 tons per year or more of PM_{10}. Emission information is compiled from each facility's operating permit issued by the Department. Smaller sources that emit less than 5 tons per year of PM_{10} are assigned to the "area source" category.

Emissions for major point sources can be considered in one of three ways: (a) actual emissions; (b) permitted emissions that reflect current operating needs (otherwise known as the Plant Site Emission Limit or "PSEL"; or (c) their maximum allowable permitted level. Actual emission levels are typically much lower than permitted limits. A facility can however increase emissions to allowable levels without evaluating the impact of the increase on air quality. Therefore, EPA requires that PM_{10} attainment and maintenance plans evaluate major industrial sources at their maximum allowable emission levels. Emissions "growth" for the major point source category reflects these maximum allowable emission levels. A comparison of 1998 actual emissions and maximum allowable emissions levels for each facility was presented previously in Figure 26. Detailed emissions information for each facility can be found in the Emissions Inventory Document (Appendix A2).

MOBILE SOURCES (CARS & TRUCKS)

Emission estimates for mobile sources (motor vehicles) are based on vehicle miles traveled (VMT) occurring within the AQMA. VMT estimates for both the 1998 and 2015 road network were developed by the Rogue Valley Council of Governments and the Oregon Department of Transportation (ODOT) using the latest local travel demand model. The travel model analysis boundary covers the greater Medford area and several adjacent communities, but not the entire AQMA. RVCOG hopes to expand the travel modeling area in the near future. For AQMA areas outside the travel model boundary, ODOT used highway performance monitoring and other traffic records to estimate and project VMT. The average growth rate for motor vehicle travel in the AQMA is approximately 2.9% per year. Mobile emission estimates reflect both current and expected motor vehicle travel on each link of the AQMA road network. VMT is allocated to the air quality dispersion modeling grid in order to estimate location specific PM_{10} emissions and ambient impacts from motor vehicles.

Estimating emissions from cars and trucks requires information on local travel patterns and vehicle types comprising the local fleet, as well as the emissions characteristics of each vehicle type. There is limited detailed information available about the motor vehicle fleet in the Medford-Ashland area. The Department's mobile emission estimates have used as much local data as possible to describe the characteristics of the Medford-Ashland motor vehicle fleet, but it has also been necessary to rely on national averages for some information. The following section provides a brief summary of key factors used to estimate mobile emissions in the AQMA.

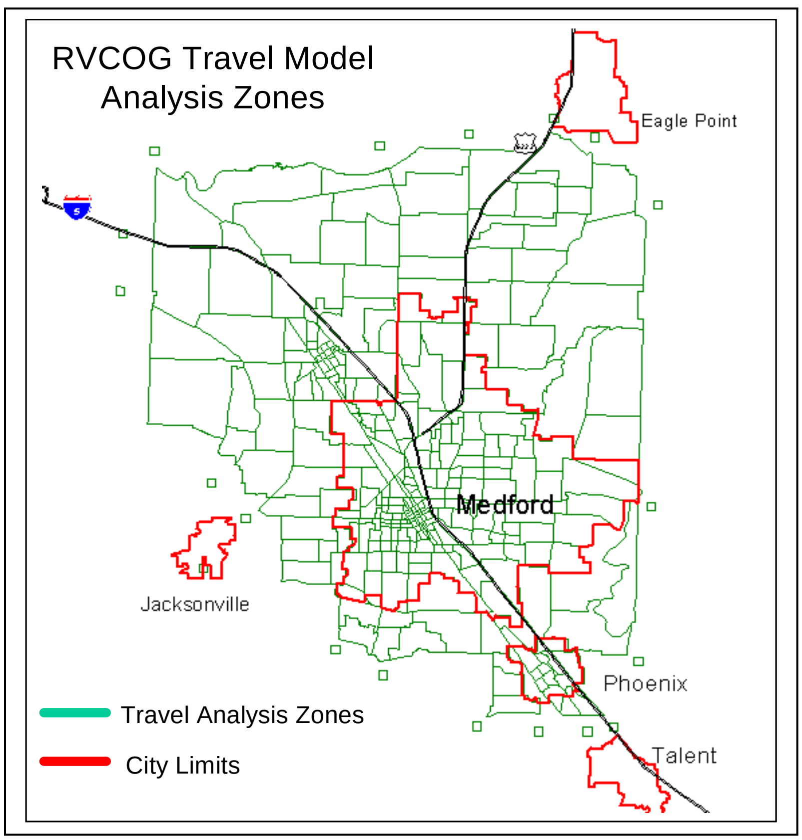


<u>Travel Modeling</u>

Traditional travel demand models consist of four main steps: *Trip Generation* (i.e. how many person trips and for what reason), *Trip Distribution* (i.e. where do the trips go), *Mode Choice* (i.e. car, bus, bike), and *Trip Assignment* (i.e. which roads are used). Trip and travel characteristics are developed from household survey and employment information such as income, household size, number of available vehicles, and availability of employment. This trip information is then used to model travel patterns in the community. Travel model results are compared to field measurements (vehicle ground counts) to evaluate whether the model is reasonably reproducing actual travel in the area. Once model performance has been validated, it is used to test future mobility needs reflecting population and employment growth as well as new road or other projects proposed in the Regional Transportation Plan. Ultimately, travel model data is used by DEQ to estimate current and future year motor vehicle emissions.

Travel Demand Model

The Oregon Department of Transportation (ODOT) and the Rogue Valley Council of Governments-RVCOG (the Metropolitan Planning Organization for the Rogue Valley) have developed an improved travel model for use in the greater Medford area. The model has been used to support the Rogue Valley Regional Transportation Plan (RTP). The travel model analysis area encompasses the greater Medford area and several adjacent communities including Central Point and White City. The RVCOG and ODOT have used local Highway Performance Monitoring System (HPMS) data, as well as other local information to estimate motor vehicle travel in the non-MPO area of the AQMA (i.e. areas outside the travel model analysis boundary).



Land use forecasts were prepared for the travel model based on current land use regulations and comprehensive plan updates. Travel forecasts are based on predicted population and employment growth and expected land use changes that influence mobility needs in Rogue Valley communities.

Population, housing and employment densities are allocated to individual transportation analysis zones (TAZs) established within the travel model. TAZ characteristics influence travel demand and motor vehicle use within the zones. DEQ uses this information to estimate mobile emissions. The same population, housing and employment densities are also used by DEQ to estimate and allocate emissions for the Area and Non-Road Mobile emission source categories.

No travel demand model, no matter how sophisticated, can reproduce motor vehicle travel at all locations and at all times with 100 percent accuracy. Typically, travel demand models will over predict travel in some areas while under predicting travel in others. Validation checks are made at each step in the process of model development. The validation of RVCOG's travel demand model has been reviewed by ODOT's Transportation Planning Analysis Unit (TPAU), the Federal Highway Administration (FHWA), and the Oregon Travel Model Steering Committee. Model performance for each roadway type is within acceptable limits.

Commercial Truck Travel

Currently, it is not possible to develop a specific travel model for local and interstate commercial truck travel in the AQMA. RVCOG and ODOT have made the best effort currently possible to describe commercial vehicle travel in the AQMA. By default, roads with high traffic volumes such as Interstate-5, or major and minor arterial roads will include a proportionally higher share of commercial travel than less traveled roads. The ability to model commercial travel should improve over time as ODOT and RVCOG develop future model upgrades.

Seasonal and Temporal VMT Adjustment

Several adjustments were made to model predicted VMT to estimate annual average and worst-case daily mobile emissions. Annual average emission estimates use VMT information that reflect average daily travel (ADT, Monday-Sunday). Worst-case daily emissions are based on adjusted VMT estimates that reflect somewhat higher traffic volumes during the work week (average weekday travel, Monday-Friday). Average Daily VMT to Weekday VMT adjustments were based on local traffic count information.

There are also seasonal differences in vehicle travel. VMT during peak summer travel months is typically higher than the yearly average, and winter travel is typically lower than average. The travel model produces VMT estimates as an average of yearly travel. This yearly average was used to estimate annual average mobile emissions. For worst-case winter day emission estimates, modeled VMT was adjusted to reflect a slightly lower amount of travel during the winter months (but increased to reflect average weekday commuter travel).

EPA Emission Factor Model

To estimate motor vehicle emissions, VMT data from the travel model must be combined with an estimate of emissions generated by a motor vehicle, typically pounds of emissions per mile driven (i.e. lbs PM_{10}/mile). The Department used EPA's particulate emission factor model (PART5) to develop the emission rates for the Medford-Ashland motor vehicle fleet. The PART5 model estimates both exhaust (tail pipe) and road dust PM_{10} emissions.

The AQMA Fleet

Both national default and locally derived data was used in the emission model to describe the characteristics of the AQMA vehicle fleet. Local data includes Department of Motor Vehicle (DMV) registrations for passenger and light duty diesel vehicles, which provides the age distribution of the AQMA passenger vehicle fleet (i.e. percent of fleet that are model years from 1 to 25+ years old). EPA's model also requires the average "mix" of vehicle miles traveled by vehicle type (i.e. how much VMT is attributable to passenger cars, heavy-duty trucks, buses, etc.). There is very little local data regarding the actual AQMA fleet "mix", or for other fleet characteristics such as local sales trends of diesel vehicles.

Traffic counts from permanent and temporary traffic recorders were evaluated to estimate the motor vehicle fleet mix in key areas of the AQMA. Traffic recorder data provides a "snap-shot" of motor vehicle travel at a specific location and time. Based on available traffic count data, custom fleet mixes were constructed for three key transportation areas in the AQMA. These include the core Medford area (which is also taken to generally represent travel in the rest of the AQMA); the White City area (including the Highway 62 corridor); and Interstate 5 (I-5). Traffic count data from 1994-2000 (all seasons) was evaluated and taken to generally represent the 1998 vehicle fleet.

Light and Heavy Duty Vehicles

Traffic data was used to evaluate the split between light-duty and heavy-duty vehicles. It is interesting to note that with the exception of Interstate-5, traffic count data shows that heavy-duty vehicles (mostly diesel trucks) represent a relatively low percentage of the total vehicle fleet. Traffic count data suggests that heavy-duty vehicles comprise just over 2% of the total vehicle fleet in the Core Medford area. In the White City Area (OR62 corridor), heavy-duty vehicles are estimated to comprise just over 4% of the total fleet. The fraction of heavy-duty vehicles on Interstate-5 is much higher, with heavy-duty vehicles making up just under 14% of total vehicles on the Interstate.

It should be noted that while heavy-duty trucks may represent a low *percentage* of the total fleet, the actual number of trucks is not necessarily low. For example, one traffic recorder close to the intersection of Highway 62 and Biddle Rd. (October 20-21, 27-28, 1997)[1] recorded a total of 522 heavy-duty trucks. However, during the same period, 17,331 light duty vehicles (mostly passenger cars) were recorded. The number of heavy-duty trucks is significant, but relative to the high number of light duty vehicles, heavy-duty vehicles represent a low percentage of the total fleet (~3% in this example). This supports the local perception that there are a significant number of heavy-duty trucks operating in the AQMA.

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1 24-hour volumes 6 a.m. to 6 a.m. documented over two separate days. 24-hour counts require several staffing shifts (standard ODOT practice).

There is no reliable data regarding future growth of local diesel vehicles in the AQMA. National default values in EPA's mobile model suggest that heavy-duty vehicles will comprise a greater percentage of the total fleet in the future. Based on EPA defaults, we have increased the fraction of heavy-duty diesel vehicles in the future at a rate of one percent per year. This increases the contribution from heavy-duty vehicles in 2015.

Table 5: Growth in Heavy-Duty Vehicle Fraction of the Fleet

Key Area	1998 Percent Heavy-Duty Vehicles	2015 Percent Heavy-Duty Vehicles
Core Medford/Rest of AQMA	2.2%	2.6%
White City Area	4.3%	5.4%
Interstate-5	13.6%	15.9%

Paved Road Dust

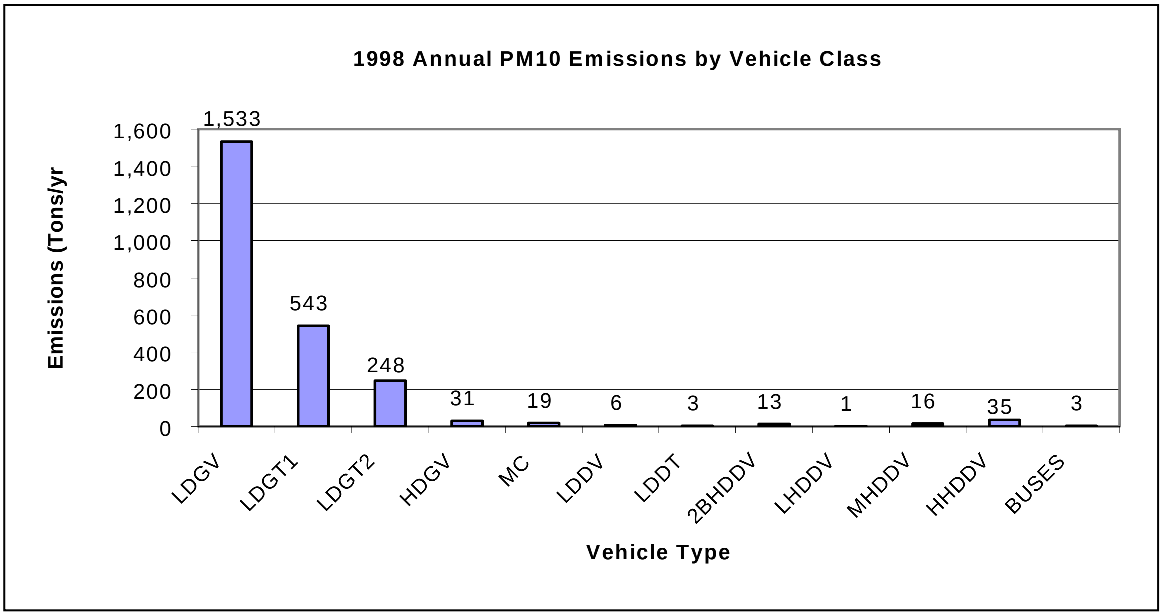
Mobile emissions include both exhaust emissions (tailpipe) and emissions from road dust generated by vehicle travel. Road dust emissions are influenced greatly by the amount of fine silt on the road surface. In May 1997, Midwest Research Institute was contracted to conduct a field study of silt loading on a representative sample of roadways in key areas of the AQMA. Paved road dust emission estimates are based on these local silt-loading factors. It was found that road silt values are generally higher in the White City area than in Medford. Silt loading is generally lower on roadways with high traffic volumes and/or high speeds (for example, Interstate-5 has the lowest silt loading). Using area specific silt loadings, custom paved road dust emission factors were developed for the Medford area (and the rest of the AQMA), the White City area, and I-5. Custom emission factors were also developed for roads with low and high average daily traffic volumes (ADT).

Table 6: Location Specific Road Silt Loadings

Area	Silt Loading (grams/meter^2)
White City	
High ADT Roads	1.4 g/m^2
Low ADT Roads	3.4 g/m^2
Avg. "G" Industrial Area	11.0 g/m^2
Medford/Rest of AQMA	
High ADT Roads	0.19 g/m^2
Low ADT Roads	0.54 g/m^2
Interstate-5	0.015 g/m^2

Using all the factors discussed above, emission estimates are derived for motor vehicle travel within the AQMA. Figure 42 shows an example of the mobile emissions distribution by vehicle type (tailpipe + road dust) in 1998. Additional information on the development of the mobile emissions inventory can be found in the Emissions Inventory Document (Appendix A2).

Figure 42: Distribution of Annual On-road Mobile PM_{10} Emissions by Vehicle Type, 1998



Vehicle Key		FHA Class	GVW (lbs)	Average
LDGV	Light Duty Gasoline Vehicle		<6,000	3,000
LDGT1	Light Duty Gasoline Truck-1	1	<6,000	3,500
LDGT2	Light Duty Gasoline Truck-2	2A	6,001-8,500	7,250
HDGV	Heavy Duty Gasoline Vehicle	2B-8B	> 8,500	8,500
MC	Motorcycle			500
LDDV	Light Duty Diesel Vehicle	1	<6,000	3,000
LDDT	Light Duty Diesel Truck	2A	6,001-8,500	3,500
2BHDDV	Class 2B Heavy duty diesel vehicle	2B	8,501-10,000	9,250
LHDDV	Light, Heavy duty diesel vehicle	3,4,5	10,001-19,500	14,750
MHDDV	Medium, Heavy duty diesel vehicle	6,7,8A	19,501-33,000	26,251
HHDDV	Heavy, Heavy duty diesel vehicle	8B	33,000+	33,000
BUSES	Buses: Estimates = to LHHDV		10,001-19,500	14,750

STATIONARY AREA SOURCES

Area sources include emissions from activities from residential, commercial, or light industrial activity, such commercial space heating, open burning, and woodstove use. The area source categories also includes stationary point sources emitting less than 5 tons per year for PM_{10}.

Area source emissions are developed using reports of commercial activity as well as population, housing and employment information. Emission factors were taken from various EPA reference documents as well as local studies conducted by DEQ or others. Emissions are assigned geographically to the modeling grid based on land use information, such as housing and employment densities. The emissions forecast for area sources relies on expected growth in population, employment, and other factors.

Wood burning is an important residential space-heating practice in Oregon, and a significant part of the Area Source category. Woodstove and fireplace emissions are significantly greater than other forms of space-heating, such as fuel oil and natural gas. Historically, residential wood burning has been a key contributor to wintertime exceedances of PM_{10} standards. While residential wood smoke has significantly declined over the years, woodstove and fireplace use can still contribute to elevated PM_{10} levels in the winter.

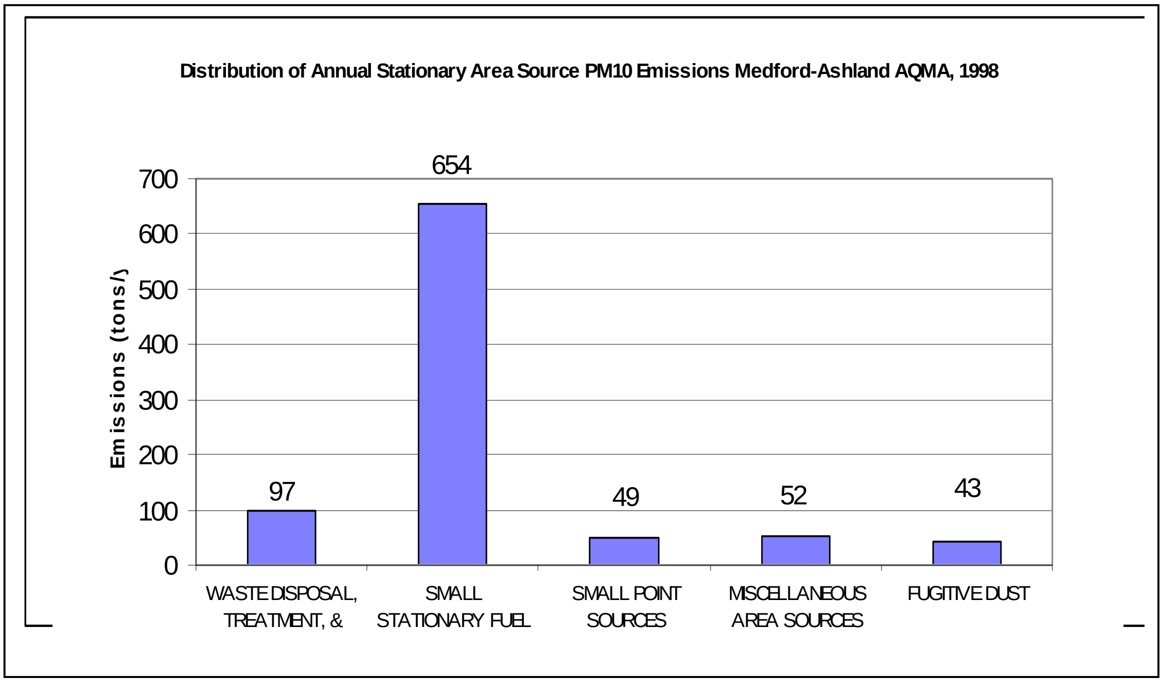
Residential Woodburning: AQMA homes were surveyed just after the 1996/97 woodheating season to develop a residential wood heating profile for the Medford-Ashland area, and to develop trends information for the growth and decline of various woodheating devices. The survey suggests a significant decrease in woodstove use in the AQMA over the past ten years (from an average 60% of AQMA homes burning wood in 1985-86 to an AQMA average of approximately 30% wood burning homes in 1996). Wood use profiles were developed for different areas in the AQMA (the City of Medford for example) using home survey responses by zip code. The survey gathered information on woodheating device type (older noncertified stove, certified catalytic, certified non-catalytic, pellet stove, etc.), as well as important fuel consumption information.

Survey information shows that over time there has been a significant decrease in noncertified woodstoves in favor of certified stoves, pelletstoves and natural gas heating appliances. Heating device trends were evaluated separately for different stove technologies. Woodheating emission trends were estimated from the net affect of growth in cleaner, “certified” woodstoves and a decline in older noncertified stoves. Woodheating trends were estimated separately for older housing stock and new construction. Heating device trends in older homes reflect the ongoing changeover of older stoves to newer woodheating technology or the replacement of wood heat with non-wood alternatives. Survey data suggests a very low rate of woodheating in new construction. Increasing trends in woodheating were estimated using a linear growth approach. Decreasing trends were conservatively estimated using a compound rate of decrease so that the removal of noncertified woodstoves from the AQMA would not be overstated.

Residential space heating emissions were allocated to the modeling grid using household density information provided by RVCOG. As part of the modeling analysis, woodheating emissions were varied by daily temperature and home heat demand. More information on estimating emissions from residential wood combustion can be found in the Emissions Inventory Document (Appendix A2)

Emission estimates (1998) for the major classifications within the Area Source Category are illustrated below in Figure 43.

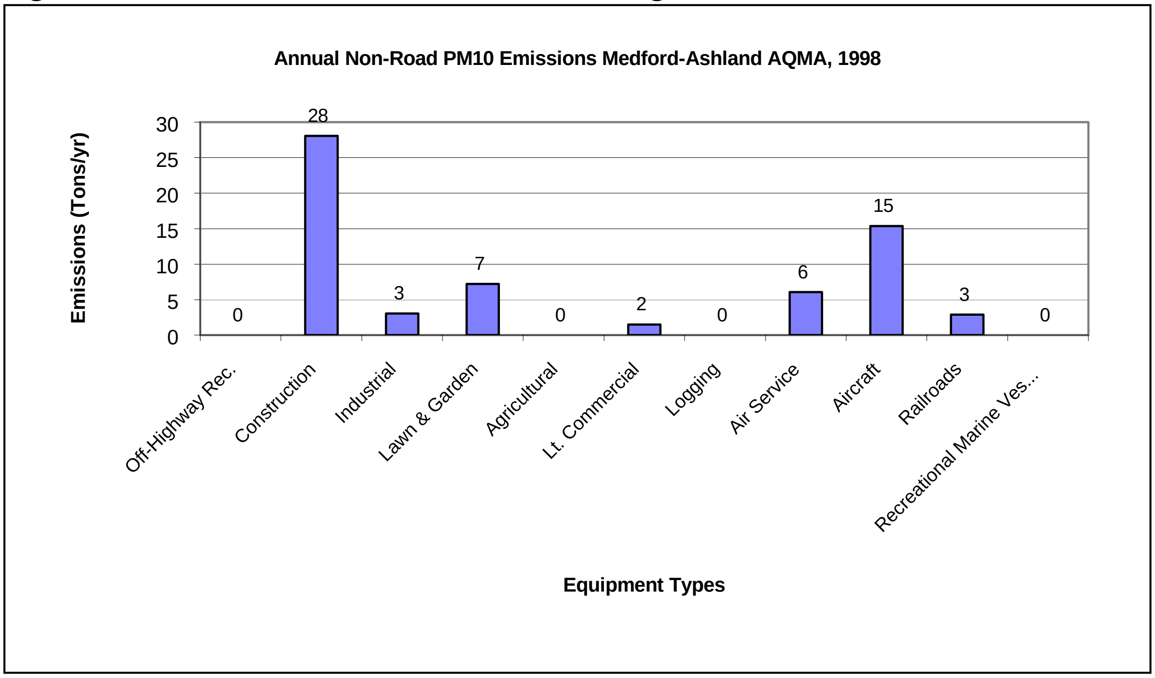
Figure 43: Distribution of Area Sources



NON-ROAD MOBILE SOURCES

The Non-Road Mobile emission source category includes sources such as gasoline and diesel-powered construction vehicles and equipment, aircraft, and railroads. The category is divided into nine sub-categories including: (1) Lawn and Garden Equipment, (2) Airport Services, (3) Recreational Equipment, (4) Light Commercial Equipment, (5) Industrial Equipment, (6) Construction Equipment, (7) Farm Equipment, (8) Agricultural Equipment, and (9) Logging Equipment. Vehicle categories are grouped into three equipment types: two-cycle gasoline engines, four-cycle gasoline engines, and diesel engines. Figure 44 shows emission estimates for the Non-Road category for 1998. More information about Non-Road Mobile emissions can be found in the Emission Inventory Document (Appendix A2).

Figure 44: Distribution of Non-Road Sources Categories



4.14.4.0: Transportation Conformity

Transportation conformity is the regulatory program that links transportation and air quality planning processes together so that emissions from motor vehicles (both now and in the future) do not jeopardize air quality standards. The transportation conformity program will continue to apply to the Medford-Ashland AQMA after it is redesignated to attainment and becomes a state PM_{10} maintenance area. Under conformity, emissions resulting from a transportation plan[2] can not exceed the allowable emissions level established for transportation in the air quality plan. The conformity rules also assure that transportation related air quality strategies are funded and implemented during the transportation planning process.

When an attainment and maintenance plan is developed for an area, conformity rules require that a "budget" be established for motor vehicle emissions. Emissions from future transportation plans, programs, and projects must stay within the allowed budget. A transportation emissions budget is established as part of a technical analysis demonstrating attainment and maintenance with air quality standards. In other words, a budget for motor vehicle emissions growth can not be established without also considering emissions growth from all other sources, and a demonstration that total future emissions growth will not lead to a violation of standards.

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[2] Transportation plans describe current and future mobility needs for a community and include projects and programs to meet those needs. Mobile source emissions are directly related to the amount of motor vehicle travel that will result from the road network and programs described in the transportation plan.

Failure to show conformity can seriously delay or jeopardize funding for important transportation projects. The emissions budget established through this PM_{10} attainment and maintenance plan will govern the conformity analysis of each update to the Rogue Valley Regional Transportation Plan for the next eight to ten years.

Until a budget is formally established, conformity determinations must rely on a comparison of the build (or action) scenario in the regional transportation plan to the no-build scenario. The "build" scenario reflects the anticipated future roadway network and project list for which funding has been secured. The "no-build" scenario reflects emissions from the current road network. In order to demonstrate conformity the build scenario must result in fewer emissions than the no-build scenario. The PM_{10} emissions budget for the AQMA will be formally established and take affect when EPA makes an initial finding that the plan submittal is adequate, and publishes that determination in the federal register. All conformity determinations thereafter must meet the emissions budget test. EPA's adequacy determination of the motor vehicle emissions budget would typically occur separately from plan approval.

Establishing the Budget

The transportation emissions budget typically reflects the motor vehicle emissions forecast used in the air quality plan. Since the emissions forecast is derived from estimates of future travel needs, the budget should be adequate to accommodate future conformity determinations. However, unanticipated growth or other factors may increase future mobility needs (and motor vehicle emissions) above levels anticipated in the air quality plan. This could result in a failure to show conformity (i.e. conformity lapse).

In addition to planning for unforeseen emission increases, there is a specific problem know as "planning cycle mismatch" that must be addressed to avoid conformity difficulties in the near future. The timing cycles for updating transportation plans (every 3-5 years) and air quality plans (every 8-10 years) are not in sync. Transportation plans are continually extending their forecasting horizon beyond the last year (and emission budget) established in the air quality plan. Planning cycle mismatch is a common conformity problem nationally.

EPA approval of the PM_{10} attainment and maintenance plan will trigger a conformity analysis for the Rogue Valley Regional Transportation Plan (RTP). The Rogue Valley Council of Governments (RVCOG) has recently updated the RTP, projecting regional mobility needs out to the year 2023. The PM_{10} plan establishes the last year of the emissions budget in 2015. To show conformity, emissions from the 2023 travel network (new RTP horizon year), as well as subsequent horizon year updates, will have to meet the 2015 budget.

There is an additional issue to consider. RVCOG will soon be expanding their metropolitan planning organization (MPO) boundary, adding several new AQMA communities to the local transportation planning area. The area covered by RVCOG's travel demand model will also be expanded to the new MPO areas. This means that future VMT and mobile emissions estimates for those areas currently outside the MPO boundary could be somewhat different than the estimates currently used in the PM_{10} maintenance plan. This creates uncertainty about the sufficiency the emissions budget for future conformity determinations.

At the request of RVCOG, an emissions buffer of approximately 1,700 lbs/day (~300 tons/year equivalent) has been added to the mobile source emissions budget to help offset the planning cycle mismatch between the 2015 and 2023 planning horizon years, and the uncertainty of adding new areas (Ashland, Jacksonville, Eagle Point) to the travel demand modeling area. Mobile emissions with the additional safety buffer were used in the maintenance modeling analysis. The analysis shows that the conformity buffer can easily be accommodated without jeopardizing compliance with PM_{10} standards.

The emissions inventory includes emission estimates for both annual and daily motor vehicle emissions. The Department estimates that annual emissions are the more constraining (more protective of air quality), and has established the 2015 motor vehicle emissions budget in terms of annual average emissions (tons/year). The Department expects VMT growth to be generally linier from 1998 to 2015 and has therefore not established interim year budgets between 1998 and 2015. Table 7 shows the PM_{10} emission budget established for the AQMA.

Table 7: Motor Vehicle Emissions Budget (PM_{10}) Through 2015

Annual PM_{10} (tons/year)

Year	2015
Motor Vehicle Emissions Budget*	3,754*

* Includes 307 tpy safety buffer

Emission factors, road dust silt loadings, and other relevant information for estimating mobile PM_{10} emissions can be found in the Emission Inventory Document (Appendix A2). Table 8 below lists the emission factors (combined road dust and exhaust) used for the 1998 and 2015 mobile emission estimates.

Table 8: Motor Vehicle Emission Factors (1998 and 2015)

Emission Factor Application	1998 Emission Factors	2015 Emission Factors
Interstate -5	0.29 grams/mile	0.33 grams/mile
Medford Area High ADT Roads	0.83 grams/mile	0.87 grams/mile
Medford Area Low ADT Roads	1.65 grams/mile	1.72 grams/mile
White City High ADT Roads	3.43 grams/mile	3.70 grams/mile
White City Low ADT Roads	6.25 grams/mile	6.74 grams/mile
White City Industrial Roads	13.41 grams/mile	14.46 grams/mile
Unpaved Roads	1.15 lbs/mile	1.15 lbs/mile

Table 9 shows the estimated annual VMT equivalent to the emissions budget.

Table 9: Estimated Annual Motor Vehicle Travel in 2015 (Miles/Year)

Year	2015
Annual Motor Vehicle Miles Traveled	1,599,355,788†

† Includes additional VMT to account for 1,799 lbs/day safety buffer.

Transportation Control Measures (TCM's)

PM_{10} emission reduction strategies for the AQMA include the street cleaning programs for the City of Medford, White City, and the connecting transportation corridor (Highway 62). Jackson County recently used funding from the Congestion Mitigation & Air Quality (CMAQ) program to purchase a high efficiency street cleaner for use in the Medford-White City area. This street cleaning program is considered by the Department to be a Transportation Control Measure (TCM) for reducing particulate pollution. At a minimum, the cleaning program must continue to use a high efficiency, vacuum street sweeper(s) (or equivalent), provide geographic coverage that includes the cities of Medford, White City, and significant intervening travel corridors, and provide cleaning frequency no less than twice per month.

EPA criteria for Motor Vehicle Emission Budget Adequacy

The motor vehicle emissions budget contained in this plan satisfies EPA adequacy criteria established under 40 CFR 93.118(e)(4). Specifically:

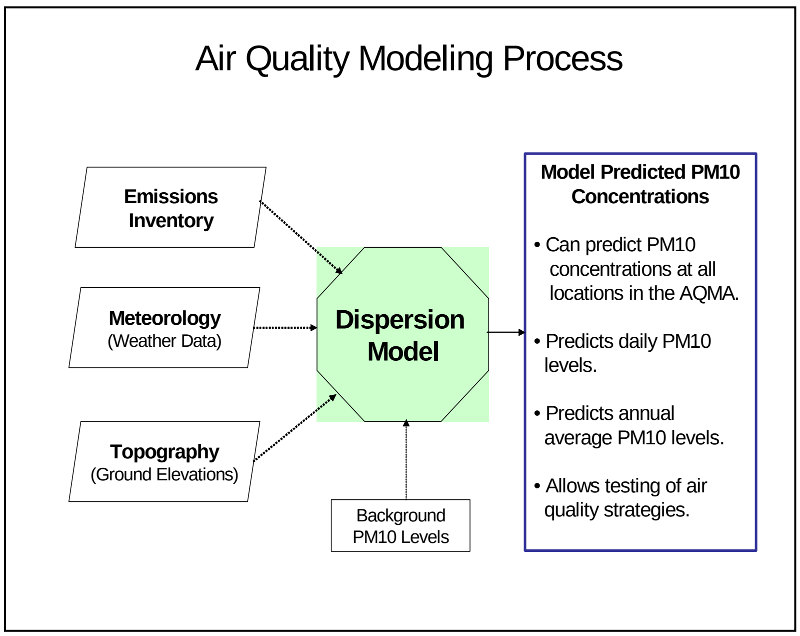
EPA Criteria	**Response**
40 CFR 93.118 (e)(4)(i)	The plan will be submitted to EPA by DEQ Director Stephanie Hallock as the Governor's designee. Public hearings were held on December 16, 2003 and January 21, 2004.
40 CFR 93.118(e)(4)(ii)	The Medford-Ashland Air Quality Advisory Committee, which included representation from local, state, and federal transportation officials, advised the Department on transportation issues in the plan including the motor vehicle emissions budget. The draft PM_{10} plan was reviewed by the Federal Highways Administration and Environmental Protection Agency. Both FHWA and EPA provided comments, which have been responded to by the Department.
40 CFR 93.118(e)(4)(iii)	The motor vehicle emissions budget is summarized in the maintenance plan document and plan appendix.
40 CFR 93.118(e)(4)(iv)	The motor vehicle emissions budget was included in the emission estimates used to demonstrate continued compliance with standards.
40 CFR 93.118(e)(4)(v)	The emissions budget is directly related to the emissions inventory and reflects strategies relied on in the plan.
40 CFR 93.118(e)(4)(vi)	The initial 1991 PM_{10} attainment plan for the AQMA was not formally approved by EPA. This 2004 PM_{10} attainment and maintenance plan establishes the first formal PM_{10} emissions budget for the AQMA.

AIR QUALITY DISPERSION MODELING

4.14.5.0: Background

A *dispersion model* is a computer simulation that uses mathematical equations to predict air pollution concentrations based on *weather, topography, and emissions data*. In 2000, the Department and Medford-Ashland Advisory Committee agreed that new dispersion modeling technology would be developed for use in the PM_{10} attainment and maintenance plan. The Department evaluated several of the latest air dispersion models, looking for a modeling system that would: 1) better represent air movement within the Rogue Valley and reflect the effect of air stagnation conditions on particulate concentrations; and 2) better mimic the dispersion and deposition of road dust.

The Department selected the CalPuff dispersion model as the best tool for predicting PM_{10} concentrations in the AQMA. The modeling system also includes the CalMet wind field model to provide meteorological information for the modeling analysis. The adjacent Figure illustrates the three main information sources used by the model to estimate PM_{10} concentrations: 1) emissions information (gridded EI for area, mobile, non-road, and major industry), 2) weather data (wind speed, temperature inversion characteristics), and topographic information (land elevations and local terrain).



Model Receptor Network

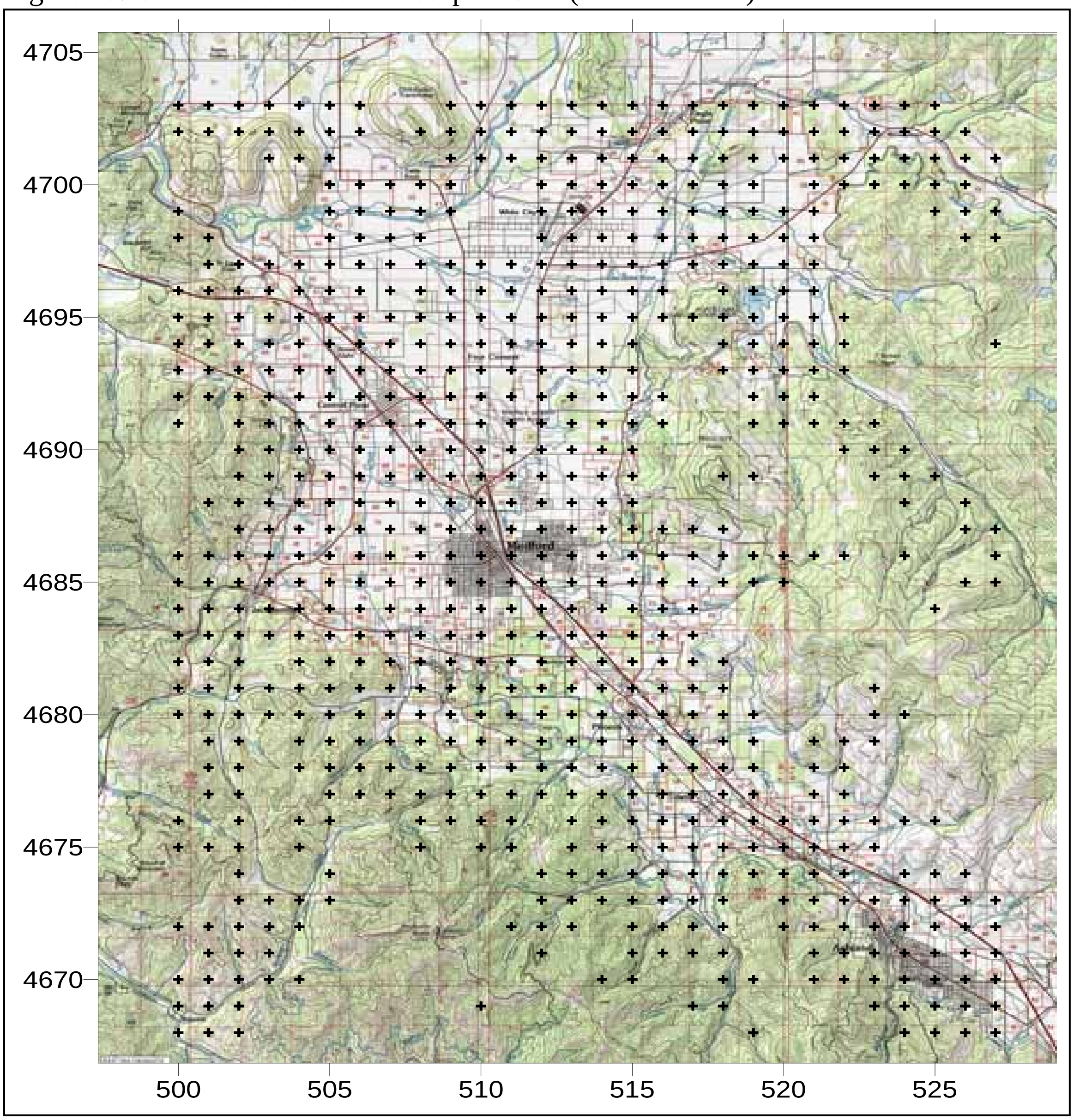
The CalPuff model can estimate ambient PM_{10} concentrations at any location in the AQMA. The modeling analysis begins by establishing a network of points throughout the AQMA (called receptors). The model then uses emissions and weather information to estimate ambient PM_{10} concentrations at each receptor location. Model receptors are typically placed near ground level to reflect the public's exposure to ambient PM_{10} concentrations.

The general modeling receptor network for the AQMA includes over 700 receptor locations, spaced 1-kilometer (0.62 miles) apart. It also includes a more closely spaced network of over 500 additional receptors in key areas of concern (Medford and White City). This higher resolution analysis is required under EPA modeling guidelines. The entire modeling receptor network estimates PM_{10} concentrations at over 1,200 locations throughout the AQMA.

Figures 45 and 46 show the receptor network used in the modeling analysis. Both the meteorological and dispersion modeling domains[1] are larger than the AQMA to account for the movement of air pollution in and out of the Valley. The meteorological domain covers an area of 100 x 110 km at a 1-km x 1-km mesh size. The meteorological domain extends from just west of Grants Pass to approximately 12 km east of Mt. McLoughlin, and from Crater Lake to about 10 kilometers into California.

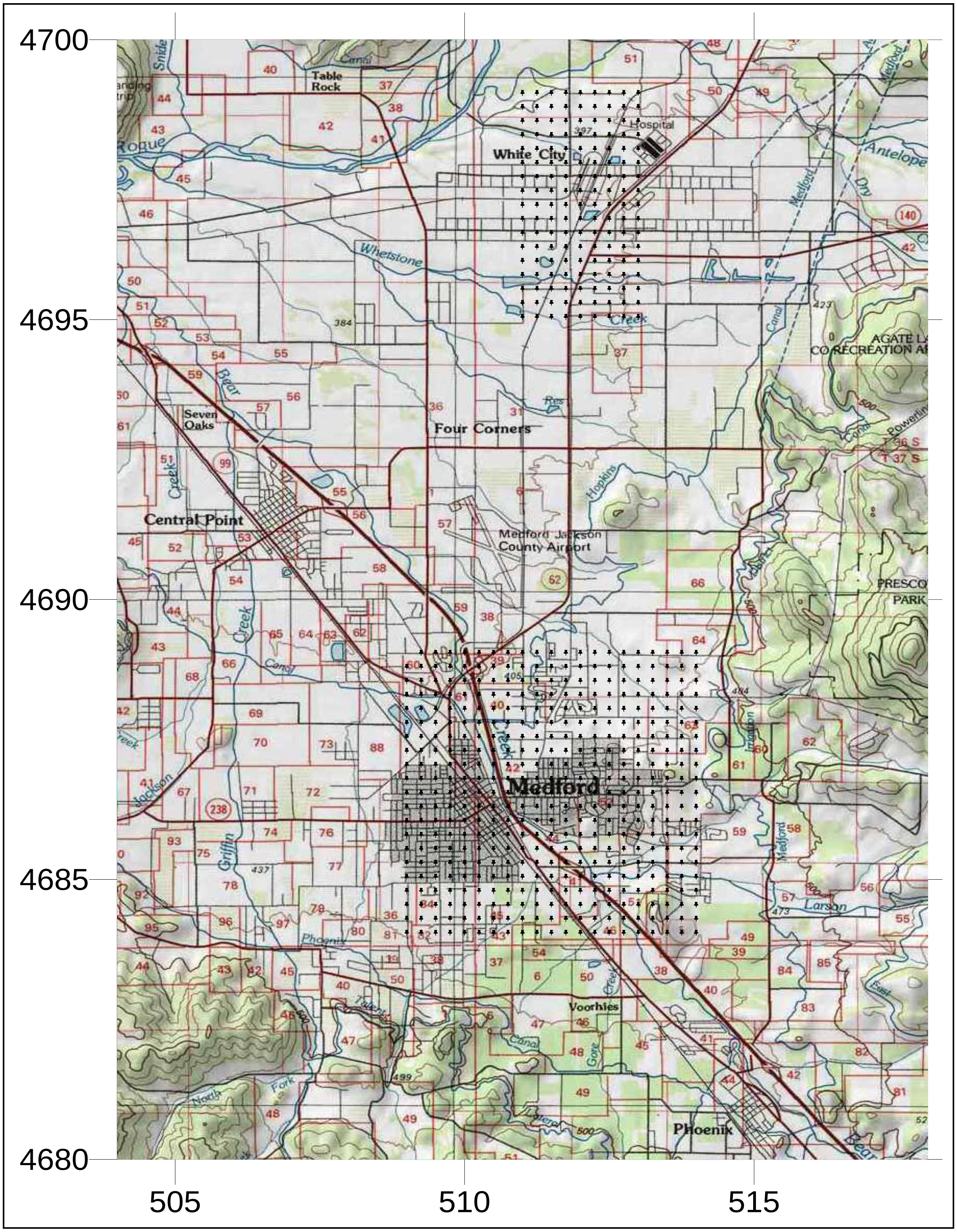
The model accounts for air movement vertically as well as horizontally. There are nine vertical levels used in the model to simulate three-dimensional air movement in the AQMA.

Figure 45: General-Scale Model Receptor Grid (1-Km x 1-Km)



[1] The model "domain" is the geographic area covered by the modeling analysis.

Figure 46: Refined Scale Model Receptor Grid (spaced every 250 meters)



4.14.5.1: Model Performance Testing

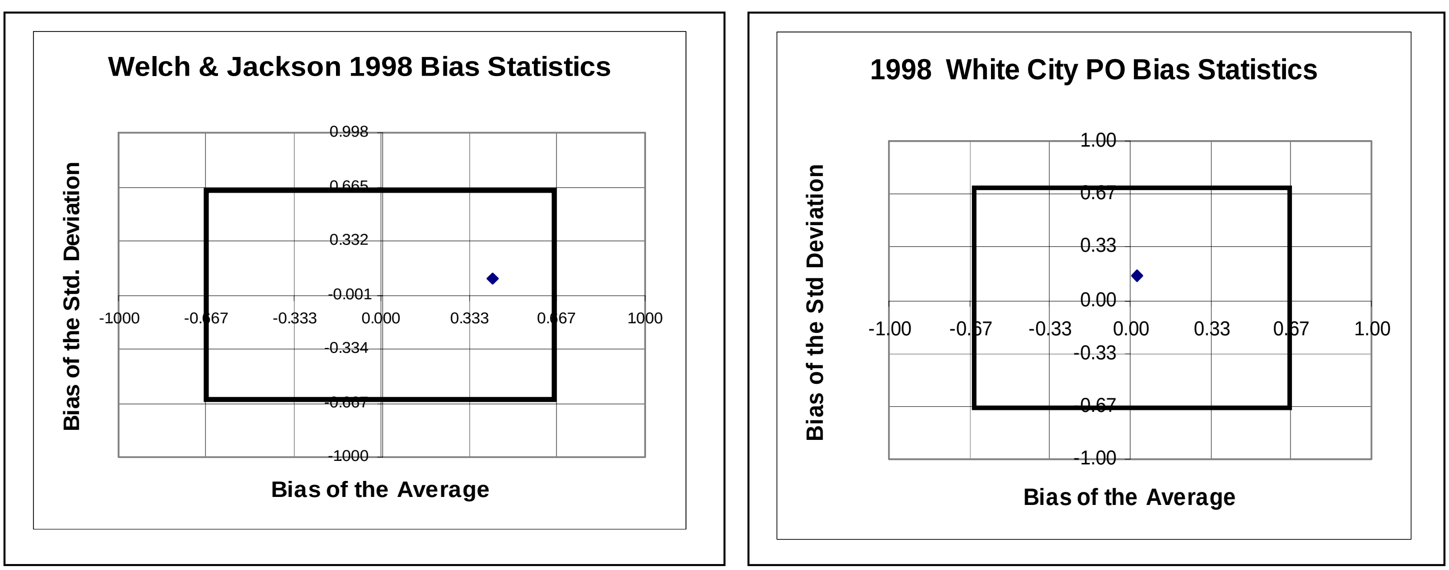
Model performance testing involves comparing model predicted PM_{10} concentrations to actual measured PM_{10} values, to see how well the model can reproduce measured PM_{10}. The emissions inventory for 1998 (actual emission levels) and measured 1998 meteorology was used in the model to predict ambient PM_{10} concentrations that would occur at the Welch & Jackson and White City PM_{10} monitoring locations. Model predicted values were compared to actual measured PM_{10} levels at the Welch & Jackson and White City monitoring sites. A total of 181 daily PM_{10} measurements were available at each of the monitoring locations during 1998. This includes every-day sampling during the periods of January 1, 1998 - March 31, 1998 and November 15, 1998 - December 31, 1998. This is a far more complete data set than was available for previous model evaluation studies for the AQMA.

No model functions with 100% accuracy, however the performance of the CalPuff modeling system is well within EPA acceptability specifications. Figure 47 shows a statistical evaluation of the model's performance. The highlighted "target box" represents the statistical bounds of acceptable model performance. The closer the performance measures are to the center of the target (bias 0,0) the better the model performance. Figure 47 shows that the Calpuff predictions are well within EPA's criteria for acceptable performance at both monitoring locations. These statistics are based on the highest 25 predicted and highest 25 measured 24-hour PM_{10} concentrations.

Figure 47: Model Performance Statistics

(a) Welch & Jackson

(b) White City



After reviewing the results of the model performance analysis, the Advisory Committee approved the use of the CalPuff modeling system as the tool for developing the Medford-Ashland PM_{10} attainment and maintenance plan.

4.14.5.2: Worst-Case Meteorology in the AQMA

One important aspect of the attainment and maintenance analysis is to evaluate the PM_{10} impacts that could occur under the air stagnation conditions that routinely occur in the Rogue Valley. Previous modeling efforts in the early 1990's used meteorology from December 1985 to estimate worst-case PM_{10} concentrations. At that time, December 1985 meteorology reflected the best data record available of surface wind measurements for a prolonged and severe air stagnation event. The data record was however, very limited.

In 2001, the Department evaluated more recent meteorology, and selected calendar year 1998, and the winters of 1999 and 2000 to use in the attainment and maintenance analysis. The newer meteorology included several prolonged air stagnation periods. The newer meteorology has other benefits as well:

- The meteorological data record is much more complete for the 1998-2000 period that it is for December 1985.

- Meteorology from 1998-2000 can be used in conjunction with more current background PM_{10} data from the Dodge Rd. site, and reflects more contemporary regional PM_{10} influences on the AQMA. The Dodge Rd. PM_{10} data record is much more complete for the 1998-2000 period than it is for December 1985.

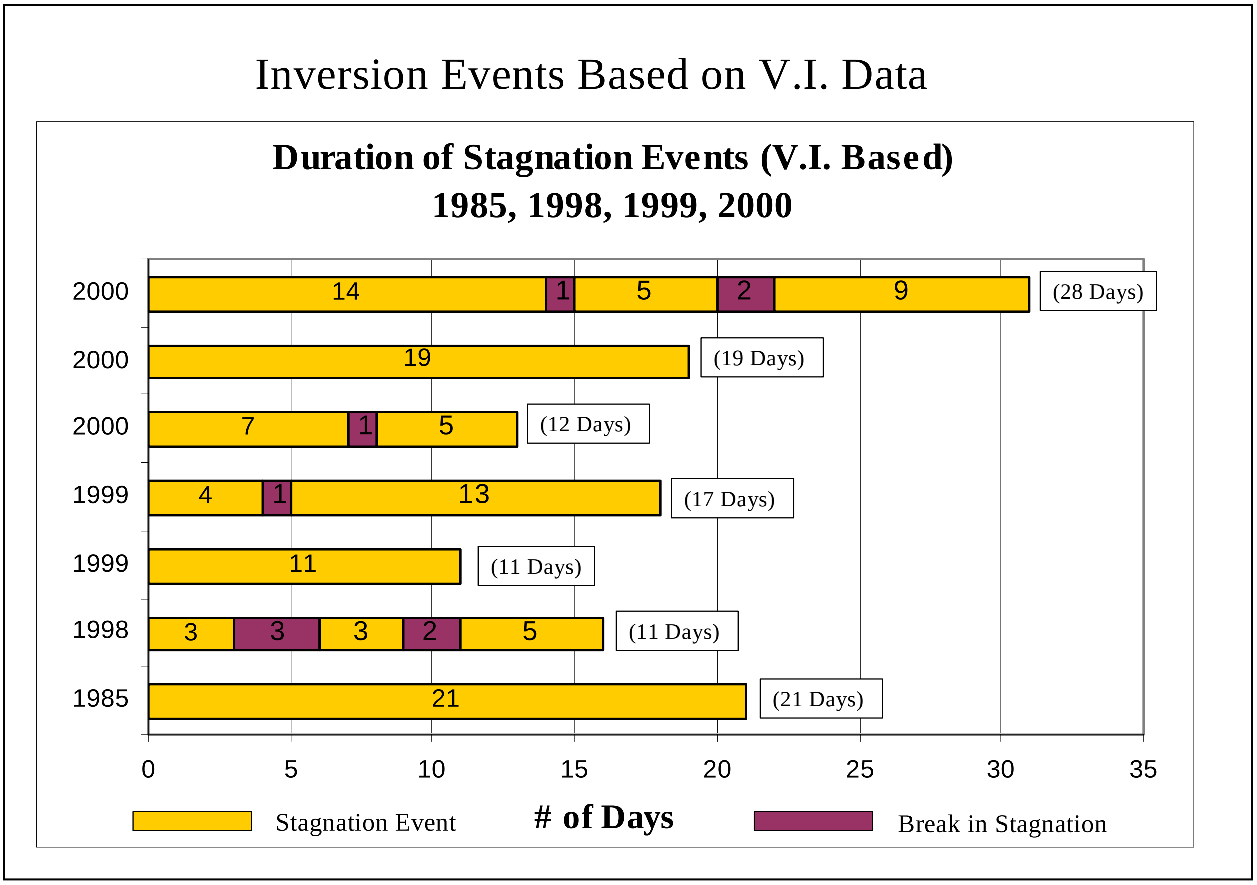
- Worst-case stagnation meteorology from 1998, 1999, and 2000 reflects a consecutive three-year period, and allows a better comparison with the daily PM_{10} standard than does the December 1985 period.

- The severity of the 1985 and (1998-2000) stagnation events are comparable.

There are several ways to compare the stagnation potential for the 1985 and (1998-2000) periods, including wind speeds, thermal inversion characteristics, duration of consecutive stagnation events, and precipitation (pollution washout effects). The Department compared all these parameters and found that while not identical, the stagnation intensity for the 1985 and (1998-2000) periods were comparable.

Figure 48. shows the duration of stagnation events for the time periods evaluated, using Ventilation Index as a basis for comparison. The Ventilation Index combines wind speed and inversion strength data. The lower the index, the more severe the stagnation event. Ventilation Index values below 200 reflect an air stagnation event.

Figure 48: Stagnation Events 1985, 1998, 1999, 2000

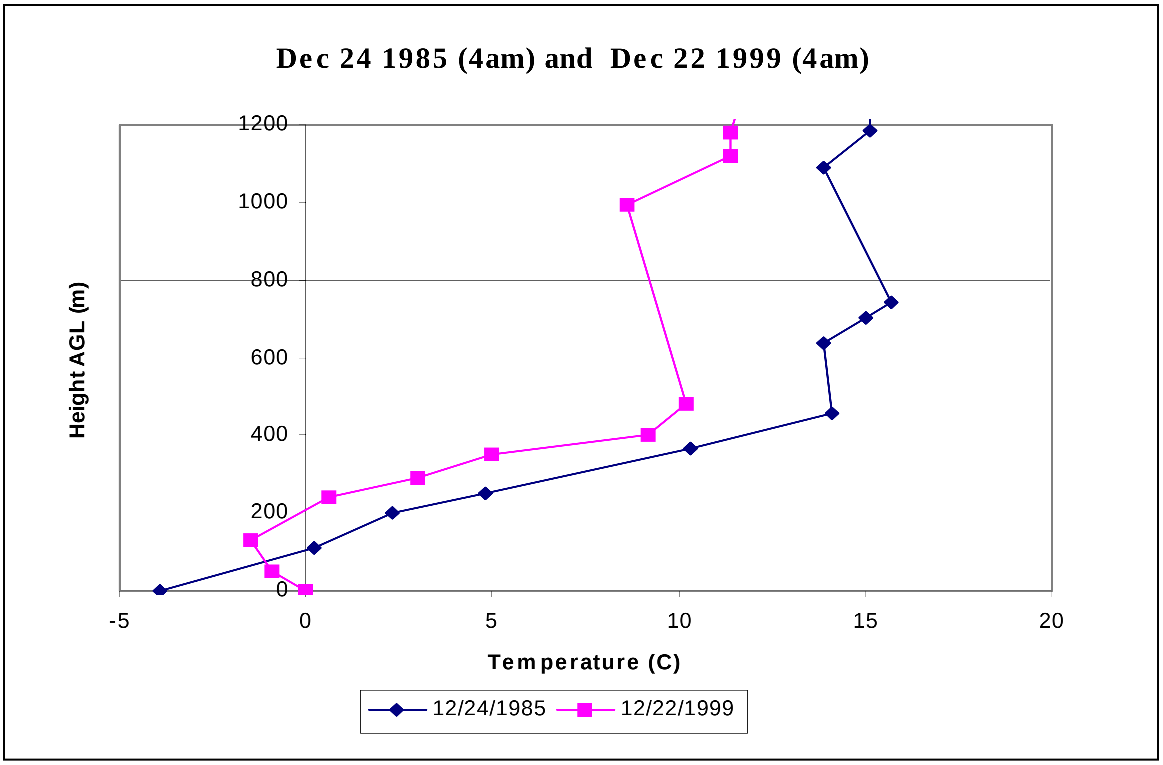


The frequency and duration of stagnation events in 1998-2000 are similar in many respects to those of 1985, and provide the potential for high PM_{10} concentrations to occur as air pollution levels build-up over several days. Often, PM_{10} concentrations will reach near peak levels within the first 3-4 days of a prolonged stagnation event.

Temperature inversions are also important considerations in air pollution build-up. In a normal atmosphere, temperatures should decrease with height above the ground. However, when there is an inversion, temperatures will increase rather than decrease with height. This reversal of the normal temperature profile restricts the upward movement of air, decreases ventilation, and can trap air pollution near the ground.

Figure 49 presents an example where two inversion events from 1985 and 2000 are compared. The temperature soundings show the change in air temperature as elevation above the ground increases. An inversion occurs when temperatures increase with height. While these inversion events are not identical, they both have comparable intensities and potential for the build-up of air pollution. The Department evaluated many such events in considering the use of 1998-2000 meteorology.

Figure 49: Temperature Inversion Profile Comparison.



After careful review, the Department concluded that more contemporary meteorology (1998-2000) offered comparable stagnation conditions to those of 1985, and would therefore provide an adequate worst-case test for the attainment and maintenance analysis. More recent meteorology would also reflect a more complete data record of weather information, and allow the use of up-to-date background data from the Dodge Road PM_{10} monitoring site. In 2001, the Air Quality Committee approved the use of 1998-2000 meteorology in the PM_{10} attainment and maintenance analysis.

AIR QUALITY MODELING ANALYAIS
ATTAINMENT AND MAINTENANCNE DEMONSTRATION

4.14.6.0: Background

The Department's dispersion modeling analysis evaluated PM_{10} concentrations throughout the Medford-Ashland AQMA, both for the 1998 attainment analysis year and the maintenance forecast year of 2015. The analysis must evaluate compliance for both the daily (24-hr average) PM_{10} standard of 150 *micrograms PM_{10} per cubic meter* (ug/m^3), and the annual average PM_{10} standard of 50 ug/m^3. The analysis must show compliance with both standards at all locations throughout the AQMA. The modeling analysis evaluates two scenarios:

<u>Attainment Analysis ("Current" Worst-Case Potential)</u>: The Attainment Analysis must evaluate the current potential for PM_{10} impacts under "worst-case" conditions. The Attainment Analysis uses the 1998 emissions inventory, which is our most accurate for the AQMA. Modeled emissions include legally allowable emissions from major industry (not actual emissions in 1998), and 1998, 1999, 2000 local meteorology (including stagnation events). This worst-case planning approach is an EPA requirement.

<u>Maintenance Analysis (Future Worst-Case Potential):</u> The Maintenance Analysis is based on our emissions forecast to the year 2015. The forecast reflects anticipated emissions growth in the AQMA from all source types (cars, woodstoves, commercial activity, etc.). Major industrial sources are again modeled at their legally allowable levels. The 2015 analysis also uses meteorology from 1998, 1999, and 2000 (including air stagnation events).

Determining Compliance with PM_{10} Standards

There is an important difference between an exceedance of the daily (24-hr) standard and a violation. The form of the daily PM_{10} standard (i.e. the method used to determine legal compliance), allows an average of one exceedance of the standard per year at any given location (averaged over a consecutive three-year period). The daily PM_{10} standard is 150 ug/m^3. Three exceedances of the standard at one location in a three year period would not be a violation. Four or more exceedances of the standard at the same location in a three year period would be a violation of the standard. It is therefore the 4^{th} highest PM_{10} value at any given location that is used to determine compliance with the standard.

For the annual average PM_{10} standard, model predicted annual average PM_{10} values must be below the annual avg. PM_{10} standard of 50 ug/m^3 in order to show compliance.

The Department's compliance analysis shows that the AQMA will continue to be in compliance with both the daily and annual average PM_{10} standards through at least the year 2015.

4.14.6.1 Attainment Analysis (1998 Worst-Case Conditions)

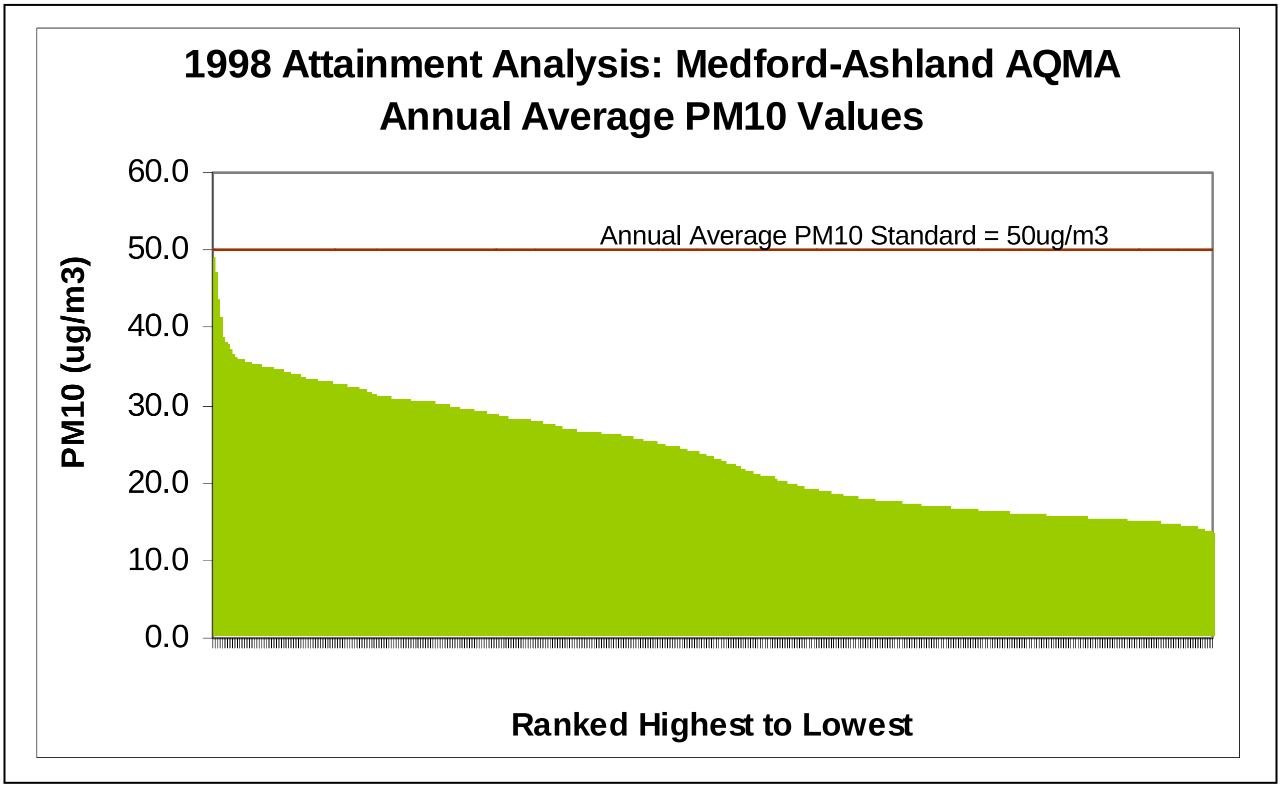
Annual Average Compliance

Table 10 shows the top 1% percent of model predicted annual average values for the 1998 (worst-case) attainment scenario (data set of 1244 receptors: initial 1-km spaced receptors plus the hot-spot modeling 0.25km spaced receptors). There are no violations predicted of the annual average PM_{10} standard. Figure 50 shows all predicted 1998 (attainment) annual average values ranked from highest to lowest.

Table 10: Top 1% of model Predicted Annual Average PM_{10} values (1998 Attainment Analysis)

Model Coordinate X	Model Coordinate Y	Predicted Annual Avg. PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	Predicted Annual Avg. PM_{10} (ug/m^3)
512.00	4697.00	**49.2**	509.25	4687.00	**43.2**
512.00	4698.00	**47.5**	509.50	4687.25	**43.2**
512.00	4698.25	**47.1**	509.75	4686.75	**41.4**
512.00	4697.50	**46.2**	512.00	4697.25	**39.7**
509.25	4687.25	**45.1**	509.75	4687.25	**39.0**
509.75	4687.00	**43.5**	509.75	4686.50	**38.8**

Figure 50: Predicted Annual Average PM_{10} Concentrations (1998 Attainment Analysis)



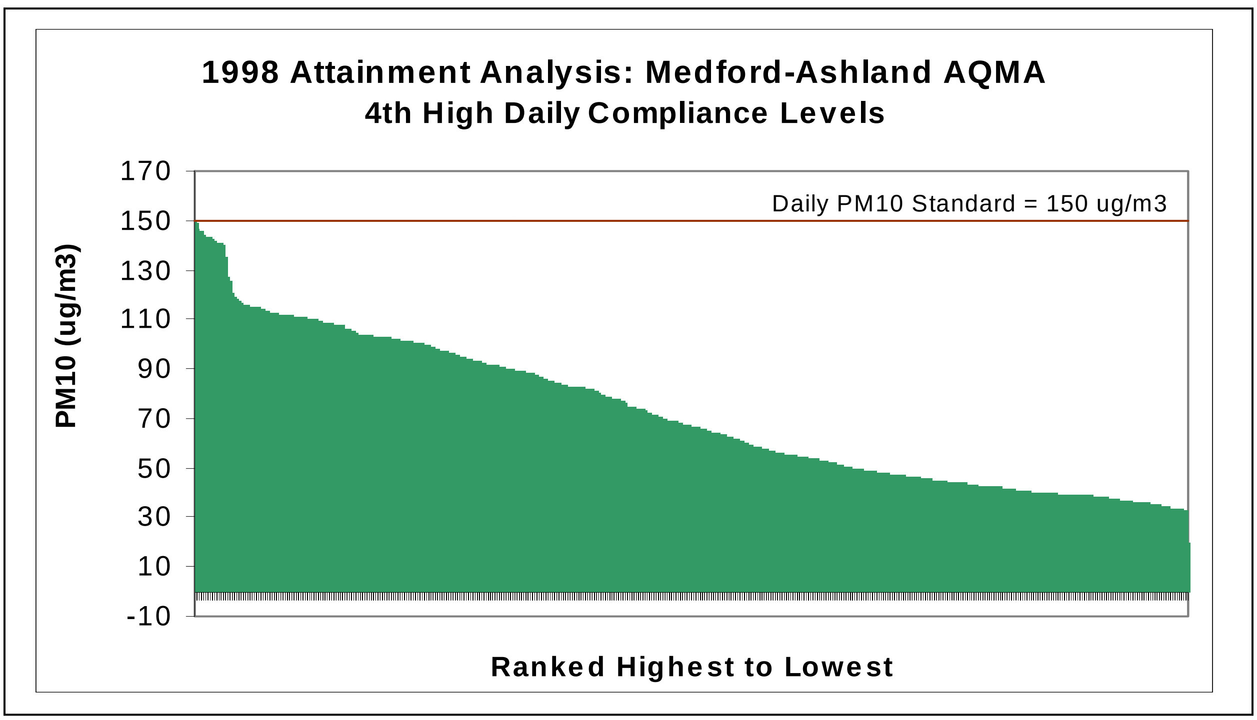
Daily (24-hr Avg.) Compliance

The modeling analysis shows that all predicted 4th highest daily PM_{10} values in the AQMA would be below the daily PM_{10} standard under worst-case conditions. Table 11 shows the top 1% of predicted 4th high daily values for the 1998 attainment scenario. Figure 51 shows all predicted 4th high daily values ranked from highest to lowest.

Table 11: Top 1% of predicted 4th Highest Daily (24-hr Avg.) PM_{10} values (1998 Attainment)

Model Receptor Coordinate X	Model Receptor Coordinate Y	Predicted 4th High Daily PM_{10} (ug/m^3)	Model Receptor Coordinate X	Model Receptor Coordinate Y	Predicted 4th High Daily PM_{10} (ug/m^3)
512.00	4697.25	**149.4**	512.75	4687.00	**145.8**
512.00	4697.75	**148.7**	513.00	4686.75	**145.7**
513.00	4687.00	**148.6**	513.50	4686.25	**145.5**
512.75	4686.75	**146.3**	513.50	4686.75	**145.0**
513.50	4686.50	**146.1**	513.25	4686.50	**144.5**
513.25	4686.75	**145.9**	513.25	4687.00	**143.9**

Figure 51: Predicted 4th High Daily PM_{10} Compliance Values

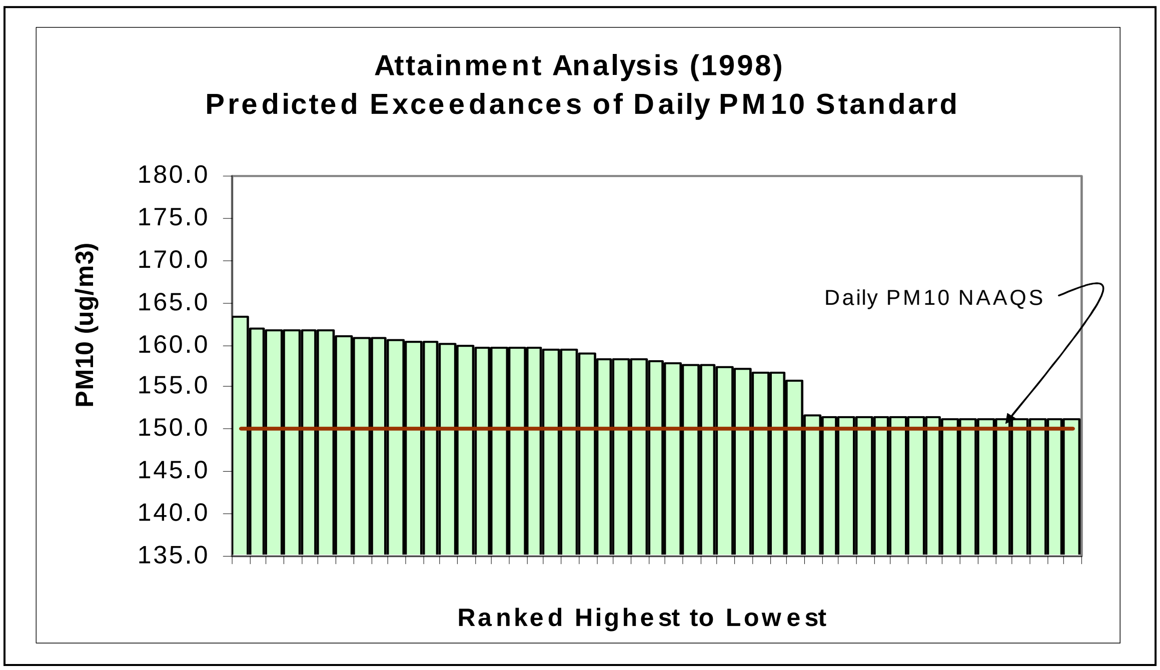


Exceedances of the Daily Standard

The attainment analysis predicts that exceedances of the daily PM_{10} standard could occur at multiple locations in the east Medford area during winter air stagnation conditions. The exceedances are predicted to occur on two winter days, in two different years (i.e. during the meteorological conditions that occurred on December 25th, 1998 and December 8th, 2000). Predicted exceedances range from approximately 151 ug/m^3 to 163 ug/m^3, and are primarily due to residential wood combustion. When woodstove curtailment is applied during these events, PM_{10} levels decrease substantially and the predicted exceedances are eliminated.

The attainment analysis also shows that one additional exceedance (156 ug/m^3) could occur under worst-case conditions in the central White City industrial area. Figure 51-1 shows the model predicted (worst-case) exceedances of the daily PM_{10} NAAQS (without the emission reduction effect of woodstove curtailment). Again, these predicted (potential) exceedances are not a violation of the PM_{10} standard.

Figure 51-1: Worst-Case exceedances of Daily PM_{10} Standard



PM_{10} levels in the AQMA: Air Quality Maps

The attached air quality maps (Figures 52-55) show predicted annual average and daily (24-hr avg.) PM_{10} levels for the attainment compliance analysis. These "isopleth" maps use contour lines to show different PM_{10} concentrations. In the maps showing daily PM_{10} values, each isopleth line changes by 10 ug/m^3. For the maps showing annual average PM_{10} concentrations, each isopleth line changes by 2 ug/m^3.

Figure 52: Annual Average PM_{10} (AQMA)

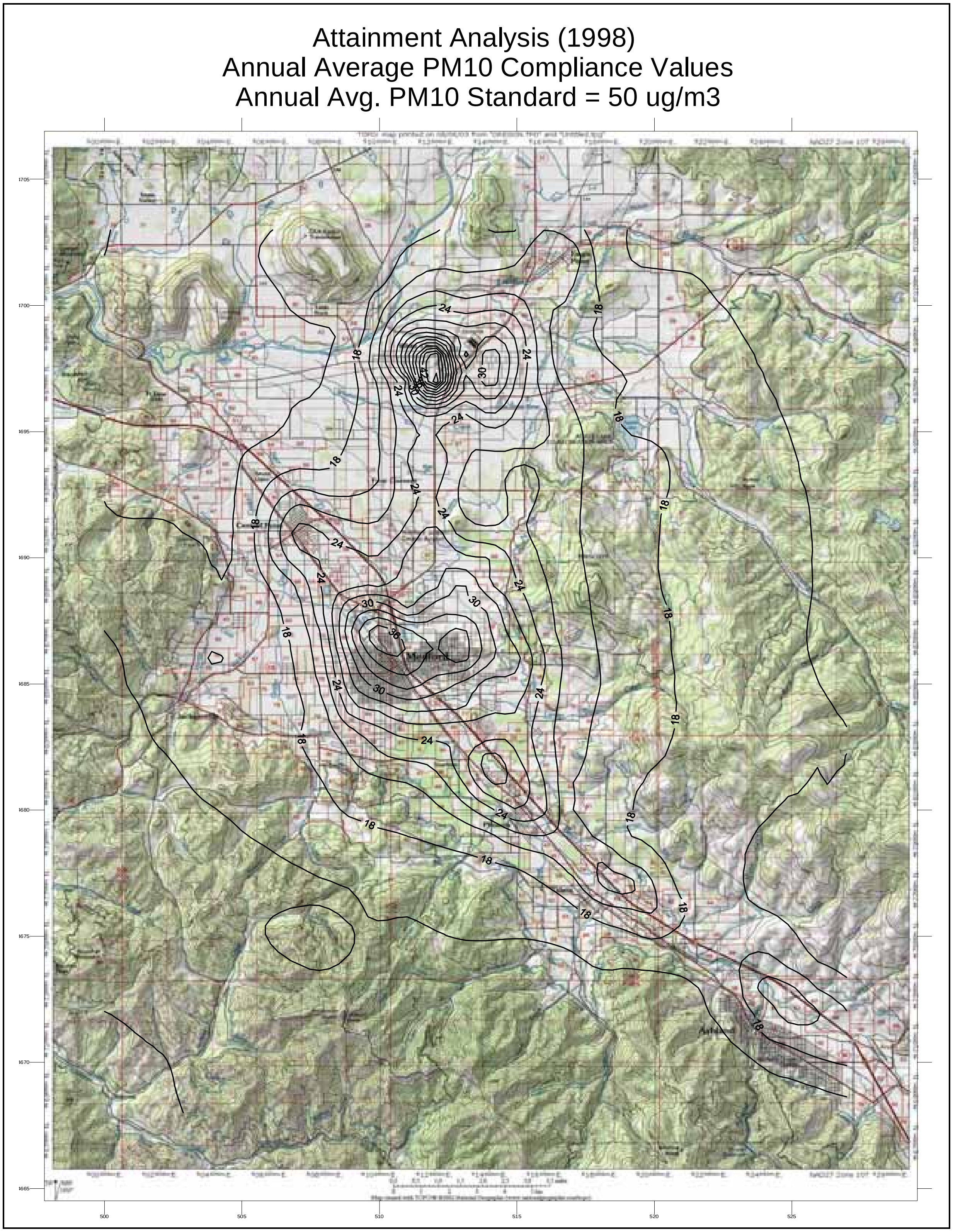


Figure 53: Daily PM_{10} (AQMA)

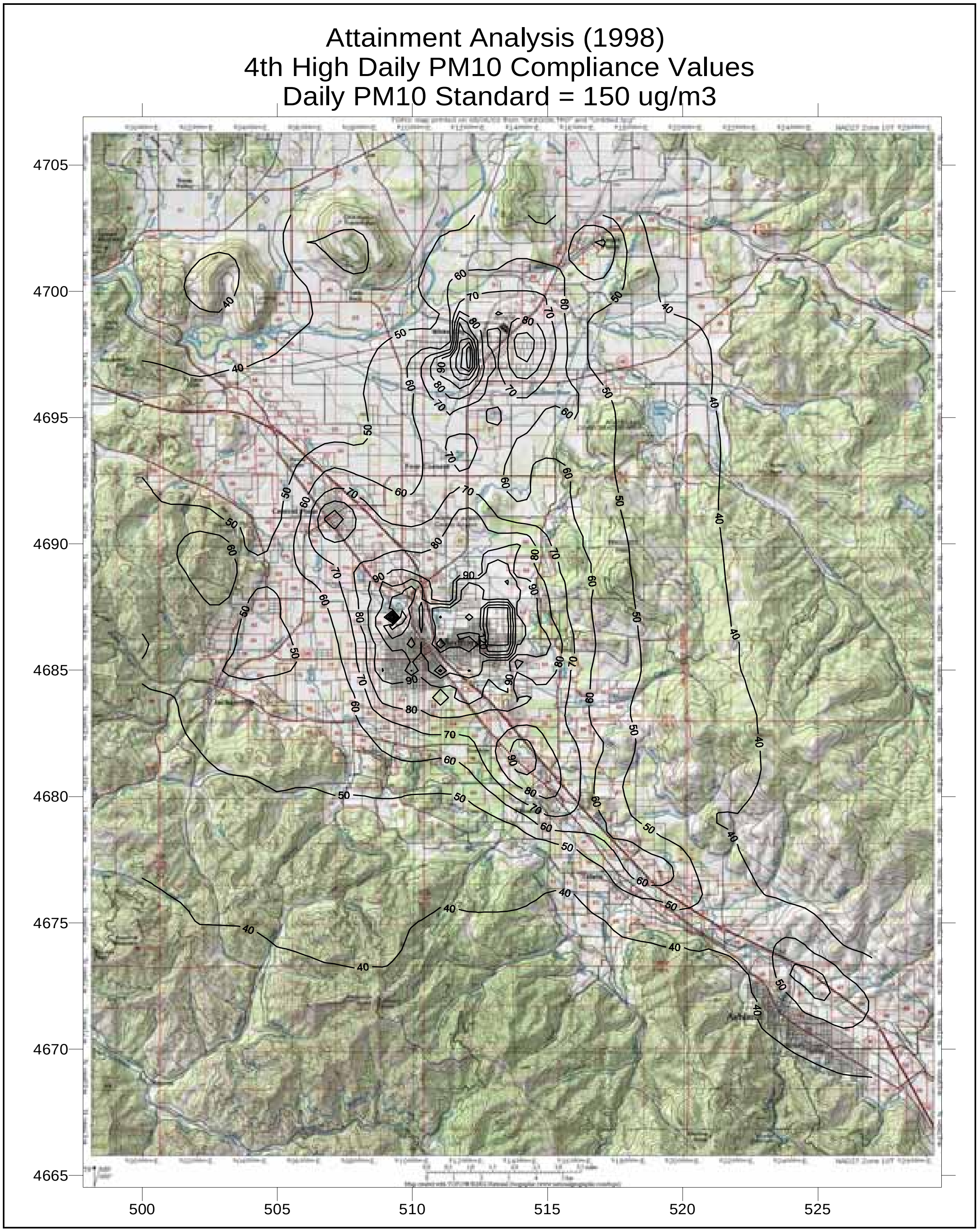


Figure 54: Annual Average PM_{10} (Medford-White City Area)

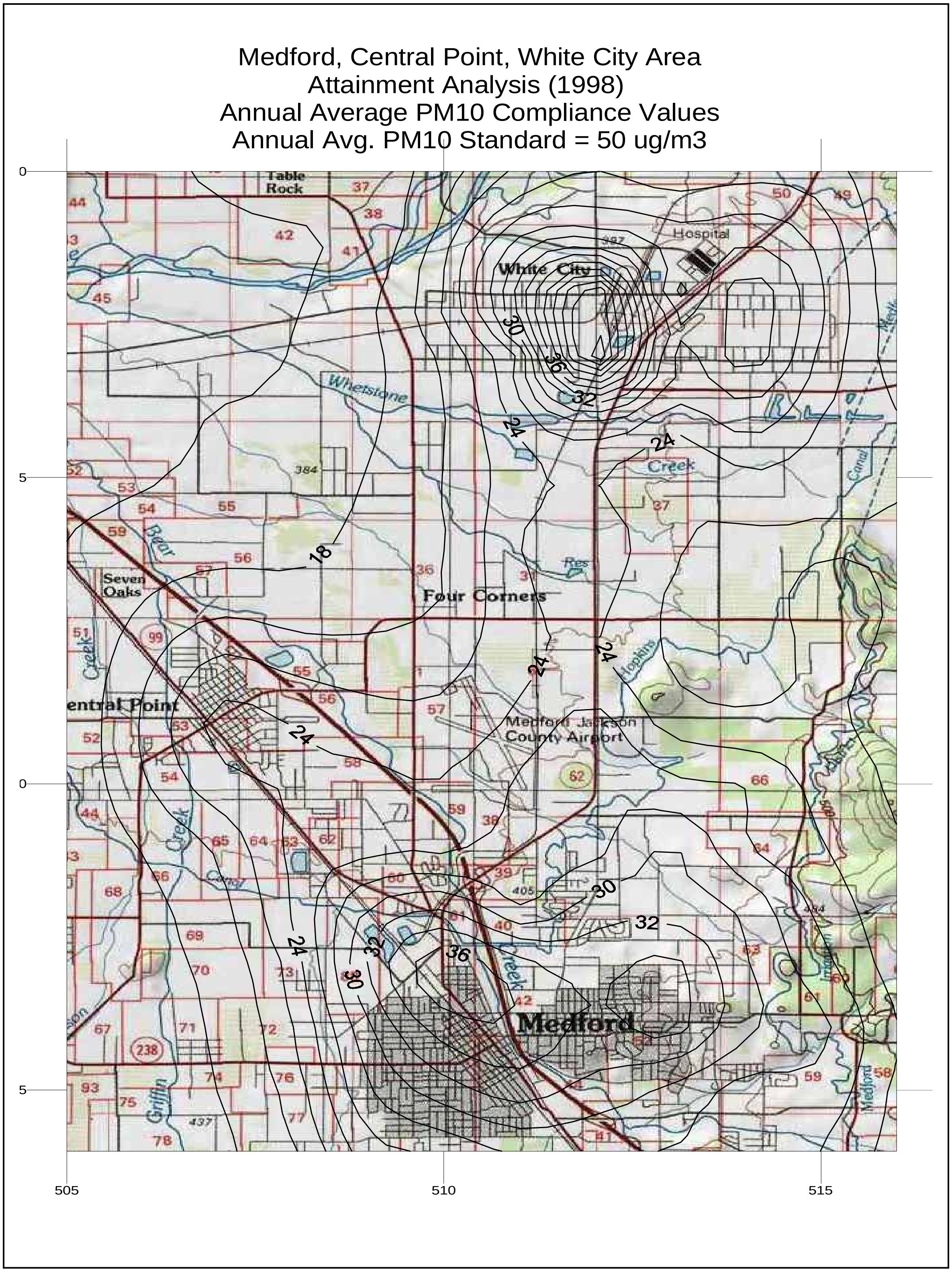
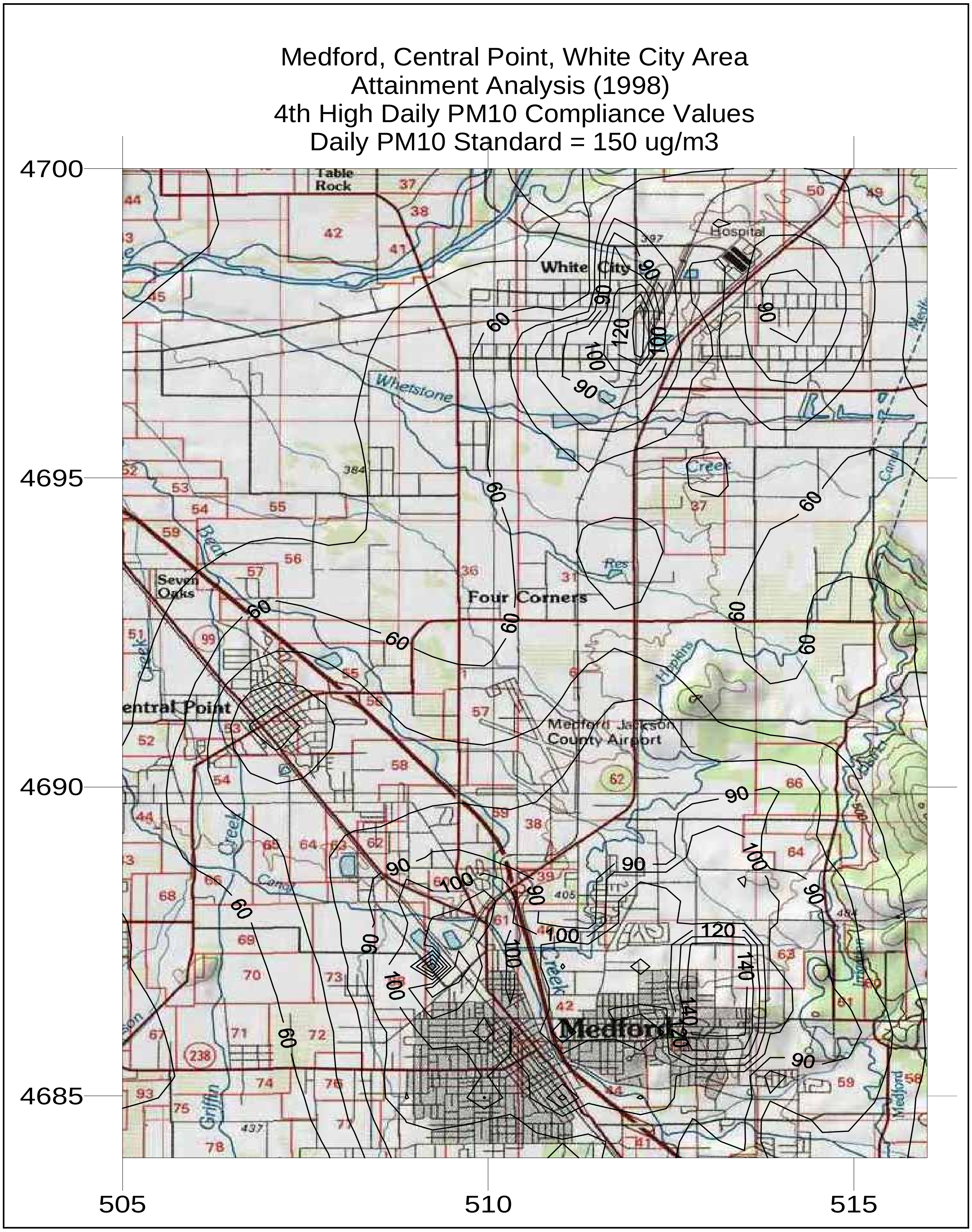


Figure 55: Daily PM_{10} (Medford-White City Area)



4.14.6.2: 2015 Maintenance Analysis

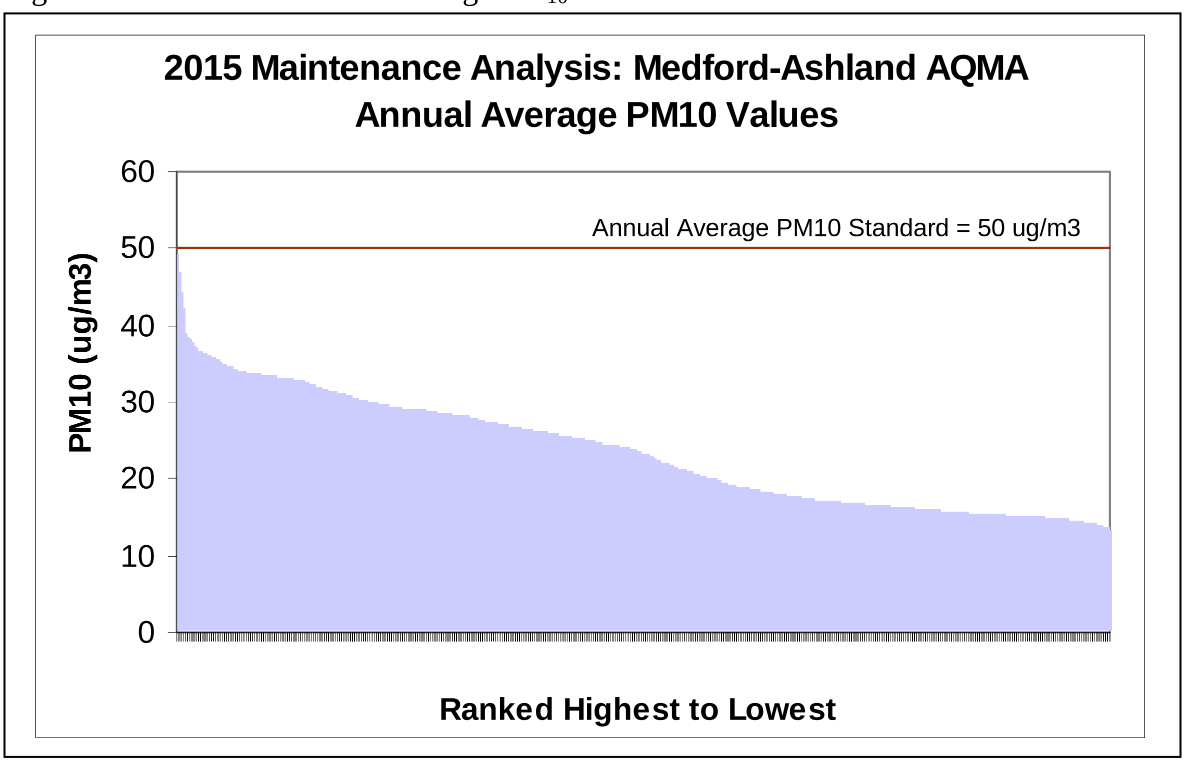
Annual Average Compliance:

Table 12 shows the top one percent of model predicted annual average values for the 2015 analysis (data set of 1244 receptors: initial 1-km spaced receptors plus the hot-spot modeling 0.25km spaced receptors). The annual average PM_{10} standard is 50 ug/m^3. There are no violations predicted of the annual average PM_{10} standard. Figure 56 shows all 2015 annual average values ranked from highest to lowest.

Table 12: Top 1% of model Predicted Annual Avg. PM_{10} values (2015 Maintenance Analysis)

Model Coordinate X	Model Coordinate Y	Predicted Annual Avg. PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	Predicted Annual Avg. PM_{10} (ug/m^3)
512.00	4697.00	**49.3**	509.50	4687.25	**43.1**
512.00	4698.25	**46.9**	509.75	4686.75	**42.2**
512.00	4697.50	**46.8**	512.00	4697.25	**40.3**
509.25	4687.25	**45.0**	509.75	4687.25	**39.8**
509.75	4687.00	**44.3**	509.75	4686.50	**39.2**
509.25	4687.00	**43.2**	510.00	4686.75	**39.1**

Figure 56: Predicted Annual Average PM_{10} Concentrations in 2015



Daily Compliance: 2015

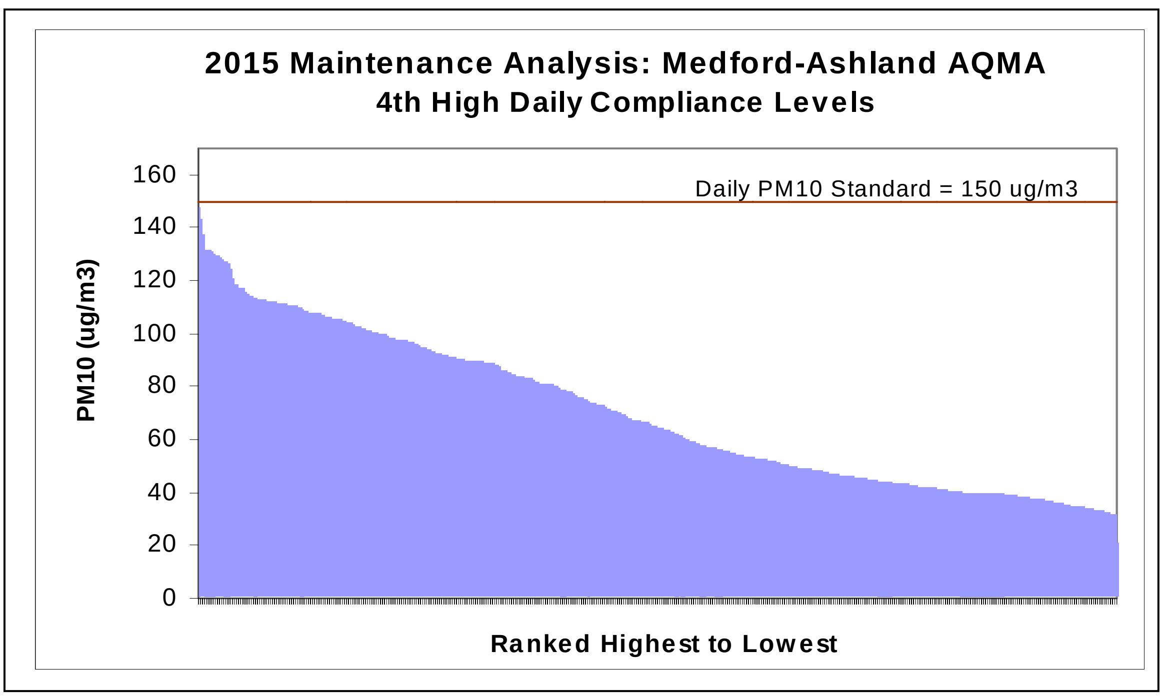
The maintenance analysis shows that all predicted 4th highest daily PM_{10} values in the AQMA will be below the daily PM_{10} standard through at least the year 2015. Table 13 shows the top 1% of predicted 4th high daily values in the 2015 analysis. Figure 57 shows all predicted 4th high daily values ranked from highest to lowest.

The modeling analysis predicts that one exceedance of the daily standard could occur in 2015 (154 ug/m^3) under worst-case conditions (i.e. all major point sources operating at maximum allowable permitted levels). The exceedance is predicted to occur at receptor location (512.00 x 4697.00). This is in the heart of the White City industrial complex. There are no exceedances predicted from residential woodheating in 2015 due to the expected continued decrease of non-certified woodstoves in the AQMA.

Table 13: Top 1% of Model Predicted 4th High Daily PM_{10} Values (2015)

Model Coordinate X	Model Coordinate Y	Predicted 4th High Daily PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	Predicted 4th High Daily PM_{10} (ug/m^3)
512.00	4697.75	**147.8**	509.50	4687.25	**134.4**
512.00	4697.50	**144.0**	513.00	4687.00	**132.4**
512.00	4697.00	**143.2**	511.00	4685.00	**131.9**
512.00	4698.00	**138.8**	513.50	4686.50	**131.8**
511.00	4686.00	**138.6**	512.75	4686.25	**131.7**
509.50	4687.00	**137.4**	513.50	4686.25	**131.6**

Figure 57: Predicted 4th High Daily PM_{10} Compliance Values in 2015



Predicted PM_{10} values in Table 13 that range from 147.8 ug/m^3 to 138.8 ug/m^3 are predicted to occur in the core White City industrial area. The remaining PM_{10} values in Table 15 are predicted to occur in east Medford, primarily due to woodsmoke. These values do not show the effect of the woodstove curtailment program, which would reduce these peak values substantially.

<u>PM_{10} levels in the AQMA: Air Quality Maps</u>

The air quality maps in Figures 58-59 show predicted annual average and daily (24-hr avg.) PM_{10} levels for the maintenance compliance analysis. These "isopleth" maps use contour lines to show different PM_{10} concentrations. For the annual average isopleth maps, PM_{10} concentrations increase in intervals of 2 ug/m^3. For the daily isopleth maps, PM_{10} concentrations increase in intervals of 10 ug/m^3.

The air quality maps in Figures 60 through 61 show maintenance analysis results for the core urban areas of Medford, Central Point, and White City.

Figure 58: Air Quality Map. Predicted (Worst-Case) Annual Avg. PM_{10} Levels in 2015

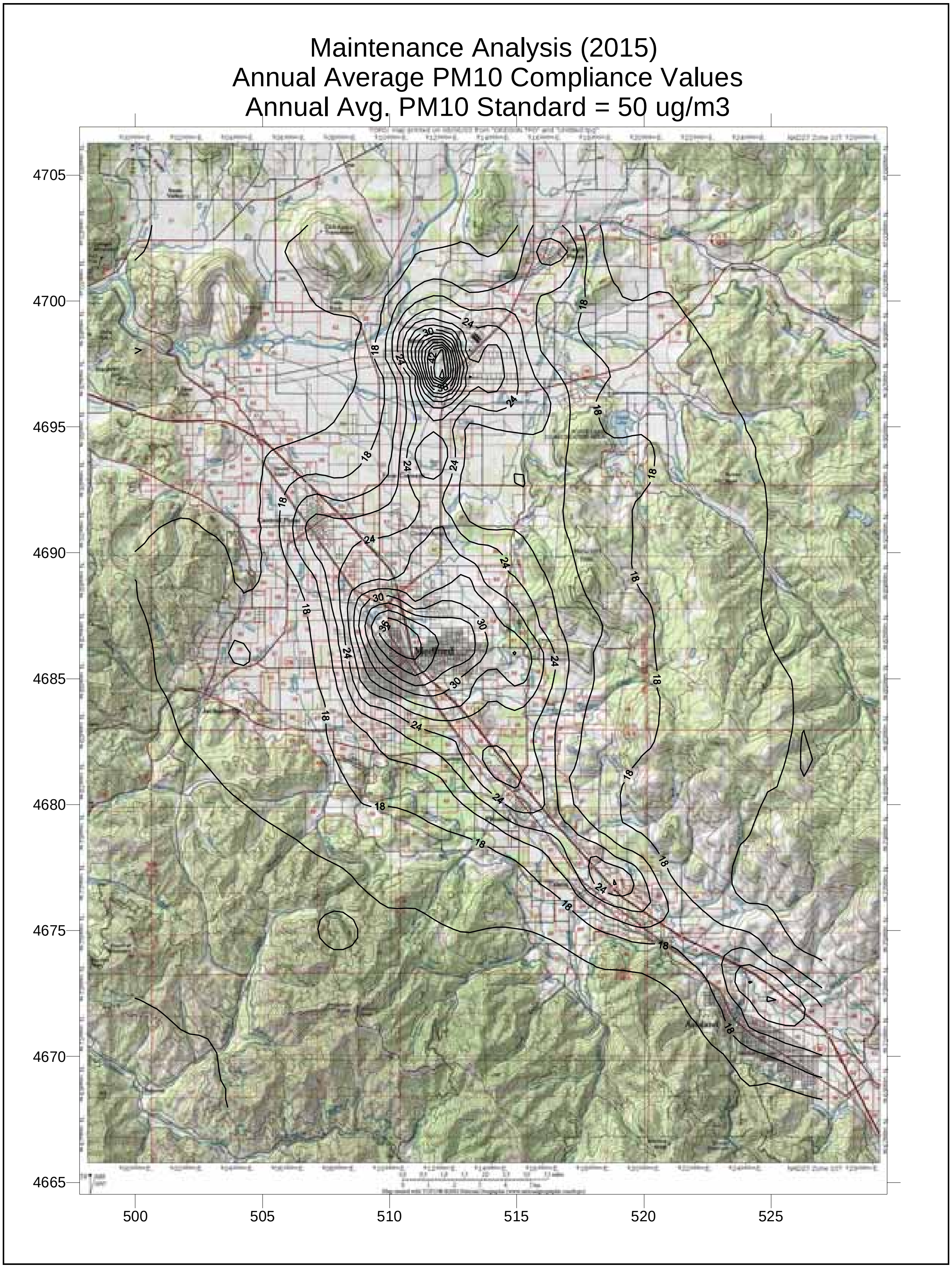


Figure 59: Air Quality Map. Predicted (Worst-Case) Daily PM_{10} Levels in 2015

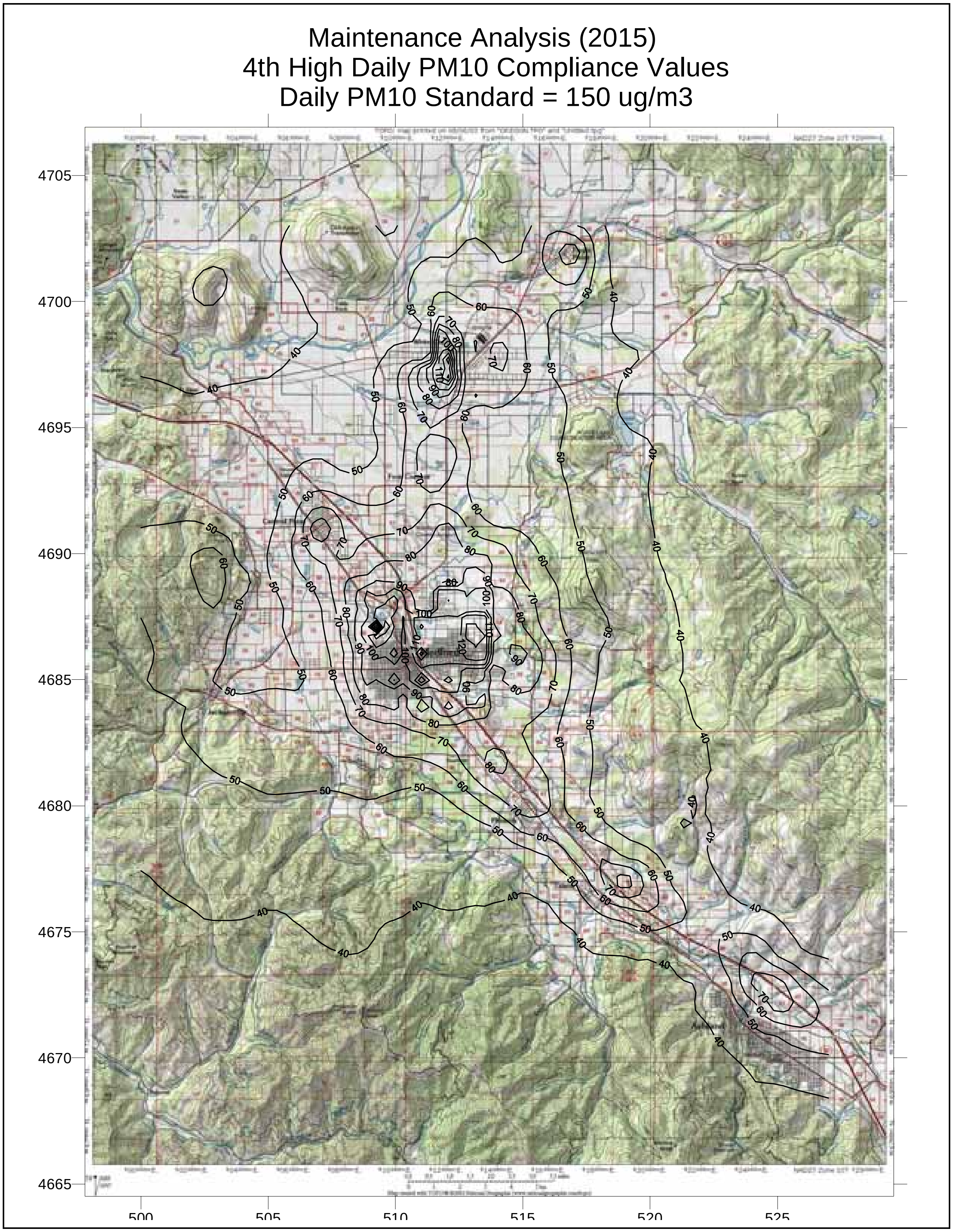


Figure 60: Medford-White City Area. Predicted (Worst-Case) Annual PM_{10} in 2015

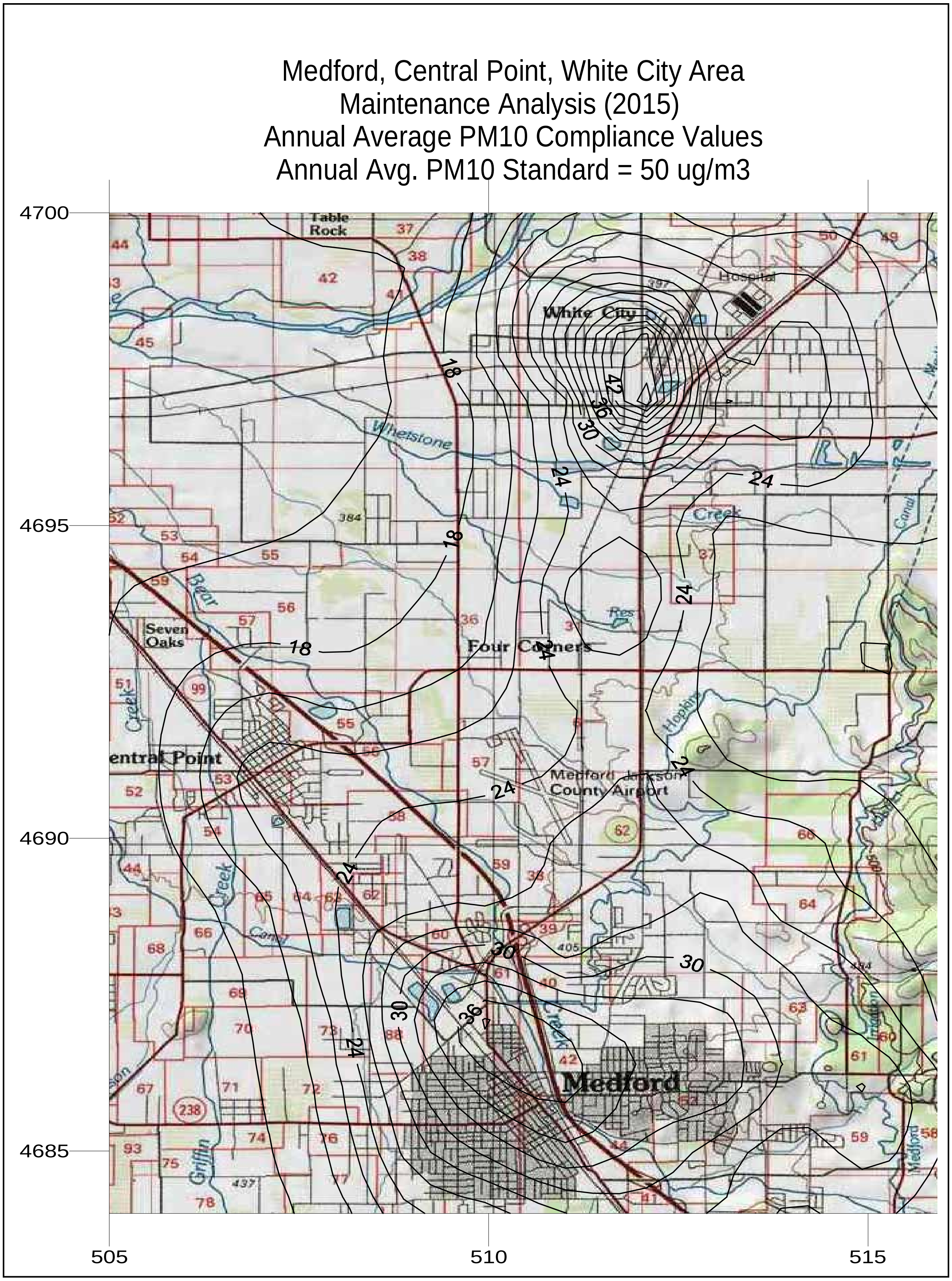
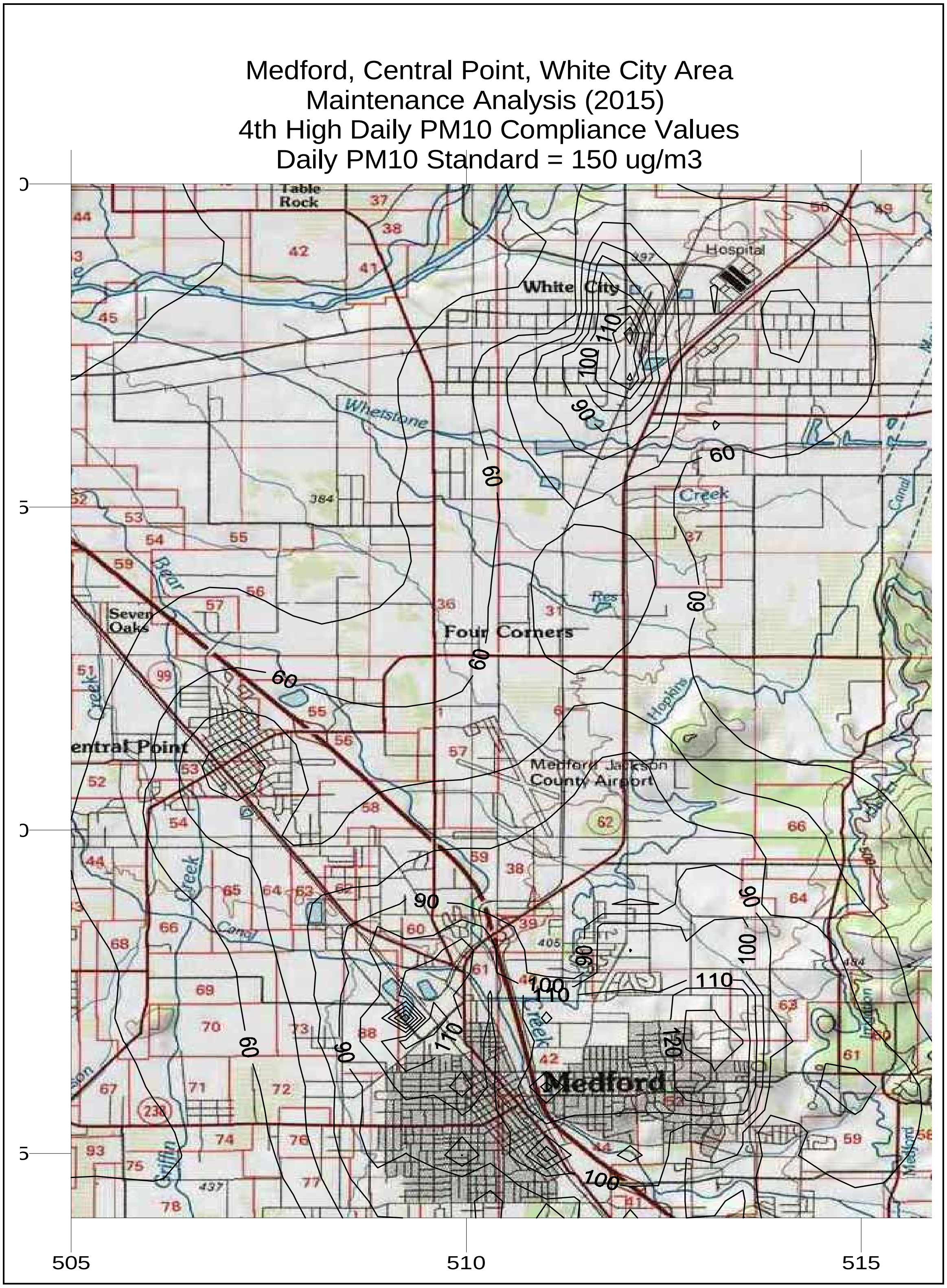


Figure 61: Medford-White City Area. Predicted (Worst-Case) Daily PM_{10} Levels in 2015



4.14.6.3: White City Industrial Area Analysis

The highest potential PM_{10} impacts for both the attainment and maintenance analysis are predicted to occur within the White City industrial complex. This is an area of concern, especially given it's proximity to commercial and residential areas of White City. The Medford industrial area is also of interest, however model predicted PM_{10} impacts in and near the Medford industrial area are well below PM_{10} standards.

Predicted high PM_{10} levels in the White City industrial area are partly the result of the worst-case analysis approach which assumes that all major industrial facilities are simultaneously emitting PM_{10} at their maximum allowable emission level. The attainment and maintenance analysis show the potential for PM_{10} impacts in the White City area under worst-case conditions. However, there is a relatively low likelihood that all White City industrial sources will simultaneously operate at their maximum allowable (permitted) emission level.

Table 14 shows predicted peak Annual Avg. and 4th-high Daily PM_{10} concentrations for the White City industrial area for the attainment analysis. Table 15 shows predicted peak Annual Avg. and 4th-high Daily PM_{10} concentrations for the White City area for the maintenance analysis. Peak PM_{10} impacts for the White City industrial are similar for the attainment and maintenance analysis because maximum allowable (permitted) industrial emission levels were used in both cases.

Table 14: Highest Predicted PM_{10}, White City Industrial Area (1998 Worst-Case)

Model Coordinate X	Model Coordinate Y	**Annual Avg.** Predicted PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	**4th High Daily** Predicted PM_{10} (ug/m^3)
512.00	4697.00	49.2	512.00	4697.25	149.4
512.00	4698.00	47.5	512.00	4697.75	148.7
512.00	4698.25	47.1	512.00	4697.50	143.8
512.00	4697.50	46.2	512.00	4697.00	143.2

Table 15: Highest Predicted PM_{10}, White City Industrial Area (2015 Worst-Case)

Model Coordinate X	Model Coordinate Y	**Annual Avg.** Predicted PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	**4th High Daily** Predicted PM_{10} (ug/m^3)
512.00	4697.00	49.3	512.00	4697.75	147.8
512.00	4698.00	46.9	512.00	4697.50	144.0
512.00	4697.50	46.8	512.00	4697.00	143.2
512.00	4698.00	46.7	512.00	4698.00	138.8

PM_{10} levels in the White City Area: Air Quality Maps

The air quality maps in Figures 62 through 65 show predicted annual average and daily (24-hr avg.) PM_{10} levels for the attainment and maintenance compliance analysis in the

White City industrial area. Major industrial facilities are identified, and predicted PM_{10} levels reflect worst-case conditions (i.e. all industrial facilities emitting at their maximum allowable permitted levels).

Figure 62: Annual Avg. PM_{10} (1998 Worst-Case) White City

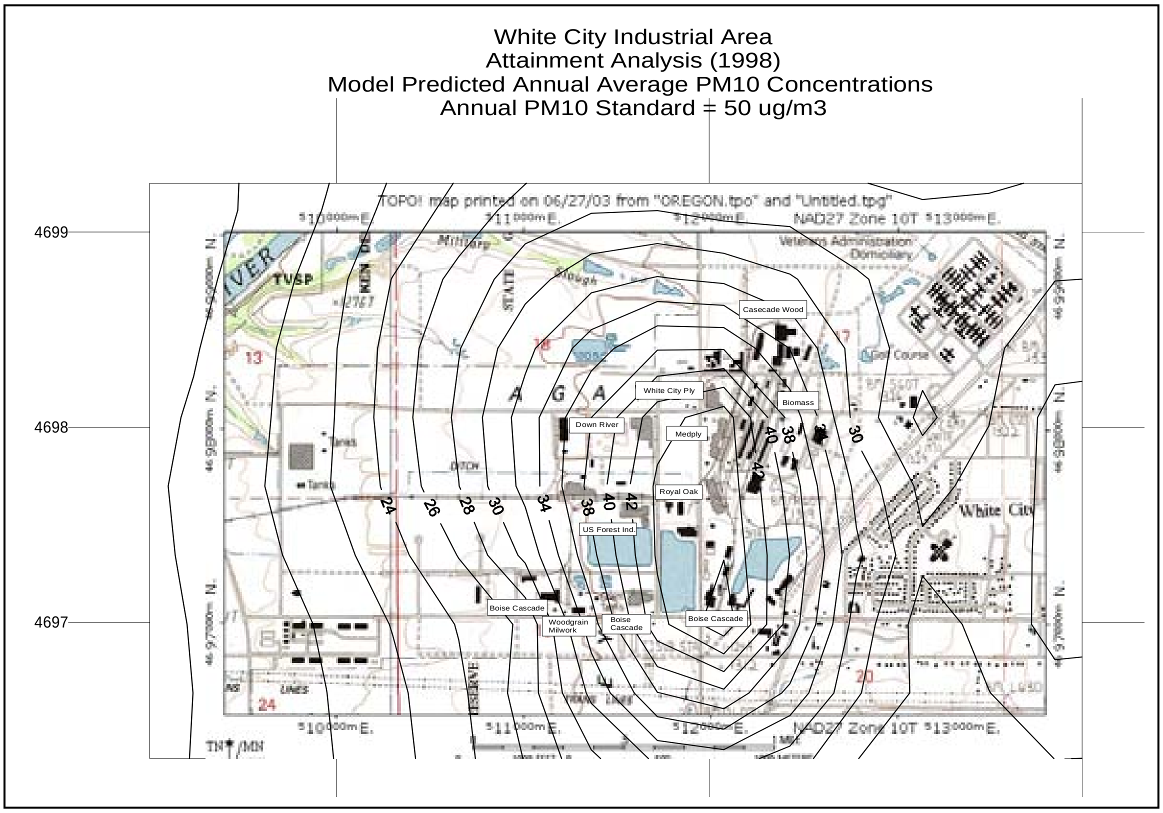


Figure 63: Daily PM_{10} (1998 Worst-Case) White City

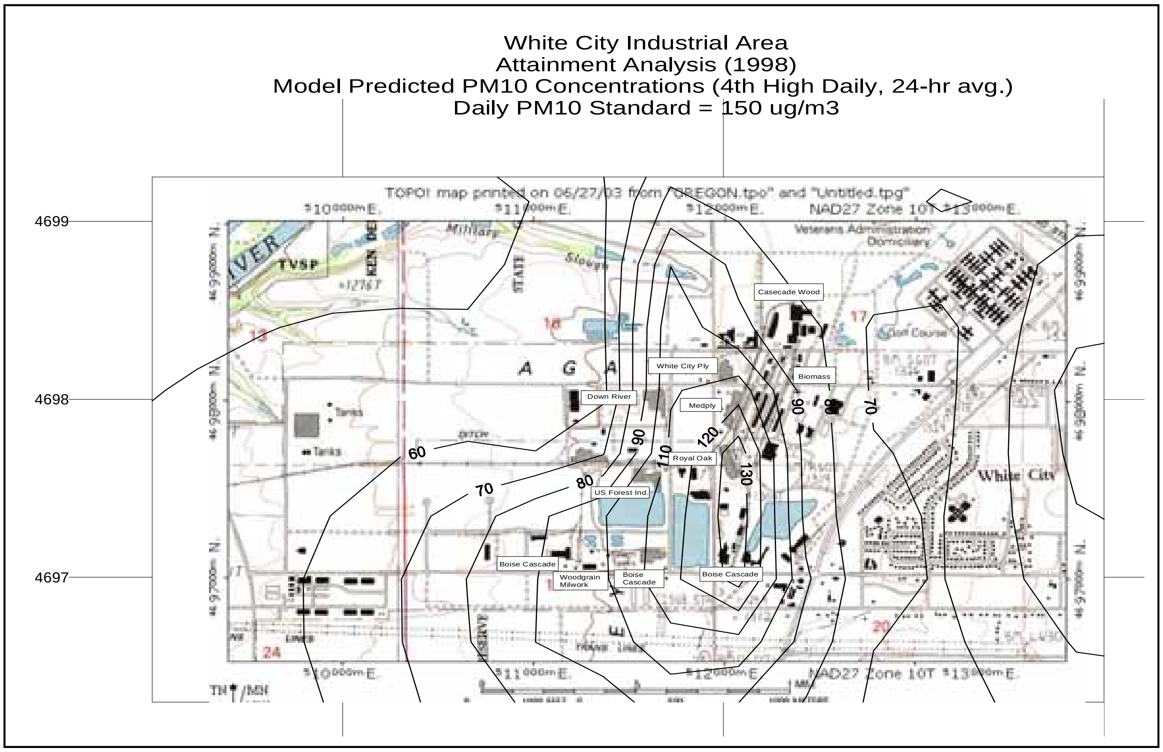


Figure 64: Annual Average PM_{10} (2015 Worst-Case) White City

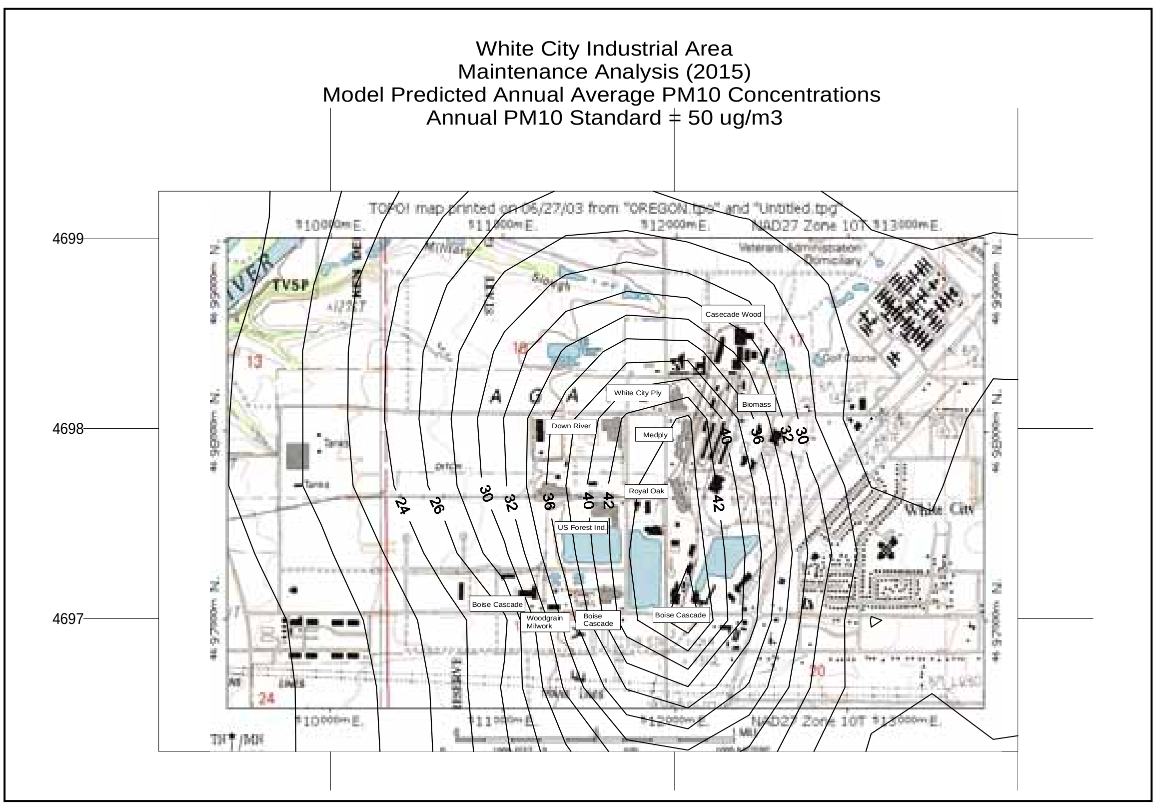
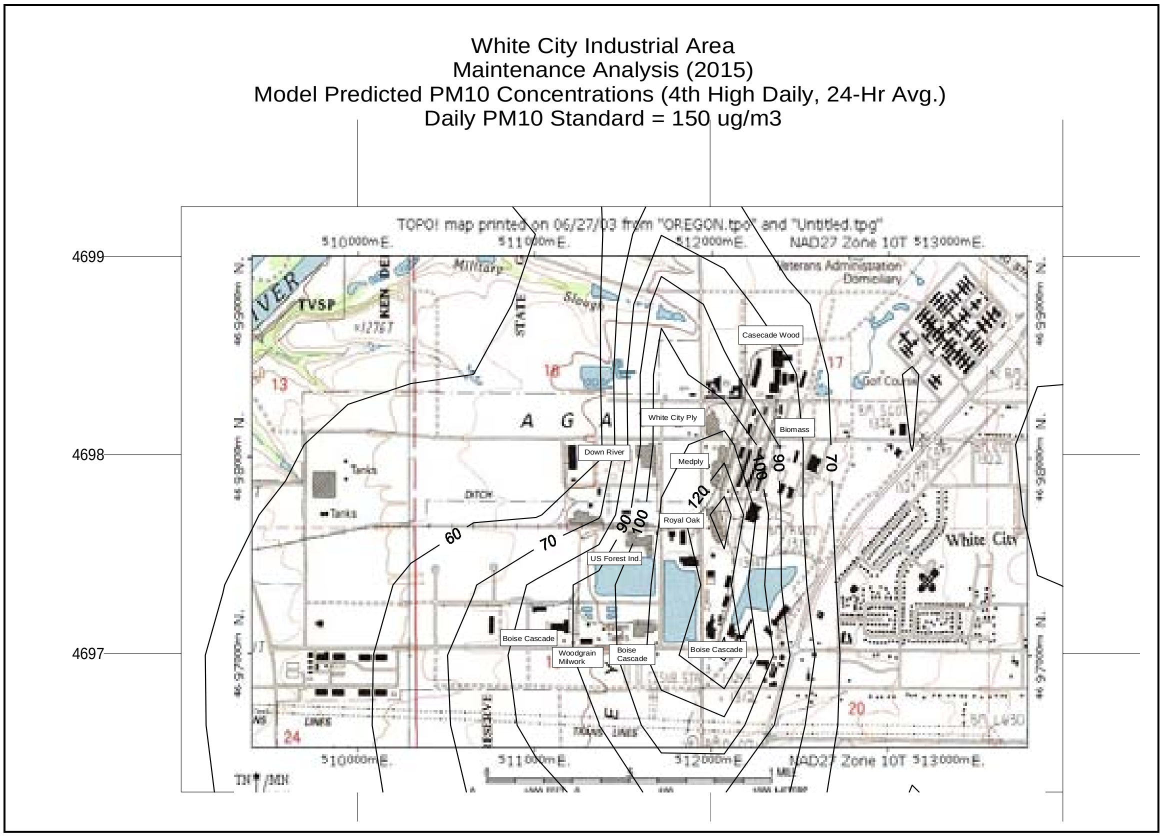


Figure 65: Daily PM_{10} (2015 Worst-Case) White City



Compliance Summary: Attainment and Maintenance Demonstration

- There are no predicted violations of the daily or annual average PM_{10} standards in either the 1998 or 2015 compliance analysis. The Attainment and Maintenance analysis show that the AQMA is currently in compliance with PM_{10} standards and will continue to be in compliance through at least the year 2015.

- Attainment Analysis: The attainment analysis predicts potential exceedances of the daily standard (but no violation) on two winter days in the east Medford area. With woodstove curtailment, these exceedances would be eliminated. One exceedance is also predicted to occur under worst-case conditions in the White City industrial area.

- Maintenance Analysis: One potential exceedance of the daily standard (154 ug/m^3) is predicted in the 2015 maintenance analysis in the White City industrial area.

- The predicted exceedances of the daily standard, together with the number of predicted PM_{10} levels within 20% or so of the standard, supports the need to continue the PM_{10} strategies (i.e. woodstove curtailment, opening burning program, road sweeping, industrial rules), that have successfully brought the

AQMA into compliance. These strategies also help prevent violations of the fine particulate standards (PM2.5).

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4.14.6.3: White City Industrial Area Analysis

The highest potential PM_{10} impacts for both the attainment and maintenance analysis are predicted to occur within the White City industrial complex. This is an area of concern, especially given it's proximity to commercial and residential areas of White City. The Medford industrial area is also of interest, however model predicted PM_{10} impacts in and near the Medford industrial area are well below PM_{10} standards.

Predicted high PM_{10} levels in the White City industrial area are partly the result of the worst-case analysis approach which assumes that all major industrial facilities are simultaneously emitting PM_{10} at their maximum allowable emission level. The attainment and maintenance analysis show the potential for PM_{10} impacts in the White City area under worst-case conditions. However, there is a relatively low likelihood that all White City industrial sources will simultaneously operate at their maximum allowable (permitted) emission level.

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Model Coordinate X	Model Coordinate Y	**Annual Avg.** Predicted PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	**4^{th} High Daily** Predicted PM_{10} (ug/m^3)
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512.00	4698.00	47.5	512.00	4697.75	148.7
512.00	4698.25	47.1	512.00	4697.50	143.8
512.00	4697.50	46.2	512.00	4697.00	143.2

Table 15: Highest Predicted PM_{10}, White City Industrial Area (2015 Worst-Case)

Model Coordinate X	Model Coordinate Y	**Annual Avg.** Predicted PM_{10} (ug/m^3)	Model Coordinate X	Model Coordinate Y	**4^{th} High Daily** Predicted PM_{10} (ug/m^3)
512.00	4697.00	49.3	512.00	4697.75	147.8
512.00	4698.00	46.9	512.00	4697.50	144.0
512.00	4697.50	46.8	512.00	4697.00	143.2
512.00	4698.00	46.7	512.00	4698.00	138.8

PM_{10} levels in the White City Area: Air Quality Maps

The air quality maps in Figures 62 through 65 show predicted annual average and daily (24-hr avg.) PM_{10} levels for the attainment and maintenance compliance analysis in the

White City industrial area. Major industrial facilities are identified, and predicted PM_{10} levels reflect worst-case conditions (i.e. all industrial facilities emitting at their maximum allowable permitted levels).

Figure 62: Annual Avg. PM_{10} (1998 Worst-Case) White City

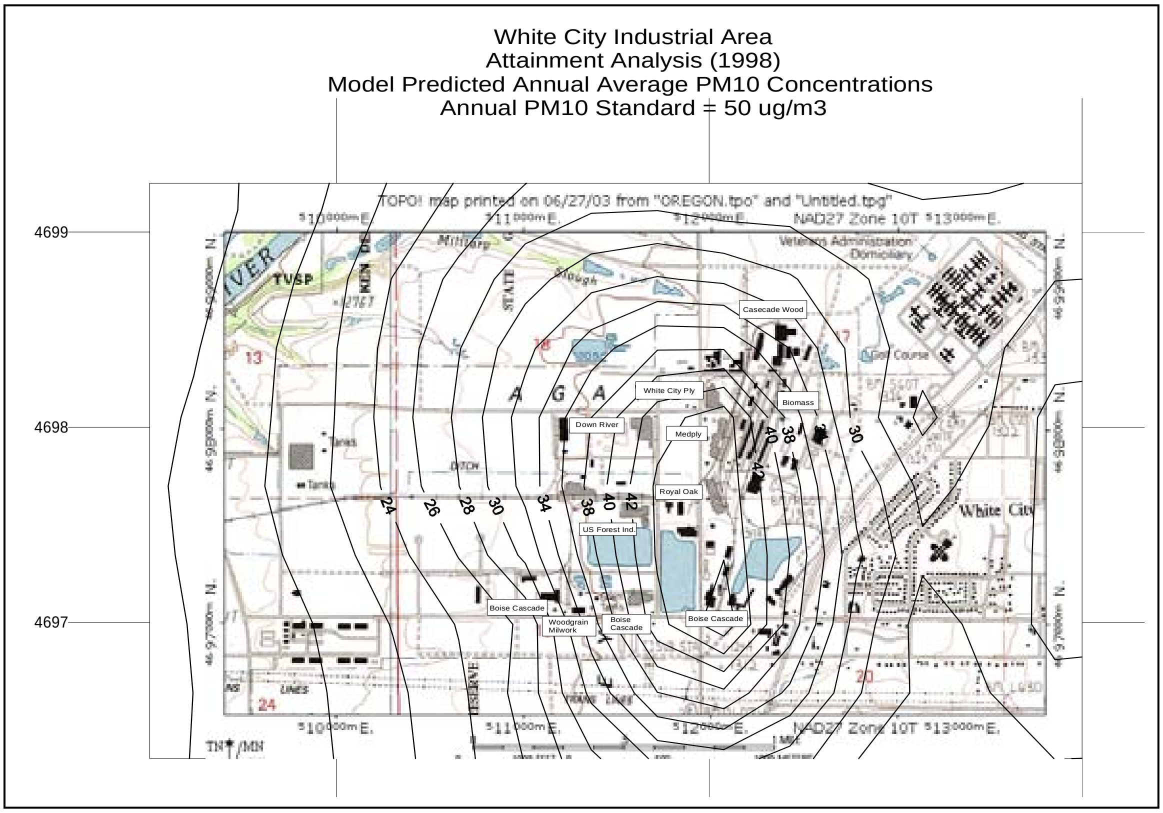


Figure 63: Daily PM_{10} (1998 Worst-Case) White City

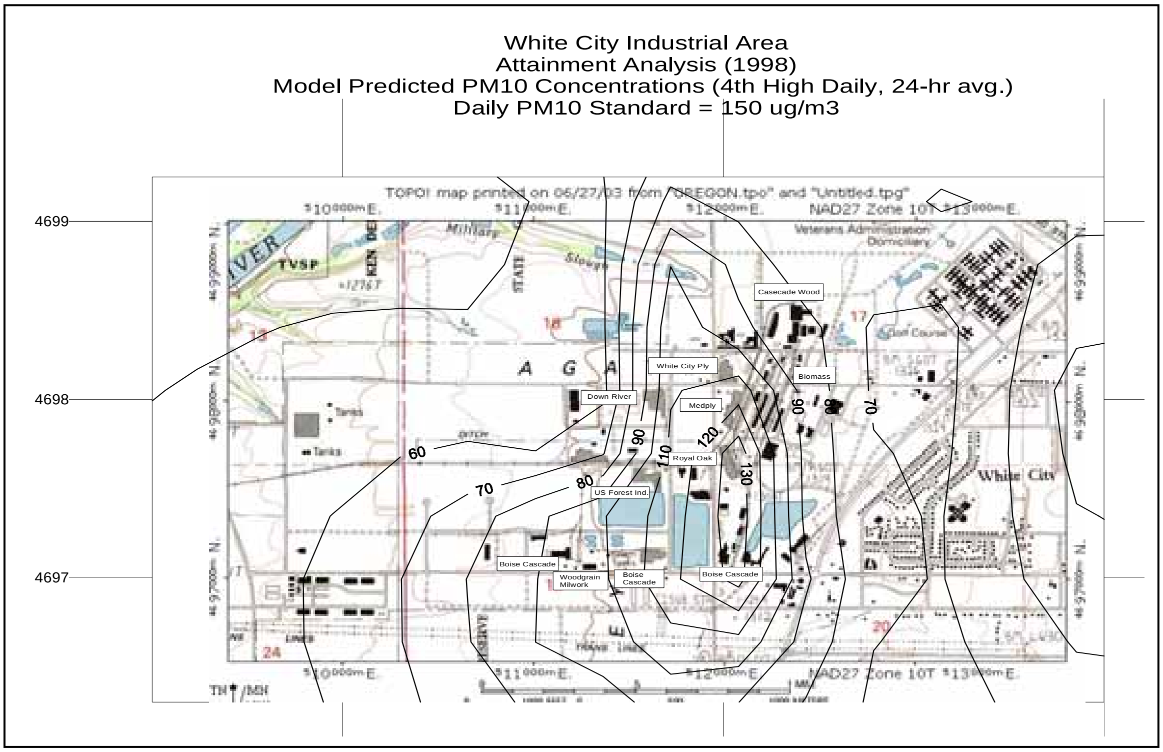


Figure 64: Annual Average PM_{10} (2015 Worst-Case) White City

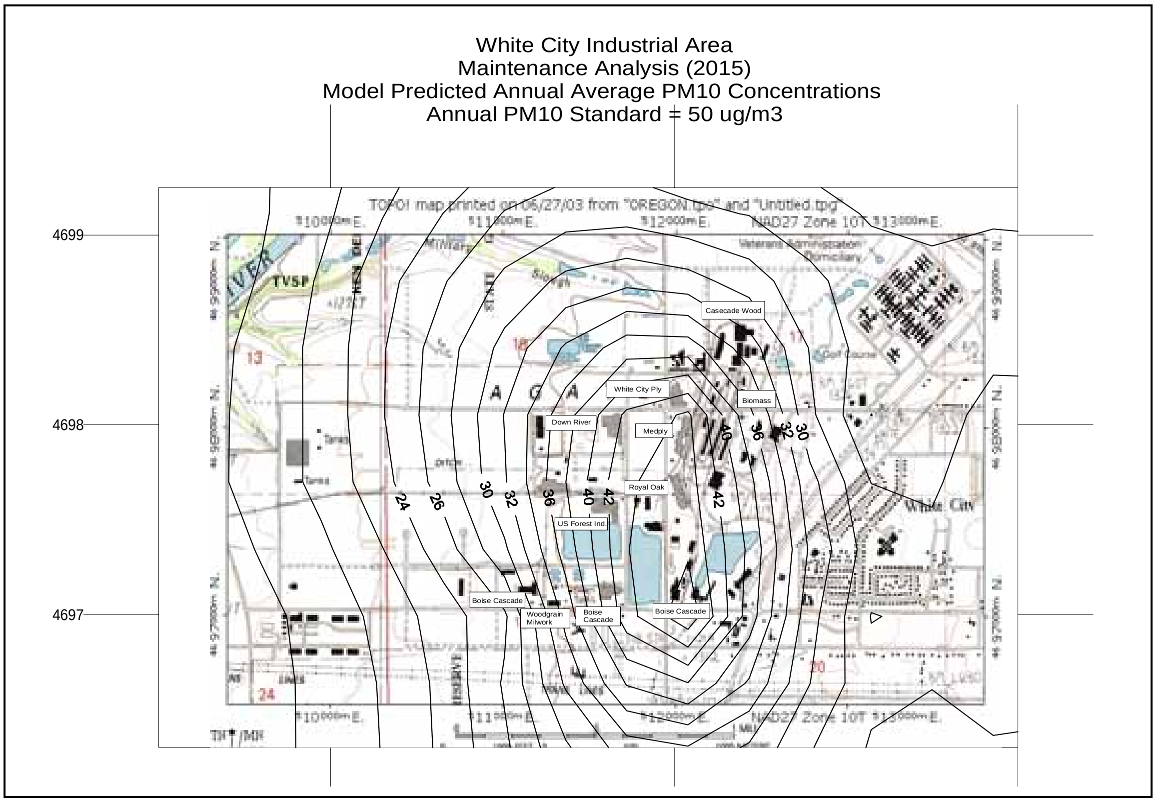
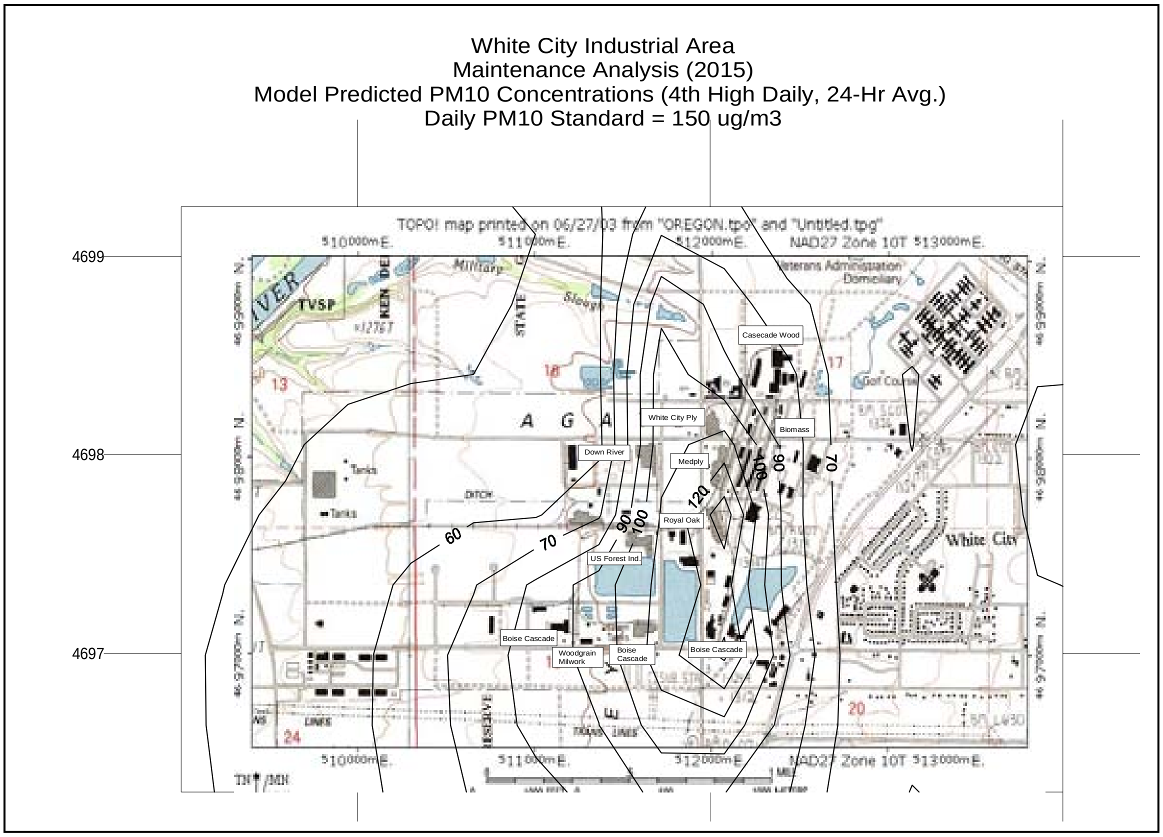


Figure 65: Daily PM_{10} (2015 Worst-Case) White City



Compliance Summary: Attainment and Maintenance Demonstration

- There are no predicted violations of the daily or annual average PM_{10} standards in either the 1998 or 2015 compliance analysis. The Attainment and Maintenance analysis show that the AQMA is currently in compliance with PM_{10} standards and will continue to be in compliance through at least the year 2015.

- Attainment Analysis: The attainment analysis predicts potential exceedances of the daily standard (but no violation) on two winter days in the east Medford area. With woodstove curtailment, these exceedances would be eliminated. One exceedance is also predicted to occur under worst-case conditions in the White City industrial area.

- Maintenance Analysis: One potential exceedance of the daily standard (154 ug/m^3) is predicted in the 2015 maintenance analysis in the White City industrial area.

- The predicted exceedances of the daily standard, together with the number of predicted PM_{10} levels within 20% or so of the standard, supports the need to continue the PM_{10} strategies (i.e. woodstove curtailment, opening burning program, road sweeping, industrial rules), that have successfully brought the

AQMA into compliance. These strategies also help prevent violations of the fine particulate standards (PM2.5).

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4.14.7.0 Emissions Reduction Measures

PM_{10} emissions in the AQMA have been substantially reduced through a suit of emission reduction measures developed and implemented over approximately 25 years (to address both TSP and PM_{10}). These strategies include emission limits on select industrial processes, the residential woodstove curtailment program, restrictions on residential open burning, street cleaning, replacement of noncertified woodstoves in low income homes, a ban on installation of non-certified woodstoves, and public education. The following sections provide a summary of these emission reduction programs.

4.14.7.1 Residential Wood Combustion Strategies

Beginning with the work of the Jackson County Woodburning Task Force 1987, the Department, Advisory Committee, and local AQMA jurisdictions have developed and implemented strategies to reduce emissions from residential wood burning. Section 189(a)(1)(C) of the Clean Air Act requires states with moderate PM_{10} nonattainment areas to assure that reasonably available control measures are implement by no later than December 10, 1993. The residential woodburning strategies were developed over several years and fully implemented with the adoption of a mandatory woodstove curtailment program in 1989.

The woodburning strategies focus on three basic approaches: (1) The improved performance and lower emissions of newer certified woodstoves; (2) attrition of older, high emission woodstoves over time; and (3) episodic emission reduction by prohibiting the use of woodstoves and fireplaces during predicted air stagnation events.

The woodburning strategy also includes a public information program that ensures awareness of the regulations, and stresses energy conservation as well as wood burning practices (such as firewood seasoning) that result in better combustion and better energy efficiency. Both of these practices result in lower emissions. No direct emission credit is taken for the public information program but it is a vital part of the woodburning strategy.

Woodburning Curtailment: A voluntary woodburning curtailment program (with daily advisories from November through February) began on November 19, 1985. Jackson County curtailment surveys during 1985-88 indicated an average compliance rate of about 25% under the voluntary program. The City of Medford adopted a mandatory woodburning curtailment program on November 2, 1989. Curtailment surveys within the City of Medford during 1989-90 indicated over 80% compliance. The City of Central Point adopted a mandatory woodburning curtailment program on December 21, 1989. A mandatory curtailment program was subsequently adopted for Jackson County.

Curtailment participation surveys conducted during the last exceedance period (1990-1991) showed compliance rates averaging 90% in the critical Medford area, and 88% in the core Medford-Central Point area. Curtailment compliance averaged approximately 66% in other parts of the curtailment control area. The combination of curtailment and public education strategies, as well as an overall trend away from woodheating has significantly reduced woodstove emissions in the AQMA from historic levels.

Woodsmoke Program Up-date

In 1998, the Air Quality Advisory Committee recommended improvements to the existing mandatory residential woodsmoke strategy as a step to reduce the risk of future violations of the new ($PM_{2.5}$) particulate standards. Improving the current strategy involved adopting a model ordinance for woodstove curtailment that applies consistent requirements throughout the AQMA. A model unified ordinance was developed by the Committee and is patterned closely after the existing ordinance in Jackson County. The main points of the ordinance include:

- Burning in noncertified woodstoves is prohibited on yellow and red advisory days.
- Burning in certified stoves would be allowed on yellow and red advisory days but owners would be held to a "no visible emissions" standard.
- A 50% opacity limit would help reduce smoke year round.

Aligning the existing Medford and Central Point woodstove curtailment ordinances to a unified approach required minor changes to incorporate the no visible emissions approach. On balance the Department and EPA believe that the unified approach (minor modification to existing ordinances, adding new areas to the curtailment program) will strengthen the overall woodstove strategy in the AQMA.

The unified ordinance applies in Jackson County, as well as the cities of Ashland[1], Central Point, Jacksonville, Medford, Phoenix, and Talent. The City of Eagle Point will continue to be encouraged to adopt the unified woodburning ordinance. Copies of local ordinances can be found in Appendix A-4.

The residential woodburning advisory (Red, Yellow, or Green) is calculated daily by assessing particulate concentrations and trends measured by the local nephelometer (located at Grant Ave. & Belmont Streets, Medford). Nephelometer data is used in combination with the local ventilation index and weather forecast to derive a predicted PM_{10} value for the next 24-hrs. General thresholds for the woodburning advisory are as follows:

Green Day: Predicted PM_{10} level less than 90 ug/m^3.
Yellow Day: Predicted PM_{10} level between 90 ug/m^3 and 129 ug/m^3.
Red Day: Predicted PM_{10} levels 130 ug/m^3 or more.

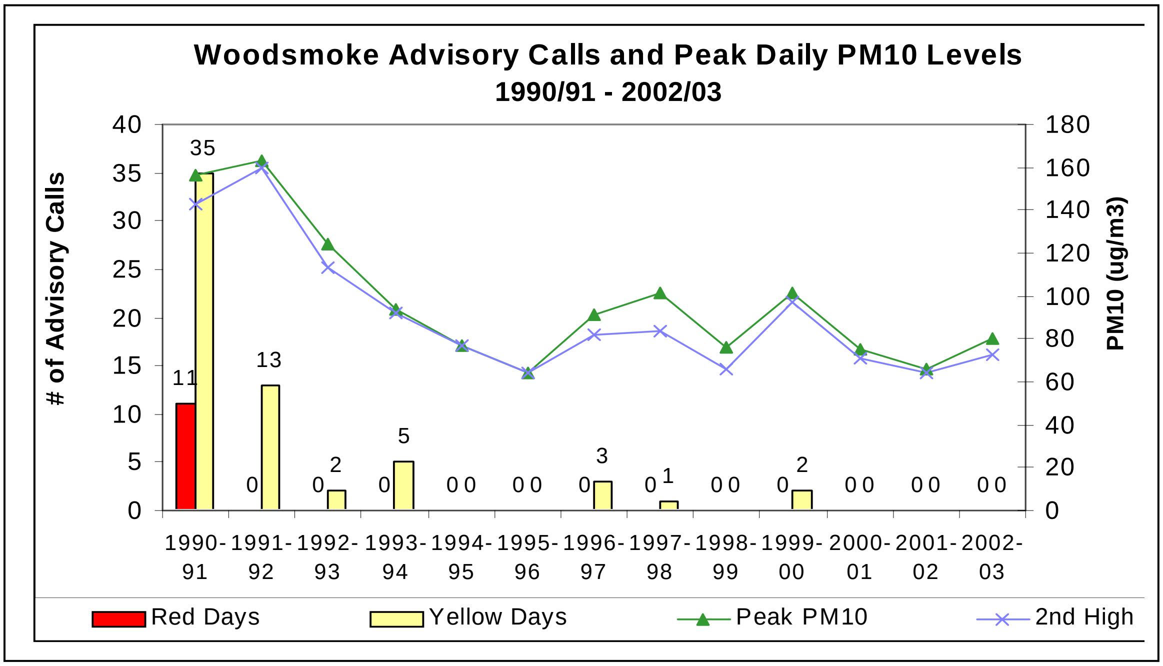
The daily advisory is made by Jackson County air program staff, and is based on both the predictive formula and on local knowledge and experience of air quality and weather patterns. The advisory is provided to the public every day during the woodheating season by 5:30 a.m. The county also maintains a phone number the public can call to hear the

[1] The City of Ashland's woodsmoke ordinance limits opacity to no more than 40%.

daily advisory. During the 2002/2003 woodheating season, the county received 18,614 calls.

Woodstove use and emissions have significantly decreased in the AQMA since the early 1990's. It has not been necessary to call a Red Day advisory since the 1990/91 woodburning season. Occasional Yellow Day advisories are necessary, and reflect the continuing potential for elevated PM_{10} levels during stagnation events. The lack of Red Day advisories is consistent with recent PM_{10} trends and the significant decrease in peak PM_{10} levels measured at Welch & Jackson and White City since 1991. Figure 66 shows the trend in Red and Yellow Day woodsmoke advisories.

Figure 66: Trend in Woodstove Curtailment Advisories and Peak PM_{10} Levels



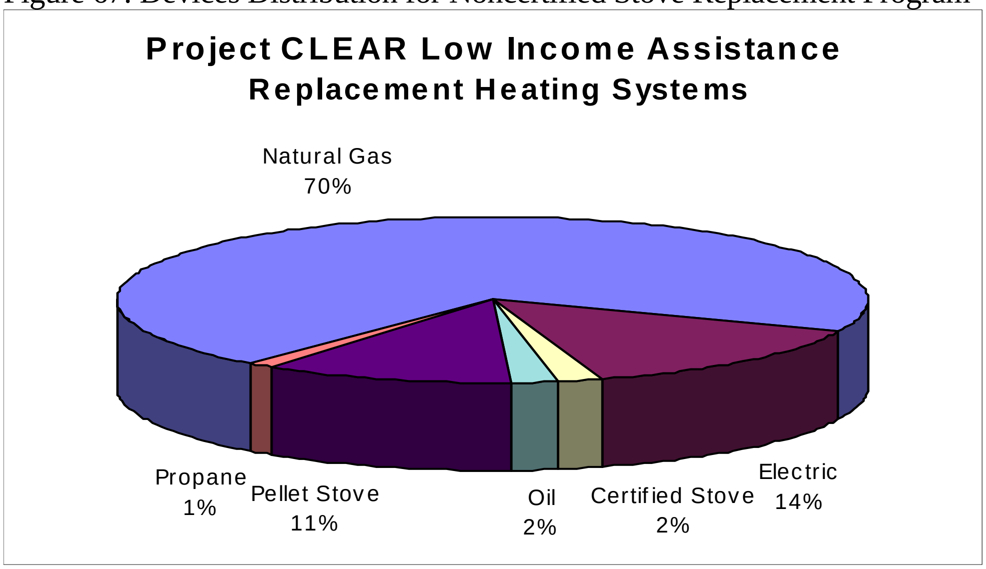
The attainment modeling analysis shows the potential for occasional high PM_{10} levels in the east Medford area. During the winter of 2003/2004, the Department conducted a special particulate study to evaluate wintertime PM2.5 levels in different areas of the AQMA. The study included new locations in Medford (including the area of model predicted PM_{10} exceedances), Central Point, White City, and other. The study allowed the Department to assess whether the curtailment program Nephelometer (located at Grant & Belmont) is located in the most appropriate area to capture residential woodheating patterns in the AQMA. The Department is currently reviewing results with the County. Early indications are that the Grant & Belmont is the best location for the curtailment program nephelometer. Refinements to the woodstove curtailment program could be made as needed based on the study results.

Woodstove Replacements: The Housing Authority of Jackson County began Project CLEAR (Cooperative Local Effort for Air Resources) in 1988 to replace woodstoves with cleaner burning units and provide cost-effective weatherization in low-income homes. Low income, woodburning homeowners are most likely to use older (high emitting stoves), have the highest fuel consumption (because of low stove efficiency), and can receive a hardship exemption from the woodstove curtailment regulations. Assisting this population to reduce emissions is a key part of the woodsmoke strategy.

About $1.8 million in funding from various sources has been obtained to date for the CLEAR project. The City of Ashland also implemented the SOLVE program (Save Our Livability, View and Environment) in July 1990. The SOLVE program also provides financial incentives (zero-interest or low-interest loans or rebates) for weatherization and the replacement of existing woodstoves.

To date, the Jackson County Housing Authority has replaced approximately 580 noncertified woodstoves in low income homes with cleaner burning alternatives, primarily natural gas. Figure 67 shows the distribution of heating device types selected to replace noncertified stoves removed under the CLEAR program. In addition to the replacement program, the Housing Authority requires that any woodstove be removed as a condition of the housing rehabilitation contract. This means that woodburning will continue to decline over time within the low income housing population.

Figure 67: Devices Distribution for Noncertified Stove Replacement Program



Home Weatherization: Home weatherization incentives (free energy audits, low-interest loans, and rebates) have been available for several years to all homeowners regardless of heat source. ACCESS (the local Community Action Program) has provided free cost-effective weatherization to low-income households. Weatherization of homes prior to installation of a new woodstove has been required by local ordinances of the City of Medford (No. 4732) and Jackson County (No. 82-6) since 1982.

Weatherization programs, combined with programs assisting the replacement of existing woodstoves with cleaner burning units, were expected to reduce woodburning emissions by about 5% by 1992. Other weatherization financial assistance programs, based on current participation rates, were expected to reduce woodburning emissions by about 3% by 1992. In 1995 WP Natural Gas (now AVista Corp.) completed 132 weatherization upgrades in low income homes, and in 1996, 79 out of 298 upgrades were for low income homes.

Woodstove Certification/Local Code Restrictions: The Oregon Woodstove Certification Program became effective on July 1, 1986. New stoves sold in Oregon since then must meet specified emission standards. Oregon's woodstove emission standards became more restrictive on July 1, 1988, and the EPA woodstove certification program also increased the stringency of woodstove emission performance standards. Changes to local and state building codes has also accelerated the attrition of older stoves. Jackson County adopted a ban on the installation of non-certified woodstoves (to prevent used non-certified stoves from being re-installed) on December 22, 1989. In 1992, the Oregon state building code was revised to prohibit the installation of noncertified woodstoves statewide.

4.14.7.2 Major Industry

The Oregon Environmental Quality Commission adopted specific industrial rules for the wood products industries in the Medford-Ashland AQMA in 1978, 1983 and 1989. The 1978 and 1983 rules included: (1) tighter pollution control requirements for particle dryers, fiber dryers, veneer dryers, large wood-fired boilers, charcoal furnaces, and air conveying systems for sanderdust and sawdust; (2) additional source testing requirements; (3) operation and maintenance plans to prevent or minimize excess emissions; and (4) site-specific fugitive dust control plans. These industrial requirements resulted in a 70% reduction in industrial particulate emissions between 1978 and 1986.

The 1991 PM_{10} strategy for major industry required: (1) tighter emission limits and better pollution control equipment on veneer dryers and large wood-fired boilers; (2) more extensive source testing and continuous emission monitoring in order to maximize performance of pollution control equipment; and (3) more restrictive emission offset requirements for new or expanding industries. These new requirements were projected to reduce industrial PM_{10} emissions by over 20% by the end of 1994, with most of this reduction occurring by 1992.

In 1998, the Advisory Committee recommended two additional interim actions to help address the uncertainty of future PM_{10} impacts from industrial sources.

The first relates to the expected reduction in particulate emissions that will likely occur as a side-benefit of the Maximum Achievable Control Technology (MACT) requirements for hazardous air pollutants. EPA has adopted rules (MACT) to reduce certain hazardous air emissions (air toxics) from particleboard and hardboard manufacturing. It is expected that several major facilities in the AQMA will need to reduce emissions in order to comply with MACT requirements, including the Timber Products, Sierra Pine, and Boise Cascade facilities. MACT applications are due in 2004, with compliance required by 2007.

In 1998, and in anticipation of MACT, the Timber Products facility committed to reduce PM_{10} emissions from their hardboard press vents by at least 90 percent by no later than November, 2003. Timber Products has completed the installation of emission control technology on their press-vents and particle dryers. This equipment is expected to provide a reduction in PM_{10} emissions of over 90%.

The attainment and maintenance modeling analysis show that these emission reductions are not needed to demonstrate compliance with PM_{10} standards. The voluntary reductions at Timber Products will not reduce the facility's allowable PM_{10} emissions. However, the reduction will provide a substantial air quality and public health benefit in the Medford area.

The second action involved an agreement between the Department and the Timber Products facility to temporary restrict ("embargo") the use of 79 tons/year in allowable PM_{10} emissions until the press vent emissions at that facility were controlled. As noted above, press-vent controls have been installed and are operational. This satisfies the 1998 agreement and repeals the embargo on allowable emissions at Timber Products.

Particulate reductions related to MACT are also possible at the Sierra Pine (Medite) facility and several Boise Cascade facilities. MACT applications from these facilities have been received by the Department and are being reviewed. It likely that some particulate reduction will result at these facilities as they comply with MACT standards. Any reduction in actual particulate emissions as a result of MACT pre-control will not reduce allowable permitted particulate levels for these facilities. It will however provide a substantial air quality and public health benefit.

Section 189(a)(1)(C) of the Clean Air Act requires states with moderate PM_{10} nonattainment areas to assure that reasonably available control measures are implement by no later than December 10, 1993. Rules for reducing PM_{10} emissions from major industrial sources were adopted in 1978, 1983, and 1989, and reflect reasonably available control measures (RACM) or better.

Table 16 lists the major PM_{10} facilities in the AQMA, with their main production processes and the current level of emission control technology. Table 17 lists the emission limit rules for major particulate industries in the AQMA. Compliance measurement methods include source testing and continuous emissions monitoring (CEM). Source testing is explicitly required for wood-fired boilers, veneer dryers, wood particle dryers, and charcoal plants. CEM's are required for wood-waste fired boilers, veneer dryers, fiber dryers, and particle dryers. Title V sources are also required to verify applicable emission factors for other processes such as cyclones and baghouses. Source testing, CEM, and emission factor verification requirements are specified in each facility's operating permit. Compliance measurement may also be required by the Department as needed to ensure that sources and air pollution control equipment are operated at their full efficiency and effectiveness.

Table 16: Major PM_{10} Producing Industrial Facilities

SOURCE NAME	EMISSION UNIT	EMISSION CONTROL EQUIPMENT	LAER/BACT
Boise RV Plywood	Boilers Veneer Dryers Plywood Presses	Wet ESP	LAER Lowest Achievable Emission Rate Technology
Murphy – White City	Veneer Dryer Cyclones	Ceilcote ionizing wet scrubber	BACT Best Available Control Technology BACT
White City Plywood	Veneer Dryers Material Handling	Electronic Filter Bed Baghouse	BACT LAER
Royal Oak	Briquette Dryer-NG Briquette Packaging	No controls. Source meets charcoal facility emission limit rule. Baghouse	BACT LAER
Timber Products (N.Medford plant)	Material Transfer Press Vents Plywood Dryers Particle Dryer	Baghouse Baghouse (Oct. install.) Electronic Filter Bed Wet ESP	LAER BACT BACT LAER
Sierra Pine (N. Medford)	Press Vents Boiler –Sander Dust Particle Dryers Material Handling	None. Source meets press vent emission limit rule. Wet ESP Wet Scrubber Baghouses	MACT (will apply for HAPs) LAER BACT LAER
Medply	Two Boilers – NG Material Handling Veneer Dryers	None. Meets Medford boiler rule. Cyclones (2) Baghouse None. Source meets Medford veneer dryer rule.	LAER BACT BACT
Cascade Wood Products	Material Handling	Cyclones (11) 2 to baghouse	BACT
Boise Cascade (N. Medford plant)	3 hog fuel boilers Veneer Dryers (3) Veneer Dryers (3) Plywood Presses (4) Material Handling	Dry ESP RCO (regenerative cat. ox) Wet ESP None. Source meets Medford veneer dryer rule. Baghouses (4)	LAER LAER LAER MACT (will apply for HAPs) LAER

Table 17: Rule Summary: Industrial PM_{10} Sources

Type of Process	Rule Requirement
Wood Waste Boilers OAR 340-240-0110	Rule adopted in 1989 to reduce emissions from existing large wood-fired boilers. Rule established an immediate requirement to meet 0.050 grains/dscf. It also established a compliance schedule to meet LAER level control (determined to be 0.015 grains/dscf at that time). The rule required compliance with LAER by no later than December 31, 1994; or upon powerhouse modernization or expansion, whichever occurred first. To lower permitted baseline emission levels and to provide some operational flexibility, facilities on the compliance schedule were allowed to set Plant Site Emission Limits using 0.030 gr/dscf (BACT level control), but actual boiler emissions had to meet LAER (0.015gr/dscf). All sources successfully met the compliance schedule. Powerhouse modernization projects that can be accomplished within the facility's existing permitted emission level are subject to the Medford rule. Proposed new and expanding power-house projects that trigger NSR are subject to both NSR emission control requirements in Division 224 (LAER), and the Medford rule. The facility would be subject to the more stringent requirement. LAER at that time may be the same or more stringent than the Medford rule established for existing boilers. The Medford rule also includes a 5%-10% opacity limit.
Veneer Dryers (Division 240-0120)	Specifies emission limits for various types of veneer drying processes. The Medford rules were adopted in 1991 to address veneer dryer emissions at existing facilities. Proposed new and expanding veneer dryer projects that trigger NSR are subject to both NSR emission control requirements (Division 224) and the Medford rule. The facility would be subject to the more stringent of LAER as it is determined at that time through NSR, or the emission limits set in the Medford rule. LAER at that time may be the same or more stringent than the Medford rule established for veneer dryers.
Air Conveying Systems (Division 240-0130)	Applies to air conveying systems emitting greater than 10 tons/yr PM. The rule requires installation of control systems that provide at least a 98.5% reduction in emissions. This rule was established to address existing facilities. Future new or expanding facilities are subject to NSR.
Wood Particle Dryers at Wood Particleboard Plants (Division 240-0140)	Wood Particle Dryers can not exceed an emission limit of 0.40 lbs/1,000 square feet of particleboard produced (3/4" basis). Rule also sets a 10%-20% opacity limit. This rule was established to address existing facilities. Future new or expanding facilities are subject to NSR.

Type of Process	Rule Requirement
Hardboard Manufacturing Plants (Division 240-0150)	Establishes emission limits for hardboard plants and associated press/cooling vents. Sets total plant emission limit (excluding press-vents at 0.25 lbs/1,000 sq-ft (1/8" basis); and plant limit (including press vents) of 0.55 lbs/1,000 sq-ft (1/8" basis). Therefore, sets a press/cooling vent limit of 0.30 lbs/1,000 sq-ft (1/8" basis). Proposed new and expanding hard board projects that trigger NSR are subject to both NSR emission control requirements (Division 224) and the Medford rule. The facility would be subject to the more stringent of LAER as it is determined at that time through NSR, or the emission limits set in the Medford rule. LAER at that time may be the same or more stringent than the Medford rule established for existing hardboard production.
Wigwam Waste Burners (Division 240-0160)	Rule prohibits the operation of a wigwam burner.
Charcoal Producing Plants (Division 240-0170)	Rule establishes emission limits for charcoal producing plants. Establishes total allowable emission limit for plant at 10 lbs of PM per ton of char produced.
Fugitive Emissions (Division 240-0180)	Requires many facility types to prepare and implement plans for controlling fugitive dust within their facility. For new and expanding sources subject to NSR, this rule would be considered part of LAER level control for the facility.
Requirement for Operation & Maintenance Plans (Division 240-0190)	Requires facilities to develop and implement an operation and maintenance plan to ensure the most efficient operation of the facility, and reduce and quickly correct any unintentional emission upsets. Required for Title V sources. Rules language establishes applicability.
Continuous Emissions Monitoring (Division 240-0210)	Requires instrumentation for measuring and recording emissions and/or process parameters that affect emissions, to ensure that air pollution control equipment is operated at full efficiency and effectiveness. Rule applies to wood-waste boilers, veneer dryers, fiber dryers, and particle dryers. CEM for these sources was required by no later than July 1, 1992 (w/one year extension possible). Rule was developed to address existing sources. CEM would be required as needed for new and expanding sources going through NSR.
Source Testing (Division 240-0220)	Rule requires periodic testing of emissions compliance: covers wood-waste boilers, veneer dryers, wood particle dryers, and charcoal plants. These rules apply to existing sources. Source test requirements for new and expanding facilities will be established by the Department case-by-case.
New Sources (Division 240-0230)	Requires new sources to comply with applicable Medford rules in addition to any NSR requirements. The more stringent requirement will

Type of Process	Rule Requirement
	apply.
Open Burning (Division 240-0250)	No open burning of domestic waste is allowed on any day or any time when the DEQ advises the general public that open burning is banned.

Note: In addition to Oregon NSR and maintenance plan requirements, federal major sources are also subject to requirements of the Prevention of Significant Deterioration (PSD) program.

4.14.7.3 Open Burning Strategies

Local ordinances throughout the AQMA restrict the practice of residential open burning. Below is a summary of local open burning restrictions[2].

Open burning is prohibited:

- Throughout Jackson County when the Ventilation Index (VI) is forecast below 400.
- Within the AQMA during November[3], December, January and February.
- At all times within the city limits of Medford and Jacksonville.
- During fire season as declared by the Oregon Department of Forestry.

Jackson County's air program staff and the Department's regional staff monitor and enforce open burning regulations as necessary. The open burning program also includes a significant effort for public outreach and education. Staff routinely make field visits to homeowners to provide educational materials, warnings, and citations as needed. A summary of local open burning ordinances can be found in Appendix A-4.

Alternatives to Burning: The public information program encourages alternatives to open burning, including composting and the transport of material to a local biomass energy production company (BioMass One). In addition, the State of Oregon offers a 35% tax credit toward the purchase of a wood chipper. This program seeks to help homeowners afford an alternative to open burning, especially in the urban/rural/forest interface areas where land clearing is conducted for fire safety.

4.14.7.4 Road Dust Strategies

PM_{10} emissions generated by motor vehicle traffic (road dust) have been reduced over the years through efforts to pave unpaved roads, curb and gutter shoulders on paved roads, minimize the use of sanding material, and to control mud and dirt trackout from industrial, construction and agricultural operations. Paving and other dust abatement projects are identified in the Regional Transportation Plan.

In addition, street cleaning programs are in place for the City of Medford, White City,

[2] Summary taken from Jackson County Air Quality Annual Report 2003, Jackson Bauers-Environmental Health.
[3] Jackson County may allow open burning up to November 15th, as long as air ventilation criteria are met.

and the connecting transportation corridor (Highway 62). Jackson County recently used CMAQ[4] funding to purchase a high efficiency street sweeper for use in the Medford-White City area. This street cleaning program is considered by the Department to be a Transportation Control Measure (TCM) for reducing particulate pollution. At a minimum, the cleaning program must continue to use a high efficiency, vacuum street sweeper(s) (or equivalent), provide geographic coverage that includes the cities of Medford, White City, and significant intervening travel corridors, and provide cleaning frequency no less than twice per month. (see Appendix A-6).

4.14.7.5 Other Strategies

Prescribed Forestry Burning

The Oregon Smoke Management Plan established an emission reduction goal for prescribed burning in Western Oregon with steadily decreasing emission targets between the 1976-79 baseline and the year 2000. Prescribed burning levels in recent years have been well below the emissions goal. In the future, prescribed burning is expected to increase over current levels to address forest health and fire safety issues. In the short term, burning levels may stay below the emission reduction goal established in the Smoke Management Plan (SMP). However, the Department is concerned about proposed future increases in prescribed burning. The state Smoke Management Plan is currently undergoing review and will be updated in 2005. The Department is participating on the SMP advisory committee and will ensure the continued protection of sensitive areas such as the Medford-Ashland AQMA.

Agricultural Trackout

The Jackson County Fruit Growers League has developed a policy to help reduce particulate emissions from roadway trackout. The trackout policy has been distributed to members of the Fruit Growers League and hobby agriculturists. Agriculturists will continue their voluntary efforts to reduce PM emissions by chipping and grinding their prunings and orchard removals. They will continue to use wind-machines and irrigation-related frost protection as a means to reduce reliance on orchard heaters. A copy of the Fruit Growers League policy is included as Appendix A-5.

4.14.7.6 Implementation of the Control Strategy

The initial PM_{10} attainment strategy for the AQMA was adopted by the Environmental Quality Commission and local jurisdictions in 1991. Compliance by major industry has been monitored by the Department. Implementation of the woodsmoke strategies has been accomplished through intergovernmental agreements between the Department and Jackson County. County air quality program staff operate the public information program, provide daily curtailment forecasting, and perform woodstove and open burning monitoring and enforcement. County staff also facilitate on-going partnerships between air quality program staff from all jurisdictions in the AQMA.

[4] Congestion Mitigation and Air Quality

4.14.7.7 Schedule for Implementation: On-Going Process

The original control strategies adopted in 1991 will be maintained. The woodstove curtailment program will be evaluated in light of new PM survey information (available spring 2004). The curtailment program may be modified as needed based on survey results. Road paving and other dust reduction projects will continue to be identified in the Regional Transportation Plan. While not required, PM_{10} emission reductions related to the MACT requirements for major industries are expected by 2007.

The Department will also continue work to address significant air quality issues affecting the AQMA. Of special interest is the impact of diesel trucks in the AQMA, air toxics, the planned increase in prescribed burning, and changes to the particulate strategy that may be needed in response to EPA's review and update of particulate standards (PM_{10} and $PM_{2.5}$).

4.14.8.0 Major New Source Review

New Source Review (NSR) is the program that governs emission increases from new and expanding major industry. The most restrictive NSR requirements apply in nonattainment areas, and these have been in effect in the AQMA for many years. Once an area is redesignated to attainment, the Clean Air Act provides an opportunity to design a more flexible NSR Program.

The NSR program includes three major elements:

- Significant Emission Rate (trigger level for the NSR process).
- Emission Control Technology Requirements.
- Air Quality Analysis and Emissions Growth Restrictions (airshed management).

While the Clean Air Act offers the opportunity to ease some New Source Review requirements in attainment areas, Rogue Valley communities have expressed a desire to retain the more stringent nonattainment area requirements for new and expanding major industry to better protect future air quality and public health in the Valley. These include:

- Significant Emission Rate: Based on the recommendation of the Medford-Ashland Air Quality Committee, the Significant Emission Rate (SER) for PM_{10} in the AQMA will continue to be 5 tons/year and 50 lbs/day. This will allow future industrial emission increases to be closely tracked and managed.

- Emission Control Technology: New and expanding major sources must install state-of-the-art emission control technology known as Lowest Achievable Emission Rate (LAER). The Medford-Ashland Air Quality Committee has recognized that while LAER is generally the more costly emission control approach, it is also the cleanest and most protective of public health. Continuing to require new and expanding industry to install LAER technology also provides equity for older existing facilities that have already invested significantly in state-of-the-art emission controls.

- Emission Offsets: New and expanding sources must obtain emission offsets at a ratio of 1:1.2 and produce a net air quality benefit. Citizens of the Rogue Valley have expressed their desire to retain this rigorous airshed management approach to better protect public health.

Once redesignated to attainment for PM_{10}, the Medford-Ashland AQMA will be both an Oregon PM_{10} Maintenance Area and a federal PM_{10} attainment area. In addition to Oregon requirements for New Source Review, federal requirements for the Prevention of Significant Deterioration (PSD) must also apply to federal major sources. Federal major sources are those facilities with emissions[5] of 250 ton/year or more, or specific industry types (listed in OAR 340-200-0020(25)) with emissions of 100 tons/year or more.

The PSD program includes emission control technology requirements for new and expanding industrial facilities; as well as two different air quality analysis requirements designed prevent a violation of federal PM_{10} standards, and limit the amount of air quality degradation that can occur from industrial emission increases. Any new or expanding federal major source will have to meet the more stringent of the Oregon NSR or federal PSD requirements. It is expected that the Oregon NSR requirements will be the more stringent.

4.14.9.0 PM_{10} Contingency Plan

A process must be established in the maintenance plan to quickly prevent or correct any measured violation of PM_{10} standards. This process of investigation and (if needed) corrective action is called the "contingency plan". Contingency plans typically have several stages of action depending on the severity of PM_{10} levels. Ambient PM_{10} thresholds are established in the contingency plan as early-warning action levels (one for the daily standard, another for the annual average standard). If monitored PM_{10} levels exceed these action levels, the contingency provisions are triggered.

If early-warning thresholds are exceeded, the first action will be an evaluation of relevant air quality data to determine why the triggering event occurred (i.e. was it a one time event or uncontrollable event such as a forest fire, or does it indicate a more serious and on-going problem). If circumstances warrant, the local advisory committee could be reconvened to assist the Department in reviewing air quality data, as well as the initial growth assumptions in the air quality plan to determine if any significant changes have occurred since plan adoption. The committee and Department could take corrective action as needed.

[5] Criteria pollutants such as PM10, CO, VOC

The Medford-Ashland PM_{10} contingency plan would be triggered if measured PM_{10} levels at either of the two PM_{10} monitoring sites (Medford or White City) exceed the early-warning thresholds below, or if a violation of PM_{10} standards occurs.

Phase 1: Risk of Exceedance

If monitored PM_{10} levels exceed 120 ug/m^3 (24-hr avg.) or 40 ug/m^3 (annual average), DEQ will assess the probable emissions and meteorological events contributing to elevated PM_{10} levels. At the Department's discretion, the Medford-Ashland Air Quality Advisory Committee may be convened to assist the Department in their review. The Department and Committee could recommend that no action be taken if it is determined that: (a) elevated PM_{10} levels were caused by an event that is unlikely to occur again within the maintenance planning timeframe, or (b) high PM_{10} levels were caused by an uncontrollable event such as a forest fire. If it is determined that the event was caused by conditions that could occur again, the Department and Committee will evaluate options for appropriate action, including the option for additional emission reduction strategies to prevent future exceedances or a violation of PM_{10} standards.

Phase 2: Measured Violation

If a violation of PM_{10} standards occurs, the Department and Committee will determine the probable emissions and meteorological events contributing to the violation, and will implement additional emission reduction strategies as needed to return the AQMA to compliance. The Clean Air Act also requires that all nonattainment area strategies be reinstated until the violation can be resolved and the maintenance plan revised. This 2004 maintenance plan already continues all previous nonattainment strategies. Therefore, should a violation occur, the Department will work to identify the new strategies necessary to ensure compliance.

4.14.10.0 Rules, Regulations and Commitments

The following rules and commitments have been adopted to assure the enforceability of the control strategies.

State of Oregon Rules

The Oregon Revised Statutes (ORS) 468.020, 468.295 and 468.305 authorize the Oregon Environmental Quality Commission to adopt programs necessary to meet and maintain state and federal standards. The mechanisms for implementing these programs are the Oregon Administrative Rules (OAR).

Specific air pollution rules applicable to the Medford-Ashland AQMA (OAR 340-240-0010 to 0070) are included in Section 3.1 of the Oregon State Implementation Plan.

OAR	Subject
340-240-0010	Purposes and Application (General)
340-240-0030	Definitions
340-240-0100	Application (Medford-Ashland AQMA)
340-240-0110	Wood Waste Boilers
340-240-0120	Veneer Dryer Emission Limitations
340-240-0130	Air Conveying Systems
340-240-0140	Wood Particle Dryers at Particleboard Plants
340-240-0150	Hardboard Manufacturing
340-240-0160	Wigwam Burners
340-240-0170	Charcoal Producing Plants
340-240-0180	Control of Fugitive Emissions
340-240-0190	Operation and Maintenance Plans
340-240-0210	Continuous Monitoring
340-240-0220	Source Testing
340-240-0230	New Sources
340-240-0250	Open Burning

Additional rules applicable statewide include, but are not limited to:

OAR	Subject
340-222-0010 to 0090	Plant Site Emission Limits
340-224-0010 to 0100	New Source Review
340-225-0010 to 0090	Air Quality Analysis Requirements
340-218-0010 to 0250	Oregon Title V Operating Permits
340-262-0010 to 0330	Residential Woodheating

Jackson County Ordinances and Orders

Codified Ordinance of Jackson County: Chapter 1810 (Air Pollution)

City of Medford Ordinances and Resolutions

City of Medford Municipal Code: 5.550 (Outside Burning)
City of Medford Municipal Code: 7.222 (Operation of Solid Fuel Burning Device Prohibition).

City of Central Point Ordinances and Resolutions

Title 8: Health and Safety (Open Burning)
Title 8: Health and Safety: (Solid Fuel Burning Devices)

City of Ashland Ordinances

Ashland Municipal Code: 10.30.010 (Open Burning)
Ashland Municipal Code: (Requirement for Solid Fuel Burning Devices)
AMA 9.08.060.J: Trackout restrictions

City of Talent Ordinances

Ordinance #565 (Open Burning)
Ordinance #98-635-0 (Solid Fuel Burning Device)

City of Phoenix Ordinances

City of Phoenix Municipal Code: Chapter 8.16 (Open Burning)
City of Phoenix Municipal Code: Chapter 8.20 (Woodheating Regulations)
Ordinance No. 792: Control of Dust and Trackout

City of Jacksonville Ordinances

Ordinance 375 (Open burning)
City of Jacksonville Municipal Code. Chapter 8.10 (Woodheating)

City of Eagle Point Ordinances

City of Eagle Point Municipal Code, Article IV, 8.08.16 (Open Burning)

Interagency Commitments

Oregon Department of Forestry Smoke Management Plan,
OAR 629-43-043

4.14.11.0 Emergency Action Plan Provisions

OAR 340 Division 206 describes Oregon's Emergency Action Plan. The rule is intended to prevent the excessive accumulation of air contaminants during periods of air stagnation which, if unchecked, could result in concentrations of pollutants which could cause significant harm to public health. The rules establish criteria for identifying and declaring air pollution episodes below the significant harm level and were adopted pursuant to requirements of the Clean Air Act. The action levels found in the Plan were established by the Environmental Protection Agency and subsequently adopted by the Department.

The 24-hour average emergency action levels for PM_{10} (adopted by the Environmental Quality Commission April 29, 1988) are as follows: significant harm level of 600 mg/m^3, emergency level of 500 mg/m^3; warning level of 420 mg/m^3; and alert level of 350 mg/m^3.

These PM_{10} levels, coupled with meteorological forecasts for continuing air stagnation, trigger the Emergency Action Plan. PM_{10} concentrations have never been measured at the warning, emergency or significant harm level in the Medford-Ashland AQMA. Alert levels were measured during a severe air stagnation episode in December 1985 and during wildfire impacts in September 1987.

Authority for the Department to regulate air pollution sources during emergency episodes is provided under Oregon Revised Statutes (ORS) Chapter 468, including emissions from woodstoves. When there is an imminent and substantial endangerment to public health, ORS 468.115 authorizes the Department, at the direction of the Governor, to enforce orders requiring any person to cease and desist actions causing the pollution. State and local police are directed to cooperate in the enforcement of such orders.

4.14.12.0 Public Involvement

Development of the initial 1991 Medford-Ashland AQMA PM_{10} control strategy included several areas of public involvement including a citizen advisory committee, public participation at hearings on proposed industrial source rules, and attendance at hearings conducted by the Jackson County Board of Commissioners and cities within the AQMA. Public involvement in the 1998-2004 plan revisions included a stakeholders advisory committee, public workshops, and public hearings.

4.14.12.1 Citizen Advisory Committees

The Jackson County Board of Commissions appointed members to the Jackson County Woodburning Task Force in May 1987 to assist the County, cities within the AQMA, and the Department in the development of control programs for the Medford-Ashland AQMA. The Task Force considered alternative control strategies and provided recommendations to the Board in December 1987.

In 1996, the Medford-Ashland Air Quality Advisory Committee was convened by the Department to assist in the development of the revised PM_{10} attainment plan and the PM_{10} maintenance plan. The Committee's recommendations, together with public comment, have been considered by the Department in drafting this attainment and maintenance plan. A record of materials submitted to the Committee and summary reports of Committee meetings are on file with the Department.

The 1996-2003 Committee membership includes one representative from each of the interests:

Medford-Ashland Air Quality Advisory Committee (2003)

- Local Business
- Jackson Co. Environmental Health Dept.
- City of Ashland
- City of Talent
- City of Medford
- City of Central Point
- City of Jacksonville
- City of Eagle Point
- City of Phoenix
- Jackson County Board of Commissioners
- Private Citizen
- Rouge Valley Transportation District
- Oregon Dept. Of Forestry
- Oregon Dept. of Transportation
- Jackson Co. Home Builders Association
- Jackson Co. Chamber of Commerce
- Jackson Co. Fruit Growers League
- Rouge Valley Council of Governments
- League of Women Voters
- Sierra Club
- Coalition To Improve Air Quality
- Boise Cascade Corporation
- Southern Oregon Timber Industries Association
- Rogue Disposal and Recycling, Inc.

4.14.12.2 Public Notice

Public notice of proposed rule revisions is done through mailing lists maintained by the Department, through notifications published in local newspapers, and through Department press releases.

4.14.12.3 Public Hearings

An informational public workshop was held on December 9, 2003, in Medford to provide the public an opportunity to ask questions of staff and express their air quality concerns. Briefings on the draft attainment and maintenance plan were provided to each city council in the AQMA and the Jackson County Board of Commissioners. A public hearing was held on December 16, 2003 to receive public testimony on the proposed attainment and maintenance plan. Due to intense public interest, the public comment period was extended to January 29, 2004, and second public hearing was held on January 21, 2004.

4.14.12.4 Intergovernmental Review

Public hearing notices regarding adoption of this revision to the State Implementation Plan will be distributed for public and state agency review prior to adoption by the Environmental Quality Commission.

4.14.12.5 State Implementation Plan Requirements

The Medford-Ashland PM_{10} Attainment and Maintenance plan meets all state implementation plan requirements specified in Section 110 and Part D of the Clean Air Act. In summary, Section 110 requires states to submit a plan that becomes part of the state implementation plan, to provide for the implementation, maintenance, and enforcement of air quality standards. Part D of the Clean Air Act outlines specific plan requirements for nonattainment areas.

4.14.12.6 Approved State Implementation Plan

The 2004 Medford-Ashland PM10 Attainment and Maintenance Plan contain emission reduction and emission growth management strategies needed to achieve and maintain compliance with PM10 standards. The PM10 Plan has been adopted as a revision to the State of Oregon Clean Air Act Implementation Plan (SIP).

4.14.12.7 1990 Clean Air Act Requirements (Attainment Date)

The Medford-Ashland AQMA has met the requirements for PM10 nonattainment area established in the 1990 Clean Air Act amendments. The area successfully met the applicable Clean Air Act attainment deadline of December 31, 2004.

4.14.12.8 Monitoring Network and Commitments

DEQ is responsible for the operation of the permanent ambient PM10 monitoring network in the Medford-Ashland AQMA. DEQ oversees the quality control and quality assurance program for the monitoring data.

DEQ will continue to comply with the air monitoring requirements if Title III, Section 319, of the Clean Air Act. The monitoring will also continue to be operated in compliance with EPA monitoring guidelines set forth in 40 CFR Part 58, “Ambient Air Quality Surveillance”, and Appendices A through G of Part 58. In addition, DEQ will continue to comply with the “Ambient Air Quality Monitoring Program” specified in Volume 2, Section 6 of the Oregon SIP. Further, DEQ will continue to operate and maintain the network of State and Local Air Monitoring Stations and National Air Monitoring Stations in accordance with the terms of the State/EPA agreement.

4.14.12.9 Verification of Continued Compliance

DEQ will analyze PM_{10} air quality data on a seasonal and annual basis to verify continued compliance with PM_{10} standards, in accordance with 40 CFR Part 50 and EPA’s Redesignation guidance. Monitored PM_{10} data will provide the information necessary to determine whether the AQMA continues to attain National Ambient Air Quality standards.

The Clean Air Act requires the state to submit a revision and update to the approved maintenance plan eight years after the first maintenance plan is approved by EPA. The updated maintenance plan must ensure continued compliance with PM_{10} standards for an additional ten years.

For the interim period between EPA approval of the plan and the required plan update, DEQ will rely on ambient monitoring data to track progress of the maintenance plan. The growth assumptions for the AQMA are modest. As long as monitoring data shows no significant upward trend in PM_{10} concentrations, a mid-term emission inventory update will not be necessary. If PM_{10} concentrations significantly increase over current levels, the cause will be investigated and further action take as necessary, consistent with the provisions of the Contingency Plan (Section 4.14.9.0).

4.14.12.10 Other Commitments

DEQ will conduct additional saturation studies as needed to evaluate the PM_{10} monitoring network, in consultation with EPA.

DEQ will evaluate growth and other planning assumptions as necessary through the provisions of the contingency plan described in Section 4.14.9.0.

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Appendices