Medford Carbon Monoxide Limited Maintenance Plan

By: Oregon Department of Environmental Quality

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State of Oregon
Department of Environmental Quality

State Implementation Plan Revision

Medford Carbon Monoxide Limited Maintenance Plan

A Limited Maintenance Plan

for Carbon Monoxide

The Medford Urban Growth Boundary

State of Oregon Clean Air Act Implementation Plan

Adopted by the
Environmental Quality Commission
December 9, 2015

State of Oregon
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Executive Summary

Medford, Oregon violated the national air quality standard for carbon monoxide in the 1970s and 1980s. Conditions have progressively improved and Medford has not violated the carbon monoxide (CO) standard since 1991. In 2001 Oregon submitted a ten-year CO Maintenance Plan to EPA and requested that Medford be redesignated to attainment. EPA approved the request as a revision to the State Implementation Plan (SIP) September 23, 2002.

Oregon DEQ has now prepared this second ten-year CO Maintenance Plan that indicates how Medford will continue to maintain the CO standard through September 23, 2022--the end of the second maintenance plan period. Once adopted by the Oregon Environmental Quality Commission this plan will be submitted to the EPA as a further revision of the SIP.

High levels of CO have been traditionally caused by motor vehicles emissions. The improvement of CO concentrations over previous decades is largely due to modern vehicle emission control systems which have reduced CO emissions dramatically.Because CO is so low this plan qualifies to use a Limited Maintenance Plan (LMP) which streamlines requirements for SIP approval. This technique is available to maintenance areas that have a design value of no higher than 7.65 ppm which is 85 percent of the 8-hour CO standard. By comparison Medford has a design value of 2.4 ppm or 27 percent of the standard.

All maintenance plans including LMPs need to establish the relationship between CO emissions and measured ambient CO concentrations. To speed development of this plan, the Rogue Valley Council of Governments contracted with Sierra Research to do assemable much of the Medford CO Emissions Inventory. DEQ and Sierra Research began with the EPA's 2008 National Emission Inventory (NEI) to quantify CO emissions in the Medford area.

This plan retains the control and contingency measures from the first CO maintenance plan. The primary control measure has been the emission standards for new motor vehicles under the Federal Motor Vehicle Control Program. Another significnat measure that continues is the New Source Review Program with Best Available Control Technology (BACT).

Another requirement for a LMP is to maintain a method of determining if an area's air quality degrades to the point where a violation could occur. Ambient CO concentrations in Medford declined to such low levels that the CO measurement equipment was removed in 2010. Because the Medford CO monitor has been removed, DEQ uses an alternate method to verify that the area continues to attain the CO standard. This alternate method of tracking CO emissions will be revised in the proposed limited maintenance plan. DEQ calculates Medford's CO emissions every three years through the Statewide Emission Inventory, which is submitted to EPA for inclusion in the National Emission Inventory. Under the new plan DEQ will evaluate any increase of Medford's CO emissions to determine if that would trigger the Contingency Plan. Control measures in the Contingency Plan include resuming testing CO concentrations in Medford's air, and if needed, forming an advisory committee to develop new strategies to prevent or correct any violation of the CO standard.

Plan Structure

This SIP revision includes the compliance history for Medford and describes how the area met and will continue to meet the standard. This document is organized as follows:

Section 1 – Introduction. Describes the purpose of this second maintenance plan, and summary on the CO standard.

Section 2 – Geographic Area. Describes the geographic area covered by the maintenance plan,

Section 3 – History of the Carbon Monoxide Problem. Summarizes Medford CO compliance history and past CO monitoring data and trends.

Section 4 – Limited Maintenance Plan Option. Describes the criteria an area must meet to qualify for this option and how Medford qualifies.

Section 5 – Emission Inventory. Includes historical information on the most significant CO emission categories from the original maintenance plan and an updated inventory on these categories.

Section 6 – Continuing Control Measures. Lists the measures that were in the original CO maintenance plan, and how these measures will be continued under this LMP.

Section 7 – Verification of Continued Attainment. Describes how compliance will be tracked and confirmed.

Section 8 – Contingency Plan. Describes the contingency measures that apply should a violation occur in the future.

Appendices – Supporting documentation for this LMP.

1. Introduction

This State Implementation Plan revision documents that the area within the Medford Urban Growth boundary will continue to meet the National Ambient Air Quality Standard (NAAQS) for CO through 2022. This plan also describes steps that must be taken if the area's carbon monoxide concentrations deteriorate to an to an actionable level. This plan is a "limited maintenance plan" developed in accordance with the federal Clean Air Act and the policies of the U.S. Environmental Protection Agency (EPA). See the 1995 "Paisie Memo" provided in Appendix 1.

The Clean Air Act requires EPA to set air quality standards to protect public health for six common air pollutants, including carbon monoxide. In 1971 EPA set the national ambient air quality standard for carbon monoxide. Carbon monoxide is a colorless, odorless gas that decreases the oxygen carrying capacity of the blood. High concentrations can severely impair the function of oxygen-dependent tissues, including the brain, heart, and muscle. Prolonged exposure to even low levels can aggravate existing conditions in people with heart disease or circulatory disorders. Motor vehicles are the primary source of CO in Oregon.

EPA established the national ambient air quality standard for CO at 35 parts per million (ppm) for a 1-hour average and 9 ppm for an 8-hour average. Two exceedances within one calendar year constitute a violation. Like most areas of the country that failed to meet the CO standard, Medford failed to meet the 8-hour portion of the standard[1].

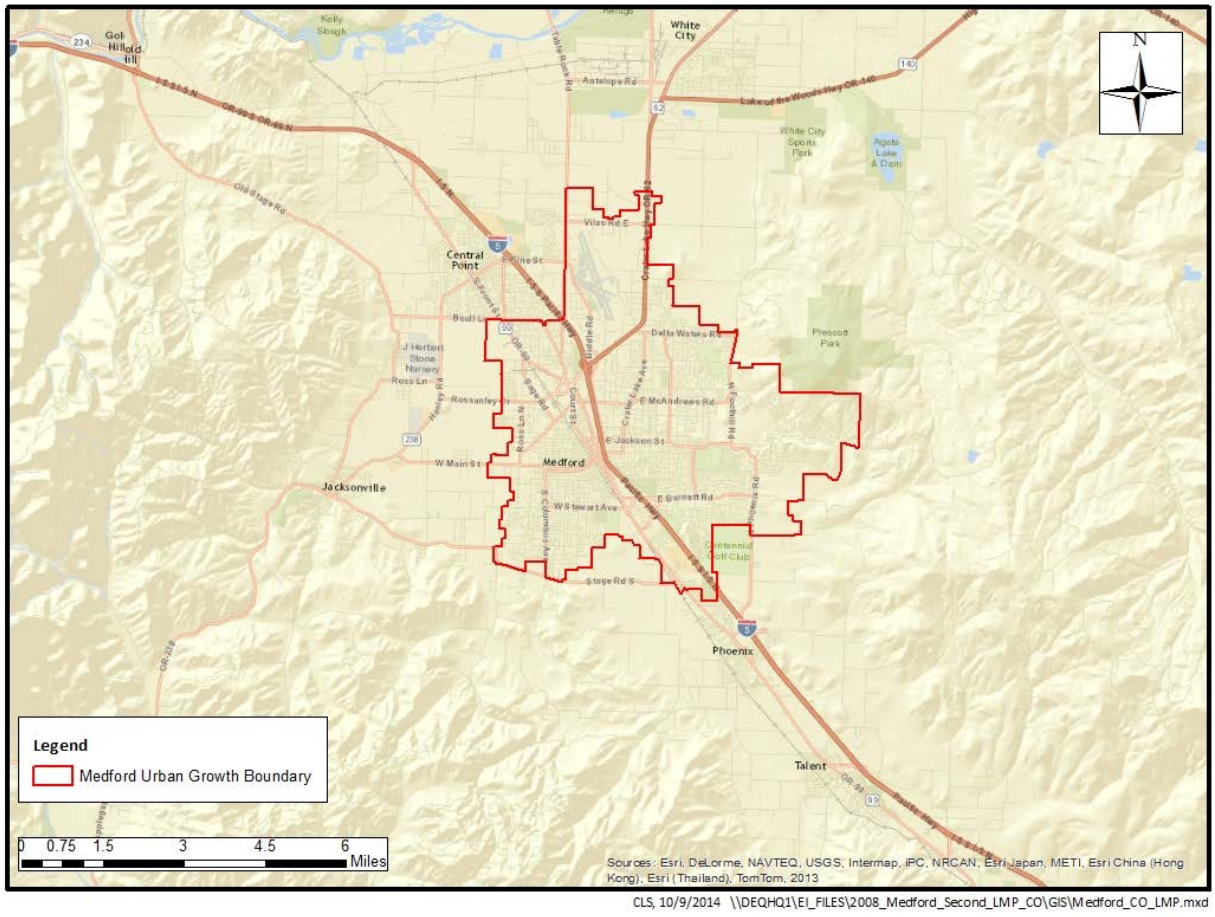
2. Geographic Area

The City of Medford is located in southwestern Oregon, West of the Cascade Mountains in the Rogue River Valley. The city is approximately 26 square miles in area, and the population in 2013 was 77,677. The surrounding hills can trap air pollution under stable meteorological conditions (inversions). These conditions exist most frequently during the winter and were associated with the majority of past carbon monoxide violations.

Figure 1 shows the Medford Urban Growth Boundary which is also the geographic area subject to this limited maintenance plan.

[1] 40CFR part 50.8 states that standards defined in parts per million should be compared "in terms of integers with fractional parts of 0.5 or greater rounding." This led to an interpretation by EPA that any 8-hour CO concentration of less than 9.5 ppm would be equivalent to attainment. Therefore, concentrations at or above 9.5 ppm represent an exceedance of the standard. Two exceedances in one calendar year constitute a violation.

Figure 1. Medford Urban Growth Boundary



3. History of CO Problem in Medford

History of CO in Medford Area/Design Values

The Medford area was designated by the Environmental Protection Agency (EPA) as a nonattainment area for carbon monoxide (CO) on March 3, 1978. On June 20, 1979 DEQ submitted a CO Control Strategy and requested an extension beyond 1982 to attain the CO standard. At that time the design value was 13.8 parts per million (ppm). EPA approved the 1979 plan and the extension, giving DEQ

until December 31, 1987 to bring the Medford area into compliance. An updated control strategy was submitted in 1982 which was revised in 1985 to include a state-operated vehicle inspection program.

Following adoption of the 1990 Clean Air Act Amendments, EPA classified Medford as a moderate CO nonattainment area with a design value of 12.1 ppm. The CO nonattainment boundary was defined as the Medford, Oregon Urban Growth Boundary (UGB) used for comprehensive land use planning under state law. In 2001, DEQ demonstrated that Medford had attained the 8-hour CO standard with a design value of 7.5 ppm and submitted a maintenance plan showing how the area would continue to meet the CO standard into the future. EPA approved the maintenance plan and redesignated Medford to attainment for CO effective September 23, 2002.

Since then, CO concentrations continued to improve and CO monitoring was ended in 2010 followed by EPA's approval of an alternate approach for tracking CO as shown in Appendix 3. Now DEQ is submitting a second CO maintenance plan with a design value of 2.4 ppm CO based on ambient monitoring from 2008 and 2009. This second CO plan is based on EPA guidance for limited maintenance plans as detailed by a memo from Joe Paisie dated October 6, 1995 and an email from Meg Patulski dated October 4, 2005.

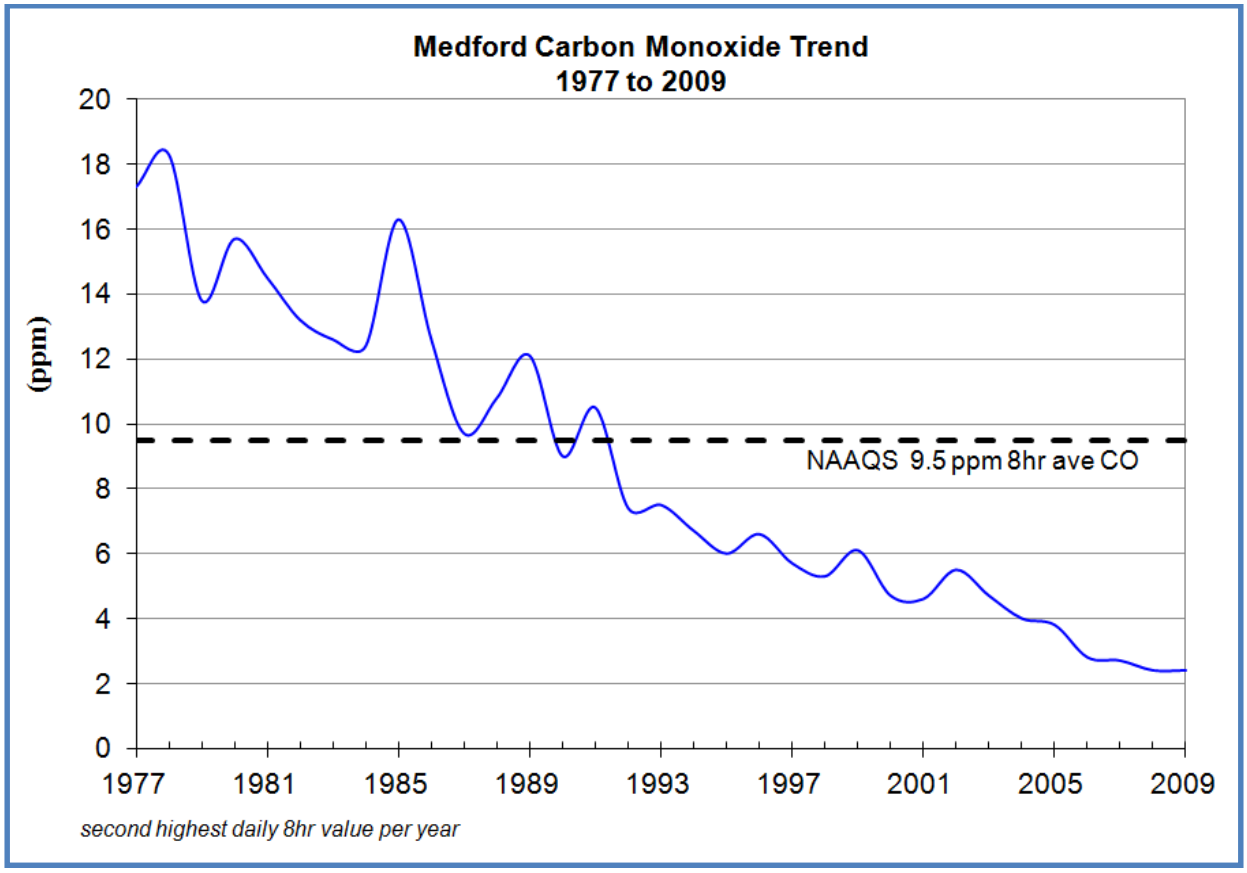
Historically, several carbon monoxide monitoring sites in the Medford nonattainment area exceeded the 8-hour NAAQS for CO. Exceedances were recorded for approximately half of the year in the late 1970s. However, because the control measures in the State Implementation Plan (SIP) were effective at reducing CO emissions, Medford air quality has met the CO standard since 1992. This is consistent with CO emission inventories from 1993 and 2008 which show that CO emissions in Medford continued to decline.

Table 1. Medford Carbon Monoxide Concentrations 1977-2009

	8-hour CO Averages	
Year	**Maximum**	**2nd Highest**
1977	21.8	17.3
1978	19.8	18.3
1979	16.2	13.8
1980	19.2	15.7
1981	14.9	14.5
1982	14.3	13.2
1983	15.8	12.6
1984	15.2	12.4
1985	16.9	16.3
1986	12.7	12.6
1987	12.9	9.7
1988	12.2	10.8
1989	12.2	12.1
1990	9.2	9.0
1991	11.9	10.5
1992	7.4	7.4
1993	8.5	7.5
1994	7.4	6.7
1995	6.1	6.0
1996	6.7	6.6
1997	7.3	5.7
1998	5.5	5.3
1999	6.8	6.1
2000	4.8	4.7
2001	4.8	4.6
2002	5.9	5.5
2003	5.0	4.7
2004	4.0	4.0
2005	4.4	3.8
2006	2.9	2.8
2007	3.1	2.7
2008	2.6	2.4
2009	2.4	2.4

(When multiple monitors operated in a given year, values shown are from the CO monitor with the highest second-high measurement.)

Figure 2. Medford Carbon Monoxide Trend 2nd highest 8-hour average, 1977-2009



4. Limited Maintenance Plan Option

EPA developed the Limited Maintenance Plan (LMP) option for areas with little risk of re-violating the carbon monoxide standard (see 1995 Paisie Memo, Appendix 1). EPA allows states to use this policy to prepare the required second 10-year maintenance plans, if the monitoring data show the design value is at or below 85 percent of the 8-hour CO standard, or 7.65 ppm. Determining the design value in this case is based on the higher of the two annual second highs in a two year calendar period. The Medford 8-hour design value is 2.4 ppm, based on the two most recent years of data (2008 and 2009). This is 27 percent of the the 8-hour standard and far below the 85 percent level at which an area is eligible for the LMP option.

The LMP approach does not require future year emission projections or a maintenance demonstration. A LMP must include an attainment inventory, provisions for verification of continued attainment, a contingency plan and a statement regarding conformity determinations. Due to the low measured CO values in Medford over the past 22 years, DEQ does not anticipate that CO levels will approach levels

that would exceed or violate the 8-hour CO standard, and as noted above, the Medford area has never exceeded the 1-hour CO standard.

5. Attainment Emission Inventory

The Medford area has met the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO) since 1991. In 2001 DEQ submitted the first Medford CO Maintenance Plan and requested that the area be redesignated to attainment. EPA approved that first Medford CO Maintenance Plan and redesignated the to attainment September 23, 2002. The current Emissions Inventory describes emissions for 2008, and is part of this proposed second limited maintenance plan showing that the area will continue to comply with EPA requirements. The principal components addressed in this inventory include stationary point sources, stationary area sources, non-road sources, on-road mobile sources, quality assurance implementation, and emissions summaries. The geographic focus for this 2008 emission inventory is the Medford CO Maintenance Area, which is defined as the Medford Urban Growth Boundary (UGB) plus emissions from industrial sources within 25 miles.

The following table summarizes contributions by source category. Emissions are reported for two time periods: annual emissions (in units of tons per year) and seasonal emissions (in units of pounds per day). A detailed breakdown of the 2008 CO emission inventory is provided in Appendix 2.

Table 2. Medford UGB 2008 CO Annual and Seasonal Emissions Inventory

	Annual		CO Season	
Source Type	tpy	% of Category	lbs/day	% of Category
Stationary Point Sources	2,376.1	15%	13,159	16%
Stationary Area Sources	3,333.1	21%	30,399	37%
Non-Road Mobile Sources	4,488.2	28%	10,061	12%
On-Road Mobile Sources	5,730.0	36%	28,731	35%
Total within Medford UGB	15,927.4	100%	82,350	100%

Using the MOVES 2010b emission factor model for an average CO season 2008 day, on-road mobile sources contribute 35% of the total CO air emissions in the Medford UGB. Gasoline vehicles contribute 97% of the CO emissions within the on-road mobile category, whereas diesel vehicles contribute 3% of the on-road mobile category.

Stationary area sources comprise 37% of the total CO air emissions in the Medford UGB on a CO season day. Within the area source category, residential wood combustion accounts for 49% of the emissions. Wood combustion in non-certified woodstoves and inserts accounts for 28% of the total

area source emissions. Prescribed burning accounts for 47% of the total area source emissions on a CO season day.

Non-road mobile sources contribute 12% of the total CO on an average CO season day. Within this category, 4-cycle engines comprise 79% of the total emissions.

Permitted stationary point sources comprise 16% of the CO air emissions in the Medford UGB on an average CO season day. This category includes permitted stationary sources with both federal Title V and state Air Contaminant Discharge Permits. There are 37 point sources within the Medford UGB and a 25-mile buffer zone around the UGB.

Emissions summaries for CO have decreased for both annual and season day as compared to the 1993 attainment year EI. Annual emissions have decreased 24%, and seasonal emissions have decreased 27% compared to the 1993 attainment year EI.

Figure 3. Medford UGB Annual CO Emissions Estimates, 1993 vs. 2008

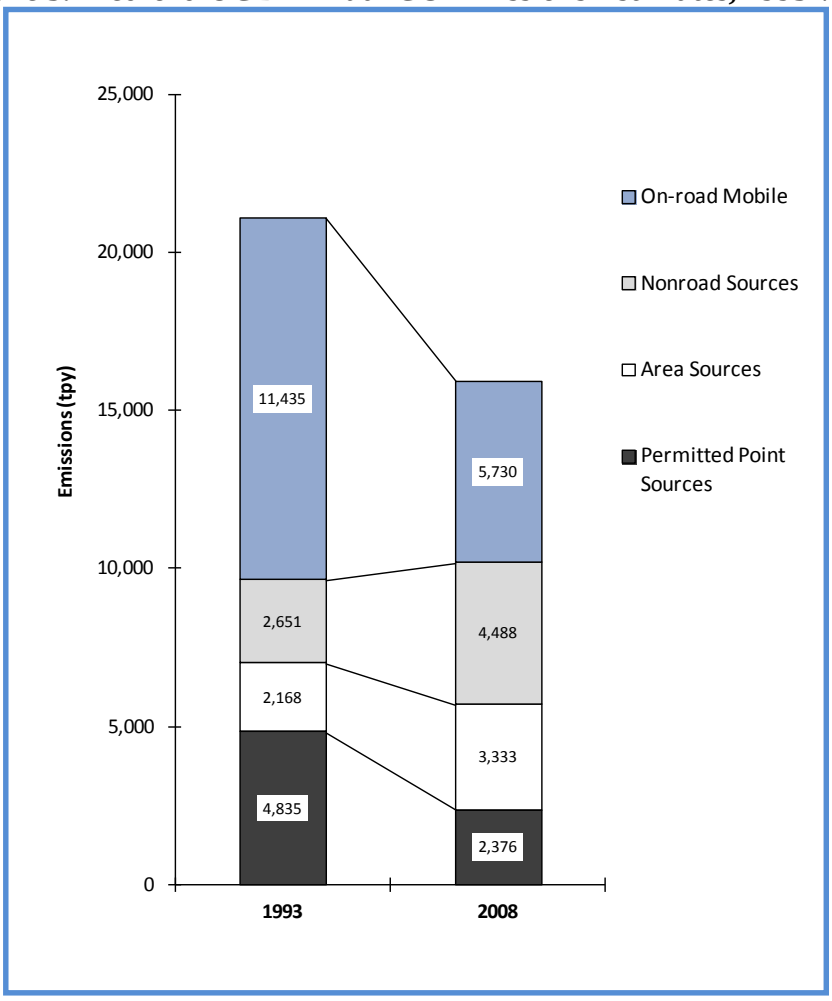
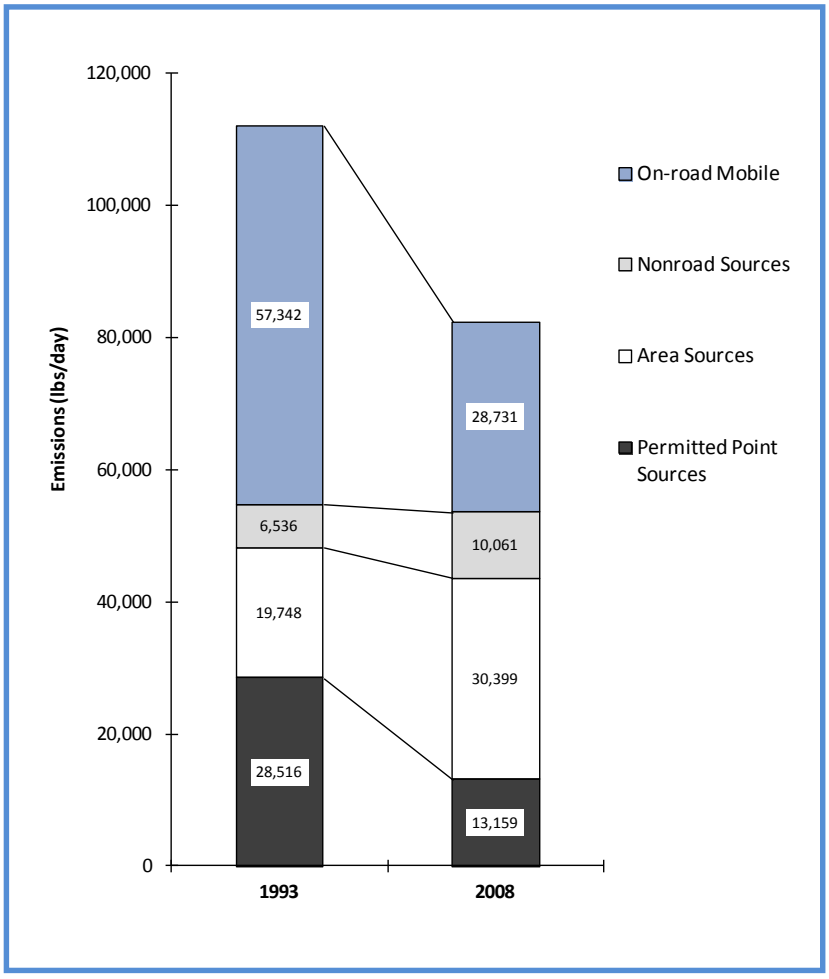


Figure 4. Medford UGB Season Day CO Emissions Estimates, 1993 vs. 2008



Details of the Oregon 2008 Medford UGB CO Limited Maintenance Plan Emission Inventory from point, area, non-road, and on-road mobile sources are presented in the full emission inventory included as Appendix 2. The amount of annual and seasonal CO emissions from stationary point, stationary area, non-road mobile, and on-road mobile sources are shown in Figures 3 and 4.

Figure 5. 2008 Medford Annual CO Emissions

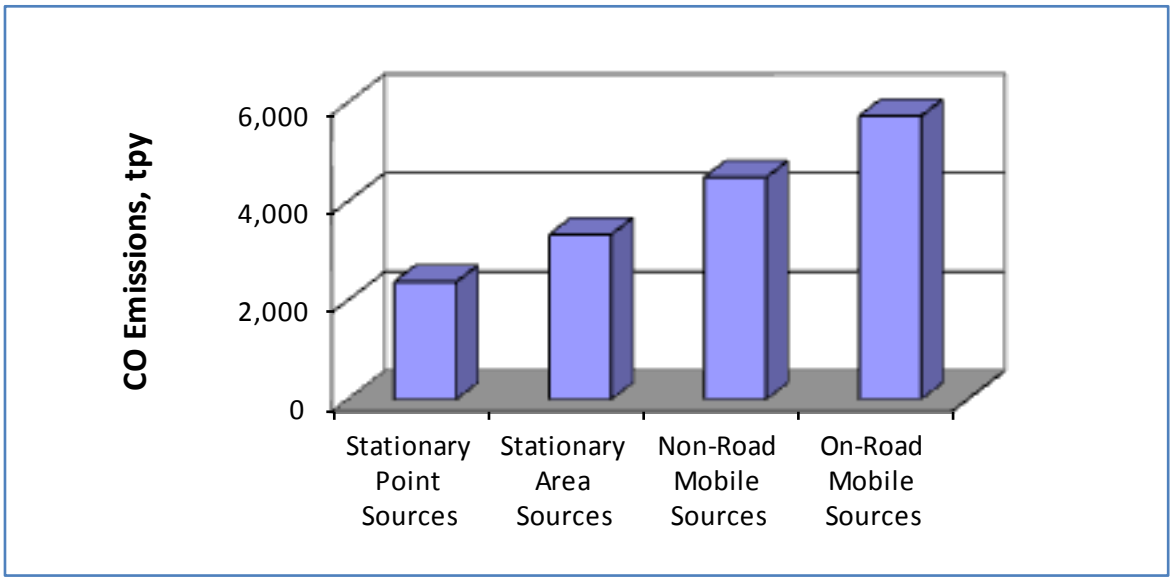
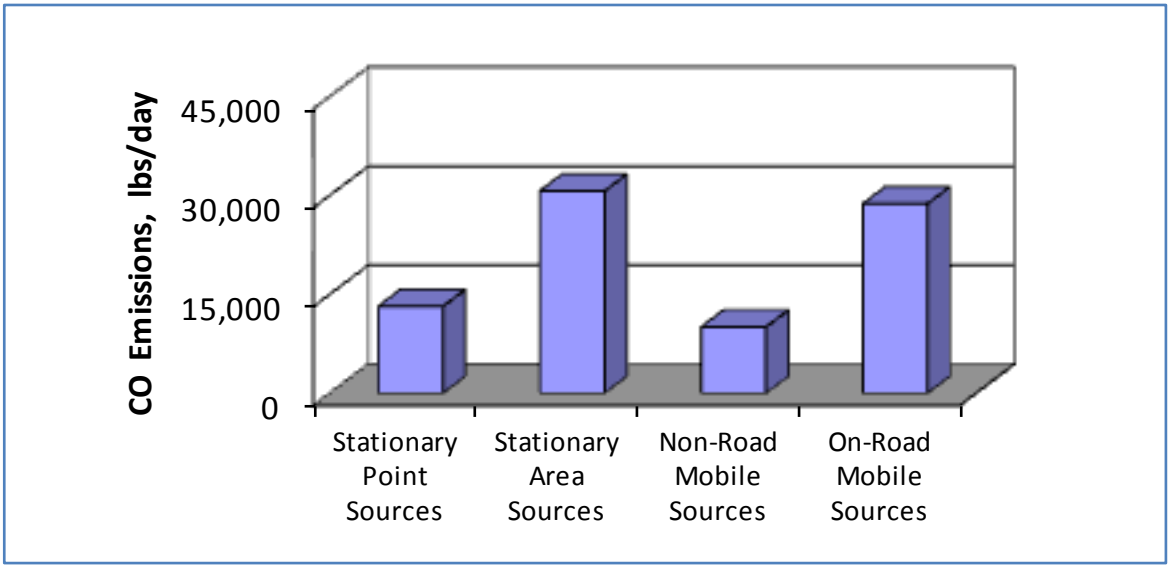


Figure 6. 2008 Medford Seasonal CO Emissions



6. Continuing Control Measures

To qualify for the LMP option, the plan must include all control measures that were relied on to demonstrate attainment of the NAAQS. The primary control measure has been the emission standards for new motor vehicles under the Federal Motor Vehicle Control Program. Other control measures have been the Motor Vehicle Inspection program, New Source Review program and a Woodstove Curtailment program.

Federal Motor Vehicle Emission Control Program

This limited maintenance plan continues to rely on federal emission standards for new motor vehicles. These requirements include the federal Tier II emission standards for new light and medium duty cars and trucks as well as standards for heavy duty on-road and non-road vehicles.

As noted in Table 2 above, on-road mobile sources are responsible for the highest annual CO concentrations in Medford. That is because cars and trucks moving through an area can assemble in significant numbers at areas of heavy traffic. The highest CO concentrations typically occur in a small region near a congested intersection as CO dissipates quickly as it moves away from its point of emission.

Emission reductions mandated by the Federal Motor Vehicle Emission Control Program have been primarily responsible for the large decrease in ambient CO concentrations in the past. Before CO emissions were regulated, a typical car of the 1950s emitted approximately 87 grams of CO per mile. Since then, federal rules have lowered CO emissions to the point where today's federal Tier II requirements limit cars to no more than 3.4 grams CO per mile - a 95% reduction of CO. This program will continue to be an effective control for on-road mobile source emissions in the future.

Major New Source Review

Under this limited maintenance plan, the emission control requirement for new or expanding major industry in Medford area will continue to require Best Available Control Technology (BACT). BACT technology provides a high level of control while allowing some flexibility and consideration of the cost effectiveness of different control options.

Motor Vehicle Inspection Program

Oregon's Vehicle Inspection Program (VIP) will continue to operate in the Medford area. Gasoline and light duty diesel vehicles up to 20 years old that are registered in the Medford-Ashland Air Quality Maintenance Area will continue to be subject to emissions testing and inspection when vehicle registrations are renewed. This program has operated since 1986 and has effectively reduced CO emissions by promoting proper vehicle maintenance.

Woodsmoke Curtailment

As noted in the previous section, residential wood combustion is a leading source of CO emissions from stationary area sources. However these sources of DO emissions are distributed widely and do not concentrate as on-road CO emissions can. These emission sources do not move and therefore contribute to a diffuse, low-level background concentration of CO. As shown in Table 2, stationary area sources represent 21 percent of the total annual and 37 percent of seasonal CO emissions in Medford. Woodsmoke emission control efforts have significantly reduced emissions through emission certification standards for new stoves, woodstove change-out programs to encourage removal of non-certified stoves, and a local voluntary curtailment program to reduce wood burning during stagnant weather periods. These efforts will be continued under this limited maintenance plan, and are expected to provide modest reductions in CO emissions in Medford.

Conformity requirements

Federal transportation conformity rules (40 CFR 51.390 and 93.100 et. seq.) and general conformity rules (40 CFR 51.851 and 93.150 et. seq.) continue to apply under a limited maintenance plan. However, as noted in the Paisie Memo these requirements are greatly simplified. Under a LMP vehicle emissions are not considered to be constraining so a Motor Vehicle Emissions Budget is not required. During future transportation conformity determinations, regional emissions analyses are not required (including modeling) as vehicle emissions are assumed to comply.[2]

[2] See Paise Memo in Appendix 1 for additional information on conformity requirements.

7. Verification of Continued Attainment

As described in this plan, CO levels in the Medford UGB have declined progressively since 1991. CO concentrations are not expected to increase significantly or threaten compliance with the CO standard. Because the Medford CO monitor was removed after 2009, DEQ implemented an alternate method of verifying continued attainment with the CO standard.

The proposed limited maintenance plan will change the way Medford's continued attainment is verified. DEQ will calculate CO emissions every three years as part of the Statewide Emission Inventory, which is submitted to EPA for inclusion in the National Emission Inventory (NEI). DEQ will review the NEI estimates to identify increases over the 2008 emission levels and report on them in the annual network plan for the applicable year. Because on-road motor vehicles and stationary area sources emit the most CO in Medford, these categories will be the focus of this review. Any increase in CO emissions will be evaluated by DEQ to verify it is not due to a change in emission calculation methodology, an exceptional event, or other factor not representative of an actual emissions increase. DEQ will consider a 10 percent increase over 2008 emission levels to be a "significant" emission increase for the purpose of triggering the Contingency Plan described in Section 8. Emission categories to be assessed for a significant increase are the total annual emissions, total seasonal emissions, annual or seasonal on-road emissions plus annual or seasonal area source emissions.

8. Contingency Plan

Section 175(A) of the Clean Air Act requires a maintenance plan to include contingency measures necessary to ensure prompt correction of any future violation of the the air quality standard. The first Medford maintenance plan contained contingency measures that would be implemented based on monitoring data--if CO concentrations exceeded 90 percent of the 8-hour standard (8.1 ppm) or if a violation of the standard were to occur. After the Medford CO monitor was removed in 2009, an alternate method of triggering the contingency measures was implemented.

Under the proposed limited maintenance plan a different Contingency Plan will apply. The new plan has three levels of action depending on the severity of the circumstances:

Phase 1. If DEQ's three-year periodic review of CO emissions shows a significant increase in emissions, as described in Section 7 of this plan, DEQ will resume monitoring ambient CO in Medford.

Phase 2. If the highest measured 8-hour CO concentration in a given year in Medford exceeds 7.65 ppm (the level at which an area is eligible for a Limited Maintenance plan), DEQ will evaluate the cause of the CO increase, and consider forming an advisory committee to recommend corrective strategies. Within 6 months of the validated 7.65 ppm or higher CO concentration, DEQ will prepare

a list of strategies to prevent or correct a violation of the 8-hour CO standard. This list is to facilitate a choice of strategies that might be implemented to reduce ambient CO concentrations.

The contingency strategies that will be considered include, but are not limited to:

- Improvements to parking and traffic circulation
- Aggressive signal retiming program
- Increased transit funding
- More stringent vehicle Inspection/Maintenance requirements, and
- Accelerated bicycle and pedestrian improvements.

DEQ (and the advisory group if needed) may also choose to conduct further evaluation, to determine if other strategies are necessary, or to take no further action if the problem was caused by an exceptional event.

Phase 3. If a violation of the CO standard occurs, and is validated by DEQ, in addition to Phase 2 above, DEQ will replace the requirement for new and expanding industry to apply Best Achievable Control Technlogy (BACT) with the requirement to apply Lowest Achievable Emission Rate (LAER) technology. In addition, DEQ will reinstate the requirement for new and expanding industry to offset any new CO emissions. More CO emission reduction measures identified in the evaluation of contingency Phase 2 may also be considered. Committing to further study in this way gives DEQ flexibility in choosing an appropriate approach should the need arise.

Appendix 1 - EPA 1995 Paisie Memo

October 6, 1995

MEMORANDUM

SUBJECT: Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas

FROM: Joseph W. Paisie, Group Leader
Integrated Policy and Strategies Group (MD-15)

TO: Air Branch Chiefs, Regions I-X

On November 16, 1994, EPA issued guidance regarding a limited maintenance plan option for nonclassifiable ozone nonattainment areas in a memorandum from Sally L. Shaver, Director, Air Quality Strategies and Standards Division, to Regional Air Division Directors. EPA believes that such an option is also appropriate for nonclassifiable CO nonattainment areas and the following questions and answers set forth EPA's guidance regarding the availability of this option for such areas. As this is guidance, final and binding determinations regarding the eligibility of areas for the limited maintenance plan option will only be made in the context of notice and comment rulemaking actions regarding specific redesignation requests.

If there are any questions concerning the limited maintenance plan option for nonclassifiable CO areas, please contact me at (919) 541-5556 or Larry Wallace at (919) 541-0906.
Attachment

cc: E. Cummings, OMS
K. McLean, OGC
C. Oldham
L. Wallace

10/6/95

Limited Maintenance Plan Option for Nonclassifiable CO
Nonattainment areas

1. **Question:**

What requirements must CO nonclassifiable areas, which are attaining the CO NAAQS with a design value that is significantly below the NAAQS, meet in order to have an approvable maintenance plan under section 175A of the Act?

Answer:

Nonclassifiable CO nonattainment areas seeking redesignation to attainment whose design values are at or below 7.65ppm (85 percent of exceedance levels of the CO NAAQS) at the time of redesignation may choose to submit a less rigorous maintenance plan than was formerly required. This new option is being termed a limited maintenance plan. Nonclassifiable CO areas with design values greater than 7.65ppm will continue to be subject to full maintenance plan requirements described in the September 4, 1992 memorandum, "Procedures for Processing Requests to Redesignate Areas to Attainment," from John Calcagni, former Director of the OAQPS Air Quality Management Division to the Regional Air Division Directors.

The EPA now believes that it is justifiable and appropriate to apply a different set of maintenance plan requirements to a nonclassifiable CO nonattainment areas whose monitored air quality is equal to or less than 85 percent of exceedance levels of the ozone NAAQS. The EPA does not believe that the full maintenance plan requirements need be applied to these areas because they have achieved air quality levels well below the standard without the application of control measures required by the Act for moderate and serious nonattainment areas. Also, these areas do not have either a recent history of monitored violation of the CO NAAQS or a long prior history of monitored air quality problems. The EPA believes that the continued applicability of prevention of significant deterioration (PSD) requirements, any control measures already in the SIP, and Federal measures (such as the Federal motor vehicle control program) should provide adequate assurance of maintenance for these areas.

2. **Question:**

Besides having a design value that is equal to or less than 85% of the CO NAAQS what other requirements are necessary for a nonclassifiable CO nonattainment area to qualify for the limited maintenance plan option?

Answer:

To qualify for the limited maintenance plan option, the CO design value for the area, based on the 8 consecutive quarters (2 years of data) used to demonstrate attainment, must be at or below 7.65ppm (85 percent of exceedance levels of the ozone NAAQS). Additionally, the design value for the area must continue to be at or below 7.65ppm until the time of final EPA action on the redesignation. The method for calculating design values is presented in the June 18, 1990 memorandum, "Ozone and Carbon Monoxide Design Value Calculations," from William G. Laxton, former Director of the OAQPS Technical Support Division to Regional Air Directors. The memorandum focuses primarily on determining design values for nonattainment areas in order to classify the areas as moderate or serious for CO. Therefore, the document discusses determining the design value for an area based on the monitors which are exceeding the standard. In the case of a nonattainment area seeking redesignation to attainment, all monitors must be meeting the standard. To assess whether a nonclassifiable area meets the applicability cutoff for the limited maintenance plan, a separate design value must be developed for every monitoring site. The highest of these design values is the design value for the whole area. If the area design value is at or below 7.65ppm, the State may select the limited maintenance plan option for the first 10-year maintenance period under section 175A. If the design value for the area exceeds 7.65ppm prior to final EPA action on the redesignation, the area no longer qualifies for the limited maintenance plan and must instead submit a full maintenance plan, as indicated in the September 4, 1992 memorandum.

3. **Question:**

What elements must be contained in a section 175A maintenance plan for nonclassifiable CO areas which qualify for the limited maintenance plan option?

Answer:

Following is a list of core provisions which should be included in the limited maintenance plan for CO nonclassifiable areas. Any final EPA determination regarding the adequacy of a limited maintenance plan will be made following review of the plan submittal in light of the particular circumstances facing the area proposed for redesignation and based on all relevant available information.

a. Attainment Inventory

The State should develop an attainment emissions inventory to identify a level of emissions in the area which is sufficient to attain the NAAQS. This inventory should be consistent with EPA's most recent guidance[1] on emissions inventories for nonattainment areas available at the time and should represent emissions during the time period associated with the monitoring data showing attainment. The inventory should be based on actual "typical winter day" emissions of CO.

b. Maintenance Demonstration

The maintenance demonstration requirement is considered to be satisfied for nonclassifiable areas if the monitoring data show that the area is meeting the air quality criteria for limited maintenance areas (7.65ppm or 85% of the CO NAAQS). There is no requirement to project emissions over the maintenance period. The EPA believes if the area begins the maintenance period at or below 85 percent of exceedance levels, the air quality along with the continued applicability of PSD requirements, any control measures already in the SIP, and Federal measures, should provide adequate assurance of maintenance over the initial 10-year maintenance period.

When EPA approves a limited maintenance plan, EPA is concluding that an emissions budget may be treated as essentially not constraining for the length of the maintenance

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[1]The EPA's current guidance on the preparation of emissions inventories for ozone areas is contained in the following documents: "Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone: Volume I" (EPA-450/4-91-016), "Emission Inventory Requirements for Ozone State Implementation Plans" (EPA-450/4-91-010), and "Procedures for Emission Inventory Preparation: Volume IV, Mobile Sources" (EPA-450/4-81-026d).

period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result.

c. Monitoring Network/Verification of Continued Attainment

To verify the attainment status of the area over the maintenance period, the maintenance plan should contain provisions for continued operation of an appropriate, EPA-approved air quality monitoring network, in accordance with 40 CFR part 58. This is particularly important for areas using a limited maintenance plan because there will be no cap on emissions.

d. Contingency Plan

Section 175A of the Act requires that a maintenance plan include contingency provisions, as necessary, to promptly correct any violation of the NAAQS that occurs after redesignation of the area. These contingency measures do not have to be fully adopted at the time of redesignation. However, the contingency plan is considered to be an enforceable part of the SIP and should ensure that the contingency measures are adopted expeditiously once they are triggered by a specified event. The contingency plan should identify the measures to be promptly adopted and provide a schedule and procedure for adoption and implementation of the measures. The State should also identify specific indicators, or triggers, which will be used to determine when the contingency measures need to be implemented. While a violation of the NAAQS is an acceptable trigger, States may wish to choose a pre-violation action level as a trigger, such as an exceedance of the NAAQS. By taking early action, a State may be able to prevent any actual violation of the NAAQS and, therefore, eliminate any need on the part of EPA to redesignate an area back to nonattainment.

e. Conformity Determinations Under Limited Maintenance Plans

The transportation conformity rule (58 FR 62188; November 24, 1993) and the general conformity rule (58 FR 63214; November 30, 1993) apply to nonattainment areas and maintenance areas operating under maintenance plans. Under either rule, one means of demonstrating conformity of Federal actions is to indicate that expected emissions from planned actions are consistent with the emissions budget for the area. Emissions budgets in limited maintenance plan areas may be treated as essentially not constraining for the length of the initial maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result. In other words, EPA would be concluding that emissions need not be capped for the maintenance period. Therefore, in areas with approved limited maintenance plans, Federal actions requiring conformity determinations under the transportation conformity rule could be considered to satisfy the "budget test" required in sections 93.118, 93.119, and 93.120 of the rule. Similarly, in these areas, Federal actions subject to the general conformity rule could be considered to satisfy the "budget test"

(DRAFT)

Appendix 2 To
Medford 2015 CO Limited Maintenance Plan

2008 Year Emission Inventory
For Carbon Monoxide (CO)

Medford Urban Growth Boundary

June 2015

Oregon Department of Environmental Quality
Environmental Solutions Division
Air Quality Technical Services Section
811 SW 6th Avenue
Portland, Oregon 97204

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1 Executive Summary

The Medford Carbon Monoxide (CO) Maintenance Area has met the National Ambient Air Quality Standards (NAAQS) for carbon monoxide. In accordance with the 1990 Federal Clean Air Act Amendments, the area has been redesignated to attainment status through the development of a Redesignation Request / Maintenance Plan. This limited maintenance plan inventory is for 2008, and is provided as part of the maintenance plan package to show compliance with published EPA requirements. The principal components for development and documentation that have been addressed in this inventory include stationary point sources, stationary area sources, non-road sources, on-road mobile sources, quality assurance implementation, and emissions summaries. The geographic focus for this 2008 emission inventory is the Medford CO Maintenance Area, which is defined as the Medford Urban Growth Boundary (UGB).

The following table summarizes contributions by source category for annual and seasonal CO emissions within the Medford UGB for 2008.

Executive Summary, Table 1 Medford UGB 2008 Estimated CO Emissions Contribution by Source Category.

	Annual		CO Season	
Source Type	tpy	% of Category	lbs/day	% of Category
Stationary Point Sources	2,376.1	15%	13,159	16%
Stationary Area Sources	3,333.1	21%	30,399	37%
Non-Road Mobile Sources	4,488.2	28%	10,061	12%
On-Road Mobile Sources	5,730.0	36%	28,731	35%
Total within Medford UGB	15,927.4	100%	82,350	100%

During the average CO season 2008 day, on-road mobile sources contribute 35% of the total carbon monoxide (CO) air emissions in the Medford UGB. Gasoline vehicles contribute 97% of the CO emissions within the on-road mobile category, whereas diesel vehicles contribute 3% of the on-road mobile category.

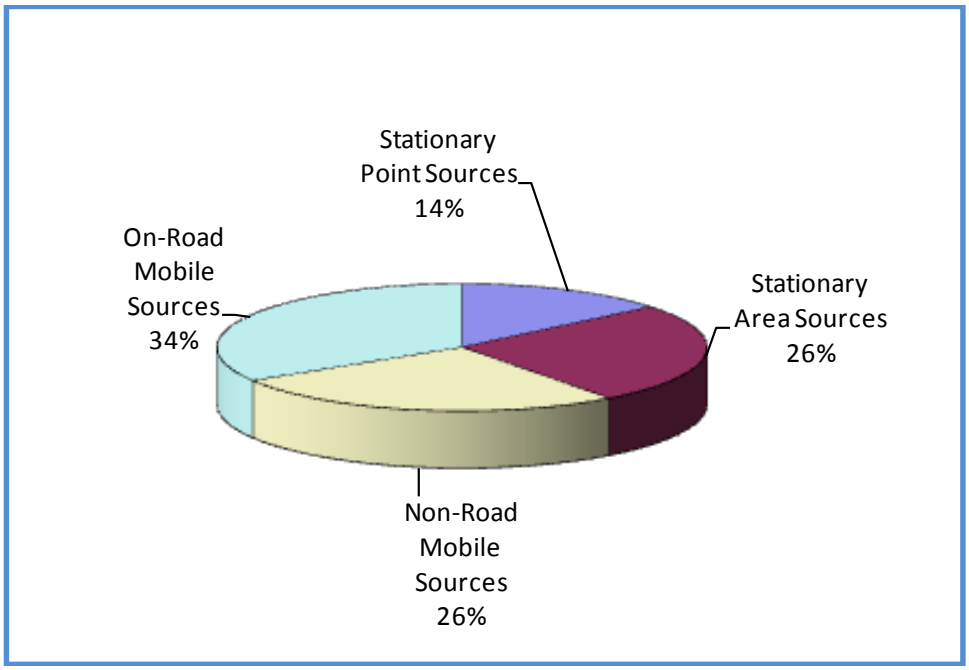
Stationary area sources comprise 37% of the total CO air emissions in the Medford UGB on a CO season day. Within the area source category, residential wood combustion accounts for 49% of the emissions. Wood combustion in non-certified woodstoves and inserts accounts for 28% of

the total area source emissions. Prescribed burning accounts for 47% of the total area source emissions on a CO season day.
Non-road mobile sources contribute 12% of the total CO on an average winter day. Within this category, 4-cycle engines comprise 79% of the total emissions.

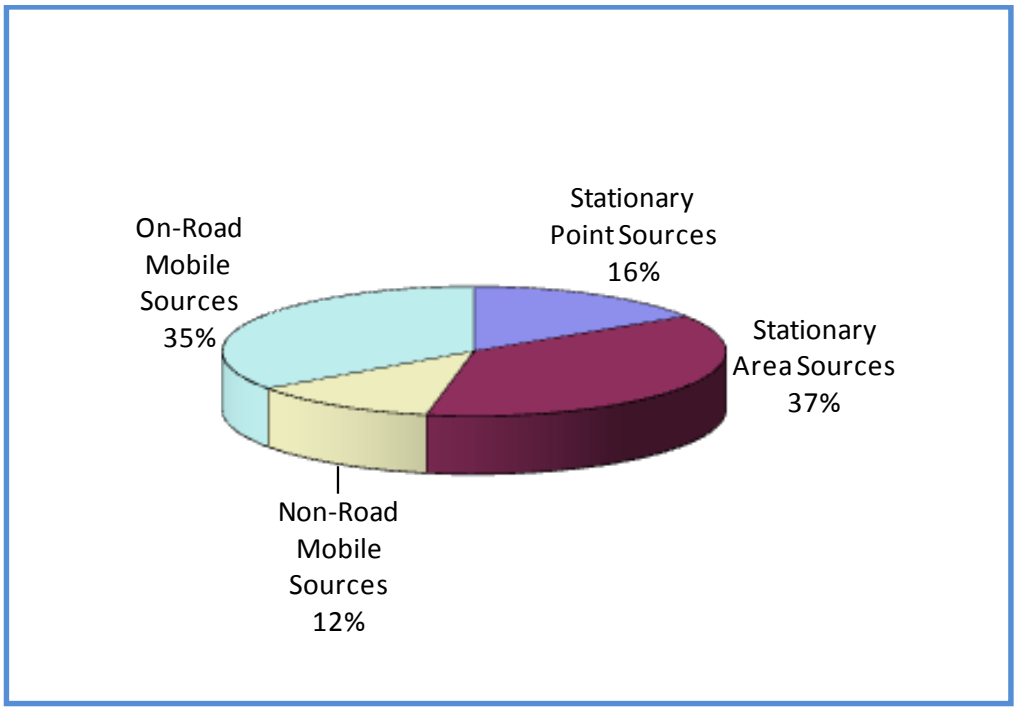
Permitted stationary point sources comprise 16% of the CO air emissions in the Medford UGB on an average CO season day. This category includes permitted stationary sources with both federal TV and state ACDP permits. There are 37 point sources within the Medford UGB and a 25-mile buffer zone around the UGB.

Emissions summaries for CO have decreased for both annual and season day as compared to the 1993 attainment year EI. Emissions have decreased 24% annually, and 27% for a season day as compared to the 1993 attainment year EI.

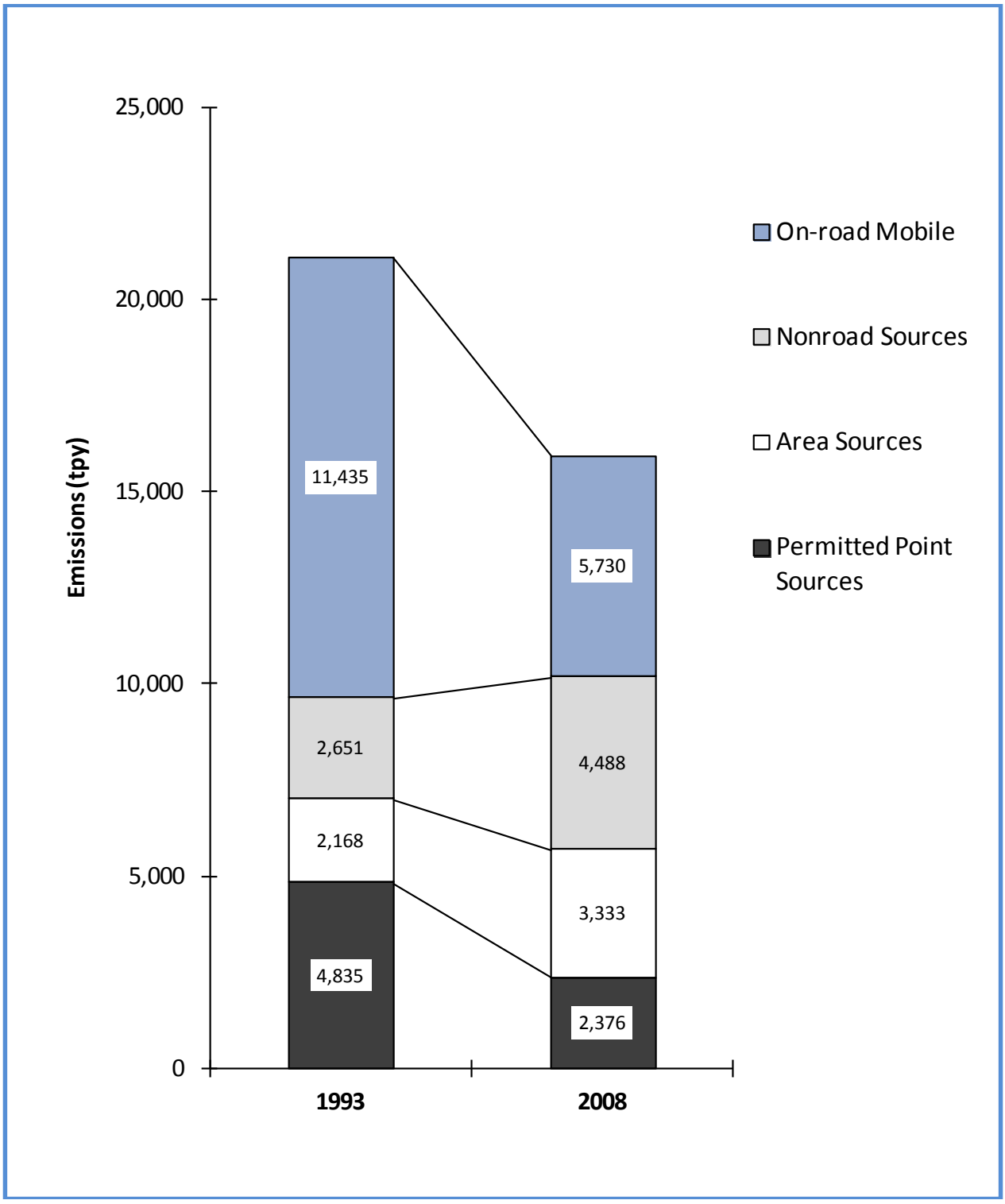
Details of the Oregon 2008 Medford UGB CO Limited Maintenance Plan Emission Inventory from point, area, non-road, and on-road mobile sources are presented in the following document. The relative percentage of annual and seasonal CO emissions from stationary point, stationary area, non-road mobile, and on-road mobile sources are shown in the Executive Summary Figures 1 through 4



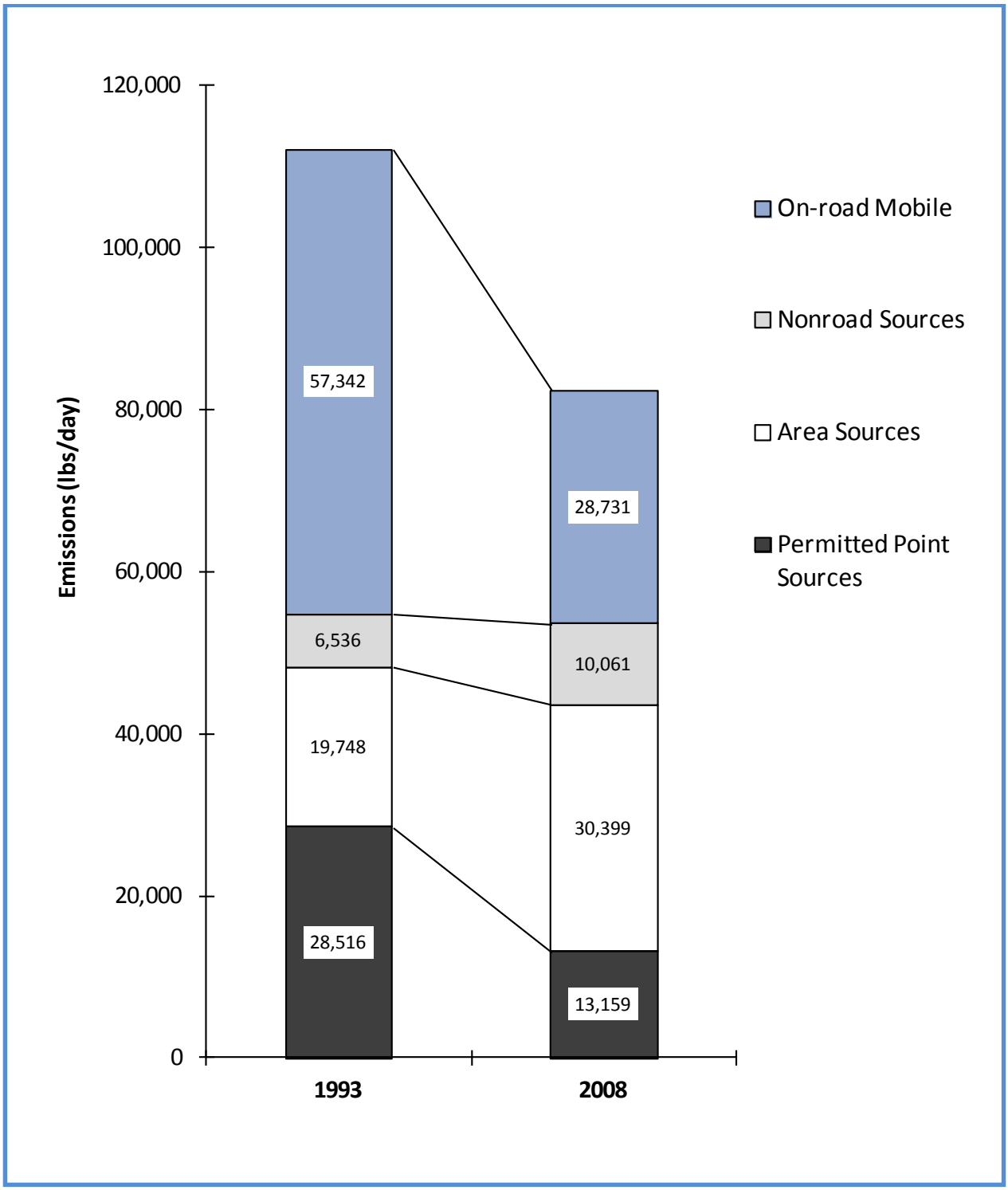
Executive Summary, Figure 1: 2008 Medford UGB annual CO emissions, percentage by source category



Executive Summary, Figure 2: 2008 Medford UGB CO season day emissions, percentage by source category



Executive Summary, Figure 3: Medford UGB Annual CO Emissions Estimates, 1993 vs. 2008



Executive Summary, Figure 4: Medford UGB Season Day CO Emissions Estimates, 1993 vs. 2008

2 Introduction

2.1 Purpose of the Report

The Clean Air Act Amendments (CAAA) of 1990 authorized the U.S. Environmental Protection Agency (EPA) to designate nonattainment areas with respect to the National Ambient Air Quality Standards (NAAQS). Under the 1990 CAAA, pre-enactment carbon monoxide nonattainment areas were classified according to the severity of nonattainment. Each state was required to submit a list designating nonattainment areas within the state.

Oregon submitted a list of areas that were in nonattainment to EPA on 15 March 1991. The area within the Medford Urban Growth Boundary was listed as nonattainment for carbon monoxide (Medford UGB / NAA). The nonattainment area had a design value of 7.5 parts per million (ppm) for carbon monoxide, and exceeded the NAAQS in the period 1977 through 1991. The NAAQS limit is 9 ppm, but it must reach 9.5 ppm to be considered an exceedance. The highest recorded CO value measured in Medford was 21.8 ppm at the Brophy building site in 1977. Previous nonattainment boundaries included the entire Medford Air Quality Maintenance Area (AQMA) under former Governor Straub in 1978. Due to hot spot problems within the downtown region of Medford in 1982, the nonattainment area was revised to include only the central business district. The nonattainment area was again modified in 1992 when the Federal Register promulgated the designation of the Medford UGB / NAA as nonattainment for CO on November 30, 1992 by letter from Governor Roberts.

The emission inventory area for the Medford CO nonattainment area was delineated as the Medford UGB in the *Inventory Preparation Plan* (IPP) submitted September 15, 1997. The Oregon CO IPP was approved by EPA Region X on June, 10, 1998 by letter from Joan Cabreza. This document fulfills the EPA requirements for preparing the limited maintenance plan 2008 year emission inventory, specified in the provisions of the 1990 CAAA, and EPA guidance documents.

2.2 Inventory Time Frame and Area Covered

The 2008 limited maintenance plan inventory covers carbon monoxide emissions for the Medford Urban Growth Boundary (UGB) maintenance area. 2008 was chosen as the bse year because it is the most recent National Emission Inventory (NEI) year for which the DEQ has PM2.5 monitoring data for the Medford area. Emissions are reported in this inventory for two representative time periods: Annual Emissions (in units of “tons per year”) and Seasonal Emissions (in units of “pounds per day”). Annual emissions represent CO emissions generated over the 2008 Maintenance Year. Seasonal emissions represent CO emissions generated on an average day in a three-month period - called the CO season - when ambient CO accumulations are typically the highest. For the Medford UGB, the CO Season is defined as the period of three consecutive months: December through February.

The geographic area of the Medford UGB is shown in Figure 1. Figure 2 shows boundaries used for the permitted point source section of the 2008 emission inventory. As in the 1993 attainment year inventory, a 25-mile buffer zone is the starting point for point source boundary definition. The 25-mile extension to the UGB area includes incorporated and unincorporated Jackson County and a part of Josephine County. Populated areas within the 25 mile buffer included in this inventory are Medford, Rogue River, Grants Pass, and White City.

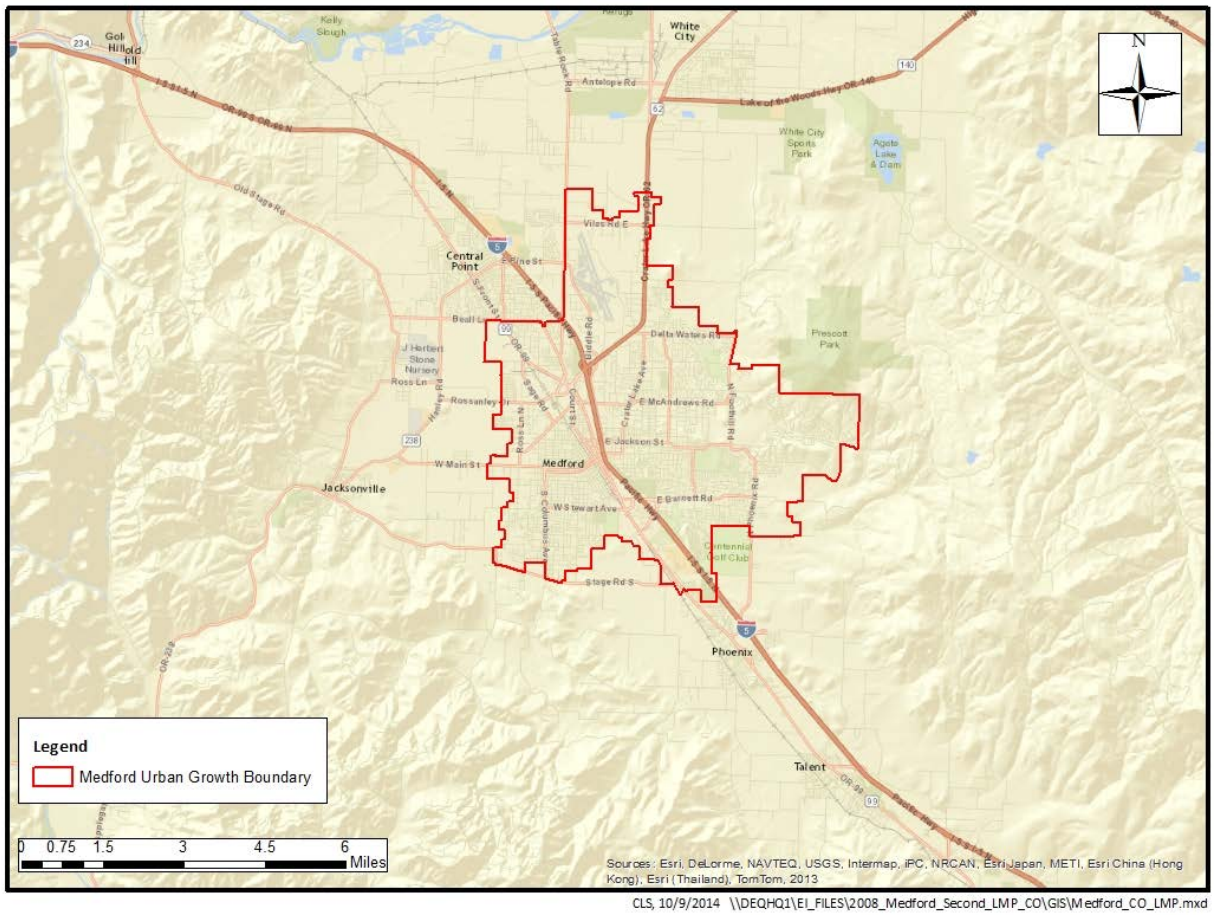


Figure 1: Medford Urban Growth Boundary

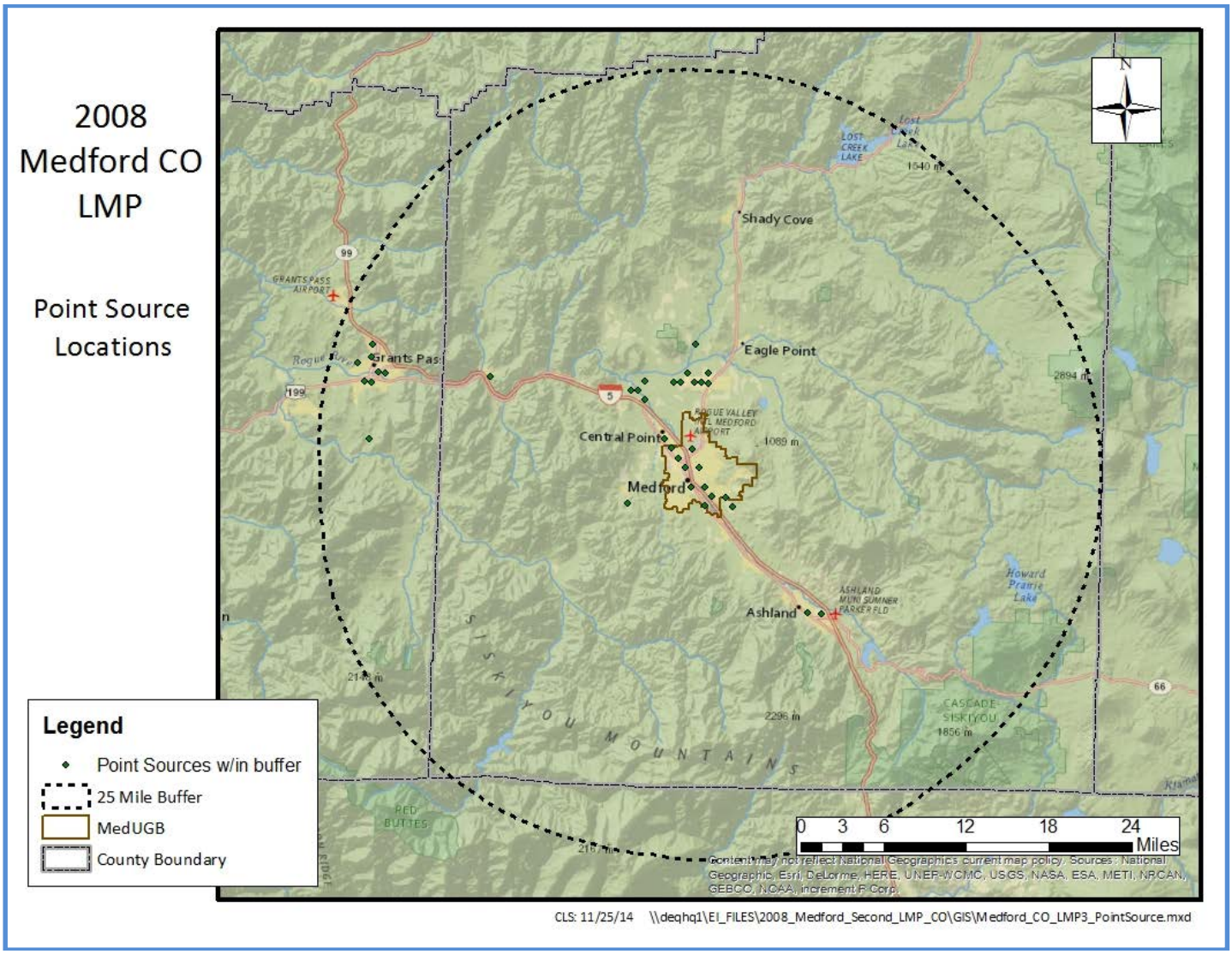


Figure 2: 2008 Medford CO LMP, 25-mile buffer and permitted point source locations

2.3 Report Contents

The Report is divided into the following components:

Part 1:	Introduction to the Report
Part 2:	Medford CO 2008 Limited Maintenance Plan Emission Inventory
Part 3:	Quality Assurance and Quality Control
Part 4:	References
Part 5:	Appendices

- Part 1 provides an introduction to this Report and its purpose. Contents of the Report are briefly described. Information concerning automated systems is included. Sources not inventoried for the inventory are described along with a rationale for the exclusions. EPA procedure and guidance documents used in preparing the inventory are described. Finally, information on the personnel responsible for the preparation of the inventory is outlined.
- Part 2 describes in detail the methodologies and approaches taken to estimate emissions in the Medford UGB for the 2008 Limited Maintenance Plan inventory. Part 2 is divided into sections describing the inventory process and the types of emission sources that are addressed in the inventory, as follows:
  - Section 1.0 provides maps of open burning control areas and the Medford-Ashland Air Quality Maintenance Area / Vehicle Inspection Boundary. *These maps are included for consistency with the 1993 Medford CO Attainment Year Inventory*. This section also provides legal descriptions of the inventory and open burning control areas, as well as the AQMA/VIP boundary.
  - Section 2.0 contains summary tables for stationary point, stationary area, non-road mobile, and on-road mobile sources in the Medford UGB.
  - Section 3.0 contains a discussion of the stationary point source emission category methodology and emissions estimate approach. Tables summarizing point source emissions estimates follow the discussion.
  - Section 4.0 addresses stationary area sources and contains a discussion of the approaches used in estimating emissions. Each area source category inventoried is described in detail, including the methodology used in making the calculations. Tables summarizing stationary area source emissions estimates follow the discussion.
  - Section 5.0 provides a discussion of the approach and methodology used in evaluating emissions from non-road mobile sources. Tables summarizing non-road mobile source emissions estimates follow the discussion.

- Section 6.0 provides a description of the approach and methodology used in evaluating emissions from on-road mobile sources. Tables summarizing on-road mobile source emissions estimates follow the discussion.

- Part 3 describes the quality assurance procedures utilized in preparing the 2008 inventory.
- Part 4 contains an extensive list of references utilized for the Medford CO emission inventory.
- Part 5 contains Appendices with supplemental data used to estimate emissions.

Tables and figures for each emission category are located at the end of the discussion section for that category. For example, summary emission tables for all stationary point source types in the Medford UGB are located at the end of Part 2, Section 3. Please note that some references listed in the tables are numbered as 'DEQ master references' (See Part 5 for this classification at the end of each entry).

2.4 Automated Systems

The inventory has been assembled by the staff of the Technical Services Section, Air Quality Division of the Oregon Department of Environmental Quality (DEQ), and by Sierra Research, a consulting firm specializing in air quality and pollution control. The point source emissions are specifically drawn from the DEQ Tracking Reporting and Administration of Air Contaminant Sources (TRAACS) database. The TRAACS data is used for tracking compliance with plant site emission limits and for reporting compliance status to the EPA EIS system. TRAACS is also used to store actual emission data also reported to EIS. TRAACS contains annual emission levels for each permitted point source as well as, emission factors, and annual activity levels (fuel use and production levels). Nonpoint emissions, except where indicated, were extracted from the EPA Emission Inventory System (EIS) EIS Gateway. The EPA EIS database houses National Emissions Inventory (NEI) data that includes submittals from states.

2.5 Sources Not Inventoried

For consistency, the 1993 attainment year emission inventory was used as a reference, and all sources in the 1993 inventory are addressed in the 2008 inventory. Calculations and methodology for sources emitting 0 emissions during a typical CO season day are included in the 2008 inventory as well.

2.6 Guidance Documents

For consistency, DEQ and Sierra followed the format and outline of the 1993 Medford UGB CO Attainment Year Emission Inventory[1]. For those sources inventoried by DEQ, inventory methodology followed applicable EPA procedure and guidance documents. Two primary documents utilized were *Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone, Volume I*[3], and *Emission Inventory Requirements for Carbon Monoxide State Implementation Plans*[2].

2.7 Contact Personnel

Due to existing workload and staffing commitments, DEQ entered into an agreement with the Rogue Valley Council of Governments (RVCOG) and Sierra Research for assistance with the Medford CO LMP emission inventory (please see Appendix C for the work proposal from Sierra).

The work breakdown was as follows:

- DEQ
  - Permitted point sources
  - Open burning
  - Wildfires and prescribed burning
- RVCOG/Sierra Research
  - Small, stationary fuel combustion (non-permitted)
  - Residential wood combustion
  - Structure fires
  - Aircraft and airport related
  - Locomotives
  - Recreational marine
  - Nonroad vehicles & equipment
  - On-road mobile (exhaust)

The abbreviated list of those conducting this Medford 2008 Limited Maintenance Plan emission inventory is shown below:

DEQ
Wendy Wiles
Environmental Solutions Division Administrator

Jeffrey Stocum,
Air Quality Technical Services Manager
Emission Inventory
Christopher Swab, Senior Emission Inventory Analyst
Brandy Albertson, Emission Inventory Analyst
Miyoung Park, Emission Inventory Specialist
Wayne Kauzlarich, ACDP Permit Writer
Dana Bailey, Permit Coordinator
Quality Assurance
Wesley Risher, Emission Inventory Analyst
David Collier,
Air Quality Planning Manager
Dave Nordberg, Air Quality Planner

Sierra Research
Tom Carlson, Principal Scientist

Wenxian Zhang, Associate Engineer

Starcrest Consulting Group, LLC
Wayne Elson, Air Quality Planner and Mobile Source Emissions Expert

Rogue Valley Council of Governments
Dan Moore, Planning Coordinator, AICP

3 Medford Carbon Monoxide Attainment Area Inventory

3.1 Inventory Area Maps and Descriptions

3.1.1 Inventory Area Maps

The following maps are presented here for consistency with the Medford CO 1993 Attainment Year SIP Emissions Inventory[1]:

- Figure 1 (previous): Medford UGB Carbon Monoxide Attainment Area
- Figure 2 (previous): Medford UGB with 25-mile point source buffer zone
- Figure 3: Open Burning Control Areas as defined in (OAR) 340-264-0078(1) and Rogue Basin Open Burning Control Area as defined in 340-264-0078(3)
- Figure 4: Woodstove Curtailment Ordinance Area / Critical PM_{10} Control Area
- Figure 5: Medford-Ashland Air Quality Maintenance Area / Vehicle Inspection Program Boundary

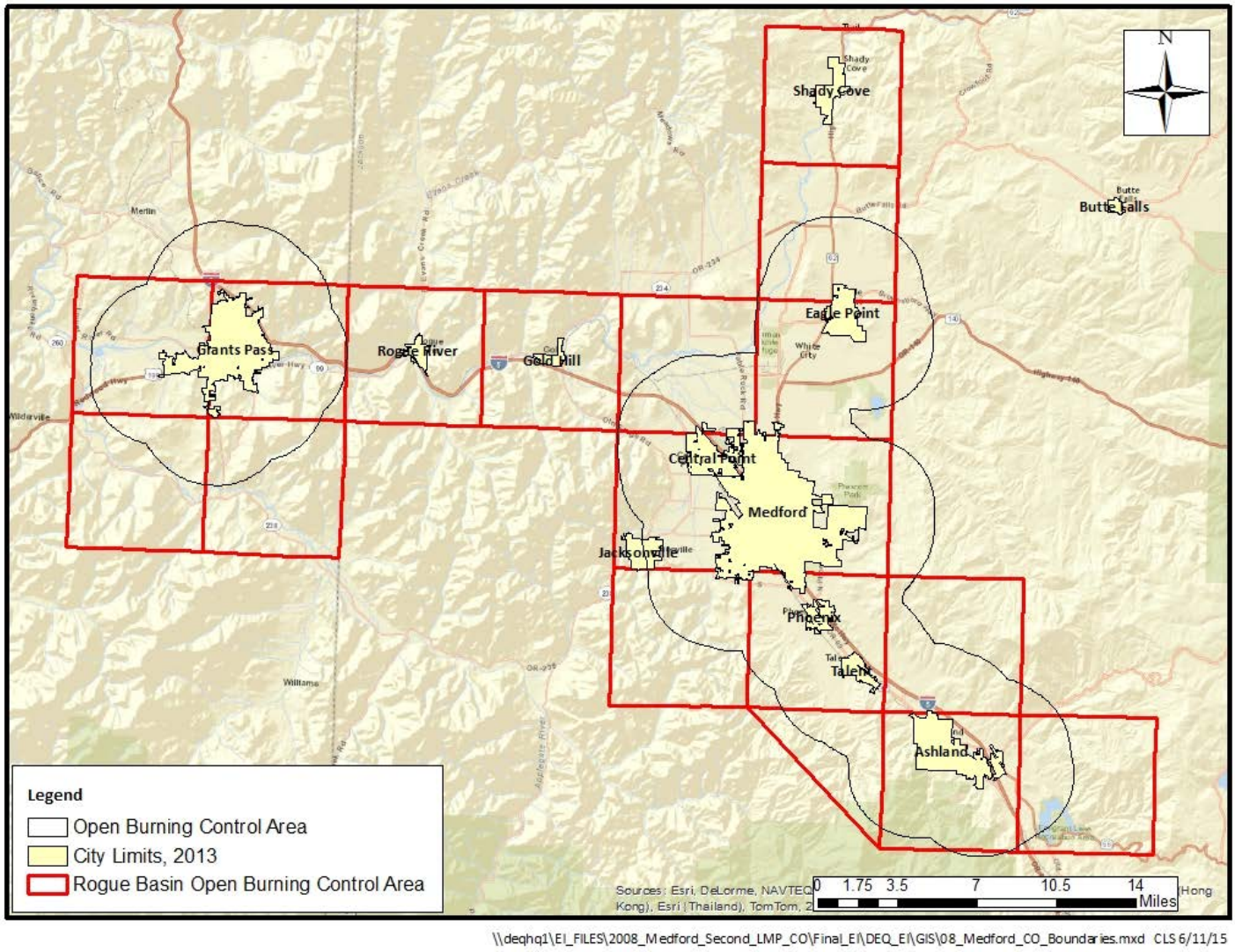


Figure 3: Open Burning Control Areas and Rogue Basin Open Burning Control Area

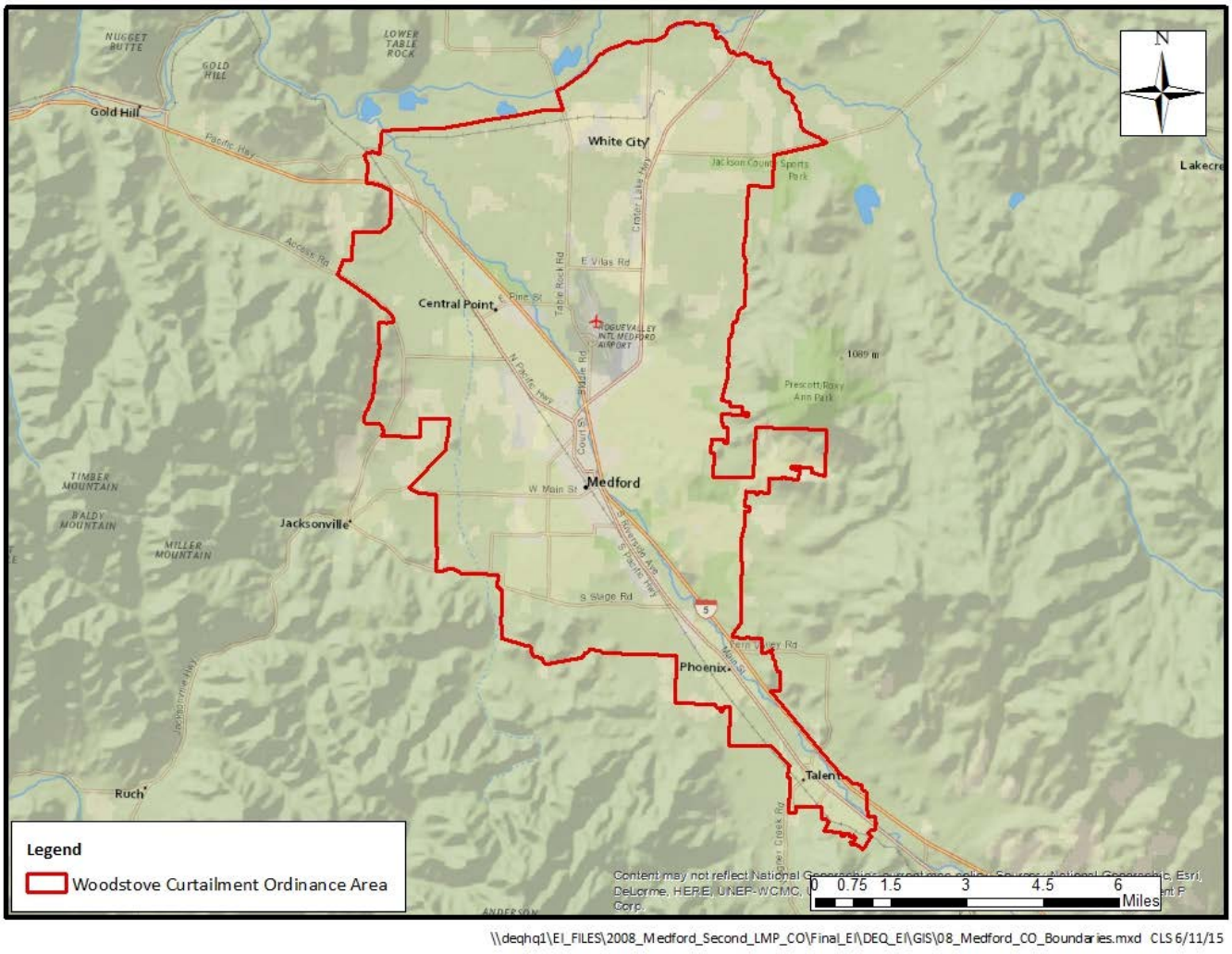


Figure 4: Woodstove Curtailment Ordinance Area / Critical PM_{10} Control Area

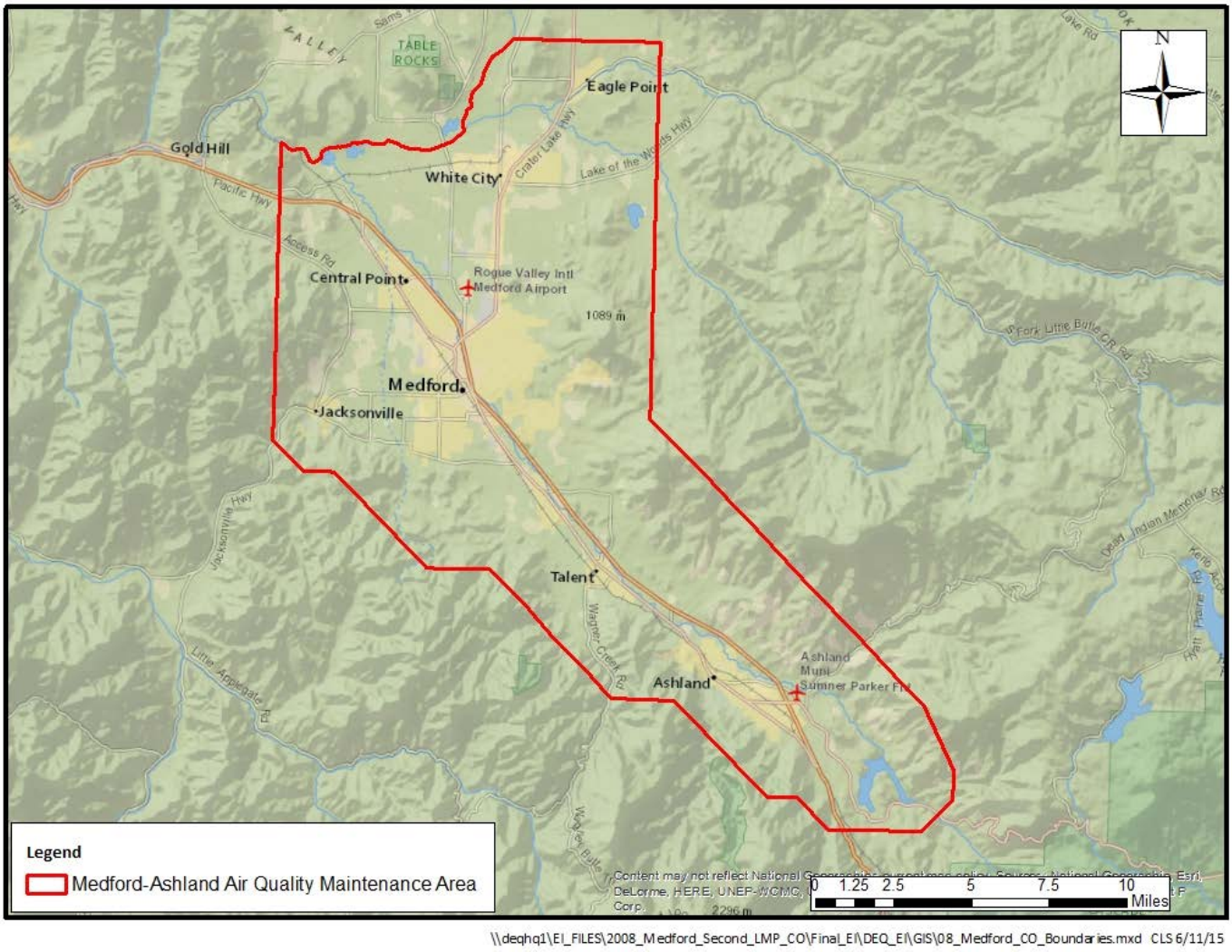


Figure 5: Medford-Ashland Air Quality Maintenance Area / Vehicle Inspection Program Boundary

3.1.2 Legal Descriptions

3.1.2.1 Legal Description of Medford Urban Growth Boundary / CO Inventory Area

Legal description of the Medford Urban Growth Boundary Attainment Area as adopted by Oregon DEQ define the boundaries as shown in Figure 1 and can be found in the Oregon Administrative Rules (OAR) 340-204-0010(12):

(12) "Medford UGB" means the area beginning at the line separating Range 1 West and Range 2 West at a point approximately 1/4 mile south of the northwest corner of Section 31, T36S, R1W; thence west approximately 1/2 mile; thence south to the north bank of Bear Creek; thence west to the south bank of Bear Creek; thence south to the intersection with the Medford Corporate Boundary; thence following the Medford Corporate Boundary west and southwesterly to the intersection with Merriman Road; thence northwesterly along Merriman Road to the intersection with the eastern boundary of Section 10, T36S, R2W; thence south along said boundary line approximately 3/4 mile; thence west approximately 1/3 mile; thence south to the intersection with the Hopkins Canal; thence east along the Hopkins Canal approximately 200 feet; thence south to Rossanely Drive; thence east along Rossanely Drive approximately 200 feet; thence south approximately 1200 feet; thence west approximately 700 feet; thence south approximately 1400 feet; thence east approximately 1400 feet; thence north approximately 100 feet; thence east approximately 700 feet; thence south to Finley Lane; thence west to the end of Finley Lane; thence approximately 1200 feet; thence west approximately 1300 feet; thence north approximately 150 feet; thence west approximately 500 feet; thence south to Highway 238; thence west along Highway 238 approximately 250 feet; thence south approximately 1250 feet to a point even with the end of Renault Avenue to the east; thence east approximately 2200 feet; thence south approximately 1100 feet to a point even with Sunset Court to the east; thence east to and along Sunset Court to the first (nameless) road to the south; thence approximately 850 feet; thence west approximately 600 feet; thence south to Stewart Avenue; thence west along Stewart Avenue approximately 750 feet; thence south approximately 1100 feet; thence west approximately 100 feet; thence south approximately 800 feet; thence east approximately 800 feet; thence south approximately 1000 feet; thence west approximately 350 feet to a point even with the north-south connector street between Sunset Drive and South Stage Road; thence south to and along said connecting road and continuing along South Stage Road to Fairlane Road; thence south to the end of Fairlane Road and extending beyond it approximately 250 feet; thence east approximately 250 feet; thence south approximately 250 feet to the intersection with Judy Way; thence east on Judy Way to Griffin Creek Road; thence north on Griffin Creek Road to South Stage Road; thence east on South Stage Road to Orchard Home Drive; thence north on Orchard Home Drive approximately 800 feet; thence east to Columbus Avenue; thence south along Columbus Avenue to South Stage Road; thence east along South Stage Road to the first road to the north after Sunnyview Lane; thence north approximately 300 feet; thence east approximately 300 feet; thence north approximately 700 feet; thence east to King's Highway; thence north along King's Highway to Experiment Station Road; thence east along Experiment Station Road to Marsh Lane; thence east along Marsh Lane to the northern boundary of Section 6, T38S, R1W; thence east along said boundary approximately 1100 feet; thence north approximately 1200 feet; thence east approximately 1/3 mile; thence north approximately 400 feet; thence east approximately 1000 feet to a drainage ditch; thence following the drainage ditch southeasterly approximately 500 feet; thence east to the eastern boundary of Section 31, T37S, R1W; thence south along said boundary approximately 1900 feet; thence east to and along the loop off of Rogue Valley Boulevard, following that loop to the Southern Pacific Railroad Line (SPRR); thence following SPRR approximately 500 feet; thence south to South Stage Road; thence east along South Stage Road to SPRR; thence southeasterly along SPRR to the intersection with the west fork of Bear Creek; thence northeasterly along the west fork of Bear Creek to the intersection with U.S. Highway 99; thence southeasterly along U.S. Highway 99 approximately 250 feet; thence east approximately 1600 feet; thence south to East Glenwood Road; thence east along East Glenwood Road approximately 1250 feet; thence north approximately 1/2 mile; thence west approximately 250 feet; thence north approximately 1/2 mile to the Medford City Limits; thence east along the city limits to Phoenix Road; thence south along Phoenix Road to Coal Mine Road; thence east along Coal Mine Road approximately 9/10 mile to the western boundary of Section 35, T37S, R1W; thence north to the midpoint of the western boundary of Section 35, T37S, R1W; thence west approximately 800 feet; thence north approximately 1700 feet to the intersection with Barnett Road; thence easterly along Barnett Road to the southeast corner of Section 27, T37S, R1W; thence north

along the eastern boundary line of said section approximately 1/2 mile to the intersection with the 1800 foot contour line; thence east to the intersection with Cherry Lane; thence following Cherry Lane southeasterly and then northerly to the intersection with Hillcrest Road; thence east along Hillcrest Road to the southeast corner of Section 23, T37S, R1W; thence north to the northeast corner of Section 23, T37S, R1W; thence west to the midpoint of the northern boundary of Section 22; T37S, R1W; thence north to the midpoint of Section 15, T37S, R1W; thence west to the midpoint of the western boundary of Section 15, T37S, R1W; thence south along said boundary approximately 600 feet; thence west approximately 1200 feet; thence north approximately 600 feet; thence west to Foothill Road; thence north along Foothill Road to a point approximately 500 feet north of Butte Road; thence west approximately 300 feet; thence south approximately 250 feet; thence west on a line parallel to and approximately 250 feet north of Butte Road to the eastern boundary of Section 8, T37S, R1W; thence north approximately 2200 feet; thence west approximately 1800 feet; thence north approximately 2000 feet; thence west approximately 500 feet; thence north to Coker Butte Road; thence east along Coker Butte Road approximately 550 feet; thence north approximately 1250 feet; thence west to U.S. Highway 62; thence north approximately 3000 feet; thence east approximately 400 feet to the 1340 foot contour line; thence north approximately 800 feet; thence west approximately 200 feet; thence north approximately 250 feet to East Vilas Road; thence east along East Vilas Road approximately 450 feet; thence north approximately 2000 feet to a point approximately 150 feet north of Swanson Creek; thence east approximately 600 feet; thence north approximately 850 feet; thence west approximately 750 feet; thence north approximately 650 feet; thence west approximately 2100 feet; thence on a line southeast approximately 600 feet; thence east approximately 450 feet; thence south approximately 1600 feet; thence west approximately 2000 feet to the continuance of the private logging road north of East Vilas Road; thence south along said logging road approximately 850 feet; thence west approximately 750 feet; thence south approximately 150 feet; thence west approximately 550 feet to Peace Lane; thence north along Peace Lane approximately 100 feet; thence west approximately 350 feet; thence north approximately 950 feet; thence west approximately 1000 feet to the western boundary of Section 31, T36S, R1W; thence north approximately 1300 feet along said boundary to the point of beginning.

3.1.2.2 Legal Description of Open Burning Control Areas

In addition to the UGB, DEQ has specific rules that address commercial, demolition, construction and industrial open burning. The rules are identified for densely populated locations in the state, including cities over 4,000 people in population and within three miles of the corporate city limits of these cities. The boundaries defined by the rules are termed Open Burning Control Areas. The rules pertaining to the Medford area may be found in the Oregon Administrative Rules (OAR) 340-264-0078, summarized below.

Generally, areas around the more densely populated locations in the state and valleys or basins that restrict atmospheric ventilation are designated "Open Burning Control Areas". The practice of open burning may be more restrictive in open burning control areas than in other areas of the state. The specific open burning restrictions associated with these open burning control areas are listed in OAR 340-264-0100 through 340-264-0170 by county. The open burning control areas of the state are defined as follows:

(1) All areas in or within three miles of the incorporated city limit of all cities with a population of 4,000 or more.

(3) The Rogue Basin Open Burning Control Area is located in Jackson and Josephine Counties with boundaries as generally depicted in Figure 4 Rogue Basin Open Burning Control Area. The area is enclosed by a line beginning at a point approximately 4-1/2 miles NE of the City of Shady Cove at the NE corner of T34S, R1W, Willamette Meridian, thence south along the Willamette Meridian to the SW corner of T37S, R1W; thence east to the NE corner of T38S, R1E; thence south to the SE corner of T38S, R1E; thence east to the NE corner of T39S, R2E; thence south to the SE corner of T39S, R2E; thence west to the SW corner of T39S, R1E; thence NW along a line to the NW corner of T39S, R1W; thence west to the SW corner of T38S, R2W; thence north to the SW corner of T36S, R2W; thence west to the SW corner of T36S, R4W; thence south to the SE corner of T37S, R5W; thence west to the SW corner of T37S, R6W; thence north to the NW corner of T36S, R6W; thence east to the SW corner of T35S, R1W; thence north to the NW corner of T34S, R1W; thence east to the point of beginning.

3.1.2.3 Legal Description of Medford Area Woodstove Curtailment Ordinance / Critical PM10 Control Area

In order to strengthen overall woodstove strategies in the Medford AQMA, local ordinances in the Medford area were unified in 1998, resulting in a Woodstove Curtailment Ordinance Area, also known as the Critical PM_{10} Control Area. The unified ordinance applies in Jackson County, as well as the cities of Ashland, Central Point, Jacksonville, Medford, Phoenix, and Talent. The legal description is as follows:

Beginning on I-5 and Tolo Road, crossover north on Tolo Road to Old Hwy 99. East on Old Hwy 99 to Kirtland Road. Northeasterly on Kirtland Road to Tablerock Road. North on Tablerock Road to the Rogue River. Northeasterly along the southern bank of the Rogue River to the mouth of Little Butte Creek. Northeasterly along Little Butte Creek to Antelope Creek. Southeasterly along Antelope Creek to Dry Creek. Southeasterly on Dry Creek to Hwy 140. Southwesterly on Hwy 140 to Kershaw Road. South on Kershaw Road to Corey Road. West on Corey Road to Foothill Road. South on Foothill Road to Medford Urban Growth Boundary (UGB) (near Delta Waters Road). Follow eastern UGB south to North Phoenix Road. South on North Phoenix Road to Phoenix UGB. Follow eastern UGB south to I-5. Southeasterly on I-5 to Talent UGB. Follow the eastern, southern, and western UGB until intersection with Southern Pacific Railroad Track (which became Union Pacific / Central Oregon & Pacific Railroad in 1994). Southern Pacific Railroad track north to Hartley Lane (Road). West on Hartley Lane (Road) to Talent-Phoenix Road (Colver Road). North on Talent-Phoenix Road (Colver Road) to Phoenix UGB. West along southern boundary of Phoenix UGB to Camp Baker Road. West on Camp Baker Road to Coleman Creek Road. North on Coleman Creek Road to Carpenter Hill Road. West on Carpenter Hill Road to Pioneer Road. Northwest on Pioneer Road to Griffin Creek Road. North on Griffin Creek Road to Medford UGB. North along Medford UGB to South Stage Road. West on South Stage Road to Arnold Lane. North on Arnold Lane to Jacksonville Hwy. West on Jacksonville Hwy to Hanley Road. Northeast on Hanley Road to Ross Lane. West on Ross Lane to Redwood Drive. South on Redwood Drive to LaPine Avenue (which becomes Wendt Road). West on LaPine Avenue (Wendt Road) to Old Stage Road. North on Old Stage Road to Old Military Road. North on Old Military Road to Old Stage Road. Northwest on Old Stage Road to Scenic Avenue. Northwest on Scenic Avenue to Tolo Road. North on Tolo Road to Willow Springs Road. East on Willow Springs Road to Ventura Lane. North on Ventura Lane to I-5. Northwest on I-5 to crossover of Tolo Road.

3.1.2.4 Legal Description of the Medford-Ashland Air Quality Maintenance Area / Vehicle Inspection Program Boundary

Vehicle owners residing within the Medford-Ashland Air Quality Maintenance Area are subject to DEQ vehicle inspection per OAR 340-256-0300(2) and (3). The legal description of the Medford – Ashland air quality maintenance area is as follows:

340-204-0010(10) "Medford-Ashland Air Quality Maintenance Area" (AQMA) means the area defined as beginning at a point approximately two and quarter miles northeast of the town of Eagle Point, Jackson County, Oregon at the northeast corner of Section 36, Township 35 South, Range 1 West (T35S, R1W); thence South along the Willamette Meridian to the southeast corner of Section 25, T37S, R1W; thence southeast along a line to the southeast corner of Section 9, T39S, R2E; thence south-southeast along line to the southeast corner of Section 22, T39S, R2E; thence South to the southeast corner of Section 27, T39S, R2E; thence southwest along a line to the southeast corner of Section 33, T39S, R2E; thence West to the southwest corner of Section 31, T39S, R2E; thence northwest along a line to the northwest corner of Section 36, T39S, R1E; thence West to the southwest corner of Section 26, T39S, R1E; thence northwest along a line to the southeast corner of Section 7, T39S, R1E; thence West to the southwest corner of Section 12, T39S, R1W, T39S, R1W; thence northwest along a line to southwest corner of Section 20, T38S, R1W; thence West to the southwest corner of Section 24, T38S, R2W; thence northwest along a line to the southwest corner of Section 4, T38S, R2W; thence West to the southwest corner of Section 6, T38S, R2W; thence northwest along a line to the southwest corner of Section 31, T37S, R2W; thence North and East along the Rogue River to the north boundary of Section 32, T35S, R1W; thence East along a line to the point of beginning.

3.2 Summary of Emissions Data

Summary tables of emission data that are presented here include stationary point sources, stationary area sources, non-road mobile sources, and on-road mobile sources. Summary emissions are expressed as charts in Figures 6 through 8. Table 2.1 provides a summary of the 2008 emissions estimates.

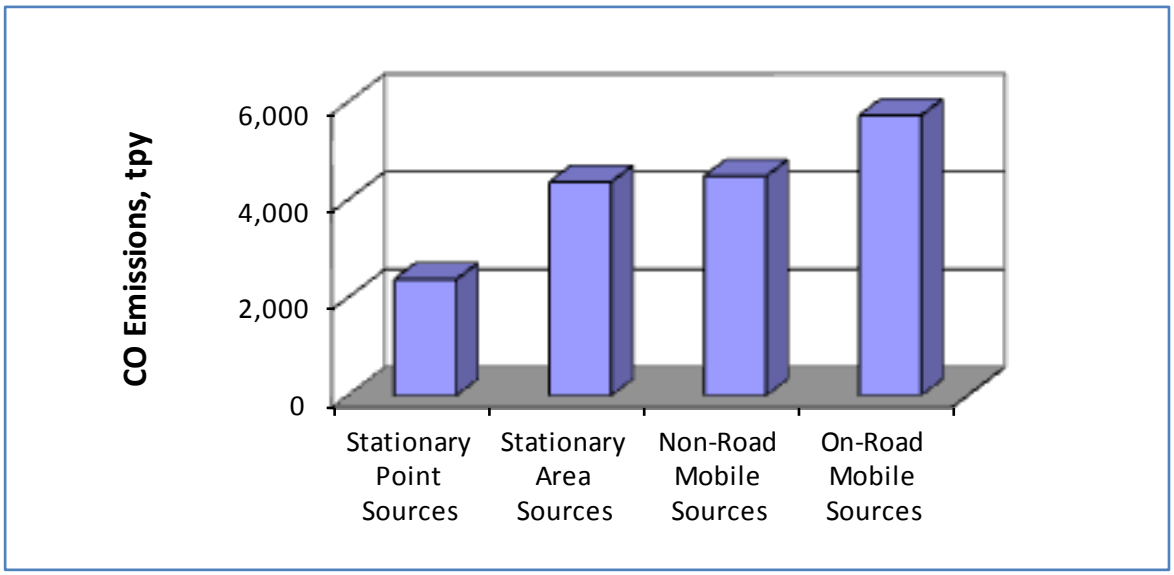


Figure 6: Distribution of 2008 Annual CO Emissions

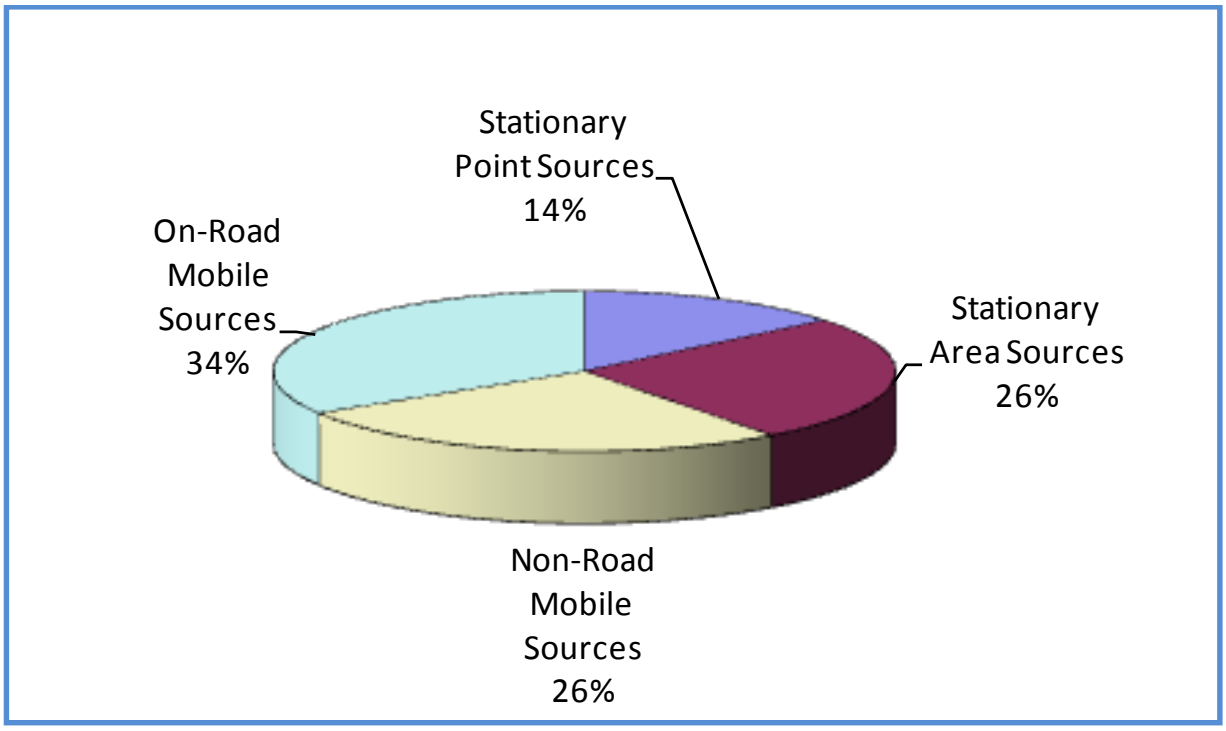


Figure 7: Annual CO Emissions by Percentage

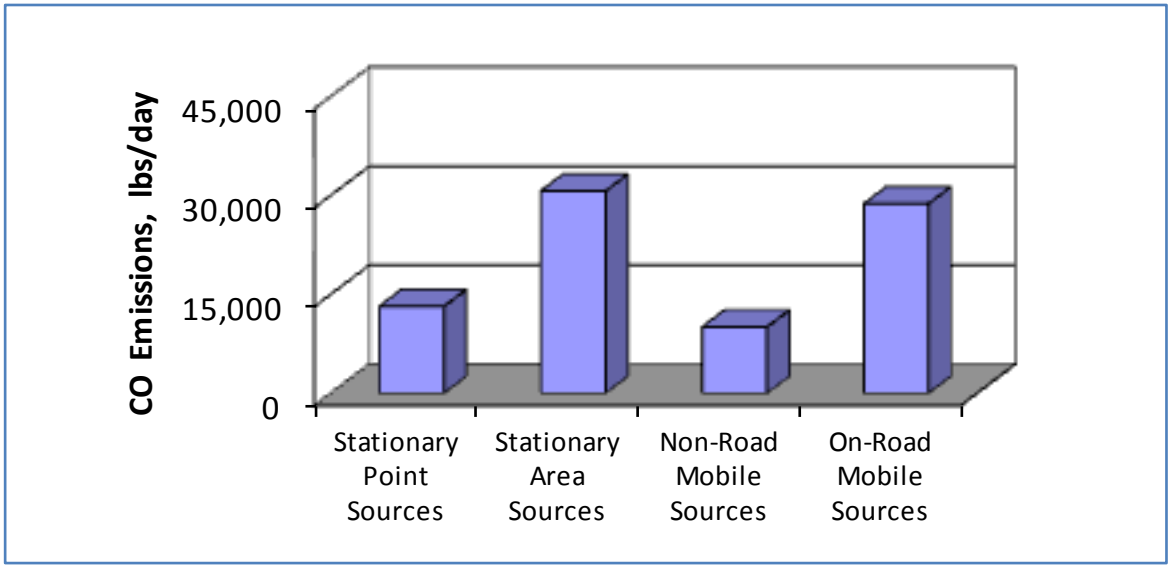


Figure 8: Distribution of 2008 Season Day CO Emissions

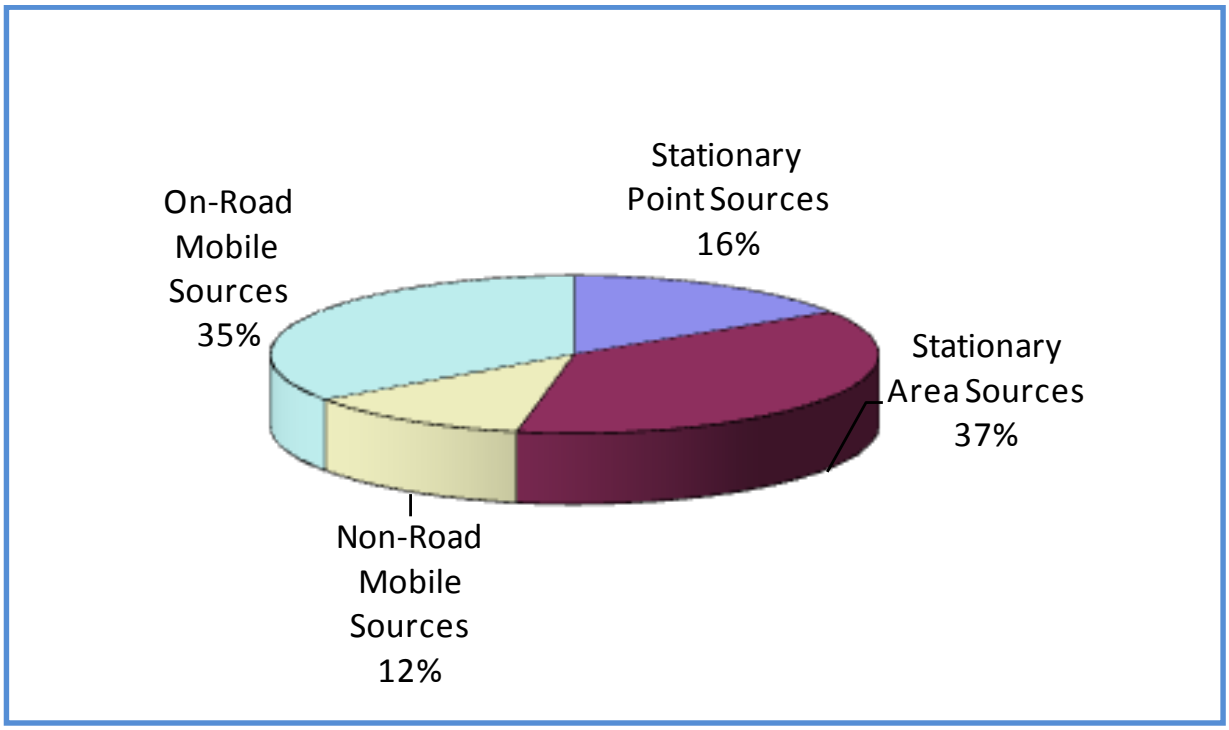


Figure 9: Season Day CO Emissions by Percentage

Table 3.1: Summary of 2008 CO Emissions Data

	Annual		CO Season	
Source Type	tpy	% of Category	lbs/day	% of Category
Stationary Point Sources	2,376.1	15%	13,159	16%
Stationary Area Sources	3,333.1	21%	30,399	37%
Non-Road Mobile Sources	4,488.2	28%	10,061	12%
On-Road Mobile Sources	5,730.0	36%	28,731	35%
Total within Medford UGB	15,927.4	100%	82,350	100%

3.3 Stationary Permitted Point Sources

3.3.1 Introduction

The following section is an overview and summary of the 2008 CO Point Source Emission Inventory developed for the Medford CO Limited Maintenance Plan (LMP) due in 2015. The 2008 CO inventory is an update to the original 1993 Attainment Year inventory[1]. However, 1993 and 2008 emission results were not compared because of discrepancies caused by a significant lapse in time between inventories and the change in point source determination methodology. This inventory includes both annual and seasonal emission estimates that establish both short and long term CO trends from industrial sources during 2008. This write up details the steps used to develop the 2008 Medford Point Source Emission Inventory and is a discussion of the results.

3.3.2 Geographic Area and Sources Included

The geographic focus for this inventory is the former Medford CO nonattainment area which is the Urban Growth Boundary (UGB) for the city. The UGB is represented by the red outline above in Section 1, Figure 1. A 25-mile buffer zone was also added to Medford's UGB to include industrial sources from other cities such as White City, Central Point, Ashland, Grants Pass, and Rogue River. Section 1, Figure 2 shows the UGB and 25-mile buffer zone as the inventory boundary.

Grants Pass industrial sources were not included in the Medford 1993 inventory because they were already inventoried for the 1993 Grants Pass State Implementation Plan[9]. The 1993 inventory for the Grants Pass SIP was updated in July 2014. Industrial sources from Grants Pass will be included in the 2008 CO inventory for Medford.

3.3.3 Point Source Determination

Point sources within the Medford UGB and 25-mile buffer zone include both industrial and non-industrial sources. Industrial sources are included under *Part 2.3 Stationary Point Sources* of this inventory and non-industrial sources are covered under *Part 2.4 Stationary AREA Sources*. This is a discussion on the point source determination for industrial sources included in both the 1993 Attainment Year Inventory and the 2008 Point Source CO Inventory for Medford.

Point sources for the 1993 Attainment Year Inventory were defined as stationary industrial sources that emitted more than 100 tons CO within the Medford UGB and a 25-mile buffer zone. Smaller stationary industrial sources that emitted less than 100 tons were included with non-industrial sources under *Part 2.4 Stationary AREA Sources* in the 1993 inventory.

Table 2.3.1 is the original list of large stationary industrial sources included in the 1993 inventory. See Reference 618, Appendix A, Point Source Data and Table A-1 Individual Stationary Point Source Determinations.

Table 2.3. 1: 1993 Attainment Year Inventory List of Permitted Point Sources

Source Number	Source Name	Permit Type	CO PSEL	Current Operating Status	SIC
15-0004	Boise Cascade Corporation	TV	2974	Active	2436
15-0012	U.S. Forest Industries	ACDP	99	Active	2435
15-0014	Medite Corporation	ACDP	99	Active	2436
15-0020	Boise Cascade Corporation	TV	796	Active	2436
15-0025	Timber Products Company	TV	237	Active	2436
15-0041	Dyno Polymers Incorporated	ACDP	1900	Closed	2861
15-0048	Medford Corporation	ACDP	947	Closed	2493
15-0058	Royal Oak Enterprises, Inc.	ACDP	613	Closed	2861
15-0073	Medford Corporation	TV	235	Active	2493
15-0159	Biomass One, L.P.	TV	570	Active	4961

Three facilities have since closed and the other seven operated in 2008 so they were added to the 2008 Medford CO EI.

3.3.3.1 2008 Point Source Determination

Point sources included in the 2008 CO Inventory are defined as stationary industrial sources that have a state or federal air operating permit and are located within the UGB and 25-mile buffer for Medford. These stationary industrial sources would fall under one of two permit programs that DEQ administers:

- Air Contaminant Discharge Permit (ACDP): a state operating permit for small industrial sources that emit 99 tons or less per year of any criteria pollutant, or
- Title V Permit (TV): a federal operating permit for large industrial sources that emit 100 tons or greater per year of any criteria pollutant.

One major change for the 2008 inventory was to include ACDP sources, reported as Area Sources in 1993, with the TV sources. DEQ has better data now to estimate CO emissions from ACDP sources.

The conditions used in 1993 for point source determination no longer apply and so the new conditions for inclusion in the 2008 inventory are as follows:

- Sources are located within the UGB and 25-mile buffer,
- Sources had an active ACDP or Title V permit in 2008
- Sources operated in 2008,
- Sources actually emit CO emissions

All ACDP and TV sources in Jackson and Josephine Counties were mapped using ArcGIS 10 in order to eliminate sources located outside the UGB and 25-mile buffer zone. The remaining ACDP and TV sources that fell within the inventory boundary were compared against the other conditions listed above to determine if they would be included in the 2008 CO EI for Medford. The list was narrowed down to 28 ACDP and 9 TV sources that met all the conditions above. Table A-1 is the final list of 37 sources by source number, name, site location, permit types, operating status, CO PSEL, and standard industrial classification codes (SIC) included in the 2008 inventory. Section 1, Figure 2 provides the geographical locations for the Medford sources included in 2008 CO inventory.

Appendix A, Table A-1.1 provides a list of 37 sources that were excluded from the 2008 inventory because they did not meet one or more of the conditions listed above. Ten sources were not included because, although they had a CO PSEL in their permit, they did not actually operate equipment that emits CO. This is fairly common with General ACDPs because they list all possible emission units and processes based on a source category and assign a facility based on the type of business they operate. An example of this is when a source is assigned to a General permit for millwork and the emission units/processes identified in the permit are boilers, veneer dryers, kilns, cyclones, target boxes, etc. The source may only operate cyclones and target boxes and nothing else in the list that may emit CO emissions.

27 sources were closed sometime between 1993 and 2008; therefore, they were not included in the 2008 CO EI for Medford

3.3.4 Methodology and Approach

The Medford inventory was developed using existing TV emissions data submitted by DEQ to EPA's 2008 National Emission Inventory (NEI) and by putting together estimates for ACDP sources where no data was readily available. Since ACDP sources are typically reported to the NEI as Area Sources by county and source classification, CO emission estimates needed to be calculated down to individual source levels. The following is the methodology and approach used to develop the 2008 Medford Point Source CO Emission inventory.

3.3.4.1 Data Collection

Data collection is necessary to gather information used to calculate both annual and seasonal emissions. Information such as a source's emission basis, activity/throughput data, operating schedules, and Plant Site Emission Limits (PSELs) were collected for the inventory. This data was collected from 2008 annual reports, permits, or retrieved electronically from a permitting database. Most emissions and compliance information for TV sources is already stored in DEQ's *Tracking Reporting and Administration of Air Contaminant Sources* (TRAACS) permitting database. However, some information for ACDP sources such as emission basis and emission estimates are stored in an external database.

3.3.4.2 Emission Basis

Emission basis details the emission units and processes permitted at a source. The basis is developed by using information from emission detail sheets found in permits or permit review reports. For TV sources emission basis is organized in a workbook, a delivery mechanism for importing data into TRAACS. The workbook contains emission source and process descriptions, activity data, emission factors or other data used in estimating emissions, and potential to emit emissions used to develop Plant Site Emission Limits (PSELs). The workbook imports the emission basis into TRAACS where this information is used in preparing emission inventories. Further, the emission basis and emissions are submitted to EPA's EIS database annually.

ACDP emission basis is collected and stored by inventory project in an MS Access database, known as *Final ACDP EI database*. This database stores the same type of information as TRAACS such as the emission units/process descriptions, emission factors, and other data necessary for calculating emissions. The information is obtained from ACDP permits and/or annual reports.

3.3.4.3 Activity Data

Activity data, also called throughput, was collected from 2008 annual reports for Title V and ACDP sources. Activity data consists of fuel use, production activity, or other annual throughput types used to estimate emissions. Sources must fulfill permit conditions for annual reporting by submitting annual activity information, emissions factors, and emission estimates for criteria air pollutants. The activity data is used to

verify existing emissions estimates from the reports as well as to calculate emissions not typically reported by the sources themselves

3.3.4.4 Plant Site Emission Limits (PSELs)

PSELs were found in the DEQ TRAACS database (see Section 1.4) or permits

3.3.4.5 Annual Emissons Calculations

Point source annual emissions were estimated at the process level for each source. Emission basis and activity data used to estimate process level emissions were collected from ACDP and TV permits and 2008 annual reports. Below are the estimation methodologies used to prepare TV source annual emissions for the 2008 NEI and ACDP source emissions for the Medford inventory.

3.3.4.5.1 Emissions Estimation Methodologies for TV Sources

Emissions for this inventory were estimated 1 of 2 ways using:

- emission factors, or
- Continuous Emissions Monitoring System (CEMS)

Emission factors, the most common methodology, are derived by the source and permit writer to determine PSELs and compliance. Emission factors are developed using such resources as AP-42, industry standards, or by source testing. Emission factors relate the quantity of a pollutant to its activity such as lb of pollutant per gallon of fuel oil. Emission factors may be based on assumptions or conversions not likely defined in the permit or emission detail sheets. These assumptions include capture efficiencies, control efficiencies, conversion constants, %LEL (lower explosive limit), and transfer efficiency.

Most of the CO emission estimates were developed using emission factors from permits and activity from 2008 annual reports. The following formula was used to estimate annual CO emissions:

*2008 Annual CO Emissions (tpy) = (2008 Activity * Emission Factor)/2000 lbs/ton*

Some CO emission estimates were derived via CEMS which is the most accurate representation of emissions at a source. Permit conditions may require direct measurement of stack emissions and recordkeeping for reporting hourly or daily CO emitted at a facility. Emission factors and CEMS are the most common estimation methodologies used to develop large industrial point source emissions for the 2008 CO inventory.

3.3.4.5.2 Emissions Estimation Methodlogies for ACDP Sources

Emissions from ACDP sources are generally not reported as point sources to the NEI but as AREA sources at the county-level and source classification code (SCC). Since ACDP sources were reported on a county-level to the 2008 NEI, emission estimates had to be developed for each individual source for this inventory.
CO emission estimates were developed using emission factors from permits and activity from 2008 annual reports. The following formula was used to estimate annual CO emissions:

*2008 Annual CO Emissions (tpy) = (2008 Activity * Emission Factor)/2000 lbs/ton*

See Appendix A, Table A-2 Stationary Point Source Emission Estimation Details. The table provides annual emission details down to process-level for both ACDP and TV sources. This table includes emission unit level information such as annual activity, emission factors, and operating details. The 2008 annual emissions for both ACDP and TV sources were used next to calculate seasonal emissions.

3.3.4.6 Seasonal Emissions Calculations

Emissions are generally not static and fluctuate during different times of the year for various reasons such as changes in source activity or temperature. For example, CO emissions may peak during winter months in urban areas due to incomplete combustion of carbon-based fuels (i.e. automobiles, woodstove, open-burning, fuel combustion of industrial boilers, etc.). The winter months of December through February is defined as the CO season, the period for which emissions are more likely to peak. The reason for this is cooler temperatures during these months prevent complete combustion of the fuel which may result in excess CO emissions trapped near the ground by atmospheric inversions.

2008 annual CO emissions were temporally allocated from annual to seasonal emissions for the CO season. Typical Season Day (TSD) emissions are average daily CO emissions calculated over the CO season and recorded in pounds per day (lbs/day). To complete seasonal emission estimates data components such as annual emissions (tpy), seasonal adjustment factors, and annual activity days are required. The following is the allocation and development methods and data components needed to calculate seasonal emissions.

3.3.4.6.1 Seasonal Adjustment Factors

Seasonal Adjustment Factors (SAF) were calculated using temporal files of peak season activity by source classification code (SCC) from EPA's Sparse Matrix Operator Kernal Emissions (SMOKE) modeling program. The data components from these files are used in the following equation to calculate SAF:

SAF =

((Sum of Peak Season Activity) (12 months)) / ((Annual Activity) (Peak Season Activity Months))

An example of how this calculation works is:

Use SCC 10200502,

Determine the peak season months and % activity for the peak season months:

Peak Season Activity Months:	% Activity During Peak Season Months
December	83
January	83
February	83
Total Annual Activity:	***996***

Insert information into pertinent components of SAF calculation:

SAF = ((83+83+83) (12 months)) / ((996) (3 months)) = 1.00

Both ACDP and TV sources required SAFs to complete seasonal calculations. See Appendix B, Table B-1: Seasonal Adjustment Factors by SCC Used for 2008 CO Inventory.

3.3.4.6.2 Season Day Emissions Calculations

Typical Season Day (TSD) emissions are average daily CO emissions calculated over the CO season (i.e. December 1st through end of February the following year). The following data components are needed to calculate TSD emissions:

- 2008 Annual CO Emissions (AE)
- SAF
- Activity Days (AD)

*TSD emissions = (AE*SAF*2000 lb/ton) / (AD)*

The following is an example calculation for natural gas fuel combusted in a veneer dryer. In order to complete the TSD calculation 2008 annual CO emissions, seasonal adjustment factor by SCC and annual activity days are needed. This formula breaks the annual emissions down to lbs/day over the CO season.

Dryer Emissions (SCC 30700716):

- AE = 140 tons
- SAF = 1.00
- AD = 365 days/yr

*TSD Emissions = (140*1.00*2000) / (365) = 767 lbs/day*

TSD emission calculations were performed for all 37 ACDP and TV sources. TSD emission estimates for TV and ACDP sources cannot be calculated nor stored in TRAACS. TV and ACDP seasonal emissions were calculated and housed in MS Access Final_*SIP_MP_PSD_EITool* database. Appendix A, Table A-2 Stationary Point Source Emission Estimation Details also provides TSD emission estimates down to the process-level for both ACDP and TV sources.

3.3.5 Summary of Stationary Point Source Emissions

Inventory results were organized into tables summarizing 2008 annual and seasonal CO emissions by source industrial classification (SIC) and at source and process levels. Appendix C, Tables 2.3.1, 2.3.2, and 2.3.3 summarize stationary point source CO emissions for the 2008 Medford inventory. See Figures 8 through 11 for how stationary point source annual and season day emissions are distributed amongst the other source categories of the inventory.

Total 2008 annual and seasonal CO emissions for industrial sources located within the Medford UGB and 25-mile buffer are 2,376.1 tons per year and 13,159 lbs per day, respectively. The major industries permitted in Medford and the surrounding cities are wood products manufacturing, concrete production, steam supply for operating processes or heating dwellings, sewer systems, crematories, and landfills.

Table 2.3.2 summarizes 2008 CO annual and seasonal emissions by SIC for the Medford UGB and 25-mile buffer area. The table reveals three industrial classifications that contribute over 96% of total point source CO emissions in 2008.

Table 2.3. 2: Medford UGB CO Season: Summary of Point Source Emissions by SIC

		(1) (2) CO Emissions	
SIC Code	SIC Name	Annual and TSD Emissions	
		tpy	lbs/day
2048	OTHER PREPARED FEEDS	0.1	1
2421	SAWMILLS AND PLANING MILLS	2.4	20
2431	MILLWORK	1.2	9
2434	WOOD KITCHEN CABINETS	0.2	1
2435	HARDWOOD VENEER AND PLYWOOD	22.4	123
2436	SOFTWOOD VENEER AND PLYWOOD	1803.6	9943
2439	STRUCTURAL WOOD MEMBERS	0.3	2
2493	RECONSTITUTED WOOD PRODUCTS	36.3	207
2951	PAVING MIXTURES AND BLOCKS	12.3	74
3272	OTHER CONCRETE PRODUCTS	5.2	37
3861	PHOTOGRAPHIC EQUIPMENT & SUPPLY	3.8	21
4952	SEWERAGE SYSTEMS	10.7	59
4953	REFUSE SYSTEMS	211.1	1160
4961	STEAM SUPPLY	266.6	1501
	Pollutant Total	**2376.1**	**13159**

Softwood veneer and plywood (SIC 2436) contributes 75.9% while steam supply (SIC 4961) and refuse systems (SIC 4953) only emit 11.2% and 8% of total CO emissions, respectively. This leaves a wide margin between softwood veneer and plywood products manufacturing and other industrial classifications.

Further evaluation required identification of sources in each SIC. Table 2.3.3 in Appendix C, is a list of sources with annual and seasonal CO emissions for each SIC. This table reveals which sources are contributing

significantly to CO emissions in the three primary SIC's listed above. A 100 tpy annual emissions cut-off was applied to these sources to determine the top emitters of CO emissions for this inventory.

Table 2.3.3 lists five sources that contribute the most CO emissions within the Medford UGB and 25-mile buffer. These five sources emit together 88% of the total annual and seasonal CO emissions. Boise Cascade Wood Products, L.L.C. (15-0004) produces over half the 2008 CO emissions out of the five sources. CO emissions for these sources occur because of fuel combustion activities such as the operation of boilers, landfill engines, and veneer dryers. All other source contributions to 2008 annual and seasonal CO emissions are considered minimal.

Table 2.3. 3: Medford UGB CO Season, Summary of Top 5 :Point Source Emitters

				(1)	(2)
				CO Emissions	
Emission Year	SIC Code	Source Number	Source Name	Annual Emissions	Typical Season Day
				tpy	lbs/day
2008	2436	15-0004	Boise Cascade Wood Products, L.L.C.	1087.6	5943
2008	2436	15-0020	Boise Cascade Wood Products, L.L.C.	513.1	2812
2008	4961	15-0159	Biomass One, L.P.	232.7	1278
2008	4953	15-0026	Dry Creek Landfill, Inc.	162.6	891
2008	2436	17-0030	TP Grants Pass, LLC	111.4	598
			Pollutant Total	2,107.4	11,521

(1) And (2), see Appendix A, Table A-2

In summation, wood product companies (Boise Cascade (15-0004) and (15-0020)) and TP Grants Pass L.L.C (17-0030) account for 81% of total CO emissions during 2008. Biomass One, L.P. (15-0159) and Dry Creek Landfill (15-0026) only account for 19% of the industrial source CO emissions in 2008. These sources contributed 2107.4 tpy out of 2376.1 tpy and 11521 lbs/day out of 13159 lbs/day over the CO season. All these sources are still in operation today.

3.3.6 Control Efficiency (CE) and Rule Effectiveness (RE)

EPA requires control efficiency and rule effectiveness to be calculated for SIPs. According to EPA's Air Emissions Reporting Requirements (AERR) rule (40 CFR Part 51) these concepts are defined as:

- Control Efficiency (CE): the capture and reduction efficiency of primary control devices
- Rule effectiveness (RE): a generic term for identifying and estimating the uncertainties in emission control programs. Rule effectiveness adjusts the control efficiency from what could be realized under ideal conditions to what is actually emitted in practice due to less than ideal conditions. It is a measure of the extent to which a rule actually achieves its desired emission reductions.

The 1993 baseline control efficiencies were zero and rule effectiveness did not apply because no CO controls were installed back then for any source. No controls for CO have been installed since 1993 for any source; therefore, control efficiency and rule effectiveness also do not apply in the 2008 inventory.

3.4 Stationary Nonpoint (Area) Sources

3.4.1 Introduction and Scope

This section describes the development of the emissions inventory for carbon monoxide for stationary area sources located in the Medford UGB in 2008. Area sources included in this inventory are stationary and collectively represent relatively small and numerous individual sources within the inventory area. Included in the area source category are three groups of distinct area source emission contributors: Waste disposal, treatment and recovery (including residential, industrial, and commercial open burning); Small stationary fuel and wood use (including residential, industrial, and commercial combustion); and Miscellaneous (forest fires, structural fires, and slash burning). A fourth group of sources, small permitted point sources, originally included in the 1993 attainment year inventory, are included in the permitted point source inventory (Section 2.3) for this emission inventory.

All tables referred to in this section of the report are shown at the end of the section.

Table 2.4.1 lists the procedures used to develop the emission estimates for the various categories of area source CO emissions included in the Medford UGB inventory. Estimated area source emissions represented in this inventory occur on an average weekday during the three-month CO season of January 1 through February 28, and December 1through December 31, 2008.

Stationary area sources are currently referred to as nonpoint sources by EPA, however the term area sources is used in this document for consistency with the 1993 attainment year EI.

3.4.2 Methodology and Approach

3.4.2.1 Source Category Identification and General Methodology Overview

Discussion of guidance documents and broad methodology used to calculate stationary area source emissions can be found in Part I. The list of stationary area sources included in the inventory was based on the EPA Procedures Document[3] and the *Emissions Inventory Requirements for CO*[1]. These area sources were compared to sources evaluated in the *1993 Attainment Year CO SIP Emission Inventory*[618], and the annual inventory of point source categories.

The starting point for emissions estimates for many area source categories was the EPA 2008 National Emission Inventory All data from the 2008 NEI was retrieved from the EPA EIS Gateway (See Part 1, Section 1.4 of this report). The 2008 NEI CO emissions estimates consist of data generated by both DEQ and EPA, depending upon source category. The DEQ data for specific categories, such as Residential Wood Combustion, were submitted to EPA through the EIS CERS XML process as required by the Air Emissions Reporting Rule (AERR). Data and documentation for the 2008 NEI may be found at the following website: http://www.epa.gov/ttnchie1/net/2008inventory.html

For DEQ generated emission estimates, emission factors were taken from the EPA Procedures Document[2], the FIRE Version 5 SCC's and Emission Factors[10], the Compilation of Air Pollution Emission Factors (AP-42)[11], various EPA Surveys, and local studies conducted by the Oregon Department of Environmental Quality or environmental consulting firms. Errors in estimated emissions could occur in the multiplier values used, in the accuracy of calculations, or in mistakes in the construction of equations. Therefore, estimated emissions were checked for reasonableness by a number of approaches: 1) using alternative multiplier values when possible;

2) comparing estimates with the results of earlier area source inventories; and 3) performing independent checks on the accuracy of the multiplier values, the methodologies, and the emission calculations.

Seasonal activity factors were taken from the EPA Procedures Document[2] or were derived by DEQ and based upon season specific activity levels following guidelines in the Procedures Document. All sources were considered to be uncontrolled with the exception of open burning; for details on how controls were incorporated into the open burning categories, please see Section 2.4.3.1.2 and associated tables.

3.4.2.2 Reconciliation with Point Source Emissions (double count prevention)

Double counted emissions were removed from area source fuel combustion emissions by subtracting emissions from point source fuel burning processes, broken down by the specific type of fuel, as shown in Appendix A, Table A-2. However, point source emissions to be removed were selected with the following two parameters:

- ACDP source emissions only, since the 2008 TV source double-count was resolved by the DEQ for the 2008 NEI submittal.
- Jackson County sources only, excluding those sources inventoried in the Grants Pass area, since area sources inventoried were for the Medford UGB only

3.4.3 Discussion of Area Source Categories

Each of the major area source categories is comprised of area source types. Detailed descriptions of the emission estimation methodology for each source type are included in Tables 2.4.3 through 2.4.14 and in Appendix B. The applicable appendix table number is included in the annotations, which accompany the summary table. Discussion of data sources, emission factors, seasonal adjustment factors, and activity levels which affect the area source are included for each area source type. Applicable state regulations affecting a specific area source emission category are included in the notes on each category summary table. If specific area source type emissions were affected by state regulations during the inventory year, control efficiency, rule effectiveness, and rule penetration have been applied[1,3]. Example calculations for emissions estimates are included on individual spreadsheets. The following sections describe these major categories; subsections corresponding to individual area source types are included.

Summary charts and tables, along with emissions estimates tables by category, are shown following this section.

3.4.3.1 Waste Disposal, Treatment and Recovery

This category includes disposal, treatment, recovery and clean up of solid and liquid wastes by incineration and open burning.

3.4.3.1.1 Incineration

This category consists of the disposal of solid waste, infectious waste, or crematory incinerator waste from industrial and commercial/institutional sources by combustion. Combustion occurs in a structure or furnace for the purpose of reduction in volume or weight of the waste material.

3.4.3.1.1.1 Industrial Incineration

The Medford UGB does not contain any industrial incineration sources and as such this category has not been inventoried

3.4.3.1.1.2 Commercial/Institutional Incineration

The 1993 attainment year emission inventory considered this category (given as "Commercial/Instititional On-Site Incineration) as an Area source. In 2008 this category was treated under point sources; Please see Part 2.3 of this document for point source methodology.

3.4.3.1.1.3 Residential Incineration

Residential on-site solid waste incineration activity is assumed to be zero. DEQ rules outlining structural requirements, source tests, and continuous emission monitoring, as well as associated permit costs, preclude individual residential construction of incineration devices. Destruction of solid waste and yard debris at residential sites is included in residential open burning calculations.

3.4.3.1.2 Open Burning

This category includes waste material disposal from industrial, commercial / institutional, and residential sources in open outdoor fires, burn barrels or incinerators which do not meet DEQ emission limits, or burn in a manner in which combustion air is not effectively controlled and combustion products do not vent through a stack or chimney.

3.4.3.1.2.1 Industrial Open Burning

Industrial open burning is prohibited in the Medford UGB except by special letter permit issued by DEQ's Western Region Office. No industrial open burning was permitted within the Medford UGB in 2008 [945, 946]. Industrial Open Burning emissions estimates are detailed in Table 2.4.11.

3.4.3.1.2.2 Commercial/Institutional Open Burning

This category is specific to the clearing of land for new construction and the burning of organic material (i.e. trees, shrubs and other vegetation). Jackson County Commercial and Institutional Open Burning emissions are from the EPA 2008 National Emissions Inventory (NEI) database. Using Jackson County land use zoning acreage, GIS allocations were created to approximate both the location and magnitude of emissions, see Appendix B, Table B-1. Annual CO Medford UGB Emissions were estimated by multiplying the county emissions by the GIS allocation (%) for the appropriate land use zoning classification (ID #8: Commercial Lawn & Garden: Commercial Zones).

Burn permits and complaints were provided by the DEQ Medford office[12,14] and City of Medford Fire District[13,15], and burn days and type of burn were based on the information.
Latitude and longitude data obtain from the permits were used in Google earth to determine which burn locations were inside the UGB area. Figure 10 shows all commercial open burning location from permits and complaints within Medford UGB area.

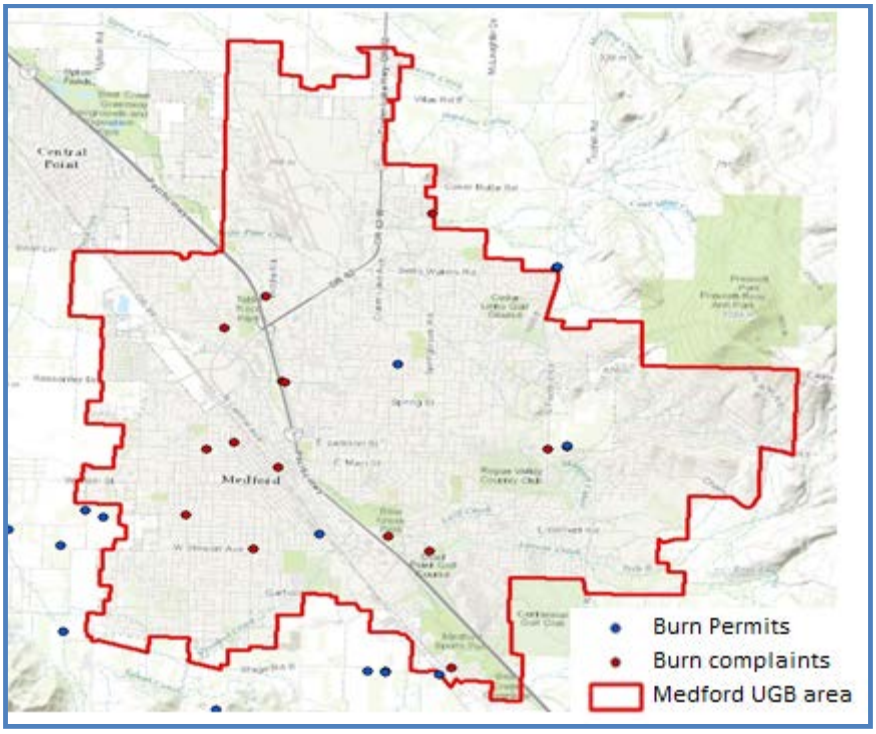


Figure 10: 2008 Commercial Open Burning Locations

There were no CO emission in the CO season because there were no permitted commercial burns and no record of illegal burns.

3.4.3.1.2.3 Residential Open Burning (back yard burning)

Residential open burning includes the outdoor burning of wood, leaves, land clearing debris, and household waste. Household waste often referred to as residential municipal solid waste (MSW), is a term for nonhazardous refuse produced by households (e.g. paper, plastics, metals, wood, glass, rubber, leather, textiles, and food wastes).

Jackson County residential open burning emissions are from the EPA 2008 National Emissions Inventory (NEI) database.
Using Jackson County land use zoning acreage, GIS allocations were created to approximate both the location and magnitude of emissions, see Appendix B, Table B-1. Annual CO Medford UGB emissions were estimated by multiplying the county emissions by the GIS allocation (%) for the appropriate land use zoning classification (ID #9: Residential Lawn & Garden: Residential Zoning).

Burn permits and complaints were provided by the DEQ Medford office[12,14] and City of Medford Fire District [13,15], and burn days and type of burn were based on the information.
Latitude and longitude data obtain from the permits were used in Google earth to determine which burn locations were inside the UGB area. Figure 11 shows all residential open burning location from permits and complaints within Medford UGB area.

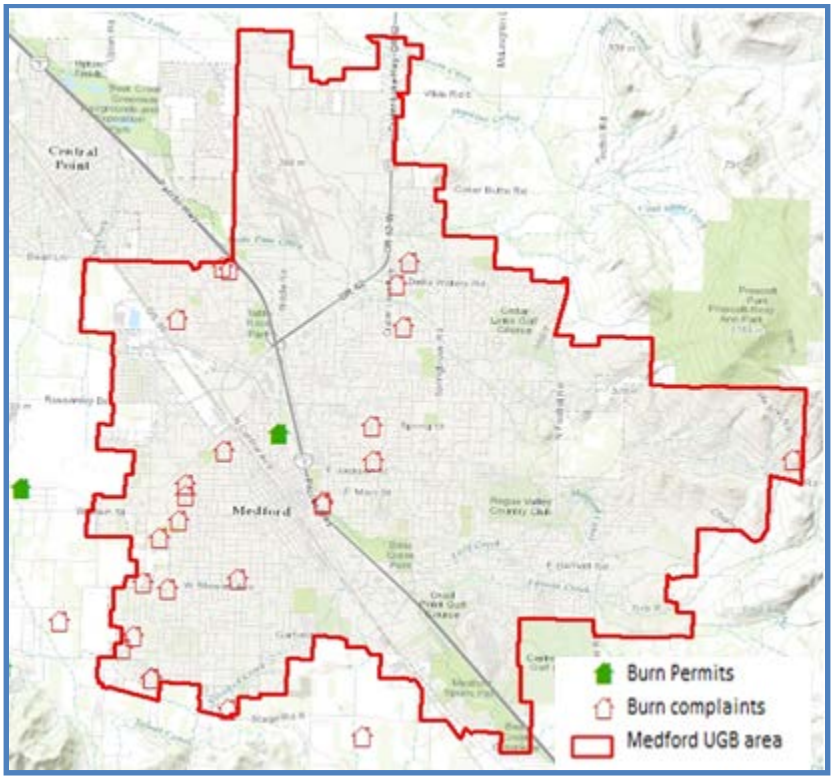


Figure 11: 2008 Residential Open Burning Locations

Weekly activity values use based on EPA's document[16]. Open burning can be expected to take place seven days a week. Typical Season Day emissions were calculated by multiplying the UGB annual emissions tons by the Seasonal Adjustment Factor (SAF), which includes burning complaints (violations record) and permitted burning during peak Season and total burning days annual activity, divided by activity days per week, multiplied by 52 weeks per year using the following formula:

*CO Typical Season Day (lbs/day) = (Annual UGB Emissions (tons/year) *2000 (lb/ton)* SAF)/ (Activity (days/wk) * 52 (wk/year))*

Residential Open Burning emissions estimates are detailed in Table 2.4.10

3.4.3.2 Small Stationary Fossil Fuel and Wood Use

This category includes small furnaces, heaters, heating units, and cooking devices that emit fewer than 100 tons of CO per year. Four main types of fuel are used within the Medford UGB by industrial, commercial/institutional, and residential sources: fuel oils, natural gas, liquefied petroleum gas (LPG), and wood. Wood fuel use is evaluated only for residential sources, where wood use is primarily in fireplaces, wood stoves, furnaces, and for cooking; fossil fuel use by residential sources is evaluated for space heating or cooking purposes only. Use of these fuels by industrial and commercial sources for other purposes is included in the point source inventory.

3.4.3.2.1 Fuel Oil Combustion

Fuel oil emissions from industrial/commercial/institutional sources are from fuel consumption in large or small boilers, furnaces, heaters, and other heating devices. Residential fuel oil emission sources are primarily from fuel consumption in furnaces, heaters, and other heating devices. For this inventory, industrial and

commercial fuel oil use includes residual oil, distillate oil, and kerosene use; residential fuel oil consumption includes distillate and kerosene use only.

Jackson County emissions for fuel oil combustion are from the EPA 2008 NEI database. Since industrial and commercial fuel use emissions were not inventoried in the 2008 NEI, the respective 2011 NEI emissions were used. EPA county-wide industrial and commercial emissions were allocated to the Medford UGB using the 2008 employee population data from the US Census Bureau and developing a ratio of UGB employees to county employees. The 2008 US Census employee population was downloaded from the following location: http://www.census.gov/econ/cbp/index.html. Two zip codes were used to represent the Medford UGB: 97501 and 97504. The residential emissions were allocated to the UGB by a ratio of the 2010 Medford UGB population to the county-wide population. The Medford UGB population was determined by mapping the census blocks with population and housing unit counts to the Medford UGB boundary using the GIS spatial analysis tool. The census block data with population and housing unit counts are from the 2010 Tiger/Line shapefiles. This type of shapefile is released every 10 years, so the 2010 shapefile was selected as the closest to year 2008. The following formula was used for spatial allocation:

*Annual UGB emissions, tpy = Annual Jackson County Emissions (tons/year) * (UGB employee or population / Jackson County employee or population)*

The employee data were used to allocate industrial and commercial fuel use, and the population data were used to allocate residential fuel use. Weekly activity and the SAF were taken from the 1993 EI.[3] Typical Season Day emissions were calculated by multiplying the UGB annual emissions tons by the SAF, divided by activity days per week, multiplied by 52 weeks per year, using the following formula.

*CO Typical Season Day Emission (lbs/day) = (Annual UGB Emissions (tons/year) * 2000 (lb/ton) *SAF)/ (Activity (days/wk) *52 (weeks/yr))*

Area source fuel combustion emissions were reconciled with permitted point source emissions by subtracting emissions from point source fuel burning processes, broken down by the specific type of fuel, as shown in Appendix A, Table A-2. However, point source emissions to be removed were selected with the following two parameters:

- ACDP source emissions only, since the 2008 TV source double-count was resolved by the DEQ for the 2008 NEI submittal.
- Jackson County sources only, excluding those sources inventoried in the Grants Pass area, since area sources inventoried were for the Medford UGB only

Fuel Oil Combustion emissions estimates are detailed in Table 2.4.3.

3.4.3.2.2 Natural Gas (NG) and Liquified Petroleum Gas (LPG)

Natural Gas (NG) and Liquefied Petroleum Gas (LPG) emissions from industrial and commercial sources are from fuel consumption in large or small boilers, furnaces, heaters, and other heating devices. Residential NG/LPG emission sources are primarily from fuel consumption in furnaces, heaters, and other heating devices.

Jackson County emissions for NG and LPG were first extracted from the EPA 2008 NEI database. Since industrial and commercial NG/LPG use emissions were not inventoried in the 2008 NEI, the respective 2011 NEI emissions were used. EPA county-wide industrial and commercial emissions were allocated to the Medford UGB using the 2008 employee population data from the US Census Bureau and developing a ratio of

UGB employees to county employees. The residential emissions were allocated to the UGB by the ratio of the 2010 Medford UGB population data divided by the county-wide population. The UGB population was determined using the same method and data described in section 2.4.3.3.1. The following formula was used for spatial allocation:

*Annual UGB emissions, tpy = (Annual Jackson County Emissions (tons/year)) * (UGB employee or population / Jackson County employee or population)*

The employee data were used to allocate industrial and commercial NG/LPG use, and the population data were used to allocate residential NG/LPG use. Typical Season Day emissions were calculated by multiplying the UGB annual emissions tons by the SAF, divided by activity days per week, and multiplied by 52 weeks per year. Weekly activity and SAFs were taken from the 1993 EI.[3]

*CO Typical Season Day Emission (lbs/day) = (Annual UGB Emissions (tons/year) * 2000 (lb/ton) *SAF)/ (Activity (days/wk) *52 (weeks/yr))*

Area source fuel combustion emissions were reconciled with permitted point source emissions by subtracting emissions from point source fuel burning processes, broken down by the specific type of fuel, as shown in Appendix A, Table A-2. However, point source emissions to be removed were selected with the following two parameters:

- ACDP source emissions only, since the 2008 TV source double-count was resolved by the DEQ for the 2008 NEI submittal.
- Jackson County sources only, excluding those sources inventoried in the Grants Pass area, since area sources inventoried were for the Medford UGB only

NG and LPG emission estimates are detailed in Table 2.4.4 and Table 2.4.5.

3.4.3.2.3 Coal and Biomass Combustion

Jackson County emissions for coal and biomass were extracted from the EPA 2011 NEI since they were not inventoried in the 2008 NEI. EPA county-wide industrial and commercial emissions were allocated to the Medford UGB using the 2008 employee population data from the US Census Bureau and developing a ratio of UGB employees to county employees. The following formula was used for spatial allocation:

*Annual UGB emissions, tpy = (Annual Jackson County Emissions (tons/year)) * (UGB employee / Jackson County employee)*

The employee data were used to allocate industrial and commercial coal and biomass use. Typical Season Day emissions were calculated by multiplying the UGB annual emissions tons by the SAF, divided by activity days per week, and multiplied by 52 weeks per year. Weekly activity and SAFs were not provided in the 1993 EI[3], so the same values as the fuel oil use were used.

*CO Typical Season Day Emission (lbs/day) = (Annual UGB Emissions (tons/year) * 2000 (lb/ton) *SAF)/ (Activity (days/wk) *52 (weeks/yr))*

Coal and biomass emission estimates are detailed in Table 2.4.14 and Table 2.4.15.

3.4.3.3 Residential Wood Combustion

Wood is an important residential space-heating source in Oregon. As a heating source, wood contributes a significant percentage of pollutants to an airshed when compared to fuel oil and NG/LPG. Because the CO season in Medford occurs during the winter months when residential wood combustion is at its height, emissions from residential wood burning are considered, and have been estimated, to be significant in the UGB.

Jackson County emissions for Residential Wood Combustion were extracted from the EPA 2008 NEI database. Annual UGB emissions were estimated by multiplying county-wide emissions by the ratio of the UGB population to county population. The UGB population was determined using the same method and data described in section 2.4.3.3.1. The following formula is used for spatial allocation:

*Annual UGB emissions, tpy = Annual Jackson County Emissions (tons/year) * (UGB population / Jackson County population)*

Typical season day emissions were calculated by multiplying the UGB annual emissions tons by the SAF, divided by activity days per week, and multiplied by 52 weeks per year. The SAFs were obtained from the 1993 EI.[1] Weekly activity is 7 days per week based on the need for heating from this fuel source, which is consistent with the 1993 EI.[1]

Residential Wood Combustion emissions estimates are detailed in Table 2.4.6.

3.4.3.4 Miscellaneous Area Sources

The area sources described in this section are combustion sources and include forest wildfires, prescribed burning, and structural fires.

3.4.3.4.1 Forest Wildfires

DEQ staff analyzed EPA 2008 NEI fire event data[17,] to determine wildfire emissions for the Medford UGB and a 10-mile buffer around the UGB. The 10-mile buffer was chosen because it captured most of the northern valleys in the area that might drain towards Medford. Since EPA NEI fire event emission data is specific to date, direct estimation of annual and seasonal emissions is possible without relying on an SAF from other reference sources. Seasonal emissions were determined to be 0 lbs/day. Forest wild fire emissions estimates and references are detailed in Table 2.4.7.

3.4.3.4.2 Prescribed Burning

By definition, "prescribed burning" means forest debris or woody vegetation to be burned under the Oregon Smoke Management Plan administered by the Oregon Department of Forestry pursuant to OAR 477.515. To estimate prescribed burning emissions, DEQ staff analyzed EPA 2008 NEI fire event data[17,] for the Medford UGB and a 10-mile buffer around the UGB. The 10-mile buffer was chosen because it captured most of the northern valleys in the area that might drain towards Medford. Since EPA NEI fire event emission data is specific to date, direct estimation of annual and seasonal emissions is possible without relying on an SAF from other reference sources.

Use of the EPA data resulted in a significant increase in prescribed burning emissions estimates - two orders of magnitude larger than the estimate for the 1993 attainment year plan. However, emission inventory staff for the attainment year plan did not have access to the considerably more exact prescribed burning data currently available from EPA for 2008. Prescribed burning emission estimates and details are found in Table 2.4.8.

3.4.3.4.3 Structure Fires

Josephine County structure fires emissions are from DEQ's 2008 county-wide emissions submitted to the EPA National Emissions Inventory (NEI).

Annual CO Medford UGB emissions are estimated by multiplying county-wide emissions by the ratio of the 2008 UGB population to county population (population data taken from the US Census Bureau) using the following formula:

*Annual UGB emissions, tpy = UGB Emissions (tons/year) * (UGB population / Josephine county population)*

The Seasonal Adjustment Factors (SAF) was estimated from Oregon Fire Marshal data specific to Medford. Weekly activity are taken from the EPA procedures document[2]. Typical Season Day emissions were calculated by multiplying the UGB annual emission tons by the SAF, divided by activity days per week, multiplied by 52 weeks per year using the following formula:

*CO Typical Day Emissions (lb/day) = (Annual UGB Emissions (tons/year) *2000 (lb/ton)* SAF)/ (Activity (days/wk) * 52 (wk/year))*

Structure Fires emissions estimates are detailed in Table 2.4.9.

Area Source Emissions Summaries and Estimates

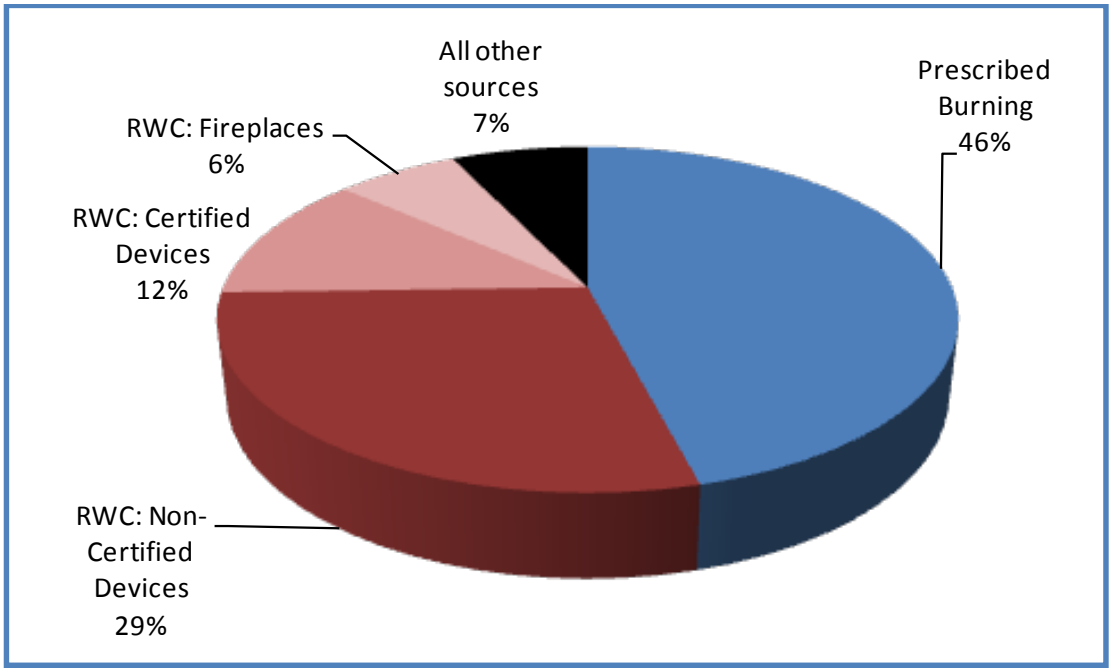


Figure 12: Area Source Annual Emissions by Percentage

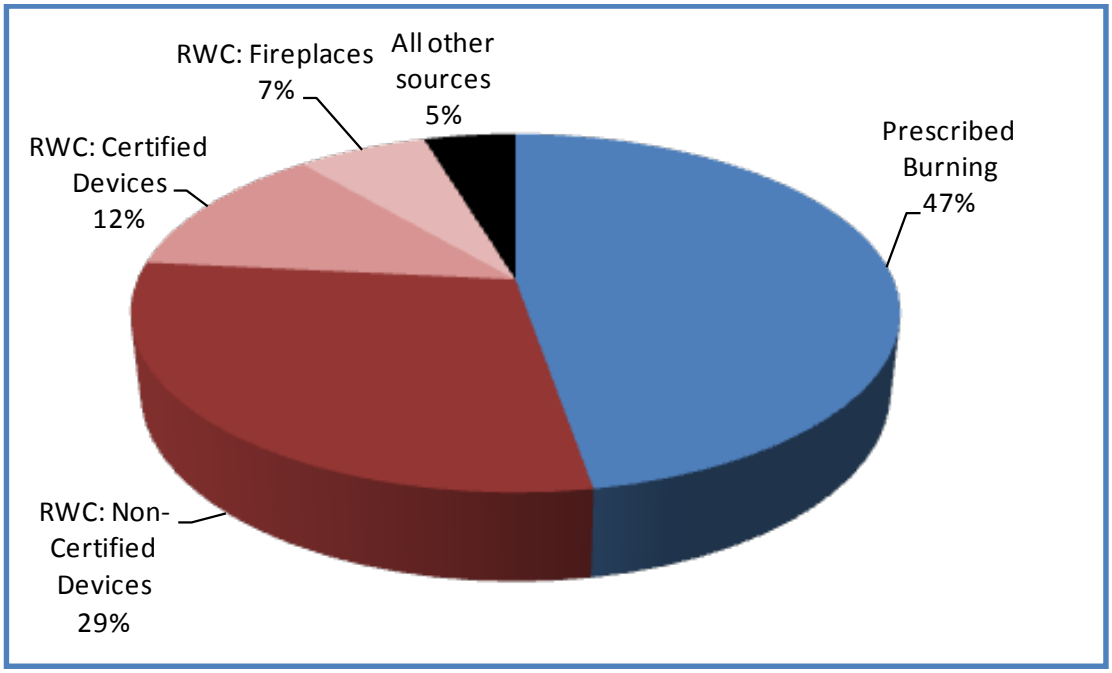


Figure 13: Area Source Season Day Emissions By Percentage

Table 2.4. 1: Medford 2008 CO EI Summary of Estimation Procedures for Area Sources

Source Description	Table Number	SCC Code	Data Source
WASTE DISPOSAL, TREATMENT, & RECOVERY			
Residential Open Burning	2.4.10	26-10-xxx-xxx	DEQ Permit/Complaint Data
Industrial Open Burning	2.4.11	26-10-010-000	DEQ Permit/Complaint Data
Commercial / Institutional Open Burning	2.4.12	26-10-020-000	DEQ Permit/Complaint Data
SMALL STATIONARY FUEL & WOOD USE			
Industrial			
Fuel Oil Combustion		21-02	
Distillate	2.4.3	21-02-004-xxx	2011NEI
Residual	2.4.3	21-02-005-000	2011NEI
Kerosene	2.4.3	21-02-011-000	2011NEI
Natural Gas Combustion	2.4.4	21-02-006-000	2011NEI
Liquid Petroleum Gas Combustion	2.4.5	21-02-007-000	2011NEI
Coal Combustion	2.4.13	21-02-002-000	2011NEI
Commercial / Institutional			
Fuel Oil Combustion		21-03	
Distillate	2.4.3	21-03-004-xxx	2011NEI
Residual	2.4.3	21-03-005-000	2011NEI
Kerosene	2.4.3	21-03-011-000	2011NEI
Natural Gas Combustion	2.4.4	21-03-006-000	2011NEI
Liquid Petroleum Gas Combustion	2.4.5	21-03-007-000	2011NEI
Biomass Combustion	2.4.14	21-03-008-000	2011NEI
Residential			
Fuel Oil Combustion		21-04	
Distillate	2.4.3	21-04-004-000	2008 NEI
Residual	2.4.3	21-04-005-000	2008 NEI
Kerosene	2.4.3	21-04-011-000	2008 NEI
Natural Gas Combustion	2.4.4	21-04-006-000	2008 NEI
Liquid Petroleum Gas Combustion	2.4.5	21-04-007-000	2008 NEI
Wood Combustion			
Fireplaces	2.4.6	21-04-008-100	2008 NEI
Woodstoves - fireplace inserts; non-EPA certified	2.4.6	21-04-008-210	2008 NEI
Woodstoves - fireplace inserts, EPA certified, non-catalytic	2.4.6	21-04-008-220	2008 NEI
Woodstoves - Insert Catalytic Certified	2.4.6	21-04-008-230	2008 NEI
Woodstoves - freestanding, non-EPA certified	2.4.6	21-04-008-310	2008 NEI
Woodstove - freestanding, EPA certified, catalytic	2.4.6	21-04-008-330	2008 NEI
Woodstove - freestanding, EPA certified, non-catalytic	2.4.6	21-04-008-320	2008 NEI
Exempt Pellet Stoves	2.4.6	21-04-008-400	2008 NEI
Furnace: Indoor, Cordwood-Fired, Not Certified	2.4.6	21-04-008-510	2008 NEI
Hydronic Heater: Outdoor	2.4.6	21-04-008-610	2008 NEI
Firelog: All Combustor Types	2.4.6	21-04-009-000	2008 NEI
MISCELLANEOUS AREA SOURCES			
Other Combustion		28-10	
Forest Wild Fires	2.4.7	28-10-001-000	2008 NEI: Events
Slash Burning	2.4.8	28-10-005-000	2008 NEI: Events
Structural Fires	2.4.9	28-10-030-000	2008 NEI

Table 2.4. 2: Medford 2008 CO EI Summary of Emissions Estimates for Area Sources

Source Description	Table #	SCC Code	CO Annual Emissions (tons/yr)	CO Season Emissions (lbs/day)
WASTE DISPOSAL, TREATMENT, & RECOVERY				
Residential Open Burning	2.4.10	26-10-xxx-xxx	0.2	1
Industrial Open Burning	2.4.11	26-10-010-000	0	0
Commercial / Institutional Open Burning	2.4.12	26-10-020-000	83.6	0
		Category Subtotal	**84**	**1**
SMALL STATIONARY FUEL & WOOD USE				
Industrial				
Fuel Oil Combustion		21-02		
Distillate	2.4.3	21-02-004-xxx	1.7	11
Residual	2.4.3	21-02-005-000	4.E-03	3.E-02
Kerosene	2.4.3	21-02-011-000	0.01	4.E-02
Coal Combustion	2.4.13	21-02-002-000	2.0	18
Natural Gas Combustion	2.4.4	21-02-006-000	0.0	0
Liquid Petroleum Gas Combustion	2.4.5	21-02-007-000	0.78	5
		Industrial Subtotal	**4**	**34**
Commercial / Institutional				
Fuel Oil Combustion		21-03		
Distillate	2.4.3	21-03-004-xxx	9.3	84
Residual	2.4.3	21-03-005-000	0.1	1
Kerosene	2.4.3	21-03-011-000	0.03	2.E-01
Biomass Combustion	2.4.14	21-03-008-000	18.7	168
Natural Gas Combustion	2.4.4	21-03-006-000	24.8	287
Liquid Petroleum Gas Combustion	2.4.5	21-03-007-000	1.80	16
		Commercial Subtotal	**55**	**556**
Residential				
Fuel Oil Combustion		21-04		
Distillate	2.4.3	21-04-004-000	0.6	5
Residual	2.4.3	21-04-005-000	0.00	0
Kerosene	2.4.3	21-04-011-000	0.04	4.E-01
		Residential Fuel Use	0.60	6
Natural Gas Combustion	2.4.4	21-04-006-000	17.3	162
Liquid Petroleum Gas Combustion	2.4.5	21-04-007-000	1.2	11
Wood Combustion				
Fireplaces	2.4.6	21-04-008-100	213.2	1,992
Woodstoves - fireplace inserts; non-EPA certified	2.4.6	21-04-008-210	274.0	2,560
Woodstoves - fireplace inserts, EPA certified, non-catalytic	2.4.6	21-04-008-220	35.8	335
Woodstoves - Insert Catalytic Certified	2.4.6	21-04-008-230	14.8	138
Woodstoves - freestanding, non-EPA certified	2.4.6	21-04-008-310	642.8	6,004
Woodstove - freestanding, EPA certified, catalytic	2.4.6	21-04-008-330	167.4	1,564
Woodstove - freestanding, EPA certified, non-catalytic	2.4.6	21-04-008-320	206.0	1,924
Exempt Pellet Stoves	2.4.6	21-04-008-400	9.8	91
Furnace: Indoor, Cordwood-Fired, Not Certified	2.4.6	21-04-008-510	36.7	343
Hydronic Heater: Outdoor	2.4.6	21-04-008-610	9.0	84
Firelog: All Combustor Types	2.4.6	21-04-009-000	13.8	129
		RWC Subtotal	1,623	15,162
		Residential Subtotal	1,643	15,341
		Category Subtotal	**1,702**	**15,931**
MISCELLANEOUS AREA SOURCES				
Other Combustion		28-10		
Forest Wild Fires	2.4.7	28-10-001-000	0.0	0
Prescribed Burning	2.4.8	28-10-015-000	1,530.8	14,381
Structural Fires	2.4.9	28-10-030-000	16.3	86
		Category Subtotal	**1,547.1**	**14,467**
		Area Source Total	**3,333.1**	**30,399**

Table 2.4. 3: Area Source Emissions From Fuel Oil Use

SCC and Category Description	(1) County Emissions (tons/year)	(2) Spatial Factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 21-02-004-xxx Industrial: Distillate Oil	5.44	31%	1.7	6	1.0	11
SCC 21-02-005-000 Industrial: Residual Oil	0.01	31%	0	6	1.4	0.0
SCC 21-02-011-000 Industrial- Kerosene	0.02	31%	0	6	1.0	0.0
SCC 21-03-004-xxx Commercial: Distillate Oil ACDP Emissions (7) Reconciled Emissions Estimate (8)	11.94	79%	9.4 ------- 8.E-02 ------- 9.3	6	1.4	85 ------- 1 ------- 84
SCC 21-03-005-000 Commercial: Residual Oil	0.16	79%	1.E-01	6	1.4	1
SCC 21-03-011-000 Commercial/Institutional- Kerosene	0.03	79%	0	6	1.4	0.2
SCC 21-04-004-000 Residential: Distillate Oil	1.48	38%	0.6	7	1.7	5
SCC 21-04-011-000 Residential: Kerosene	0.11	38%	0	7	1.7	0.4
Total			------- 11.8			------- 102

Notes for Table 2.4.3

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor allocates county-wide emissions to Medord UGB. Population is used as spatical surrogate for redidential fuel use. Industrial and commerical employee population is used as spatial surrogates for industrial and commerical fuel use, respectively.

Population taken from the U.S. Census Bureau.

Jackson County	Medford UGB Area Population	UGB Pop /County Pop
203,206	76,465	38%

Industrial and Commercial Employees population taken from the U.S.Census Bureau. Two ZIP codes were used to represent the UGB: 97501 and 97504.

	---------- Parameters ----------				
Description	Unit	Jackson County	Medford UGB	Medford UGB / Jackson County	Comment
Industrial	Employees	6,118	1,913	31%	NAICS 31
Commercial	Employees	41,859	33,146	79%	NAICS 42~56, 72, 81

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.3 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.4.3 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

(7) ACDP Emissions taken from Appendix A, Tables A-1 & A-2

Diesel (Distillate): Commercial/Institutional, SCC 21-03-005-000				
ACDP	15-0030	City of Medford	1.E-02	8.E-02
ACDP	15-0084	Grange Cooperative Supply Association	7.E-02	1
			-------	-------
Total ACDP Comm/Instititional Diesel			**8.E-02**	**1**

(8) Reconciled Emissions Estimates = Area source emissions estimates - ACDP emissions estimates

Table 2.4. 4: Area Source Emissions From Natural Gas (NG) Use

SCC and Category Description	(1) County Emissions (tons/year	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 21-02-006-000	69.70	31%	21.6	6	1.0	139
Industrial: NG			-------			-------
ACDP Emissions (7)			29.5			219
			-------			-------
Reconciled Emissions Estimate (8)			0			0
SCC 21-03-006-000	55.10	79%	43.5	6	1.4	391
Comm/Inst. NG			-------			-------
ACDP Emissions (7)			18.7			104
			-------			-------
Reconciled Emissions Estimate (8)			24.8			287
SCC 21-04-006-000	45.56	38%	17.3	7	1.7	162
Residential: NG						
			--------			--------
Total CO UGB Emissions (tpy):			42.1	Total CO UGB Typical Season Day Emissions (lbs/day):		448

Notes for Table 2.4.4

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor allocates county-wide emissions to Medord UGB. Population is used as spatical surrogate for redidential fuel use. Industrial and commerical employee population is used as spatial surrogates for industrial and commerical fuel use, respectively.

Population taken from the U.S. Census Bureau.

Jackson County	Medford UGB Area Population	UGB Pop /County Pop
203,206	76,465	38%

Industrial and Commercial Employees population taken from the U.S.Census Bureau. Two ZIP codes were used to represent the UGB: 97501 and 97504.

	---------- Parameters ----------				
Description	Unit	Jackson County	Medford UGB	Medford UGB / Jackson County	Comment
Industrial	Employees	6,118	1,913	31%	NAICS 31
Commercial	Employees	41,859	33,146	79%	NAICS 42~56, 72, 81

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.4 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.4.4 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

(7) ACDP Emissions taken from Appendix A, Tables A-1 & A-2

Permit	Src No.	Source Name	Annual, tpy	Season Day, lbs/day
Commercial/Institutional Natural Gas: SCC 21-03-006-000				
ACDP	15-0013	Chapel of the Valley Funeral Home Inc.	0.1	4.E-01
ACDP	15-0030	City of Medford	1.2	7
ACDP	15-0066	Amy's Kitchen, Inc.	9.4	52
ACDP	15-0075	Sisters of Providence in Oregon	3.2	18
ACDP	15-0088	Southern Oregon University Foundation	3.3	18
ACDP	15-0111	Rogue Valley Manor	1.5	8
ACDP	15-0155	Hillcrest Memorial Park and Mortuary	4.E-02	1
ACDP	15-0163	Litwiller Funeral Home, Inc.	4.E-02	2.E-01
			---	---
Total Commercial/Institutional NG removal			**18.7**	**104**
Industrial Natural Gas: SCC 21-02-006-000				
ACDP	15-0012	Murphy Company dba Murphy Veneer	2.7	15
ACDP	15-0022	Plycem USA, Inc.	5.2	37
ACDP	15-0037	Medford Moulding Co.	0.8	6
ACDP	15-0046	Boise Cascade Wood Products, L.L.C.	2.4	20
ACDP	15-0079	Bear Creek Operations, Inc.	2.2	36
ACDP	15-0109	Tree Top, Inc., A Washinglb/Ton Corporation	13.0	84
ACDP	15-0154	C & L Western	3.E-02	1
ACDP	15-0157	Leavitt Oregon	0.2	3
ACDP	15-0222	Boise Cascade Wood Products, L.L.C.	0.3	2
ACDP	15-9538	LTM, Incorporated dba Knife River Materials	2.8	15

Total Industrial NG removal			**29.5**	**219**

(8) Reconciled Emissions Estimates = Area source emissions estimates - ACDP emissions estimates

Table 2.4. 5: Area Source Emissions From Liquified Petroleum Gas (LPG) Use

SCC and Category Description	(1) County Emissions (tons/year	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 21-02-007-000 Industrial: LPG	2.51	31%	0.778	6	1	4.99
SCC 21-03-007-000 Commercial: LPG	2.28	79%	1.803	6	1.4	16.18
SCC 21-04-007-000 Residential: LPG	3.12	38%	1.187	7	1.7	11.08
			--------			--------
		Total CO UGB Emissions (tpy):	4		Total CO UGB Typical Season Day Emissions(lbs/day):	32

Notes for Table 2.4.5

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor allocates county-wide emissions to Medord UGB. Population is used as spatical surrogate for redidential fuel use. Industrial and commerical employee population is used as spatial surrogates for industrial and commerical fuel use, respectively.

Population taken from the U.S. Census Bureau.

Jackson County	Medford UGB Area Population	UGB Pop /County Pop
203,206	76,465	38%

Industrial and Commercial Employees population taken from the U.S.Census Bureau. Two ZIP codes were used to represent the UGB: 97501 and 97504.

	---------- Parameters ----------				
Description	Unit	Jackson County	Medford UGB	Medford UGB / Jackson County	Comment
Industrial	Employees	6,118	1,913	31%	NAICS 31
Commercial	Employees	41,859	33,146	79%	NAICS 42~56, 72, 81

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.5 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.4.5 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

Table 2.4. 6: Area Source Emissions From Residential Wood Combustion

SCC and Category Description	(1) County Emissions (tons/year)	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 21-04-008-100 Fireplace: general	561.1	38%	213.2	7	1.7	1,991.7
SCC 21-04-008-210 Insert Not Certified	721.1	38%	274.0	7	1.7	2,559.6
SCC 21-04-008-220 Insert NonCatalytic Certified	94.3	38%	35.8	7	1.7	334.6
SCC 21-04-008-230 Insert Catalytic Certified	38.8	38%	14.8	7	1.7	137.8
SCC 21-04-008-310 Woodstoves: Freestanding, Not Certified	1,691.5	38%	642.8	7	1.7	6,004.0
SCC 21-04-008-320 Woodstove: Freestanding, NonCatalytic Certified	542.0	38%	206.0	7	1.7	1,923.9
SCC 21-04-008-330 Woodstove: Freestanding, Catalytic Certified	440.5	38%	167.4	7	1.7	1,563.7
SCC 21-04-008-400 Pellet Stove	25.7	38%	9.8	7	1.7	91.3
SCC 21-04-008-510 Furnace: Indoor, Cordwood-Fired, Not Certified	96.6	38%	36.7	7	1.7	342.9
SCC 21-04-008-610 Hydronic Heater: Outdoor	23.6	38%	9.0	7	1.7	83.7
SCC 21-04-009-000 Firelog: All Combustor Types	36.3	38%	13.8	7	1.7	128.9
			--------			--------
		Total CO UGB Emissions (tpy) :	1,623.2	Total CO Typical Season day Emissions (lbs/day):		15,162.2

Notes for Table 2.4.6

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor allocates county-wide emissions to Medord UGB. Population is used as spatical surrogate for redidential fuel use. Industrial and commerical employee population is used as spatial surrogates for industrial and commerical fuel use, respectively.

Population taken from the U.S. Census Bureau.

Jackson County	Medford UGB Area Population	UGB Pop /County Pop
203,206	76,465	38%

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.6 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.4.5 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

Table 2.4. 7: Area Source Emissions From Wildfires

EventID	type	Date	LAT DD	LONG DD	Area	County	Tons CO
Source Data (1)							
--	--	--	--	--	--	--	**0**
Emissions Estimates							--------
TPY							0
(2) SAF							0
(3) TSD Emissions, lbs/day							0

Shaded cells indicate fires during the CO season (no fires occurred during CO season)

(1) EPA 2008 NEI (Reference 17)

2008 Raw fire data may be found here:

\\deghq1\EI_FILES\SIP_REFa\Electronic_References\Begin_2011_3\Ref_762.xlsx

Medford CO LMP ArcGIS project, including clipped fire data, is located here:

\\deghq1\EI_FILES\2008_Medford_Second_LMP_CO\GIS\Medford_CO_LMP.mxd

Please see Appendix B, Figure B-1 for fire locations in relation to the Medford UGB

GIS analysis shows no fires occurring within a 10 mile radius of the UGB in 2008.

(2) Seasonal Adjustment Factor (SAF) = (Seasonal Activity * 12 months) / (Annual Activity * Season Months)

Annual Emissions, tpy =	0.0
Seasonal Emissions, tpy =	0
SAF, based on CO emissions = (0 tpy * 12 months) / (6232.6 tpy * 3 months) =	0.00

(3) Typical Season Day emissions =

((Annual Emissions, tpy) * (2000 lbs/ton) * SAF) / (365 days/yr)

Table 2.4. 8: Area Source Emissions From Prescribed (RX) Burning

EventID	type	Date	LAT DD	LONG DD	Area	County	Tons CO
Source Data (1)							
SF11E261363	RX	1/18/2008	42.313	-123.038	46	Jackson	59.2
SF11E268150	RX	1/22/2008	42.332	-123.044	46	Jackson	63.7
SF11E297075	RX	3/14/2008	42.407	-123.081	46	Jackson	75.6
SF11E276460	RX	3/15/2008	42.366	-123.054	210	Jackson	345.0
SF11E273531	RX	4/17/2008	42.389	-123.094	46	Jackson	84.5
SF11E306548	RX	5/4/2008	42.388	-123.102	138	Jackson	255.9
SF11E306553	RX	10/14/2008	42.209	-122.991	70	Jackson	131.1
SF11E306553	RX	10/14/2008	42.233	-122.971	46	Jackson	71.0
SF11E315988	RX	11/20/2008	42.144	-122.834	70	Jackson	44.0
SF11E344144	RX	11/21/2008	42.436	-122.678	70	Jackson	56.2
SF11E332127	RX	12/3/2008	42.179	-122.964	350	Jackson	344.5
Emissions Estimates							--------
TPY							1,530.8
(2) SAF							1.22
(3) Activity, days per week							5
(4) TSD Emissions, lbs/day							14,381

Shaded cells indicate fires during the CO season

(1) EPA 2008 NEI (Reference 17)

2008 Raw fire data may be found here:

\\deqhq1\EI_FILES\SIP_REFa\Electronic_References\Begin_2011_3\Ref_762.xlsx

Medford CO LMP ArcGIS project, including clipped fire data, is located here:

\\deqhq1\EI_FILES\2008_Medford_Second_LMP_CO\GIS\Medford_CO_LMP.mxd

Please see Appendix B, Figure B-1 for fire locations in relation to the Medford UGB

(2) Seasonal Adjustment Factor (SAF) = (Seasonal Activity * 12 months) / (Annual Activity * Season Months)

Annual Emissions, tpy =	1,530.8
Seasonal Emissions, tpy =	467.4
SAF, based on CO emissions = (2687.3 tpy * 12 months) / (8778.5 tpy * 3 months) =	1.22

(3) Activity in days per week is taken from the 1993 Attainment Year Inventory (DEQ Ref. 618, Table 2.4.8)

(4) Typical Season Day emissions =

((Annual Emissions, tpy) * (2000 lbs/ton) * SAF) / (activity, days per week) * (5 days per week * 52 weeks per year)

Table 2.4. 9: Area Source Emissions From Structure Fires

SCC and Category Description	(1) County Emissions (tons/year)	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 28-10-030-000 Structure Fires	43.0	38%	16.3	7	0.96	86
			---			---
		Total CO UGB Emissions (tpy) :	16.3		Total CO Typical Season day Emissions (lbs/day):	86

Notes for Table 2.4.9

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

Data also found here: \\deqhq1\EI_FILES\2008_Medford_Second_LMP_CO\Final_EI\DEQ_EI\Fires\2008_Structure_FIRE_DATA.accdb

(2) Spatial factor allocates county-wide emissions to Medord UGB. Population is used as spatial surrogate for redidential fuel use.

Population taken from the U.S. Census Bureau.

Jackson County	Medford UGB Area Population	UGB Pop /County Pop
203,206	76,465	38%

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.9 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) estimated using alarm dates:

Fire alarm data for Medford found here:

\\deqhq1\EI_FILES\2008_Medford_Second_LMP_CO\Final_EI\DEQ_EI\Fires\2008_Structure_FIRE_DATA.accdb

Annual Fires = 71

Seasonal Fires (Dec, Jan, Feb) = 17

Seasonal Adjustment Factor = (Seasonal activity * 12 months) / (annual activity * season months)

Seasonal Adjustment Factor = (17*12) / (71*3) = 0.96

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

Table 2.4. 10: Area Source Emissions From Residential Open Burning

SCC and Category Description	(1) County Emissions (tons/year)	(2) Spatial Factor (%)	(3) Annual UGB Emission (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 26-10-030-000 Residential Open Burning of Municipal Household Garbage Waste	0.10	0.8%	0.0008	7	1.3	0.01
SCC 26-10-000-400 Yard Waste - Brush Species Unspecified	14.17	0.8%	0.1	7	1.3	0.8
SCC 26-10-000-100 Yard Waste - Leaf Species Unspecified	11.34	0.8%	0.1	7	1.3	0.7
	---					---
		Total CO UGB Emissions (tpy):	0.21	Total CO UGB Season Typical Season Day Emissions (lbs/day):		1.48

Notes: for Table 2.4.10

(1). The MS Access application used to query both databases is located at :
\\deqhq1\EI_FILES\2008_Medford_Second_LMP_CO\Final_EI\2008_NEI\Final_Data_ForBrian.accdb

(2) Appendix B, Table B-1. GIS Allocation Results: Jackson County Zones, County-Wide and by Medford UGB

(3) Annual UGB Emissions (tons/year)= County Emissions (tons/year)*Spatial Factor (%)

(4) Activity values use based on DEQ Ref 947. page 16.3-9
Open burning can be expected to take place **7** days a week.

(5) SAF = (8 day peak season activity *12 months)/ (25 days annual activity * 3 month) = **1.28**
Burn days include complaint (illegal)burn data and permitted burns (DEQ Ref.951, 952 and 946)

(6) CO Season Typical Day [lb/day] =
((Annual UGB Emissions (tons/year) *((2000 [lb./ton]) * (SAF))/ ((Activity [days/wk]) * (52 [wk./year]))

Table 2.4. 11: Area Source Emissions From Industrial Open Burning

SCC and Category Description	(1) (2) County Emissions (tons/year)	Spatial factor (%)	Annual UGB Emissions (tons/year)	Activity (days/week)	Seasonal Adjustment Factor (SAF)	CO Typical Season Day Emissions (lbs/day)
SCC 26-10-010-000 Industrial Open Burning	0	--	0	--	0	0

Notes:
No industrial open burning in the city of Medford. (References 12 & 13)

Table 2.4. 12: Area Source Emissions From Commercial/Institutional Open BUrning

SCC and Category Description	(1) County Emission (tons/year)	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emission (lbs/day)
Legal Burning - Permitted						
SCC: 26-10-000-500 Commercial / Institutional Open Burning	166	50.3%	84	5	0	0

Notes:
(1). The MS Access application used to query both databases is located at :
\\deghq1\EI_FILES\2008_Medford_Second_LMP_CO\Final_EI\2008_NEI\Final_Data_ForBrian.accdb

(2) Spatial Factor (%), using Josephine County land use zoning acreage GIS Allocation Results were created to approximate both the location and magnitude of emissions. County-Wide emission estimates were allocated by UGB percentage taken from Appendix X, Table C-X, (ID 8 = Commercial Lawn & Garden: Commercial Zones) GIS Allocation Results: Josephine County Zones, County-Wide and by UGB. Spatial surrogates are typically used to approximate emissions inside smaller boundaries from larger boundaries.

(3) Annual UGB Emissions: (tons/year)= County Emissions (tons/year)*Spatial Factor (%)

(4) Activity values used in the 1993 EI : Activity is based on the assumption that an individual commercial employee works 5 days per week even if the commercial source's operation runs 7 days per week. This employee activity is important because the emissions are based on employee population numbers.

(5) Seasonal Adjustment Factor (SAF)= (0 peak season activity * 12 months)/(173 annual activity * 3 months) 0
Burn days include complaint(illegal) burn data and permitted burns (DEQ Ref.951, 952 and 946)

(6) CO Typical Season Day Emissions [lb/day] =
((Annual Emissions [tons/year]) * (2000 [lb./ton]) * (SAF))/ ((Activity [days/wk]) * (52 [wk./year]))

Table 2.4. 13: Area Source Emissions From Coal Use

SCC and Category Description	(1) County Emissions (tons/year	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 21-02-001,2-000 Industrial: Coal	6.44	31%	2.00	6	1.4	17.9
SCC 21-03-001,2-000 Commercial: Coal	0.00	79%	0.00	6	1.4	0.0
			--------			--------
		Total CO UGB Emissions (tpy):	2	Total CO UGB Typical Season Day Emissions (lbs/day):		18

Notes for Table 2.4.13

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor allocates county-wide emissions to Medord UGB. Industrial and commerical employee population is used as spatial surrogates for industrial and commerical fuel use, respectively.

Industrial and Commercial Employees population taken from the U.S.Census Bureau. Two ZIP codes were used to represent the UGB: 97501 and 97504.

	---------- Parameters ----------				
Description	Unit	Jackson County	Medford UGB	Medford UGB / Jackson County	Comment
Industrial	Employees	6,118	1,913	31%	NAICS 31
Commercial	Employees	41,859	33,146	79%	NAICS 42~56, 72, 81

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.4 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.4.5 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

Table 2.4. 14: Area Source Emissions From Biomass Burning

SCC and Category Description	(1) County Emissions (tons/year	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Activity (days/week)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 21-02-008-000 Industrial: Biomass	0.00	31%	0.00	6	1.4	0.0
SCC 21-03-008-000 Commercial: Biomass	23.70	79%	18.72	6	1.4	168.0
			---			---
		Total CO UGB Emissions (tpy):	19	Total CO UGB Typical Season Day Emissions (lbs/day):		168

Notes for Table 2.4.14

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor allocates county-wide emissions to Medord UGB. Industrial and commerical employee population is used as spatial surrogates for industrial and commerical fuel use, respectively.

Industrial and Commercial Employees population taken from the U.S.Census Bureau. Two ZIP codes were used to represent the UGB: 97501 and 97504.

	---------- Parameters ----------				
Description	Unit	Jackson County	Medford UGB	Medford UGB / Jackson County	Comment
Industrial	Employees	6,118	1,913	31%	NAICS 31
Commercial	Employees	41,859	33,146	79%	NAICS 42~56, 72, 81

(3) UGB Fuel Use = County Emissions (tons/year)*Spatial Factor (%)

(4) Activity is obtained from Table 2.4.4 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.4.5 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Season CO Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (activity [days/week] * 52 [weeks/yr])

3.5 Nonroad Vehicles and Equipment

3.5.1 Introduction and Scope

This section describes the development of the emission inventory for carbon monoxide for nonroad mobile sources located in the Medford UGB in the 2008 CO Limited Maintenance Plan year. Sources inventoried within the nonroad mobile sector include off-road gasoline and diesel-powered vehicles and equipment, aircraft, and railroads as well as recreational and commercial waterborne vessels.

As with most of the area source categories, emissions within the Medford UGB were developed by applying SCC-specific spatial and temporal scaling factors to county-wide estimates of annual emissions for Jackson County from the 2008 NEI pursuant to the methodology outlined in the IPP.

Table 2.5.1 summarizes the nonroad mobile source emission inventory for the major nonroad source categories in terms of both annual and daily emissions (adjusted for activity during the CO season). Figures 2-1 through 2-4 compare emissions of the nonroad emission subcategories.

3.5.2 Nonroad Vehicles and Equipment

This category encompasses 2-stroke gasoline, 4-stroke gasoline, Compressed Natural Gas (CNG) / Liquefied Petroleum Gas (LPG), and diesel vehicles and equipment. Each of the sub-categories includes the following vehicle categories: Recreational Equipment, Construction Equipment, Industrial Equipment, Lawn/Garden Equipment, Agricultural Equipment, Light Commercial Equipment, and Logging Equipment.

3.5.2.1 Vehicle Categories

The nonroad vehicles and equipment category includes the following gasoline, CNG/LPG, and diesel sources:
SCC: 22-xx-001-xxx: Recreational Equipment
SCC: 22-xx-002-xxx: Construction Equipment
SCC: 22-xx-003-xxx: Industrial Equipment
SCC: 22-xx-004-xxx: Lawn / Garden Equipment
SCC: 22-xx-005-xxx: Agricultural Equipment
SCC: 22-xx-006-xxx: Light Commercial Equipment
SCC: 22-xx-007-xxx: Logging Equipment

3.5.2.2 Methodology

The starting point for emissions estimates for sources in this category was the county-wide, annual CO emissions from the EPA 2008 NEI. Using Jackson county land use zoning acreage,[7] GIS-based spatial allocation factors were created to estimate the fraction of county-wide emissions from each of the vehicle types (Appendix A, Table A-1) occurring within the Medford UGB. Annual Medford UGB emissions were estimated by multiplying the county-wide emissions by the spatial factor (%) for the appropriate zoning ID. The following formula was used for spatial allocation:

*Annual UGB emissions [tpy] = Annual Jackson County Emissions (tons/year) * Spatial Allocation Factor*

Typical CO Season Day emissions were calculated by multiplying the UGB annual emissions tons by the SAF) divided by 365 days per year. SAFs were taken from the 1993 EI.[3] The activity is assumed to be 7 days per week across all vehicle types to be consistent with the 1993 EI.[3]

*CO Typical Season Day Emission [lbs/day] = (Annual UGB Emissions (t/yr) * 2000(lb/ton) *SAF)/ (365 days/yr))*

Nonroad vehicle and equipment emissions are detailed in Tables 2.5.2 through 2.5.5.

3.5.3 Aircraft and Airport Operations Emissions

The aircraft and airport operation emission source categories inventoried include commercial and military aircraft, general aviation, air taxi, airport auxiliary power unit, and airport ground service equipment (GSE). Annual Jackson County CO emissions from aircraft and airport operation were obtained from the 2008 NEI.[*] Annual Medford UGB CO emissions were estimated by multiplying the county-wide emissions by appropriate spatial allocation factors. Spatial factors for general aviation and air taxi were calculated by dividing the total aircraft-related emissions by those of the Jackson County. The military and commercial aircraft, auxiliary power unit, and GSE were assigned a 100% spatial allocation factor since all these sources occur at the Rouge Valley International Medford Airport located within the UGB, which is the sole commercial airport operating in Jackson County. The details of these calculations and a summary of aircraft and airport emissions are given in Table 2.5.6.

3.5.4 Waterborne Vessels

Waterborne vessels fall under two categories: commercial/military marine vessels and recreational pleasure craft. Although pleasure craft emissions occur in other areas of Jackson County, neither category of waterborne vessel has any activity within the Medford UGB due to lack of sufficient water bodies and inland location to support such activity. As such, waterborne vessel emissions within the Medford UGB were set to zero.

3.5.5 Rail

Railroad emissions encompass both locomotive operation and railway maintenance as shown by individual SCC category below.

SCC: 22-85-002-007: Locomotives: Line-Haul
SCC: 22-85-002-010: Locomotives: Yard

County-wide annual emissions for railroads were taken from the EPA 2008 NEI database.[†] Jackson County annual emission estimates for locomotive emissions were allocated using only active track miles within the Medford UGB and locating railroad yard activity within the Medford UGB using the railway GIS shapefiles in the 2008 NEI supporting data.

The 2008 NEI had no railway maintenance emissions for Jackson County; therefore, emissions for these SCC categories were set to zero for the Medford UGB.

Typical Season Day emissions were calculated by multiplying the UGB annual emissions tons by the SAF, divided by 365 days per year. To be consistent with the 1993 EI,[3] seasonal activity is assumed to be uniform and the SAF is equal to 1.0.

---

[*] Aircraft and airport operations have traditionally been classified within the Nonroad Mobile Source sector. Although their SCC classifications have not changed, EPA grouped them within the Point Source sector beginning with the 2008 NEI. To maintain consistency with previous Medford air quality plans and emission inventories, these emissions continue to be reported within the Nonroad sector.

[†] Railroad have traditionally been classified within the Nonroad Mobile Source sector. Although their SCC classifications have not changed, EPA grouped them within the Non-Point (Area) Source sector beginning with the 2008 NEI. To maintain consistency with previous Medford air quality plans and emission inventories, these emissions continue to be reported within the Nonroad sector.

*CO Typical Season Day Emission [lbs/day] = (Annual UGB Emissions (t/yr) * 2000(lb/ton) *SAF)/ (365 days/yr))*

Railroad emission estimates are detailed in Table 2.5.7.

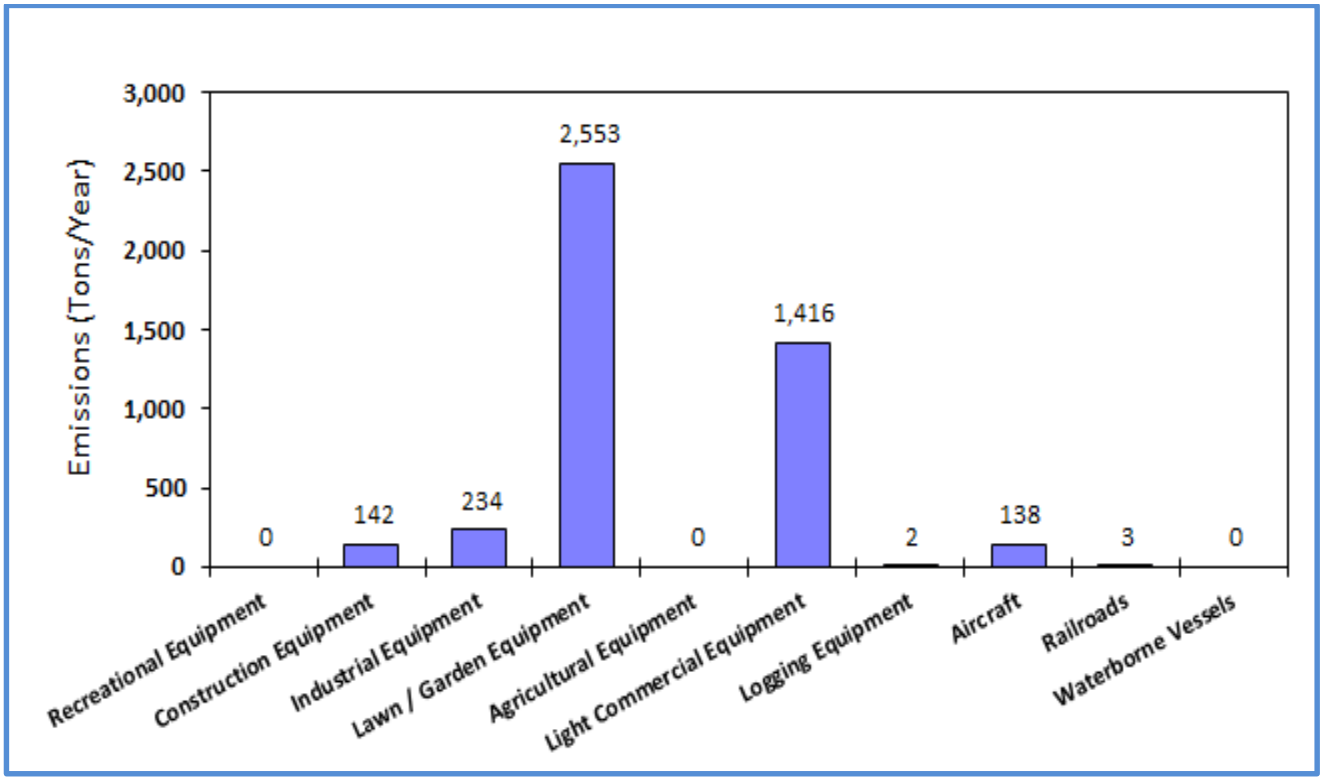


Figure 14: Distribution of Medford UGB Annual Nonroad Source CO Emissions, 2008

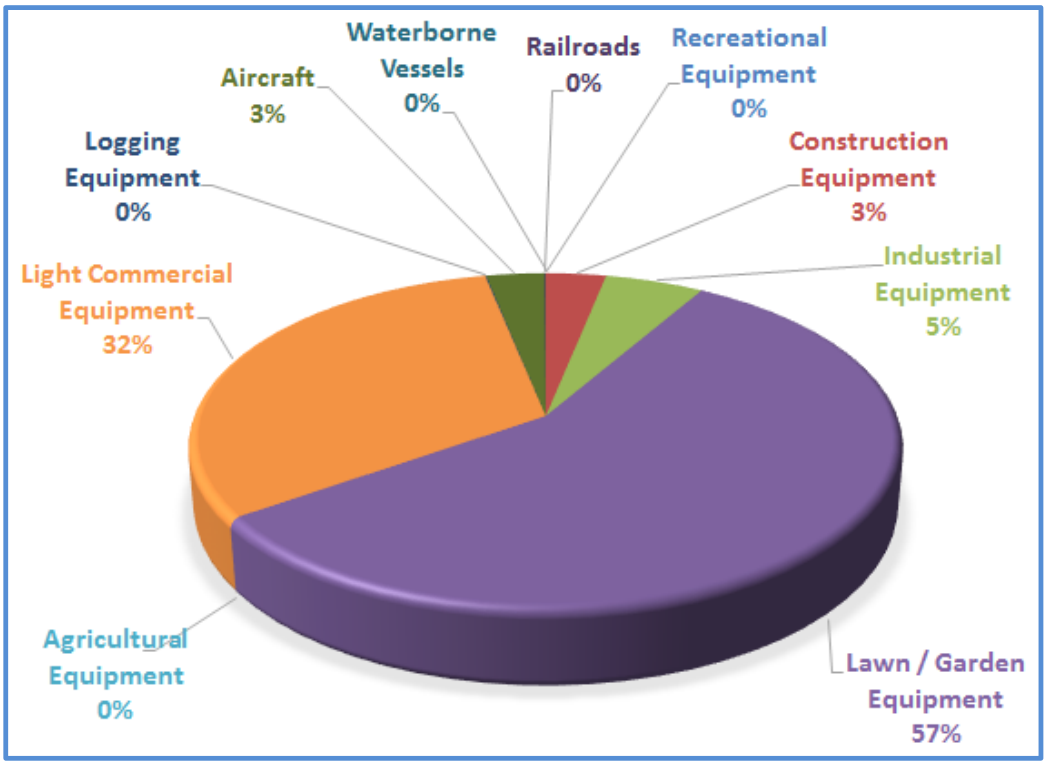


Figure 15: Percentage of Medford Annual Nonroad CO Source Emissions, 2008

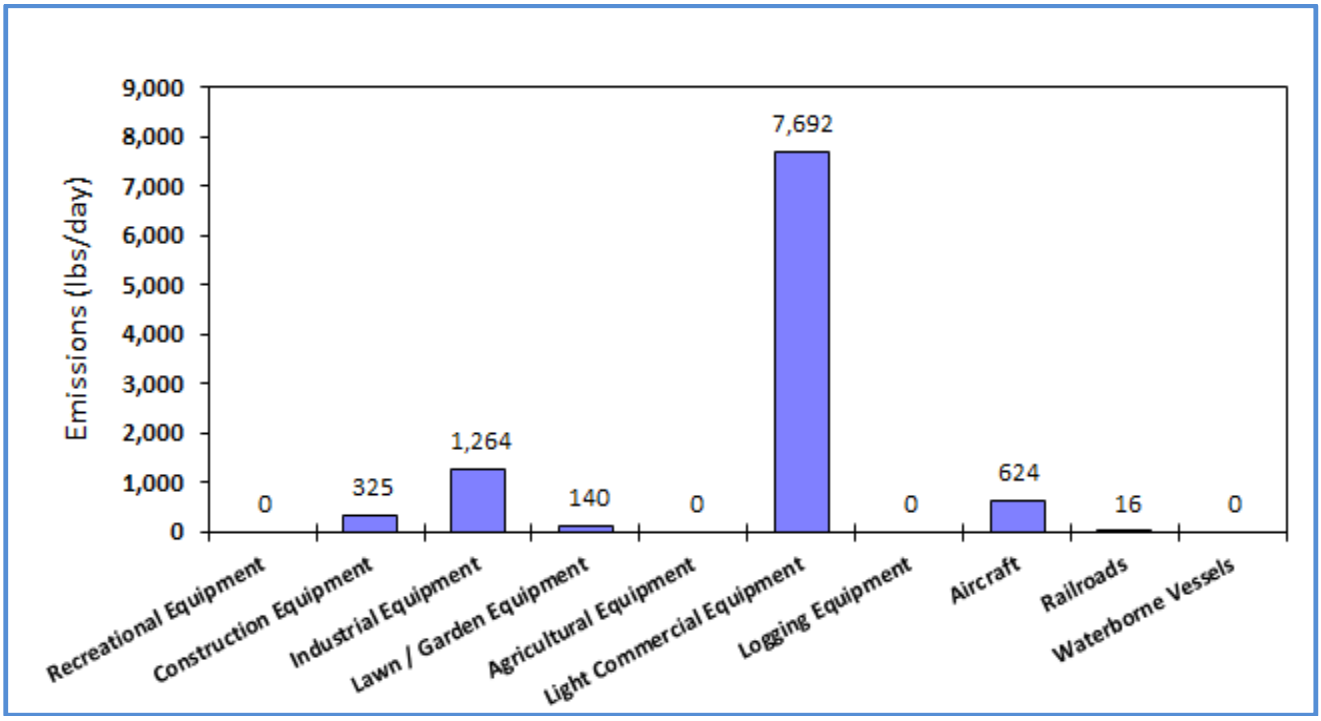


Figure 16: Distribution of Medford CO Season Day Nonroad Source Emissions, 2008

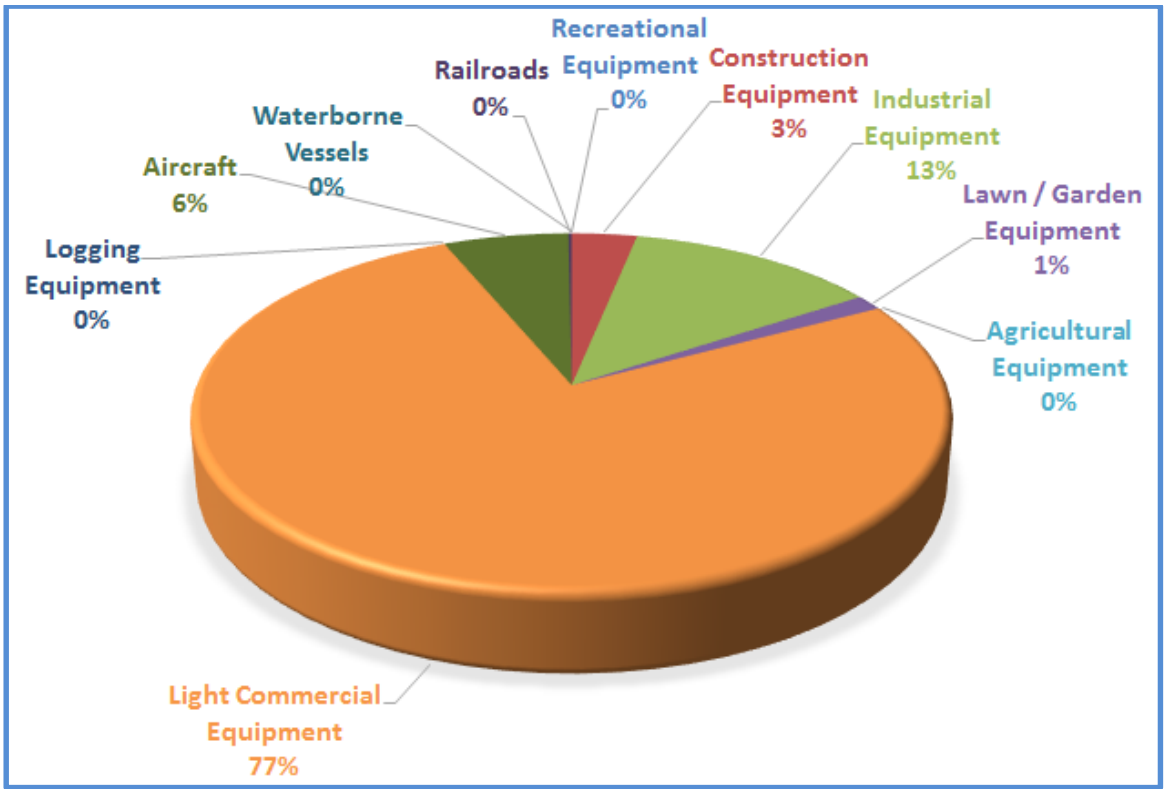


Figure 17: Percentage of Medford UGB CO Season Day Nonroad Source Emission, 2008

Table 2.5. 1: Medford UGB 2008 CO Summary of Emissions from Nonroad Sources

Source Description	Table #	SCC Code	2008 EI	
			CO Annual UGB Emissions (tons/yr)	CO Typical Season Day Emissions (lbs/day)
GAS, 2-Cycle				
Recreational Equipment	2.5.2	22-60-001-xxx	0.0	0.0
Construction Equipment	2.5.2	22-60-002-xxx	12.2	36.2
Industrial Equipment	2.5.2	22-60-003-xxx	0.1	0.3
Lawn / Garden Equipment	2.5.2	22-60-004-xxx	225	12
Agricultural Equipment	2.5.2	22-60-005-035	0	0
Light Commercial Equipment	2.5.2	22-60-006-xxx	17	93
Logging Equipment	2.5.2	22-60-007-005	0	0
		Category Subtotal	**254**	**142**
GAS, 4-Cycle				
Recreational Equipment	2.5.3	22-65-001-xxx	0	0
Construction Equipment	2.5.3	22-65-002-xxx	63	138
Industrial Equipment	2.5.3	22-65-003-xxx	32	172
Lawn / Garden Equipment	2.5.3	22-65-004-xxx	2,322	127
Agricultural Equipment	2.5.3	22-65-005-xxx	0	0
Light Commercial Equipment	2.5.3	22-65-006-xxx	1,378	7,476
Logging Equipment	2.5.3	22-65-007-xxx	0	0
		Category Subtotal	**3,795**	**7,914**
CNG/LPG				
Recreational Equipment	2.5.4	22-67,68-xxx-xxx	0	0
Construction Equipment	2.5.4	22-67,68-xxx-xxx	2	4
Industrial Equipment	2.5.4	22-67,68-xxx-xxx	190	1,031
Lawn / Garden Equipment	2.5.4	22-67,68-xxx-xxx	2	0
Agricultural Equipment	2.5.4	22-67,68-xxx-xxx	0	0
Light Commercial Equipment	2.5.4	22-67,68-xxx-xxx	0	0
Logging Equipment	2.5.4	22-67,68-xxx-xxx	0	0
		Category Subtotal	**194**	**1,036**
Diesel				
Recreational Equipment	2.5.5	22-70-001-xxx	0	0
Construction Equipment	2.5.5	22-70-002-xxx	65	146
Industrial Equipment	2.5.5	22-70-003-xxx	12	60
Lawn / Garden Equipment	2.5.5	22-70-004-xxx	4	0
Agricultural Equipment	2.5.5	22-70-005-xxx	0	0
Light Commercial Equipment	2.5.5	22-70-006-xxx	20	123
Logging Equipment	2.5.5	22-70-007-xxx	2	0
		Category Subtotal	**104**	**329**
VEHICLE SUBTOTAL		**Category Subtotal**	**4,348**	**9,421**
AIRCRAFT				
Military Aircraft	2.5.6	22-75-001-000	2	4
Aircraft: Commercial Aircraft	2.5.6	22-75-020-000	17	86
Aircraft: General Aviation	2.5.6	22-75-050-xxx	48	155
Aircraft: Air Taxi	2.5.6	22-75-060-xxx	7	37
Aircraft Auxillary Power Unit	2.5.6	22-75-070-000	2	12
Airport GSE	2.5.6	22-xx-008-005	61	330
		Category Subtotal	**138**	**624**
RAILROADS				
Locomotives: Line-Haul	2.5.7	22-85-002-007	0	1
Locomotives: Yard	2.5.7	22-85-002-010	3	15
		Category Subtotal	**3**	**16**
MARINE VESSELS				
Commercial Marine Vessels	2.5.8	22-80-004-000	0	0
Pleasure Craft-Diesel-Inboard/Stern	2.5.8	22-82-020-005	0	0
Pleasure Craft-Diesel-Outboard	2.5.8	22-82-020-010	0	0
Pleasure Craft-Gasoline 2-Stroke-Ou	2.5.8	22-82-005-010	0	0
Pleasure Craft-Gasoline 2-Stroke-Pe	2.5.8	22-82-005-015	0	0
Pleasure Craft-Gasoline 4-Stroke-Int	2.5.8	22-82-010-005	0	0
		Category Subtotal	**0**	**0**
			(tons/yr)	(lbs/day)
		TOTAL NON-ROAD	**4,488**	**10,061**

Table 2.5. 2: Medford UGB 2008 CO, Summary of Emissions from Nonroad Gasoline Vehicles * Equipment, 2-Cycle

SCC and Category Description	(2) County Emissions (tons/year)	(3) Spatial Factor (%)	(4) Annual UGB Emissions (tons/year)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 22-60-001-xxx (1) Recreational Equipment	399.87	0%	0.00	0	0.00
SCC 22-60-002-xxx Construction Equipment	55.54	22%	12.22	0.54	36.15
SCC 22-60-003-xxx Industrial Equipment	0.14	41%	0.06	0.99	0.30
SCC 22-60-004-xxx Lawn / Garden Equipment	440.27	51%	224.54	0.01	12.30
SCC 22-60-005-035 Agricultural Equipment	0.13	0%	0.00	0	0.00
SCC 22-60-006-xxx Light Commercial Equipment	24.17	71%	17.16	0.99	93.09
SCC 22-60-007-005 Logging Equipment	49.26	0%	0.00	0	0.00
			--------		--------
		Total CO UGB Emissions (typ) :	253.97	Total CO UGB Season Typical Day Emissions (lbs/day) :	141.85

Notes for Table 2.5.2

(1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories

(2) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(3) Spatial Factor (%) allocates county-wide emissions to UGB. Jackson County land use zoning acreage were used as spatial surrogates, and UGB percentages (spatial factors) were calculated by GIS allocation, the results of which can be found in file 08_Medford_spatial_surrogate_crossref.xlsx. The Jackson County land use zoning GIS datasets can be downloaded at

http://gis.jacksoncounty.org/Portal/gis-data.aspx Please see Appendix B, Table B-1 for GIS and spatial allocation data.

(4) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.5.2 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

Table 2. 5. 3. 2008 Medford UGB CO: Summary of Emissions from Nonroad Gasoline Vehicles and Equipment, 4-Cycle

SCC and Category Description	(2) County Emission (tons/year)	(3) Spatial factor (%)	(4) Annual UGB Emissions (tons/year)	(5) Seasonal Adjustment Factor (SAF)	(6) CO Typical Season Day Emissions (lbs/day)
SCC 22-65-001-xxx (1) Recreational Equipment	851.25	0%	0.00	0	0.00
SCC 22-65-002-xxx Construction Equipment	286.64	22%	63.06	0.4	138.22
SCC 22-65-003-xxx, 22-65-010-010 Industrial Equipment	77.31	41%	31.70	0.99	171.95
SCC 22-65-004-xxx Lawn / Garden Equipment	4552.82	51%	2321.94	0.01	127.23
SCC 22-65-005-xxx Agricultural Equipment	24.43	0%	0.00	0	0.00
SCC 22-65-006-xxx Light Commercial Equipment	1941.11	71%	1378.19	0.99	7476.22
SCC 22-65-007-xxx Logging Equipment	102.21	0%	0.00	0	0.00
			--------		--------
			Total CO UGB Emissions (tpy) : 3795	Total CO UGB Season Typical Day Emissions (lbs/day):	7914

Notes for Table 2.5.3

(1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories

(2) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(3) Spatial Factor (%) allocates county-wide emissions to UGB. Jackson County land use zoning acreage were used as spatial surrogates, and UGB percentages (spatial factors) were calculated by GIS allocation, the results of which can be found in file 08_Medford_spatial_surrogate_crossref.xlsx. The Jackson County land use zoning GIS datasets can be downloaded at

http://gis.jacksoncounty.org/Portal/gis-data.aspx Please see Appendix B, Table B-1 for GIS and spatial allocation data.

(4) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.5.3 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

Table 2. 5. 4. 2008 Medford UGB CO: Summary of Emissions from Nonroad CNG/LPG Vehicles and Equipment

SCC and Category Description	(2) County Emission (tons/year)	(3) Spatial factor (%)	(4) Annual UGB Emissions (tons/year)	(6) Seasonal Adjustment Factor (SAF)	(7) CO Typical Season Day Emissions (lbs/day)
SCC 22-67,68-xxx-xxx (1) Recreational Equipment	0.37	0%	0.00	0	0.00
SCC 22-67,68-xxx-xxx Construction Equipment	9.16	22%	2.01	0.4	4.42
SCC 22-67,68-xxx-xxx Industrial Equipment	463.70	41%	190.12	0.99	1031.32
SCC 22-67,68-xxx-xxx Lawn / Garden Equipment	4.42	51%	2.25	0.01	0.12
SCC 22-67,68-xxx-xxx Agricultural Equipment	0.07	0%	0.00	0	0.00
SCC 22-67,68-xxx-xxx Light Commercial Equipment	0.00	71%	0.00	0.99	0.00
SCC 22-67,68-xxx-xxx Logging Equipment	0.00	0%	0.00	0	0.00
			--------		--------
		Total CO UGB Emissions (tpy) :	194	Total CO UGB Season Typical Day Emissions (lbs/day):	1036

Notes for Table 2.5.4

(1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories

(2) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(3) Spatial Factor (%) allocates county-wide emissions to UGB. Jackson County land use zoning acreage were used as spatial surrogates, percentages (spatial factors) were calculated by GIS allocation, the results of which can be found in file 08_Medford_spatial_surrogate_ The Jackson County land use zoning GIS datasets can be downloaded at

http://gis.jacksoncounty.org/Portal/gis-data.aspx Please see Appendix B, Table B-1 for GIS and spatial allocation data.

(4) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(5) Seasonal Adjustment Factor (SAF) is not available in1993 EI, so the same SAFs of 4-stroke nonroad vehicles are used (i.e., the SAFs in T

(6) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

Table 2. 5. 5. 2008 Medford UGB CO: Summary of Emissions from Nonroad Diesel Vehicles and Equipment

SCC and Category Description	(2) County Emission (tons/year)	(3) Spatial factor (%)	(4) Annual UGB Emissions (tons/year)	(6) Seasonal Adjustment Factor (SAF)	(7) CO Typical Season Day Emissions (lbs/day)
SCC 22-70-001-xxx (1) Recreational Equipment	1.07	0%	0.00	0	0.00
SCC 22-70-002-xxx Construction Equipment	295.92	22%	65.10	0.41	146.26
SCC 22-70-003-xxx, 22-70-010-010 Industrial Equipment	29.76	41%	12.20	0.9	60.18
SCC 22-70-004-xxx Lawn / Garden Equipment	8.67	51%	4.42	0	0.00
SCC 22-70-005-xxx Agricultural Equipment	27.64	0%	0.00	0	0.00
SCC 22-70-006-xxx Light Commercial Equipment	28.49	71%	20.23	1.11	123.02
SCC 22-70-007-xxx Logging Equipment	11.12	22%	2.45	0	0.00
			--------		--------
			Total CO UGB Emissions (tpy) : 104	Total CO UGB Season Typical Day Emissions (lbs/day):	329

Notes for Table 2.5.5

(1) Recreational Equipment does not include Water Recreation vehicles; as are defined in the Nonroad Emissions inventories

(2) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(3) Spatial Factor (%) allocates county-wide emissions to UGB. Jackson County land use zoning acreage were used as spatial surrogates, and UGB percentages (spatial factors) were calculated by GIS allocation, the results of which can be found in file 08_Medford_spatial_surrogate_crossref.xlsx. The Jackson County land use zoning GIS datasets can be downloaded at

http://gis.jacksoncounty.org/Portal/gis-data.aspx Please see Appendix B, Table B-1 for GIS and spatial allocation data.

(4) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(5) Seasonal Adjustment Factor (SAF) is obtained from Table 2.5.4 in Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

Table 2.5. 6. 2008 Medford UGB CO: Summary of Emissions from Aircraft and Airport GSE

SCC and Category Description	(1) County Emission (tons/year)	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Seasonal Adjustment Factor (SAF)	(5) CO Typical Season Day Emissions (lbs/day)
SCC 22-75-001-000 Military Aircraft	2.17	100%	2.17	0.319	3.79
SCC 22-75-020-000 Aircraft: Commercial Aircraft	17.23	100%	17.23	0.907	85.61
SCC 22-75-050-xxx Aircraft: General Aviation	165.11	29%	47.88	0.591	155.06
SCC 22-75-060-xxx Aircraft: Air Taxi	24.38	29%	7.07	0.965	37.39
SCC 22-75-070-000 Aircraft Auxillary Power Unit	2.40	100%	2.40	0.907	11.94
SCC 22-65,67,68,70-008-005 Airport GSE	60.87	100%	60.87	0.99	330.20
			--------	Typical Day Emissions	--------
		Total CO UGB Emissions (tpy) :	138	(lbs/day):	624

Notes for Table 2.5.6

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial Factor (%) allocates county-wide general aviation and air taxi aircraft emissions to UGB. Facility locations were used as spatial surrogates, and UGB percentages (spatial factors) were calculated by dividing the number of aircraft-related facilities in UGB by those in Jackson County. The facility locations were obtained from 2008 NEI and can be found in file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." The Military, Commercial, Auxiliary Power Units, and GSE were assigned 100% spatial factor since all these sources are at Rogue Valley International Medford Airport inside the UGB.

Jackson County Number of Facilities	Medford UGB Number of Facilities	Spatial Factor
21	6	29%

(3) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(4) Seasonal Adjustment Factor (SAF) is back-calculated using the annual and CO season emissions in Table 2.5.5 in the 1993 EI.

(5) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

Table 2.5. 7. 2008 Medford UGB CO: Summary of Emissions from Railroads

SCC and Category Description	(1) County Emission (tons/year)	(2) Spatial factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Seasonal Adjustment Factor (SAF)	(5) CO Typical Season Day Emissions (lbs/day)
SCC 22-85-002-007 Locomotives: Line-Haul	6.66	3%	0.22	1	1.21
SCC 22-85-002-010 Locomotives: Yard	8.01	33%	2.67	1	14.63
			--------	Total CO UGB Season Typical	--------
		Total CO UGB Emissions (tpy) :	3	Day Emissions (lbs/day):	16

Notes for Table 2.5.7

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) Spatial factor (%) allocates county-wide emissions to UGB. The spatial surrogates for line-haul and yard emissions are track miles and yard locations, respectively. Track miles were obtained from 2008 NEI railway shapfile, and yard locations were identified by using ODET TransGIS:

https://gis.odot.state.or.us/transGIS/

	Jackson County	Medford UGB	Spatial Factor
Line-haul	138.3	4.6	3.33%
Yard	3	1	33.33%

(3) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(4) Seasonal Adjustment Factor (SAF) is obtained from Table 2.5.6 of Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

3.6 On-Road Mobile Sources

3.6.1 Introduction and Scope

This section describes the development of the emission inventory for CO from on-road mobile sources in the Medford UGB for the 2008 CO LMP analysis year. On-road emission estimates from Version 3 of the 2008 NEI database were used to represent countywide emissions. (The on-road emission estimates in Version 3 of the 2008 NEI were developed using EPA's MOVES2010b vehicle emissions model.) On-road sources included in this inventory were grouped by both vehicle type and road type. Separate sets of on-road CO emissions categorized by vehicle type and by road type were estimated and reported.

3.6.2 Spatial and Temporal Allocation of 2008 NEI Data

3.6.2.1 Spatial Allocation

County-wide 2008 on-road exhaust emissions from the 2008 NEI were allocated to the Medford UGB using spatial surrogates based on vehicle miles traveled (VMT). The spatial factor was calculated by dividing the Medford UGB annual VMT by the Jackson County annual VMT in 2008. Medford UGB annual VMT was calculated from the model output of the RVMPO "Models Version 3.0" travel demand model.[8] Jackson County annual VMT was calculated from the monthly VMT provided in the 2008 NEI supporting "4c" archive file[3] database for transportation activity. Table 2.6.1 and Table 2.6.2 detail spatial allocation of data for on-road mobile sources. The following formula was used for spatial allocation:

*Annual UGB emissions, tpy = Annual Jackson County Emissions (tons/year) * (UGB Annual VMT / Jackson County Annual VMT)*

3.6.2.2 Temporal Allocation

Typical Season Day CO emissions were calculated by multiplying the UGB annual emissions tons by the SAF, divided by 365 days per year. The SAFs for on-road emissions grouped by vehicle type were calculated using the values in Table 2.6.5 in the 1993 EI.[1] The SAFs for on-road emissions grouped by road type were taken from Table 2.6.3 in the 1993 EI,[1] and the weekly adjustment factors were taken from Table 2.6.4 in the 1993 EI[1]. The following formula was used for temporal allocation:

*CO Typical Season Day Emission (lbs/day) = (Annual UGB Emissions (tons/year) * 2000 (lb/ton) *SAF)/ (365 days/year)*

3.6.3 Summary of On-Road Mobile Source Emissions

On-road mobile emissions have been summarized by vehicle type and roadway type for annual and season day emissions in Figures 19 through 21, and Tables 2.6.1 and 2.6.2 respectively.

The CO Season daily emissions are nominally different in Tables 2.6.1 and 2.6.2 because of the SAFs, which were taken from the 1993 Attainment Year EI[1]. A*lthough these SAFs gave the same*

[3] ftp://ftp.epa.gov/EmisInventory/2008v3/doc.

CO Season daily emissions in respective tables in the 1993 EI, they result in slightly different CO season daily emissions when applied to the 2008 NEI.

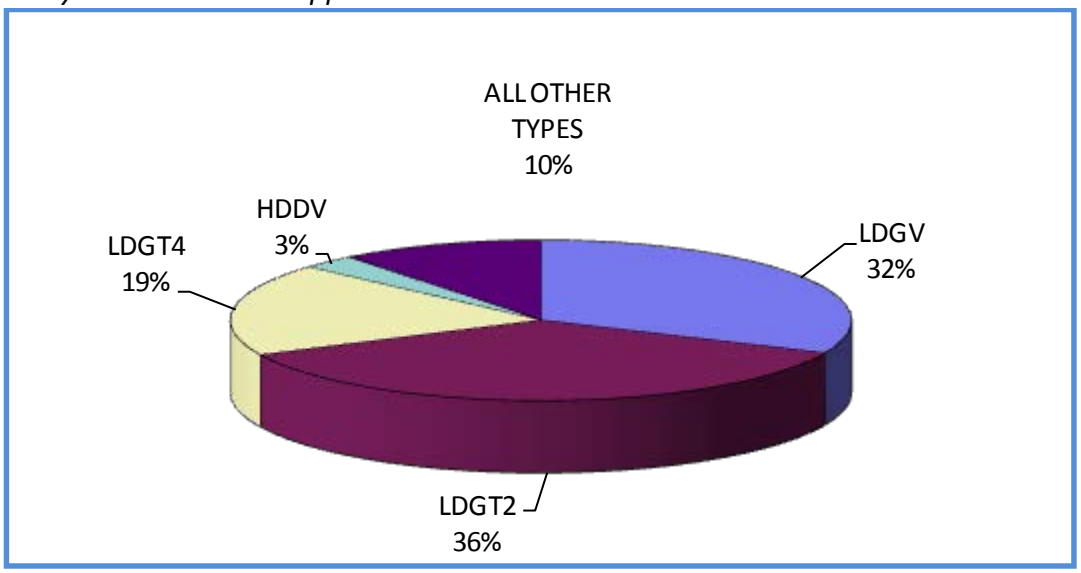


Figure 18: Percentage of 2008 Medford Annual Onroad CO Source Emissions, by Vehicle Type

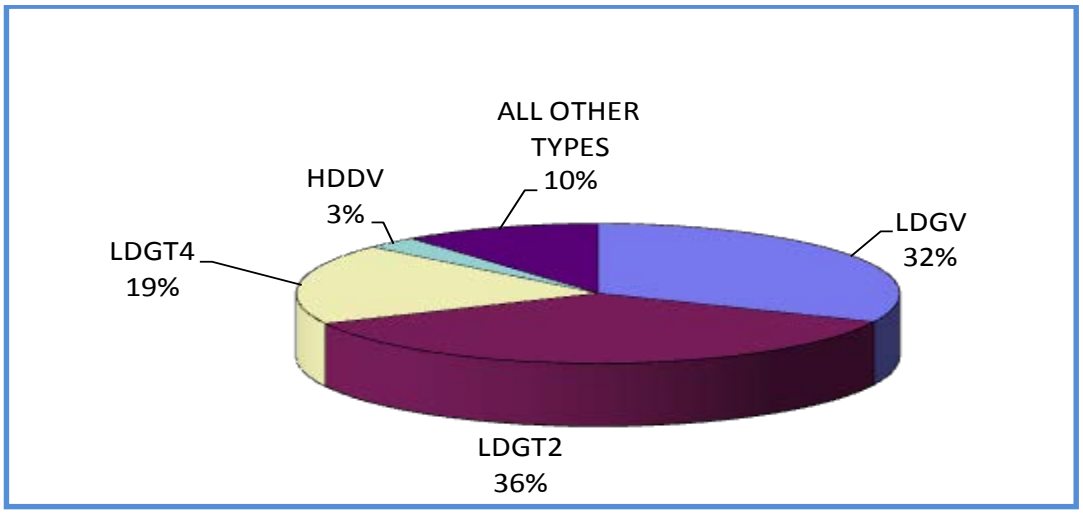


Figure 19: Percentage of 2008 Medford Season Day Onroad CO Source Emissions, by Vehicle Type

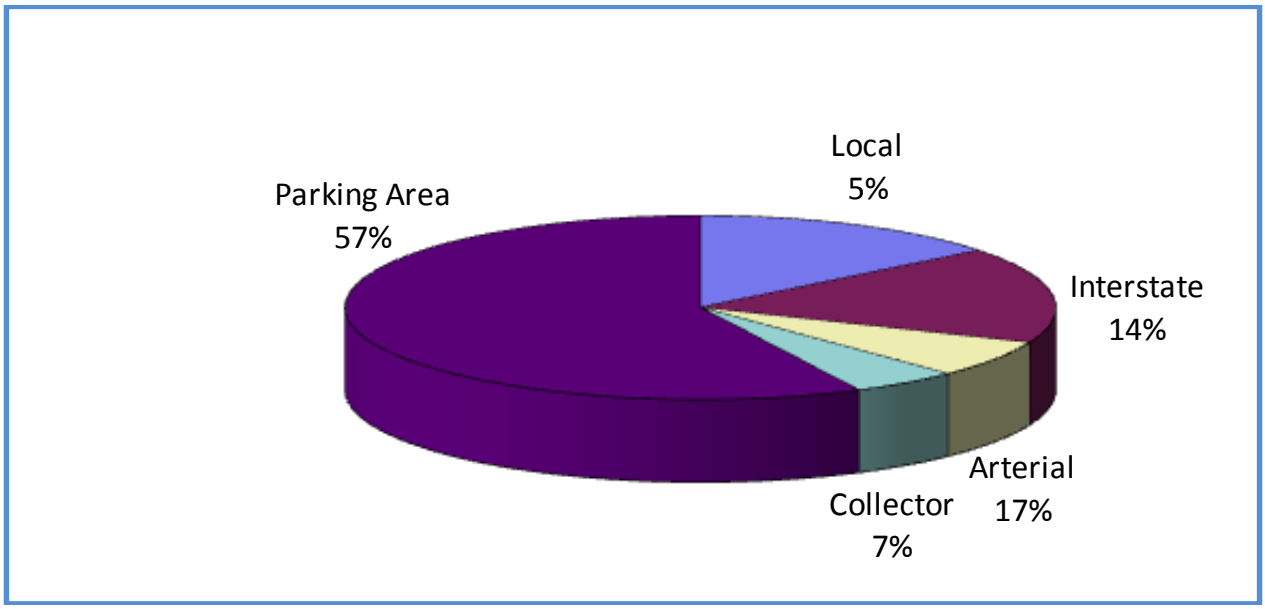


Figure 20: Percentage of 2008 Medford Annual Onroad CO Source Emissions, by Roadway Type

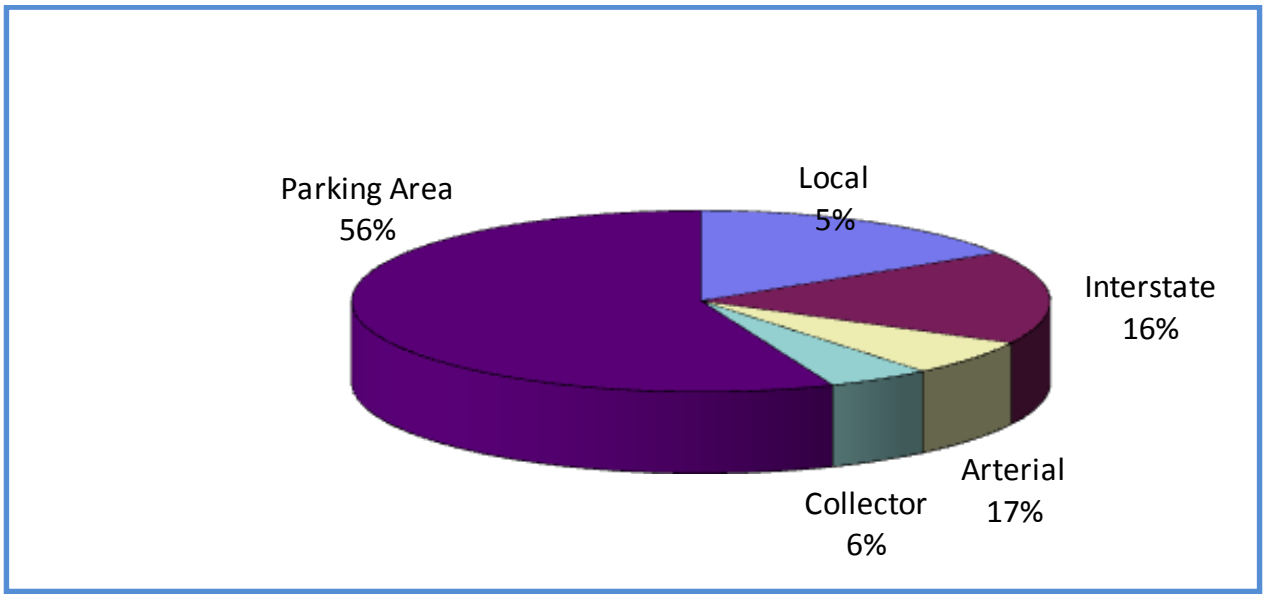


Figure 21: Percentage of 2008 Medford Season Day Onroad CO Source Emissions, by Roadway Type

Table 2.6. 1. 2008 Medford UGB CO: Summary of On-Road Mobile Emissions by Vehicle Type

SCC and Category Descri	(1) County Emissions (tons/year)	(2) Spatial Factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Seasonal Adjustment Factor (SAF)	(5) CO Typical Season Day Emissions (lbs/day)
SCC 22-01-001-xxx LDGV	5579.91	32.5%	1815.44	0.915	9102.07
SCC 22-01-020-xxx LDGT 1 & 2	6376.41	32.5%	2074.58	0.915	10401.33
SCC 22-01-040-xxx LDGT 3 & 4	3284.82	32.5%	1068.73	0.915	5358.27
SCC 22-01-070-xxx HDGV	1651.71	32.5%	537.39	0.915	2694.30
SCC 22-01-080-xxx MC	190.11	32.5%	61.85	0.921	312.15
SCC 22-30-001-xxx LDDV	1.44	32.5%	0.47	0.918	2.36
SCC 22-30-060-xxx LDDT 1 ~ 4	28.04	32.5%	9.12	0.913	45.64
SCC 22-30-07x-xxx HDDV	499.29	32.5%	162.44	0.916	815.34
	17611.73		--------	Total CO UGB Season Typical	--------
		Total CO UGB Emissions (typ) :	5730.03	Day Emissions (lbs/day) :	28731.46

Notes for Table 2.6.1

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) The spatial surrogate is vehicle miles traveled (VMT). The spatial factors are calculated by dividing total VMT in the Medford UGB by that of Jackson County. Jackson County Annual VMT are extracted from 2008 NEI supporting data, and are summarized in file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." Medford UGB annual VMT are calculated from the model output of the RVMPO Travel Demand Models Version 3.0 provided by ODOT/TPAU. More information can be found in the memo "Modeling to Support the RVMPO 2015-2018 TIP Air Quality Conformity Determination (AQCD)"

Jackson County Annual VMT	Medford UGB Annual VMT	Spatial Factor
1,576,787,247	513,012,245	32.535%

(3) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(4) Seasonal Adjustment Factor (SAF) is calculated using the annual and CO season emissions in Table 2.6.5 of Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

Table 2.6. 2. 2008 Medford UGB CO: Summary of On-Road Mobile Emissions by Road Type

SCC and Category Description	(1) County Emissions (tons/year)	(2) Spatial Factor (%)	(3) Annual UGB Emissions (tons/year)	(4) Seasonal Adjustment Factor (SAF)	(5) Weekday Adjustment Factor	(6) CO Typical Season Day Emissions (lbs/day)
SCC 22-xx-xxx-110,230 Interstate	2518.67	32.5%	819.46	0.939	0.94	4485.40
SCC 22-xx-xxx-150,130,290,270 Arterial	2982.05	32.5%	970.22	0.817	0.94	4620.63
SCC 22-xx-xxx-170,190,310 Collector	1152.35	32.5%	374.92	0.817	0.94	1785.55
SCC 22-xx-xxx-210,330 Local	861.80	32.5%	280.39	0.817	0.94	1335.34
SCC 22-xx-xxx-390 Parking Area	10096.87	32.5%	3285.04	0.817	0.94	15644.89
	17611.73		--------		Total CO UGB Season Typical	--------
		Total CO UGB Emissions (typ) :	5730.03		Day Emissions (lbs/day) :	27871.79

Notes for Table 2.6.2

(1) The data are from the 2008 NEI, summarized in the file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." (References 5 and 18)

(2) The spatial surrogate is vehicle miles traveled (VMT). The spatial factors are calculated by dividing total VMT in the Medford UGB by that of Jackson County. Jackson County Annual VMT are extracted from 2008 NEI supporting data, and are summarized in file "MedfordCOLMP_2008NEI_Jackson_County.xlsx." Medford UGB annual VMT are calculated from the model output of the RVMPO Travel Demand Models Version 3.0 provided by ODOT/TPAU. More information can be found in the memo "Modeling to Support the RVMPO 2015-2018 TIP Air Quality Conformity Determination (AQCD)"

Jackson County Annual VMT	Medford UGB Annual VMT	Spatial Factor
1,576,787,247	513,012,245	32.535%

(3) Annual UGB CO Emissions (tons/year) = County Emissions (tons/year)*Spatial Factor (%).

(4) Seasonal Adjustment Factor (SAF) is calculated using the annual and CO season emissions in Table 2.6.5 of Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(5) Weekday and average-day activity adjustment factor is obtained from Table 2.6.4 of Oregon 1993 Medford UGB Carbon Monoxide Attainment year SIP Emission Inventory

(6) CO Typical Season Day Emissions [lbs/day] = ((Annual Emissions [tons/yr] * 2000 [lbs/ton]) * SAF) / (365 [days])

4 Quality Assurance and Quality Control

4.1 Introduction

The Oregon DEQ is responsible for overall quality and accuracy of this inventory of Carbon Monoxide (CO) sources and emissions for the Medford urban growth boundary (UGB) for the 2008 Limited Maintenance Plan. As presented in the IPP delivered to EPA in November 2014, DEQ used existing data that has already been quality checked. DEQ staff performed quality assurance for accuracy, completeness, and representativeness on the spatial and temporal allocation of emissions from the existing inventory. DEQ and Sierra Research used EPA county database estimates from the 2008 NEI v.3 generated using MOVES2010b modeled emissions rates.[5,18]

4.2 Organization and Personnel

Wesley Risher, an emission inventory analyst at the DEQ, was appointed Quality Assurance Coordinator. DEQ staff Brandy Albertson, Christopher Swab, and Miyoung Park, along with Wenxian Zhang at Sierra Research, performed the bulk of the required source calculations. The abbreviated organizational hierarchy for carrying out the Quality Assurance Program is shown below.

Oregon Department of Environmental Quality
Air Quality Division

Wendy Wiles, Administrator – Environmental Solutions Division
Jeffrey Stocum, Manager – Air Quality Technical Services Section
Emission Inventory
Christopher Swab, Senior Emission Inventory Analyst
Brandy Albertson, Emission Inventory Analyst
Miyoung Park, Emission Inventory Specialist
Quality Assurance
Wesley Risher, Emission Inventory Analyst

David Collier,
Air Quality Planning Manager
Dave Nordberg, Air Quality Planner

Sierra Research
Tom Carlson, Principal Scientist
Wenxian Zhang, Associate Engineer

4.3 Data Collection and Analysis

4.3.1 Data Collection and Analysis

To ensure the comprehensive nature of the emission inventory, a source listing from the 1993 attainment year inventory was used as a starting point[1]. The listing of sources in the 1993 inventory was generated using EPA's Quality Assurance Plan guidance document[1] and EPA's *Procedures for the Preparation of Emissions for Carbon Monoxide And Precursors Of Ozone*[2] were used. The inventoried sources are marked under the appropriate pollutant category. Only those sources that had been determined to operate in the inventory areas were included

Inventory source categories were divided into Stationary Point Sources, Stationary Area Sources, Non-Road Mobile and On-Road Mobile Sources, the details of which are discussed in Parts 2.3 through 2.6 of this report. Permitted stationary point source information is maintained by DEQ for sources with annual emissions of at least 5 tons per year, so a questionnaire/survey was not necessary to identify stationary area and point sources. Emissions from permitted point sources were calculated on the basis of 2008 production levels and the best available emission factors (from TV source tests or from the permits). Point sources considered in this inventory are listed in Appendix A, Table A-1.

The majority of the area and nonroad source emissions data at annual, county-wide levels were taken from previously compiled EPA and DEQ estimates that were subjected to QA/QC protocols[5]. Many of the stationary area sources and non-road mobile sources were allocated to UGB by applying a spatial surrogate developed using ArcGIS and zoning shapefiles. Zoning and railway line GIS work was reviewed for completeness and accuracy by DEQ staff familiar with the Medford UGB region and activity. Population, fuel use, and employee data was reviewed by DEQ staff as part of the QA/QC protocols outlined here. Additionally, in all cases, the source of the information and validation for its use was documented in the calculation spreadsheets and checked at the time of QC for reliability and appropriateness.

4.4 DATA HANDLING

Data handling by DEQ staff included: 1) data tracking, and 2) QA/QC (which included data checking, data correcting, and handling corrected data). Specific additional procedures included checking data after conversion to the inventory format, checking for missing data, and reviewing the estimates.

4.5 Data Coding and Recording

No air dispersion modeling was performed for this SIP so coding the source emissions for entry into the model was not necessary.

4.6 Data Tracking

Information obtained from source files, other divisions of the DEQ, other State, Federal, and local agencies, and private companies used in compiling the emission inventories were recorded in reference files, in appendices, and documented on the calculation spreadsheets. The appendices and calculation spreadsheets were also stored electronically. All emission

factors, throughputs, seasonal adjustment factors, and activities were documented on the calculation spreadsheets in both hard copy and electronic copy. All of the above mentioned information is kept at DEQ Headquarters.

4.7 QA/QC Procedures - Checking and Correcting

The QC of all source category emissions included:

1. Checking input data for inventory completeness, missing data, incorrect calculations, incorrect information, and reasonableness, and
2. Correcting the calculation sheets, summary sheets, and Appendices where needed.

The QA of the emission estimates include:

1. Reviewing the emission summary for reasonableness, and
2. Ensuring that the data transferred between agencies and consultants was intact.

4.7.1 Checking Data

4.7.1.1 Inventory Completeness

Completeness of the inventory was determined by checking against the EPA QA Plan guidance source listings and the 1993 attainment year inventory. Double counting of sources was reviewed to ensure that source categories included in stationary point source category were not also included in area or non-road mobile categories. Double-count removal is detailed in Tables 2.4.3 and 2.4.4 of this document.

4.7.1.2 Missing Data

In order to ensure that all the necessary data was submitted for each stationary point source, forms were created to identify all the data elements required by EPA to be reported for each stationary point source. Any parameter left blank during the initial completion of the form was considered a missing data element. Further review of the source files and, as necessary, contact with facility personnel were procedures used to obtain the missing information. If these steps did not result in supplying a missing data element, estimates were made based on similar point sources or from information contained in EPA publications. Written documentation of the source of the data were recorded in the Emission Inventory notebook on the Data Error Report and Correction form as well as in the Audit Trail notebook.

Missing data for stationary area sources and non-road mobile sources can usually be identified by the inability to calculate emissions. If the appropriate data was missing, a reasonable effort was made to acquire it. If this was unsuccessful, estimates were made based on data of recent years or on information contained in EPA documents. Missing data were recorded on the QC area and non-road mobile correction forms.

4.7.1.3 Incorrect Calculations

In order to ensure that all the calculations were done correctly, the calculations were first reviewed to ensure that they were used correctly, followed by review of electronic equations in

order to make sure that they were entered correctly. Any improperly used or incorrect calculations were noted on the calculation sheet.

4.7.1.4 Incorrect Information

In order to ensure that the information on summary sheets, calculations sheets, and Appendices for this report are correct, all the explanations, titles, and reference were checked for accuracy and clarity. Any changes were documented either directly on the sheet.

4.7.1.5 Reasonableness

A reasonableness check was performed on the estimated emissions, activity levels, and emission factors using the 1993 Medford Attainment Year CO SIP emission inventory[1] as a background comparison.

Stationary point source estimated emissions associated with the Air Contaminant Discharge Permit, Title V Permit, or Title V draft for each identified point source were reviewed in relation to similar sources. In addition, the stationary point source production levels source tests, and permitted emission factors were rechecked. The source's current operational status was also reviewed using notices of construction, permit addendums, and DEQ source inspector information. Stationary area source and non-road mobile estimated emissions were compared, when possible to the 1993 Medford Attainment Year CO SIP emission inventory[1]. The references from which the emission factors and activity levels were taken were confirmed for the appropriateness of their use. Any reasonableness errors were documented in the correction forms.

4.7.1.6 Emissions Summary Reasonableness

Emissions summaries were reviewed against the 1993 attainment year, as shown in Executive Summary Figures 3 and 4 of this document.

4.8 Data Reporting

An electronic copy of this report will be provided to EPA Region X in June 2015. Electronic copies of the summary and calculations spreadsheets will be made available to EPA upon request.

5 References

1. State of Oregon 1993 Attainment Year SIP Emission Inventory: Medford UGB Carbon Monoxide, Appendix D3-4. Air Quality Division, Oregon Department of Environmental Quality, Portland, OR, March 9, 2001. (DEQ AQ-TS Ref. 618)

2. *Procedures Document for National Emission Inventory, Criteria Air Pollutants 1985-1999*, EPA-454/R-01-006, U.S. EPA, Research Triangle Park, NC. March 2001. (DEQ AQ-TS Ref. 2)

3. *Emission Inventory Requirements for Carbon Monoxide State Implementation Plans*, EPA-450/4-91-011, U.S. EPA, Research Triangle Park, NC. March 1991. (DEQ AQ-TS Ref. 1a)

4. *Inventory Preparation Plan/Quality Assurance Plan for the Medford Urban Growth Boundary 2008 Carbon Monoxide (CO) Limited Maintenance Plan*, Oregon Department of Environmental Quality, February 2015: Please see Appendix C.

5. http://www.epa.gov/ttnchie1/net/2008inventory.html.

6. *2008 National Emissions Inventory, Version 3, Technical Support Document, Draft*, U.S. EPA, Research Triangle Park, Sep 2013.

7. The Jackson County zoning data were downloaded from http://gis.jacksoncounty.org/Portal/gis-data.aspx.

8. *Technical Memorandum: Modeling to Support the RVMPO 2015-2018 TIP Air Quality Conformity Determination (AQCD)*, prepared by Jin Ren with ODOT/TPAU, June 2014.

9. Grants Pass SIP Appendices for Carbon Monoxide. Appendix D4-4: Grants Pass UGB and CO NAA: 1993 Base Year and 2015 Forecast Year Emission Inventory and Forecast. Oregon DEQ. September 13, 2002. (DEQ AQ-TS Ref. 933)

10. Internet: http://www.epa.gov/ttnchie1/software/fire/index.html

11. *Compilation of Air Pollutant Emission Factors*, Fifth Edition and Supplements, AP-42, U.S. EPA, Research Triangle Park, NC. January 1995. (DEQ AQ-TS Ref. 8).

12. Email from Wayne Kauzlarich, DEQ WR Medford, AQ Permit Writer/Inspector to Miyoung Park. City of Medford burn information (2008year). November 28, 2014 (DEQ AQ-TS Ref. 945).

13. Email from Greg G. Kleinberg, City of Medford , Deputy Chief - Fire Marshal, Medford Fire-Rescue to Miyoung Park. City of Medford burn Information (2008 year). November 25, 2014 (DEQ AQ-TS Ref. 946).

14. Email from Meghan Fagundes, DEQ WR Medford, AQ Permit Writer/Inspector to Miyoung Park. Complaint open burning locations for Jackson County in 2008. March 12, 2015 (DEQ AQ-TS Ref. 951).

15. Email from Greg G. Kleinberg, City of Medford , Deputy Chief - Fire Marshal, Medford Fire-Rescue to Miyoung Park. City of Medford, illegal burn information (2008 year). March 12, 2015 (DEQ AQ-TS Ref. 952).

16. Open Burning Emission factor: Emission Inventory Improvement Program (EIIP), EPA, Office of Air Quality Planning and Standards, Emission Factor and Inventory Group, Research Triangle Park, NC. Volume III: Chapter 16 (DEQ AQ-TS Ref. 947)

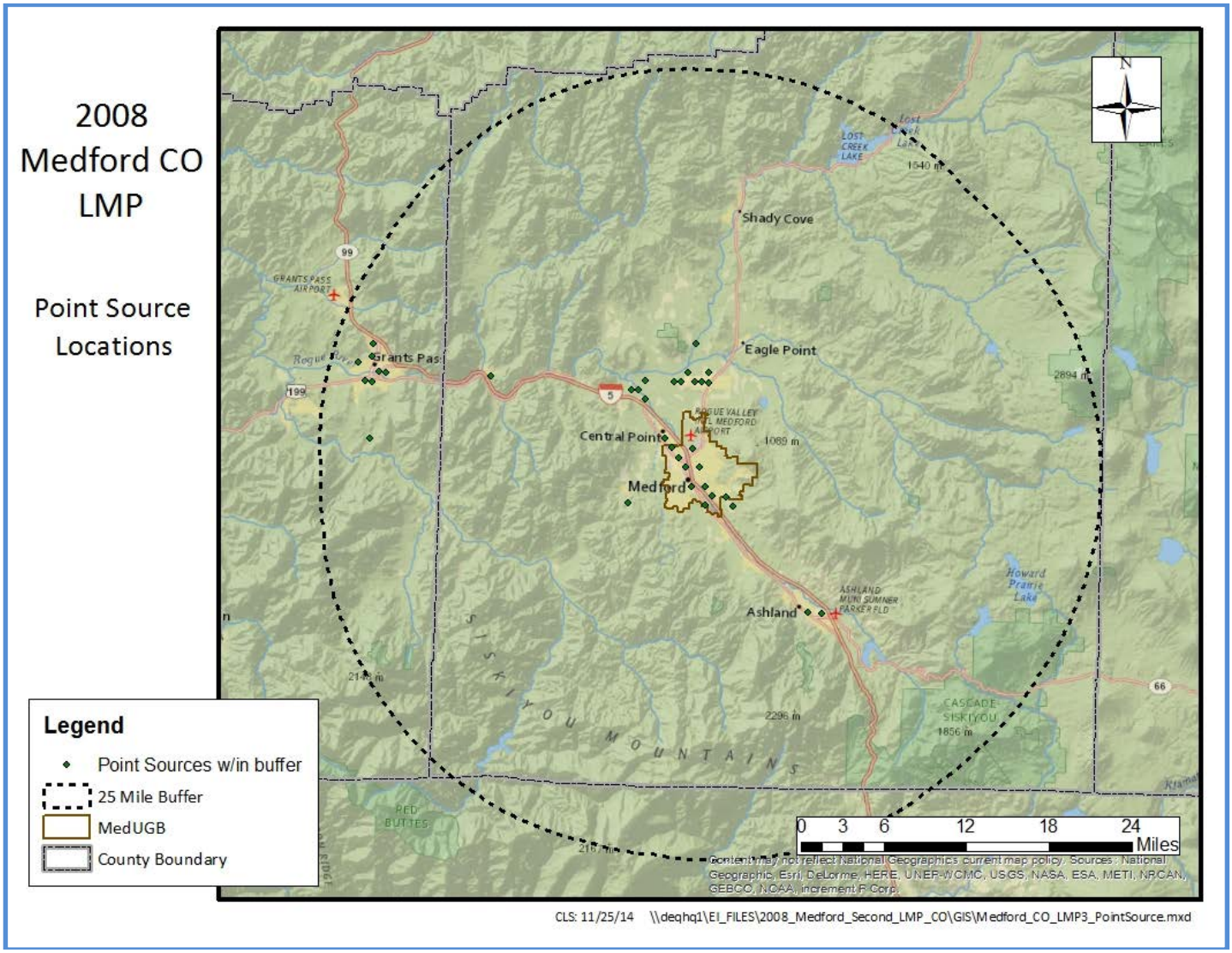
17. E-mail from Venkatesh Rao (EPA) to C. Swab. EPA 2008 Oregon/California prescribed burning and wildfire emissions estimates, EIS event format. August 3, 2011. (DEQ AQ-TS Ref. 762)

18. E-mail from Wenxian Zhang to C. Swab. Medford UGB 2008 CO LMP - Draft Emission Inventory. April 27, 2015. (DEQ AQ-TS Ref. 961).

6 Appendices to the Emission Inventory

APPENDIX A: STATIONARY PERMITTED POINT SOURCES

- Figure A-1: Point Source Locations
- Table A-1: Stationary Point Source Determination for 2008 CO Inventory Determination
- Table A-2: Exclusion of 1993 and some 2008 Facilities from CO Emission Inventory
- Table A-3: Stationary Point Source Emission Estimation Details



Appendix A, Figure A- 1: 2008 Medford CO LMP Permitted Point Source Locations

Appendix A, Table A- 1: Stationary Point Source Determination for 2008 CO Inventory

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
County Code	*County Name*	*Source Number*	*Source Name*	*Site Address*	*City*	*Permit Type*	*Operating Status*	*Inventory Period & Pollutant(s)*	*SIC Codes*	*CO PSEL*	*Comments*
15	JACKSON	15-0004	Boise Cascade Wood Products, L.L.C.	3285 N PACIFIC HWY	MEDFORD	TV	Active	2008 CO	2436	2974	
15	JACKSON	15-0012	Murphy Company dba Murphy Veneer	7975 11TH ST	WHITE CITY	ACDP	Active	2008 CO	2435	99	
15	JACKSON	15-0013	Chapel of the Valley Funeral Home Inc.	550 BUSINESS PARK DR	MEDFORD	ACDP	Active	2008 CO	4953	99	
15	JACKSON	15-0014	Murphy Company dba Murphy Plywood	5205 NORTH RIVER DR.	ROGUE RIVER	ACDP	Active	2008 CO	2436	99	
15	JACKSON	15-0020	Boise Cascade Wood Products, L.L.C.	1795 ANTELOPE RD	WHITE CITY	TV	Active	2008 CO	2436	796	
15	JACKSON	15-0021	South Stage Landfill, Inc.	4761 SOUTH STAGE RD	MEDFORD	ACDP	Active	2008 CO	4953	99	
15	JACKSON	15-0022	Plycem USA, Inc.	1200 AVENUE G	WHITE CITY	ACDP	Active	2008 CO	3272	99	
15	JACKSON	15-0025	Timber Products Co.	25 E. McAndrews	MEDFORD	TV	Active	2008 CO	2436	237	
15	JACKSON	15-0026	Dry Creek Landfill, Inc.	8001 Table Rock Road	White City	TV	Active	2008 CO	4953	169	
15	JACKSON	15-0029	Carestream Health, Inc.	8124 PACIFIC AVE	WHITE CITY	TV	Active	2008 CO	3861	99	
15	JACKSON	15-0030	City of Medford	1100 KIRTLAND RD	CENTRAL POINT	ACDP	Active	2008 CO	4952	99	
15	JACKSON	15-0037	Medford Moulding Co.	2350 AVENUE F	WHITE CITY	ACDP	Active	2008 CO	2431	99	
15	JACKSON	15-0046	Boise Cascade Wood Products, L.L.C.	7890 AGATE RD	WHITE CITY	ACDP	Active	2008 CO	2421	99	
15	JACKSON	15-0066	Amy's Kitchen, Inc.	441 W. ANTELOPE RD.	WHITE CITY	ACDP	Active	2008 CO	4961	99	
15	JACKSON	15-0073	SierraPine, A California Limited Partner	2685 N PACIFIC HWY	MEDFORD	TV	Active	2008 CO	2493	235	
15	JACKSON	15-0075	Sisters of Providence in Oregon	1111 CRATER LAKE AVE	MEDFORD	ACDP	Active	2008 CO	4961	99	
15	JACKSON	15-0079	Bear Creek Operations, Inc.	2518 S PACIFIC HWY	MEDFORD	ACDP	Active	2008 CO	4961	99	
15	JACKSON	15-0084	Grange Cooperative Supply Association	225 S FRONT ST	CENTRAL POINT	ACDP	Active	2008 CO	2048	99	
15	JACKSON	15-0088	Southern Oregon University Foundation	1250 SISKIYOU BLVD	ASHLAND	ACDP	Active	2008 CO	4961	99	
15	JACKSON	15-0109	Tree Top, Inc., A Washington Corporation	690 S GRAPE ST	MEDFORD	ACDP	Active	2008 CO	4961	99	
15	JACKSON	15-0111	Rogue Valley Manor	1200 MIRA MAR AVE	MEDFORD	ACDP	Active	2008 CO	4961	99	
15	JACKSON	15-0154	C & L Western	1859 N PHOENIX RD	MEDFORD	ACDP	Active	2008 CO	4953	99	
15	JACKSON	15-0155	Hillcrest Memorial Park and Mortuary	2201 N PHOENIX RD	MEDFORD	ACDP	Active	2008 CO	4953	99	
15	JACKSON	15-0157	Leavitt Oregon, Inc. dba Siskiyou Memorial Park	2100 SISKIYOU BLVD.	MEDFORD	ACDP	Active	2008 CO	4953	99	
15	JACKSON	15-0159	Biomass One, L.P.	2350 AVE G	WHITE CITY	TV	Active	2008 CO	4961	570	
15	JACKSON	15-0163	Litwiller Funeral Home, Inc.	1811 ASHLAND ST	ASHLAND	ACDP	Active	2008 CO	4953	99	
15	JACKSON	15-0222	Boise Cascade Wood Products, L.L.C.	1155 ANTELOPE RD	WHITE CITY	ACDP	Active	2008 CO	2439	99	
15	JACKSON	15-9538	LTM, Incorporated dba Knife River Materials	3750 KIRTLAND ROAD	CENTRAL POINT	ACDP	Active	2008 CO	2951	99	
15	JACKSON	15-9542	C & M Western, Inc. dba Conger-Morris Crematory	800 S FRONT ST	CENTRAL POINT	ACDP	Active	2008 CO	4953	99	
17	JOSEPHINE	17-0003	Chapel Of The Valley Funeral Home Inc.	2065 UPPER RIVER RD	GRANTS PASS	ACDP	Active	2008 CO	4953	99	
17	JOSEPHINE	17-0008	Grants Pass Moulding, Inc.	123 NE BEACON DR	GRANTS PASS	ACDP	Active	2008 CO	2431	99	
17	JOSEPHINE	17-0017	Asante Health System	500 RAMSEY AVE.	GRANTS PASS	ACDP	Active	2008 CO	4961	99	
17	JOSEPHINE	17-0028	Stephens Family Chapel	1629 WILLIAMS HWY.	GRANTS PASS	ACDP	Active	2008 CO	4953	99	
17	JOSEPHINE	17-0030	TP Grants Pass, LLC	1090 SE M ST	GRANTS PASS	TV	Active	2008 CO	2436	281	
17	JOSEPHINE	17-0046	MasterBrand Cabinets, Inc.	550 SE MILL ST	GRANTS PASS	TV	Active	2008 CO	2434	99	
17	JOSEPHINE	17-0062	Hull & Hull Funeral Home, Inc.	612 NW A ST	GRANTS PASS	ACDP	Active	2008 CO	4953	99	
17	JOSEPHINE	17-0075	Copeland Paving, Inc.	6890 WILLIAMS HWY	MURPHY	ACDP	Active	2008 CO	2951	99	

Note: ACDP facilities were originally inventoried under the Stationary Area Sources category in 1993. Some of these facilities are now included in the 2008 CO emission inventory to more effectively represent emission estimates for the LMP Update.

Appendix A, Table A- 2: Exclusion of 1993 and some 2008 Facilities from CO Emission Inventory

County Code	County Name	Source Number	Source Name	Current Operating Status	Date Closed	Reason for Exclusion
15	JACKSON	15-0002	LTM, Incorporated	Closed	2/12/1996	Closed
15	JACKSON	15-0003	LTM, Incorporated	Closed	3/14/1996	Closed
15	JACKSON	15-0005	Cascade Wood Products	Active	n/a	No CO
15	JACKSON	15-0006	Stone Forest Industries	Closed	10/21/1996	Closed
15	JACKSON	15-0007	Central Pt. Lumber Co.	Closed	8/13/2001	Closed
15	JACKSON	15-0009	Medite Corporation	Closed	4/9/1997	Closed
15	JACKSON	15-0010	Superior Lumber Co.	Closed	2/2/1999	Closed
15	JACKSON	15-0011	Eugene F. Burrill Lumber	Closed	1/8/2002	Closed
15	JACKSON	15-0015	Kogap Manufacturing Co.	Closed	10/21/1996	Closed
15	JACKSON	15-0016	Croman Corp.	Closed	1/4/1997	Closed
15	JACKSON	15-0018	Medply Inc.	Closed	4/8/2009	Closed
15	JACKSON	15-0027	Down River Forest Products	Closed	12/15/2004	Closed
15	JACKSON	15-0039	Stone Forest Industries	Closed	3/10/1997	Closed
15	JACKSON	15-0041	Georgia-Pacific Resins, Inc.	Closed	1/11/2008	Closed
15	JACKSON	15-0043	Rogue Aggregates, Inc.	Closed	4/4/2002	Closed
15	JACKSON	15-0047	Jessup Millwork	Closed	5/12/2008	Closed
15	JACKSON	15-0048	Medite Corporation	Closed	3/5/1997	Closed
15	JACKSON	15-0056	Southern Oregon Tallow Co.	Closed	11/10/2006	Closed
15	JACKSON	15-0058	Royal Oak Enterprises, Inc.	Closed	4/17/2006	Closed
15	JACKSON	15-0100	Bristol Silica and Limestone	Closed	9/12/2001	Closed
15	JACKSON	15-0141	Colvin Oil Co.	Active	n/a	No CO
15	JACKSON	15-0144	Medford Fuel	Closed	12/8/2008	Closed
15	JACKSON	15-0145	Rogue Valley Oil Co.	Closed	10/27/1995	Closed
15	JACKSON	15-0166	Grange Coop. Supply Assoc.	Closed	1/3/2011	Closed
15	JACKSON	15-0171	Hawk Oil Co.	Closed	1/19/1996	Closed
15	JACKSON	15-0180	Medford Ready Mix, Inc.	Closed	12/2/1996	Closed
15	JACKSON	15-0190	Pacific Paving , Inc.	Closed	1/8/2002	Closed
15	JACKSON	15-0223	Davis Finish Products, Inc.	Closed	10/272006	Closed
15	JACKSON	15-0224	Western Veneer and Slicing	Closed	8/16/2007	Closed
15	JACKSON	15-0024	Southern Oregon Ready Mix, LLC	Active	n/a	Permit has CO PSEL but does not actually emit CO.
15	JACKSON	15-0036	Savage Redimix	Active	n/a	Permit has CO PSEL but does not actually emit CO.
15	JACKSON	15-0038	Crater Sand & Gravel, Inc.	Active	n/a	Permit has CO PSEL but does not actually emit CO.
15	JACKSON	15-0199	Oregon Fir Millwork, Inc.	Active	n/a	Permit has CO PSEL but does not actually emit CO.
15	JACKSON	15-9540	LTM, Incorporated	Active	n/a	Permit has CO PSEL but does not actually emit CO.
17	JOSEPHINE	17-0009	Bentwood Furniture, Inc.	Active	n/a	Permit has CO PSEL but does not actually emit CO.
17	JOSEPHINE	17-0040	Riverside Ready Mix, Inc.	Active	n/a	Permit has CO PSEL but does not actually emit CO.
17	JOSEPHINE	17-0053	Gary L. Peterson	Active	n/a	Permit has CO PSEL but does not actually emit CO.

Note: ACDP facilities were originally inventoried under the Stationary Area Sources category in 1993. These facilities have been excluded from the 2008 CO inventory for the various reasons described above.

Appendix A, Table A- 3: Stationary Point Source Emission Estimation Details

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Emission Year	*Source Number*	*Source Name*	*ES Code*	*Process Code*	*SCC*	*ES Description*	*Pollutant*	*Throughput Quantity*	*Throughput Unit of Measure*	*Throughput Type*	*Emission Factor*	*Emission Factor Unit of Measure*	*SAF*	*Days/yr*	*Annual Emissions*	*Typical Season Day*
												lbs/unit			*tpy*	*lbs/day*
2008	15-0004	Boise Cascade Wood Products, L.L.C.	PS-1	P-1	1-02-009-02	EU1: Boilers	CO	591,381.00	1000 Pounds	Steam	3.45	lb/1000 Pounds	1.00	365	1,020.0	5,572
2008	15-0004	Boise Cascade Wood Products, L.L.C.	PS-2	P-2	3-07-007-66	EU2: Veneer Dryers	CO	15,634.00	Hours	Hours of Operation	8.65	lb/Hour	1.00	365	67.6	370
														Total =	***1,087.6***	***5,943***
2008	15-0012	Murphy Company dba Murphy Veneer	EU5	P-1	1-02-006-02	Boiler	CO	63.40	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	2.7	15
2008	15-0012	Murphy Company dba Murphy Veneer	EU1	P-1	3-07-007-67	Veneer Dryer	CO	24,874.00	1000 Square Feet	Veneer 3/8 Inch Basis DF	0.92	lb/1000 Square Feet	1.00	365	11.4	63
2008	15-0012	Murphy Company dba Murphy Veneer	EU1	P-2	3-07-007-60	Veneer Dryer	CO	14,942.00	1000 Square Feet	Veneer 3/8 Inch Basis Pine	1.10	lb/1000 Square Feet	1.00	365	8.2	45
														Total =	***22.4***	***123***
2008	15-0013	Chapel of the Valley Funeral Home Inc.	EU1	P-2	3-15-021-01	Crematory Incinerator	CO	1.55	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	365	0.1	0
														Total =	***0.1***	***0***
2008	15-0014	Murphy Company dba Murphy Plywood	EU1	P-1	1-02-009-02	Boiler-HF	CO	181,272.00	1000 Pounds	Steam	0.80	lb/1000 Pounds	1.00	300	72.2	480
														Total =	***72.2***	***480***
2008	15-0020	Boise Cascade Wood Products, L.L.C.	GS-1	P-1	1-02-009-05	Boiler 1	CO	18,161.00	1000 Pounds	Steam	1.00	lb/1000 Pounds	1.00	365	9.1	50
2008	15-0020	Boise Cascade Wood Products, L.L.C.	GS-2	P-1	1-02-006-02	Boiler 2	CO	2,619.00	1000 Pounds	Steam	0.03	lb/1000 Pounds	1.01	365	0.0	0
2008	15-0020	Boise Cascade Wood Products, L.L.C.	PS-1	P-1	3-07-007-46	Veneer Dryers 1-3	CO	100,742.00	1000 Square Feet	Veneer 3/8 Inch Basis	10.00	lb/1000 Square Feet	1.00	365	504.0	2,762
														Total =	***513.1***	***2,812***
2008	15-0021	South Stage Landfill, Inc.	EU1	P-1	5-01-004-10	Flare and Landfill Gas	CO	8,640.00	Hours	Landfill Gas	11.10	lb/Hour	1.00	365	48.0	263
														Total =	***48.0***	***263***
2008	15-0022	Plycem USA, Inc.	007	P-1	1-02-006-03	Boiler	CO	80.13	Million Cubic Feet	Natural Gas	6.00	lb/Million Cubic Feet	1.09	280	0.2	2
2008	15-0022	Plycem USA, Inc.	010	P-1	3-02-900-03	Paint Cure Oven	CO	45.00	Million Cubic Feet	Natural Gas	220.00	lb/Million Cubic Feet	1.00	280	5.0	35
														Total =	***5.2***	***37***
2008	15-0025	Timber Products Co.	GS-1	P-1	1-02-006-01	Boiler-1: Boiler	CO	293.62	Million Cubic Feet	Natural Gas	29.90	lb/Million Cubic Feet	1.01	350	4.4	25
2008	15-0025	Timber Products Co.	PS-1	P-1	3-07-006-25	Particle Dryers-1: Particle Dryers 1-2	CO	57,008.00	1000 Square Feet	3/4-inch Particleboard	0.52	lb/1000 Square Feet	1.00	350	14.9	85
														Total =	***19.3***	***110***
2008	15-0026	Dry Creek Landfill, Inc.	PS-2	P-1	5-01-004-21	GTE	CO	541.00	Million Cubic Feet	Landfill Gas	595.00	lb/Million Cubic Feet	1.00	365	161.0	882
2008	15-0026	Dry Creek Landfill, Inc.	PS-1	P-1	5-01-004-10	LFG-Flare	CO	40.20	Million Cubic Feet	Landfill Gas	36.40	lb/Million Cubic Feet	1.00	365	0.7	4
2008	15-0026	Dry Creek Landfill, Inc.	FS-2	P-1	5-01-004-01	Unpaved roads	CO	25,450.00	Each	Vehicle	0.07	lb/Each	1.00	365	0.8	5
														Total =	***162.6***	***891***
2008	15-0029	Carestream Health, Inc.	GS-1	P-1	1-02-006-02	EU7-11: Boilers, Oven, TO	CO	214.39	Million Cubic Feet	Natural Gas	35.00	lb/Million Cubic Feet	1.01	365	3.8	21
														Total =	***3.8***	***21***
2008	15-0030	City of Medford	EU4	P-1	2-03-001-09	Backup Engine Generator	CO	10.00	Hours	Diesel	2.97	lb/Hour	1.00	365	0.0	0
2008	15-0030	City of Medford	EU2	P-2	1-01-007-12	Boiler	CO	6.14	Million Cubic Feet	Digester Gas	84.00	lb/Million Cubic Feet	1.00	365	0.3	1
2008	15-0030	City of Medford	EU2	P-1	1-02-006-02	Boiler	CO	24.10	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	1.0	6
2008	15-0030	City of Medford	EU1	P-1	2-03-002-09	Engine Generator	CO	0.10	Million Cubic Feet	Natural Gas	3,868.80	lb/Million Cubic Feet	1.00	365	0.2	1
2008	15-0030	City of Medford	EU1	P-3	2-03-007-09	Engine Generator	CO	6,082.49	Hours	Digester Gas	2.22	lb/Hour	1.00	365	6.7	37
2008	15-0030	City of Medford	EU3	P-1	5-01-007-89	Flare	CO	22.47	Million Cubic Feet	Digester Gas	222.00	lb/Million Cubic Feet	1.00	365	2.5	14
														Total =	***10.7***	***59***
2008	15-0037	Medford Moulding Co.	EU1	P-1	1-02-006-02	Boilers	CO	18.60	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	250	0.8	6
2008	15-0037	Medford Moulding Co.	EU3	P-1	3-07-007-67	Veneer Dryers	CO	3,034.00	1000 Square Feet	Veneer 3/8 Inch Basis	0.02	lb/1000 Square Feet	1.00	250	0.0	0
														Total =	***0.8***	***7***
2008	15-0046	Boise Cascade Wood Products, L.L.C.	EU1	P-1	1-02-006-03	Boilers	CO	58.00	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.09	260	2.4	20
														Total =	***2.4***	***20***
2008	15-0066	Amy's Kitchen, Inc.	EU1	P-1	1-02-006-02	Boiler	CO	223.44	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	9.4	52
														Total =	***9.4***	***52***
2008	15-0073	SierraPine, A California Limited Partner	PS-1	P-2	1-02-006-02	EU1: BOILER 4	CO	119.41	Million Cubic Feet	Natural Gas		lb/Million Cubic Feet	1.01	350	0.0	0
2008	15-0073	SierraPine, A California Limited Partner	PS-1	P-1	1-02-009-02	EU1: BOILER 4	CO	349,758.00	1000 Pounds	Steam		lb/1000 Pounds	1.00	350	33.7	192
2008	15-0073	SierraPine, A California Limited Partner	PS-4	P-1	2-02-002-01	EU10: GAS TURBINES 2 & 3	CO	0.00	Million Cubic Feet	Natural Gas	191.00	lb/Million Cubic Feet	0.98	350	0.0	0
2008	15-0073	SierraPine, A California Limited Partner	PS-2	P-1	3-07-009-32	EU2: FIBER DRYER SCRUBBERS	CO	75,280.28	Tons	Material	0.07	lb/Ton	1.00	350	2.6	15
														Total =	***36.3***	***207***

(cont'd on next page)

Appendix A, Table A-3 Continued

															Total =	***36.3***	***207***
2008	15-0075	Sisters of Providence in Oregon	EU1	P-1	1-02-006-02	Boiler	CO	76.44	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	3.2	18
2008	15-0075	Sisters of Providence in Oregon	EU1	P-2	1-02-005-02	Boiler	CO	0.00	1000 Gallons	Distillate Oil (No. 2)	5.00	lb/1000 Gallons	1.00	365	0.0	0
															Total =	***3.2***	***18***
2008	15-0079	Bear Creek Operations, Inc.	EU1	P-1	1-02-006-02	Boilers	CO	53.17	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	125	2.2	36
															Total =	***2.2***	***36***
2008	15-0084	Grange Cooperative Supply Association	EU5	P-1	1-02-006-03	Boiler	CO	27.25	1000 Gallons	Diesel	5.00	lb/1000 Gallons	1.09	260	0.1	1
															Total =	***0.1***	***1***
2008	15-0088	Southern Oregon University Foundation	EU1	P-1	1-02-006-02	Boilers	CO	77.70	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	3.3	18
															Total =	***3.3***	***18***
2008	15-0109	Tree Top, Inc., A Washinglb/Ton Corporation	EU1	P-1	1-02-006-02	Boilers	CO	309.00	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	312	13.0	84
															Total =	***13.0***	***84***
2008	15-0111	Rogue Valley Manor	EU1	P-1	1-02-006-02	Boiler	CO	36.01	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	1.5	8
															Total =	***1.5***	***8***
2008	15-0154	C & L Western	EU1	P-1	3-15-021-01	Crematory Incinerator	CO	0.76	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	104	0.0	1
															Total =	***0.0***	***1***
2008	15-0155	Hillcrest Memorial Park and Mortuary	EU1	P-2	3-15-021-01	Crematory Incinerator	CO	0.95	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	104	0.0	1
															Total =	***0.0***	***1***
2008	15-0157	Leavitt Oregon	EU1	P-2	3-15-021-01	Crematory Incinerator	CO	3.69	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	105	0.2	3
															Total =	***0.2***	***3***
2008	15-0159	Biomass One, L.P.	PS-1	P-1	1-02-009-02	EU 011: N. BOILER	CO	792,000.00	1000 Pounds	Steam	0.24	lb/1000 Pounds	1.00	365	96.6	528
2008	15-0159	Biomass One, L.P.	PS-2	P-1	1-02-009-02	EU 012: S. BOILER	CO	831,000.00	1000 Pounds	Steam	0.33	lb/1000 Pounds	1.00	365	135.0	738
2008	15-0159	Biomass One, L.P.	FS-1	P-1	1-05-001-05	EU 013: SPACE HTR	CO	1,623,000.00	1000 Gallons	Distillate Oil	0.00	lb/1000 Gallons	2.10	365	1.1	13
															Total =	***232.7***	***1,278***
2008	15-0163	Litwiller Funeral Home, Inc.	EU1	P-1	3-15-021-01	Crematory Incinerator	CO	0.85	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	312	0.0	0
															Total =	***0.0***	***0***
2008	15-0222	Boise Cascade Wood Products, L.L.C.	EU1	P-1	1-02-006-03	Boiler	CO	6.78	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.09	312	0.3	2
															Total =	***0.3***	***2***
2008	15-9538	LTM, Incorporated dba Knife River Materials	EU1	P-3	3-05-002-55	Drum Plant- Natural Gas	CO	0.04	1000 Gallons	Fuel	130.00	lb/1000 Gallons	1.00	365	0.0	0
2008	15-9538	LTM, Incorporated dba Knife River Materials	EU1	P-1	3-05-002-55	Drum Plant- Natural Gas	CO	189,840.00	Tons	Asphalt	0.07	lb/Ton	1.00	365	6.6	36
2008	15-9538	LTM, Incorporated dba Knife River Materials	EU1	P-2	3-05-002-55	Drum Plant- Natural Gas	CO	14.00	Million Cubic Feet	Natural Gas	399.00	lb/Million Cubic Feet	1.00	365	2.8	15
															Total =	***9.4***	***52***
2008	15-9542	C & M Western	EU1	P-1	3-15-021-01	Crematory Incinerator	CO	0.39	Million Cubic Feet	Body	84.00	lb/Million Cubic Feet	1.00	365	0.0	0
															Total =	***0.0***	***0***
2008	17-0003	Chapel Of The Valley Funeral Home Inc.	EU1	P-2	3-15-021-01	Crematory Incinerator	CO	1.40	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	260	0.1	0
															Total =	***0.1***	***0***
2008	17-0008	Grants Pass Moulding, Inc.	EU1	P-1	1-02-006-02	Boilers	CO	8.62	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	255	0.4	3
															Total =	***0.4***	***3***
2008	17-0017	Asante Health System	EU1	P-2	1-02-005-02	Boilers	CO	0.00	1000 Gallons	Distillate Oil (No. 1 & 2)	5.00	lb/1000 Gallons	1.00	365	0.0	0
2008	17-0017	Asante Health System	EU1	P-1	1-02-006-02	Boilers	CO	32.17	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.01	365	1.4	7
															Total =	***1.4***	***7***
2008	17-0028	Stephens Family Chapel	EU1	P-2	3-15-021-01	Crematory Incinerator	CO	1.41	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	260	0.1	0
															Total =	***0.1***	***0***
2008	17-0030	TP Grants Pass, LLC	GS-1	P-3	3-07-007-80	Boilers	CO	0.00	1000 Square Feet	3/8-inch Plywood	0.01	lb/1000 Square Feet	1.00	365	0.0	0
2008	17-0030	TP Grants Pass, LLC	GS-1	P-1	1-02-006-02	Boilers	CO	45,760.00	Million Cubic Feet	Natural Gas	0.01	lb/Million Cubic Feet	1.01	365	0.3	2
2008	17-0030	TP Grants Pass, LLC	FS-1	P-1	3-07-040-02	F1: Hog fuel storage dump	CO	58,240.00	Tons	Wood/Bark	0.00	lb/Ton	1.00	365	0.1	1
2008	17-0030	TP Grants Pass, LLC	PS-1	P-1	3-07-007-11	Veneer Dryers	CO	58,240.00	1000 Square Feet	Veneer	3.82	lb/1000 Square Feet	0.98	365	111.0	596
															Total =	***111.4***	***598***
2008	17-0046	MasterBrand Cabinets, Inc.	GS-1	P-1	1-05-001-06	EU-5 & EU-6: AIR HANDLERS & HOT WATER HEATER	CO	12.24	Million Cubic Feet	Natural Gas	31.20	lb/Million Cubic Feet	1.11	365	0.2	1
															Total =	***0.2***	***1***
2008	17-0062	Hull & Hull Funeral Home, Inc.	EU1	P-2	3-15-021-01	Crematory Incinerator	CO	2.16	Million Cubic Feet	Natural Gas	84.00	lb/Million Cubic Feet	1.00	260	0.1	1
															Total =	***0.1***	***1***
2008	17-0075	Copeland Paving, Inc.	EU1	P-1	3-05-002-05	Drum Plant- Oil Fired	CO	80,609.00	Tons	Asphalt	0.07	lb/Ton	1.00	250	2.8	23
															Total =	***2.8***	***23***
															Pollutant Total	***2,376.1***	***13,159***

Notes:

(9) thru (13) Throughput and emission basis taken from 2008 annual reports and permits active during 2008.

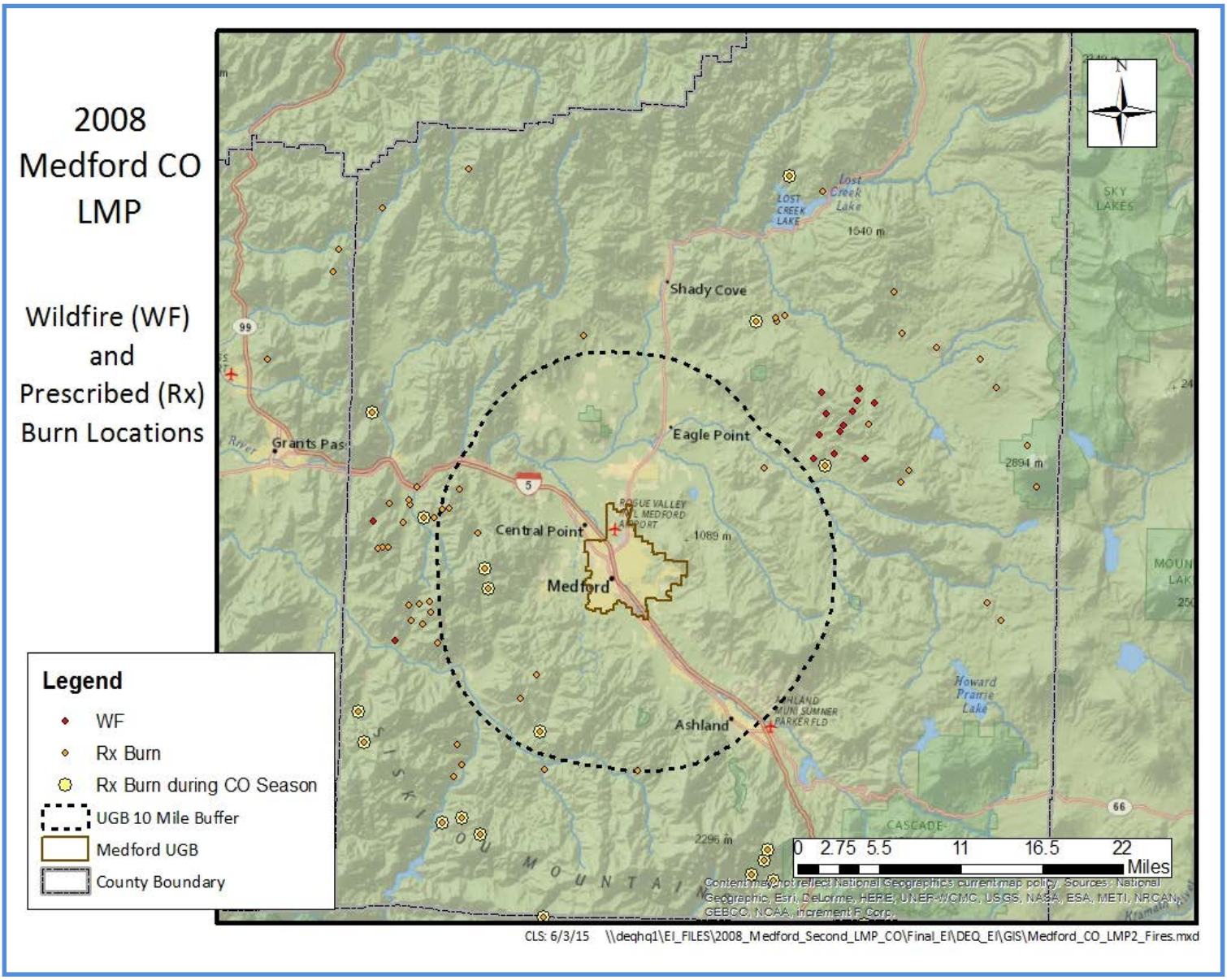
(14) Seasonal Adjustment Factor calculated using EPA Temporal Files of peak season activity by Source Classification Code (SCC)
Peak Season Activity Months = December, January, February
SAF = ((Sum of Peak Season Activity) * (12 months))/((Annual Activity)(Peak Season Activity Months))

(16) Annual Emissions (tpy) = (Throughput Qty * EF)/2000 lbs/ton

(17) Typical Season Day Emissions (lbs/day) = Annual Emissions (tpy) * SAF * 2000 (lbs/ton) / (Days/yr)

APPENDIX B: STATIONARY AREA SOURCES

- Figure B-1: Wildfire and Prescribed Burning Locations
- Table B-1: GIS Allocation Results: Josephine County Zones, County-Wide and by UGB



Appendix B, Figure B- 1: Wildfire and Prescribed Burn Location and Date

Appendix B, Table B- 1: GIS Allocation Results: Josephine County Zones, County-Wide and by UGB

(1) Jackson County Zone	(1) County	(1) UGB	(3) ID1	(3) ID2	(3) ID3	(3) ID4	(3) ID5	(3a) ID6	(3) ID7	(3) ID8	(3) ID9	(1a) ID10
	Acres	Acres										
Aggregate Removal (AR)	6,372	0										
Applegate Rural Residential - 5	141	0			X				X		X	
Applegate Rural Service Commercial	17	0		X	X					X		
CITY	157	0										
CITY OF CENTRAL POINT	53	0										
Exclusive Farm Use (EFU)	250,299	476	X									
Forest Resource (FR)	1,244,847	0					X					
General Commercial (GC)	686	100		X	X							
General Industrial (GI)	3,678	601			X	X						
Interchange Commercial (IC)	112	0		X								
Light Industrial (LI)	2,594	1,823			X	X						
Limited Use (LU)	240	0										
Neighborhood Commercial (NC)	21	20		X	X							
Open Space Reserve (OSR)	38,170	118					X					
Ruch Rural Service Commercial	41	0		X	X					X		
Rural Light Industrial (RLI)	23	0			X	X						
Rural Residential - 00 (RR-00)	5,418	0			X				X		X	
Rural Residential - 10 (RR-10)	4,255	0			X				X		X	
Rural Residential - 2.5 (RR-2.5)	6,478	0			X				X		X	
Rural Residential - 5 (RR-5)	29,925	198			X				X		X	
Rural Service Commercial (RS)	151	0		X	X					X		
Sams Valley Rural Service Commercial	25	0		X	X					X		
Urban Residential - 10 (UR-10)	134	0			X						X	
Urban Residential - 30 (UR-30)	30	0			X						X	
Urban Residential - 8 (UR-8)	25	0			X						X	
Urban Residential (UR-1)	2,528	0			X						X	
White City Urban Residential - 10	98	0			X						X	
White City Urban Residential - 30	87	0			X						X	
White City Urban Residential - 4	150	0			X						X	
White City Urban Residential - 6	410	0			X						X	
White City Urban Residential - 8	297	0			X						X	
Woodland Resource (WR)	171,324	0					X					
Community Commercial	611	611		X	X							
Farm 5 Acre Mimimum Lot Size	13	13	X									
Heavy Commercial	396	396		X	X							
Heavy Industrial	271	271			X	X						
MF Residential - 15 Units / Acre	24	24			X							
MF Residential - 20 Units / Acre	631	631			X							
MF Residential - 30 Units / Acre	181	181			X							
Regional Commercial	787	787		X	X							
Service Commercial and Professional Office	404	404		X	X							
SF Residential - 10 Units / Acre	1,312	1,312			X							
SF Residential - 2 Units / Acre	255	255			X							
SF Residential - 4 Units / Acre	5,120	5,120			X							
SF Residential - 6 Units / Acre	1,969	1,969			X							
Single-Family Res. - 1 dwelling unit per existin	479	479			X							
Suburban Res. - 1 Acre Minumum	26	26			X						X	
Suburban Res. - 2.5 Acre Minumum	189	189			X						X	
Active Rail Line (miles)												
	------	------	------	------	------	------	------	------	------	------	------	------
County Area	1,781,454		250,311	3,252	69,868	6,566	1,454,341	0	46,218	234	50,191	0
UGB Area		16,004	489	2,318	15,397	2,695	118	0	198	118	413	0
UGB % of County			0%	71%	22%	41%	0%	0%	0%	50%	1%	0%

Notes for Table B-1

(1) The Jackson County and Medford UGB zoning data are found here:
http://gis.jacksoncounty.org/Portal/gis-data.aspx

(2) Unit of Measure

(3) IDs are as follows:

ID 1 = Agriculturally Zoned: Farm and Farm Resource: From Jackson County Zoning.

ID 2 = Commercially Zoned: From Jackson County Zoning.

ID 3 = Construction: Commercial/Residential/Industrial Zoning Mix: From Jackson County Zoning.

ID 4 = Industrially Zoned: From Jackson County Zoning.

ID 5 = Forest Land: From Jackson County Zoning.

ID 6 = county golf courses located within K Falls NA: Not applicable to Jackson County

ID 7 = Recreational Vehicles & Equipment: Farm/Rural and Low-Density Residential Zoning Mix.

ID 8 = Commercial Lawn & Garden: Commercial Zones: From Jackson County Zoning.

ID 9 = Residential Lawn & Garden: Residential Zoning: From Jackson County Zoning.

ID 10 = Active Rail Line: Not estimated here. Estimated by 2008 NEI track miles and yard locations seperately.

(4) "Serpentine" Zoning is described as a mix of agricultural, rural residential, and commercial forest land by county ordinance. Acreage will be divided evenly among IDs 1, 5, 7, and 9.

Appendix 3 - EPA Approval Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

JAN 06 2012

OFFICE OF
AIR, WASTE AND TOXICS

Dept of Environmental Quality
Air Quality Division

JAN 09 2012

RECEIVED

Mr. Anthony Barnack
Air Monitoring Program
Oregon Department of Environmental Quality
811 SW Sixth Avenue
Portland, Oregon 97204-1390

Dear Mr. Barnack:

We have evaluated the 2011 Oregon Ambient Air Monitoring Network Plan, which describes changes to the OR monitoring network for 2011-12. The proposed changes, and EPA's responses, are listed below:

Discontinued Monitors:

1) Discontinued PM2.5 FRM sampling at Bend, Pump Station (41-017-0120). This site has been consistently below 75% of the NAAQS. A nephelometer remains at the site for the woodstove advisory program. EPA approves this change.

2) Discontinued PM2.5 FRM duplicate sampling at Hillsboro, Hare Field (41-067-0004). The reductions in PM2.5 FRM samplers in 2011 resulted in a lowering of the requirement duplicate sites from three to two. EPA approves this change.

3) Discontinued air toxics monitoring at Salem, State Hospital (41-047-0041). Site was deemed to have enough data. Resources were moved to support an air toxics site in Klamath Falls. EPA approves this change.

4) Discontinued the Halsey field burning meteorology site. EPA approves this change.

5) Discontinued monitoring for wet Mercury Deposition January 1, 2011 at Beaverton Highland Park (41-067-0111). The grant's funding ended. EPA approves this change.

6) Discontinued PM10 FRM sampling at Eugene, Lane Community College (41-039-0013). This site was redundant as discussed in the five year plan. EPA approves this change.

7) Discontinue CO monitors in Eugene, at the Lane Community College site (41-039-0013), and in Medford, the Rogue Valley Mall site (41-029-0018). EPA approves discontinuing these monitors, and the justification for discontinuing these monitors provided in the ODEQ report "Justification for Discontinuing of Monitoring in Carbon Monoxide and PM10 Maintenance Areas" (October 2011).

a) Portland/SE Lafayette
b) Eugene/Amazon Park
c) Medford/Grant & Belmont
d) Klamath Fall

3. Pre-cursor gas monitors at the Portland/SE Lafayette NCore site

"Core" monitors are those monitors in the network that must be operated with available PM2.5 monitoring funds. The "non-core" PM2.5 monitors in the State's network can be operated at ODEQ's discretion with any remaining federal funds or State funds. If you have any questions about our approval of the Oregon monitoring network, please contact Keith Rose at (206) 553-1949.

Sincerely,

Debra Suzuki

Debra Suzuki, Manager
State and Tribal Program Unit

Report

Justification for Discontinuation of Monitoring in Carbon Monoxide and PM_{10} Maintenance Areas

State of Oregon
Department of
Environmental
Quality

Submitted to: Keith Rose, EPA Region 10

By: Anthony Barnack, Oregon DEQ

October, 2011

Last Updated: 12/01/11
By: Anthony Barnack

This report prepared by:

Oregon Department of Environmental Quality
811 SW 6th Avenue
Portland, OR 97204
1-800-452-4011
www.oregon.gov/deq

Contact:
Anthony Barnack
(503) 229-5713

Monitoring Discontinuation Justification

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Glossary of Terms:

NAAQS – National Ambient Air Quality Standards (EPA criteria pollutant standards)
CO – Carbon monoxide
PM_{10} – Particulate matter, 10 microns in diameter or smaller
$PM_{2.5}$ - Particulate matter, 10 microns in diameter or smaller
ODEQ – Oregon Department of Environmental Quality
LRAPA – Lane Regional Air Protection Authority (Lane County, Oregon)
SIP – State Implementation Plan
ppm – Parts per million (concentration)
$\mu g/m^3$– micrograms per meter cubed (concentration)
FRM – Federal Reference Method
MPO – Metropolitan Planning Organization
AQCD - The Air Quality Conformity Determination

Monitoring Discontinuation Justification

1. Executive Summary

Due to budget cuts, Oregon DEQ and the Lane Regional Air Protection Authority needed to discontinue carbon monoxide and PM_{10} monitoring in maintenance areas which are now far below the National Ambient Air Quality Standard (NAAQS). The monitoring funds have either been lost or reinvested in higher priority monitoring such as $PM_{2.5}$ or ozone. These pollutants are much closer to the NAAQS and require sustained monitoring.

The CO and PM_{10} maintenance plans require continued monitoring for compliance determination and as triggers for contingency plans. To remove this requirement from the plans would require resources and time that ODEQ and LRAPA cannot afford at this time. EPA Region 10 has proposed a compromise which would require the use of alternative methods to track these pollutants in maintenance areas. The alternative methods will be included in the next maintenance plan revisions.

The method for tracking CO would use the regional emissions analysis performed in the Air Quality Transportation Conformity Determination. This is conducted every four years by the Metropolitan Planning Organizations. These analyses will show the emission trends and will provide a trigger for the contingency plans written into the maintenance plans. As a real time measure, the Portland CO monitor will be used to track trends in general CO levels.

For PM_{10}, $PM_{2.5}$ will be used as a surrogate. The percent of PM_{10} that is $PM_{2.5}$ is very high in Oregon and the control strategies are the same for both pollutants.

Maintenance Plans are located at: http://www.deq.state.or.us/aq/planning/maintenance.htm

2. Introduction

Beginning in the 1970s, and continuing through the early part of the 1990s, Oregon had several communities that violated the carbon monoxide and PM_{10} NAAQS and were consequently declared out of attainment for these pollutants. Oregon DEQ and local stake holders implemented State Implementation Plans (SIPs) to bring these areas under the NAAQS. After many years of levels below the standards, maintenance plans were installed to keep the air quality below the NAAQS. The maintenance plans included requirements to continue monitoring to determine long-term trends and compliance. Monitoring was also required for contingency measure triggers for additional regulatory actions.

Over the last twenty years, the CO and PM_{10} concentrations have dropped far below the NAAQS. Monitoring continued only to meet the maintenance requirements, but had no real benefit for public health. The maintenance plans require monitoring until 2014 for Eugene/Springfield CO, and 2022 for Medford CO, and 2023 for Grants Pass PM_{10} and Klamath Falls PM_{10}. Public health benefits most from $PM_{2.5}$, ozone, and air toxic monitoring.

In the last ten years ODEQ and LRAPA have experienced repeated budget cuts as a result of diminished revenue and expanded costs. In 2010 and 2011, budget cuts were especially deep and resulted in the elimination or reprioritization of many monitoring activities. ODEQ and LRAPA had already cut discretionary monitoring and had to now consider shutting down required, but low priority monitoring. CO and PM_{10} sites were considered expendable as long as alternative methods were available to track general concentrations and act as contingency measure triggers.

This report shows the how alternative methods can be used to adequately track CO and PM_{10} and trigger contingency measures.

3. Pollutant Trends and Source of Emissions

3.1 Carbon Monoxide Trends for Eugene/Springfield and Medford

The carbon monoxide levels have continuously dropped over the past 20 years and are now routinely one quarter of the NAAQS. Figure 1 shows the CO trends for Medford and Eugene/Springfield and Table 1 provides the design values from 2000 to 2010. Medford has been below the NAAQS since 1993 and Eugene/Springfield has been below the NAAQS since 1983. With ever more cleaner cars on the road, the design values are not expected to increase.

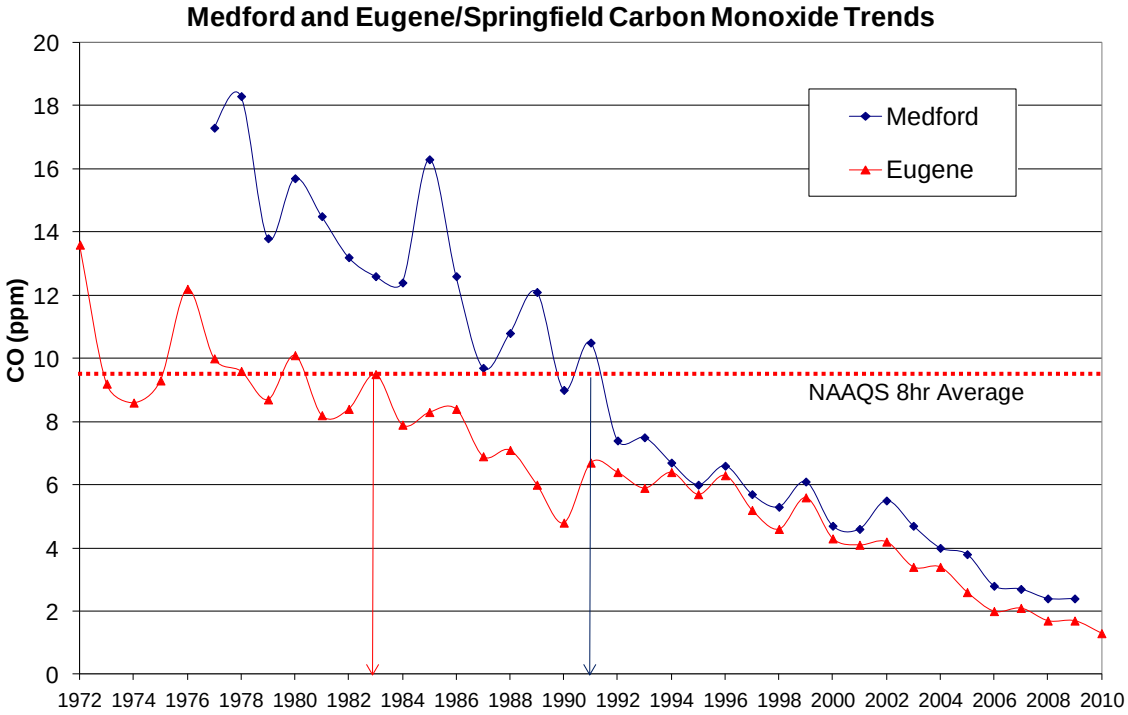

Figure 1. Medford and Eugene/Springfield CO trends.
Second highest 8 hour average.

Table 1. Medford and Eugene/Springfield CO design values.

	Eugene		Medford	
	(ppm)	% of NAAQS	(ppm)	% of NAAQS
2000	4.3	45%	4.7	49%
2001	4.1	43%	4.6	48%
2002	4.2	44%	5.5	58%
2003	3.4	36%	4.7	49%
2004	3.4	36%	4	42%
2005	2.6	27%	3.8	40%
2006	2	21%	2.8	29%
2007	2.1	22%	2.7	28%
2008	1.7	18%	2.4	25%
2009	1.7	18%	2.4	25%
2010	1.3	14%	ND	ND

Based on annual 2nd highest, daily maximum eight hour average.

3.2 Carbon Monoxide Emission Sources in Eugene/Springfield and Medford

In the past, CO emissions in Medford and Eugene/Springfield were primarily from mobile source. In newer vehicles, catalytic converters, fuel injections, and electronic timing have greatly reduced tailpipe CO levels. As the vehicle fleet becomes newer the CO levels are expected to continue dropping.

Non-mobile CO sources include industrial and area sources. Both areas have EPA Title V sources with Plant Site Emission Limits over 100 tons per year. These sources have been operating for years and are regulated. They would have to go through Prevention of Significant Deterioration review if they wanted to raise their CO emissions.

Both areas also have a significant population using residential wood heating. Both were PM_{10} non-attainment areas and have had programs in place for years that encourages the use of certified woodstoves. All of Oregon now has the Heat Smart Program which requires the removal of non-certified woodstove upon sale of a home. Certified wood stoves emit far less CO than non-certified stoves.

3.3 PM_{10} Trends

Over the last 20 years PM_{10} levels have dropped statewide because of permitting programs and other reduction strategies. Figure 2 shows the PM_{10} trends for Grants Pass and Klamath Falls from 1987 to 2010. Table 2 provides the design values from 2000 to 2010. Grants Pass has been below the NAAQS since 1988 and Klamath Falls has been below the NAAQS since 1991.

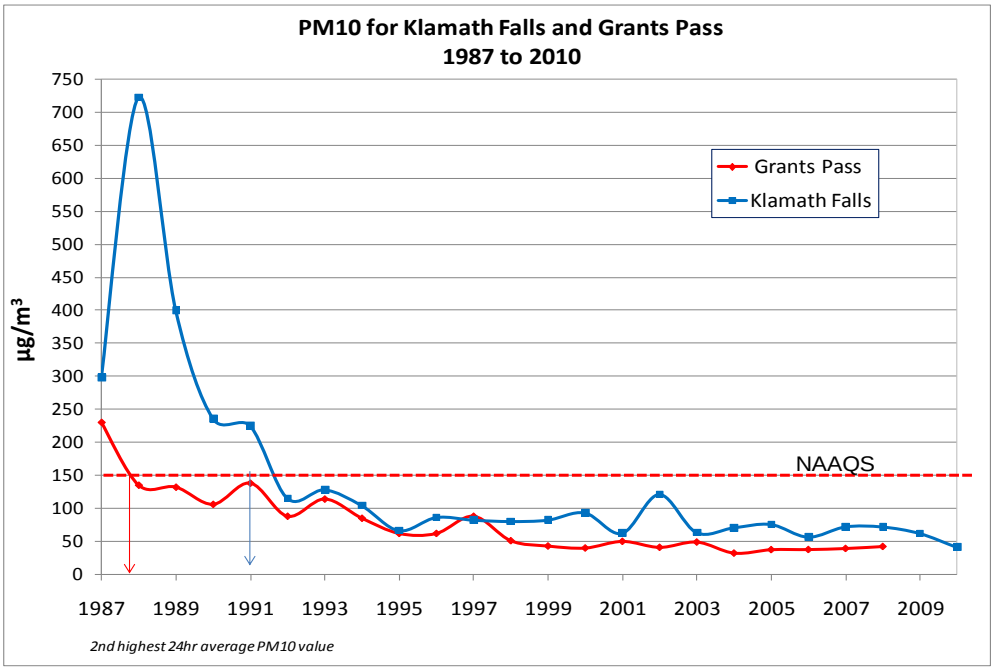

Figure 2. Grants Pass and Klamath Falls PM_{10} trends.

Second highest 24 hour average PM_{10} values.

Table 2. Grants Pass and Klamath Falls PM_{10} design values.

	Grants Pass		Klamath Falls	
	(µg/m3)	% of NAAQS	(µg/m3)	% of NAAQS
2000	40.0	27%	93.0	62%
2001	50.0	33%	62.0	41%
2002	41.0	27%	121.0*	81%
2003	49.0	33%	63.2	42%
2004	32.3	22%	70.4	47%
2005	37.5	25%	75.5	50%
2006	37.7	25%	56.3	38%
2007	39.3	26%	71.8	48%
2008	42.3	28%	71.7	48%
2009	ND	ND	61.8	41%
2010	ND	ND	40.8	27%

Based on annual 2nd highest, 24 hour average.

* The 2002 Klamath Falls PM_{10} value was from a forest fire but was not considered an exceptional event because it was below the NAAQS.

3.4 PM_{10} Emission Sources in Eugene/Springfield and Medford

In the past, PM_{10} emissions in Medford and Eugene/Springfield were primarily from industrial and area sources. Both areas have EPA Title V sources with Plant Site Emission Limits over 100 tons per year. Industrial sources were regulated and now have cyclones , bag houses, and more efficient boilers to control emissions. Other methods such as Wigwam burners were outlawed. If these sources wanted to emit more PM_{10} they would have to go through Prevention of Significant Deteriation review.

The primary source of PM_{10} is now smoke from residential wood heating. Medford and Eugene/Springfield were PM_{10} non-attainment areas and have had programs in place for years that encourage the use of certified woodstoves. All of Oregon now has the Heat Smart Program which requires the removal of non-certified woodstove upon sale of a home. Certified wood stoves emit far less PM_{10} than non-certified stoves.

4. Fraction of PM_{10} that is $PM_{2.5}$

In Oregon, PM_{10} is mostly made up of $PM_{2.5}$. This section will show the results of years of wintertime collocated PM_{10} and $PM_{2.5}$ sampling in Klamath Falls and Grants Pass to ascertain the PM coarse (PMc) fraction of PM_{10}. In Oregon, winter weather occurs from November through February. This is when most winter inversions occur and the highest concentrations are measured.

4.1 Klamath Falls PM_{10} vs. $PM_{2.5}$

Comparable PM_{10} and $PM_{2.5}$ FRM samplers were operated in Klamath Falls from 2007 through 2010. Comparison of the winter $PM_{2.5}$ and PM_{10} data shows a correlation with an R Squared of 0.87 (Figure 3). During this period there were 17 samples greater than ¼ of the NAAQS, three of which were greater than ½ the NAAQS. The highest value in the past three winters was 57% of the PM_{10} NAAQS. On average, winter PM_{10} is 70% $PM_{2.5}$ by weight with a 95% confidence level of 66% to 74% (summarized in Table 3). Figure 4 shows the $PM_{2.5}$ and PMcoarse fractions for the highest winter values for 2007-2009.

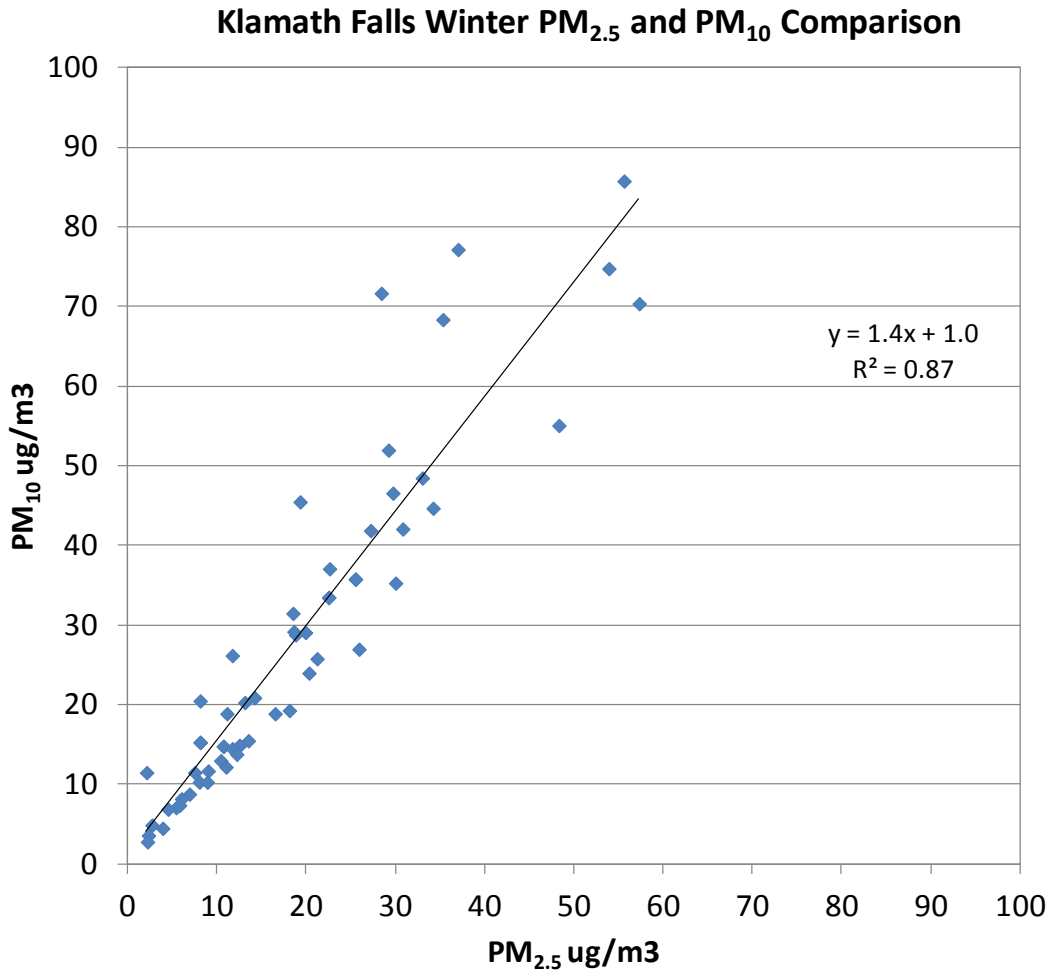

Figure 3. Klamath Falls, Peterson School $PM_{10}/PM_{2.5}$ Correlation.

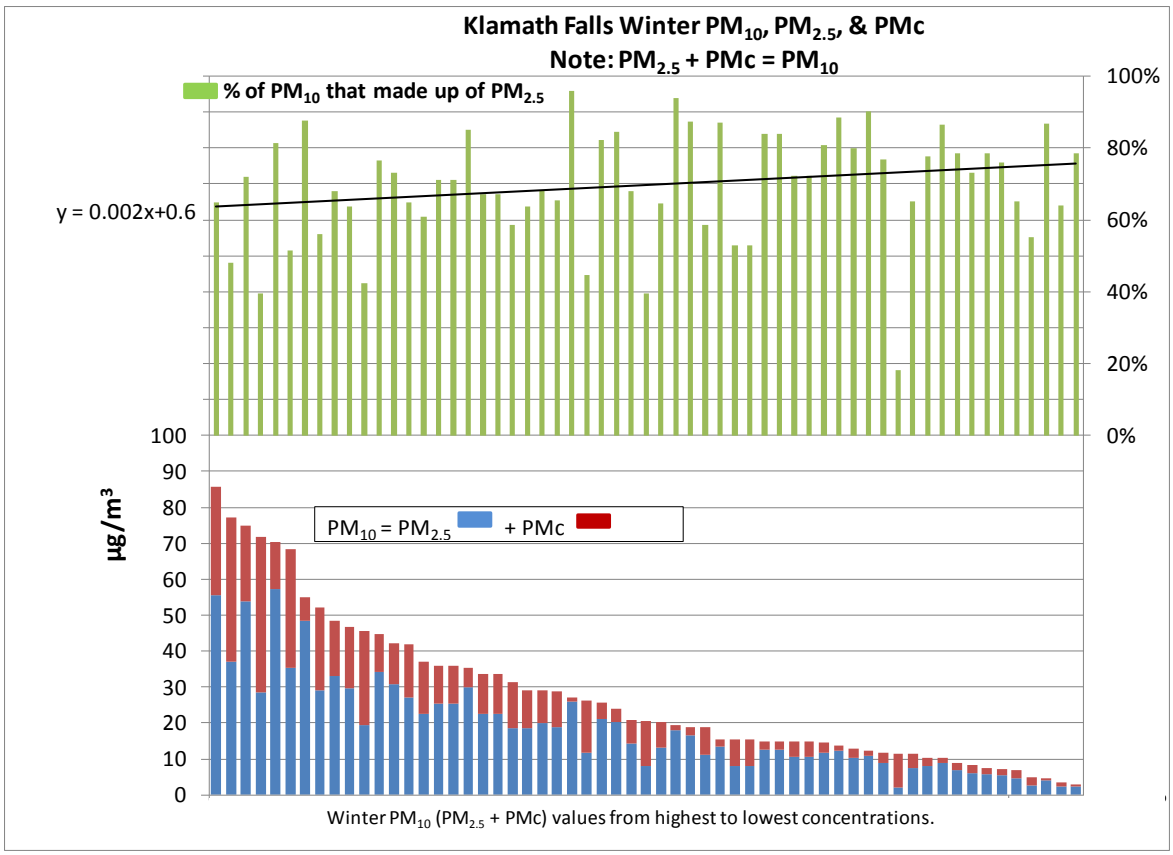

Figure 4. Klamath Falls winter time PM_{10} distribution of PMcoarse and $PM_{2.5}$.
Note: In Figure 4, PMc(red)+$PM_{2.5}$ (blue) = PM_{10}

Over the past ten years there were two years with elevated days outside of winter. In 2002, massive forest fires caused elevated levels during August; the PM_{10} was mostly $PM_{2.5}$. In 2009, a dust event caused an elevated level in early October. The dust event had a low $PM_{2.5}$ quotient but the PM_{10} concentration (87µg/m^3) was well below the NAAQS. If that single dust event was included in the linear regression done in Figure 2, the RSquared would change from 0.87 to 0.76 and the equation would change from y =1.4x+1.0 to y =1.4x+3.2. This is only a 2.2µg/m^3 higher PM_{10} derived value if the dust event is included.

4.2 Grants Pass PM_{10} vs. $PM_{2.5}$:

Comparable PM_{10} and $PM_{2.5}$ samplers were co-located in Grants Pass from 2006 through 2008. The $PM_{2.5}$ and PM_{10} correlation has an R Squared of 0.94 (Figure 5).

From 2006 to 2008 there were only four samples over ¼ of the NAAQS, and none over ½ the NAAQS. On average, winter PM_{10} is 73% $PM_{2.5}$ by weight with a 95% confidence level of 70% to 76% (summarized in Table 3). The highest value in the past three winters was only 29% of the PM_{10} NAAQS. Figure 6 shows the $PM_{2.5}$ and PM coarse fractions for the winter values for 2006-2008.

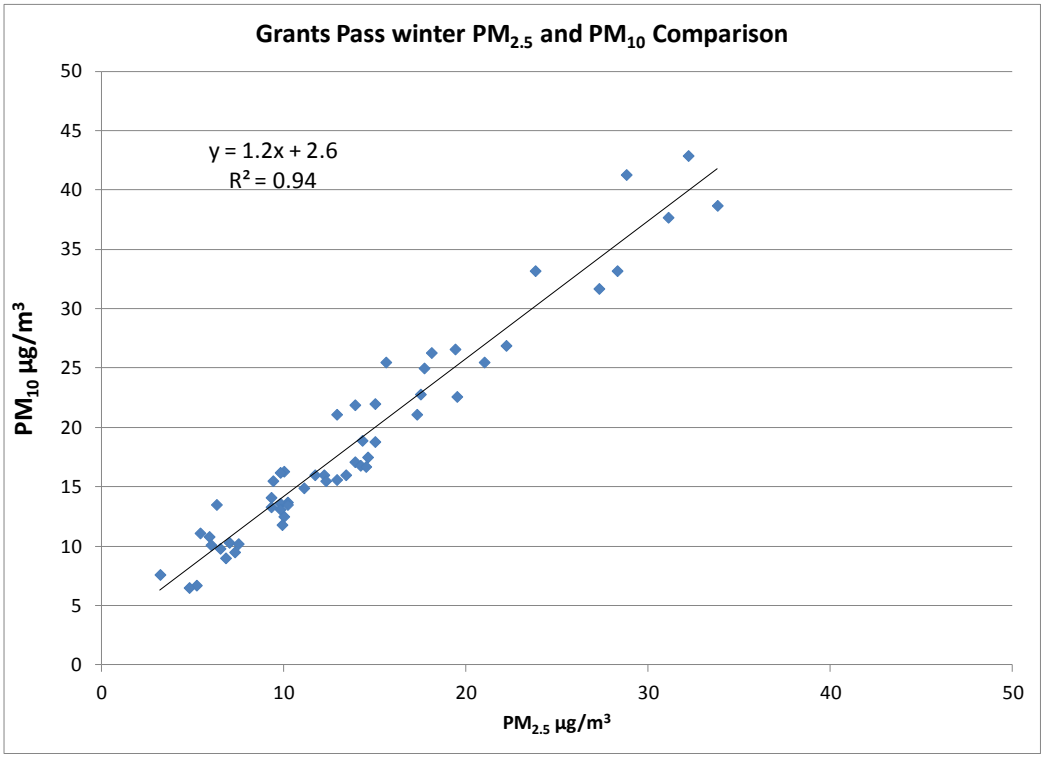

Figure 5. Grants Pass, Parkside School PM10/PM2.5 Correlation.

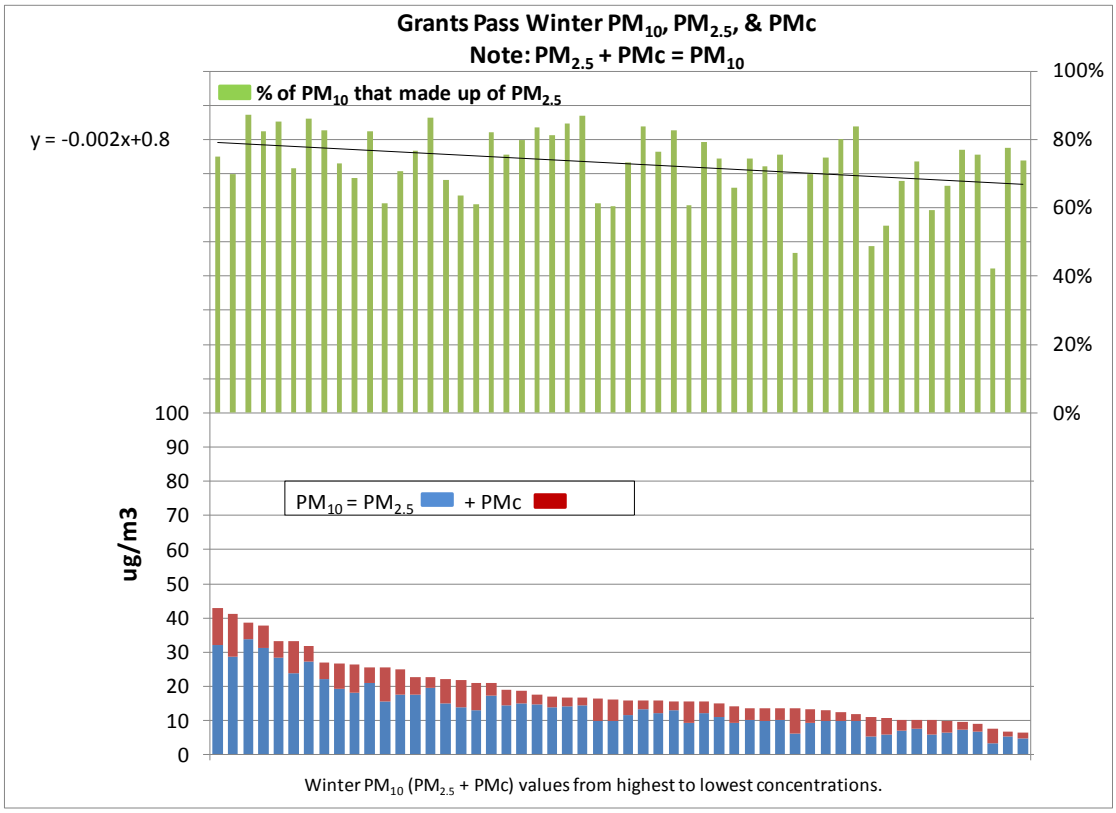

Figure 6. Grants Pass, winter time PM_{10} distribution of PMcoarse and $PM_{2.5}$.
Note: In Figure 6, PMc(red)+$PM_{2.5}$ (blue) = PM_{10}

4.3 PM_{10} vs. $PM_{2.5}$ Summary:

Table 3 shows the summary of the winter co-located PM_{10} and $PM_{2.5}$ samples. This percentage shows the percentage (by weight) of PM_{10} that is $PM_{2.5}$.

Table 3. $PM_{2.5}$ fraction of PM_{10} Average and 95% confidence level.

	Average	95% Confidence Level
Klamath Falls	70%	66% - 74%
Grants Pass	73%	70% - 76%

5. Emission Estimate Methods:

Modeled CO emission estimates are developed by the Metropolitan Planning Organizations (MPOs) for Eugene/Springfield and Medford as part of the transportation conformity requirements in the maintenance plans in accordance with Clean Air Act section 176(c). Transportation conformity ensures that federal funding and approval are given to highway and transit projects that are consistent with ("conform to") the air quality goals established by a SIP. Conformity, to the purpose of the SIP, means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS.

A regional emissions analysis is a major component of demonstrating transportation conformity. The regional emissions analysis includes emissions from all current and planned regionally significant projects in the entire transportation system in the maintenance area for the duration of the transportation plan or TIP. The regional emissions analysis must use the latest planning assumptions and latest emissions model.

This following section discusses the regional emissions analyses conducted in Eugene/Springfield and Medford for transportation conformity determinations.

5.1 The Central Lane MPO Regional Emissions Analysis

The Central Lane MPO is the agency responsible for performing the regional emissions analysis in the Eugene/Springfield maintenance area. The most recent regional emissions analysis was completed in 2010 for the "FY10-13 Metropolitan Transportation Improvement Program."

The 2010 CO emissions projections from the regional emissions analyses are shown in Table 4 (in tons per year). The first year listed, 2004, is the regional land use/transportation model base year.

Table 4. 2010 CO emission estimates within the Eugene/Springfield boundary.

Analysis Year	Estimated CO Emissions (tons/yr)
2004	*2,198*
2008	1,634
2018	1,160
2028	1,056
2031	1,059

5.2 The Rogue Valley Regional Emissions Analysis

The Rogue Valley MPO is the agency responsible for performing the regional emissions analysis in the Medford maintenance area. The most recent regional emissions analysis was completed in 2010 "2010-2013 Metropolitan Transportation Improvement Program 2009-2034 Regional Transportation Plan".

The 2010 AQCD's CO emissions from the regional emissions analysis are shown in Table 5 (in pounds per day). The first year listed, 2005, is the regional land use/transportation model base year used in the "2001-2023 Regional Transportation Plan and 2002-2005 Transportation Improvement Program".

Table 5. 2010 CO emission estimates within the Medford urban growth boundary.

Analysis Year	Estimated CO Emissions (lbs/day)
2005	*33,910*
2015	19,359
2020	20,280
2026	19,770
2034	32,640

6. An alternate approach for tracking the pollutant

CO and PM_{10} maintenance plans required continued monitoring to determine NAAQS compliance. If the monitoring agency discontinues monitoring, CO and PM_{10} must be tracked using alternative methods. This section outlines the specific tracking methods ODEQ and LRAPA will use for CO in Medford and Eugene/Springfield, and PM_{10} in Klamath Falls and Grants Pass.

6.1 Tracking Carbon Monoxide:

Carbon monoxide has traditionally been tracked by monitoring and modeling. Once monitoring is discontinued in the Eugene/Springfield and Medford maintenance areas, regional emissions modeling will be the primary method of tracking CO.

Because on-road motor vehicle emissions are the primary source of CO in the Eugene/Springfield and Medford maintenance areas, ODEQ believes the regional emissions analysis conducted for the CO maintenance areas provides an effective surrogate method for tracking CO emissions. The regional emissions analysis must use the latest planning assumptions (e.g., population, vehicle miles traveled, employment estimates) and the latest emissions model. The regional emissions modeling is done at least every four years and produces CO estimates based on current and planned transportation activities throughout the CO maintenance areas. If these estimates exceed the base year estimates (shown in italics in Tables 4 and 5), then the current CO concentrations may be higher than the design values for those years (3.4 ppm in Eugene in 2004 and 3.8 ppm in Medford in 2005, see Table 1). If this occurs, EPA and ODEQ or LRAPA will decide whether to conduct CO survey monitoring. If the CO survey monitoring shows levels > ½ of the NAAQS, then CO monitoring will be restarted. Survey monitoring is done with an inexpensive non-FRM monitor.

ODEQ will also continue to monitor CO in Portland. This monitoring will track general CO concentrations, because if the CO levels increase in Portland, they may also be going up in the other cities. If the Portland CO design value exceeds ½ the NAAQS, survey monitoring may be performed at the former Medford and Eugene/Springfield CO sites to determine current conditions. If the surveyed CO levels are ½ the NAAQS, CO monitoring will be restarted.

The CO estimates will be included in the annual network review.

6.2 Tracking PM_{10}:

PM_{10} in Klamath Falls and Grants Pass will be tracked using $PM_{2.5}$ monitoring. The major source of PM_{10} in these communities is smoke from wood heating. The percentage of PM_{10} which is $PM_{2.5}$ is known in both of these communities and PM_{10} estimates can be made using $PM_{2.5}$ monitored levels. $PM_{2.5}$ is monitored with both continuous and FRM samplers. Table 6 contains the linear regression equations used to estimate PM_{10} from $PM_{2.5}$ at these sampling locations.

The PM_{10} estimates will be included in the annual network review.

7. Alternate contingency measure trigger

CO and PM_{10} maintenance plans contain contingency triggers which are tied to monitored levels. If the trigger concentration is reached, ODEQ or LRAPA must institute the contingency measures outlined in the maintenance plan. If the monitoring agency wants to discontinue monitoring, they need to offer an alternative method to measure air quality for comparison to the trigger level. This section outlines the specific alternative trigger methods for CO in Medford and Eugene/Springfield, and PM_{10} in Klamath Falls and Grants Pass.

7.1 Alternative trigger for CO for Medford UGB:

Contingency trigger requirements:

On March 9th, 2001, the Environmental Quality Commission adopted the State implementation plan revision for carbon monoxide in the Medford urban growth boundary (a

plan for maintaining the national ambient air quality standards for carbon monoxide). Section 4.52.3.3 of the plan requires a "Contingency Plan" to take effect if the second highest daily 8 hour average monitored values were 1) above 90% of the NAAQS (phase 1), or 2) above the NAAQS (phase 2). The "Plan" makes an exception for the Medford Old Car Rally.

The problem:

ODEQ had to discontinue CO monitoring due to budget cuts and very low concentrations. The contingency plan relies on continued monitoring to compare to the trigger points. ODEQ needs to adopt a trigger point based on an alternative pollutant measure.

The Solution:

For Medford, two alternative contingency trigger methods will be used. Method 1 relies on estimates produced every four years. Method 2 relies on hourly, real time data.

Method 1:

The first method will be to use the modeled CO emissions in the regional emissions analysis conducted every four years by the Rogue Valley MPO for the transportation conformity determination. If the modeled emissions are above the modeled baseline year emissions, CO survey monitoring will be started to determine whether the contingency requirements are triggered. Survey monitoring is done with an inexpensive non-FRM monitor.

Method 2:

The Portland, SE Lafayette CO monitor will be used as a surrogate. This provides real time monitoring data. If the Portland monitor reaches ½ the NAAQS, survey sampling will be started in Medford to determine whether the contingency requirements are triggered. Survey monitoring is done with an inexpensive non-FRM monitor.

7.2 Alternative trigger for CO for Eugene/Springfield AQMA:

Contingency trigger requirements:

On February 27th, 1992, Lane Regional Air Pollution (now Protection) Authority sent an addendum to their carbon monoxide maintenance plan title "Contingency Commitment for Amendment of Oregon's SIP, Eugene-Springfield carbon monoxide Attainment Redesignation & Adoption of Maintenance Plan". The letter committed LRAPA to a carbon monoxide contingency plan as part of their carbon monoxide maintenance plan. The letter stated that "Within 60 days of reporting on AIRS that a violation of the carbon monoxide NAAQS has occurred within the Eugene-Springfield AQMA, LRAPA and LCOG will submit to the EPA a contingency plan for attaining the standard, which will be implemented as expeditiously as practicable". Since the carbon monoxide NAAQS was never violated following this letter, the contingency plan for attaining the standard was never required.

The problem:

LRAPA had to discontinue CO monitoring due to budget cuts and low CO concentrations. The contingency plan relies on continued monitoring to compare to the trigger points. LRAPA needs to adopt a trigger point based on an alternative pollutant measure.

The Solution:
For Eugene/Springfield, one of two alternative contingency trigger methods will be used. Method 1 relies on estimates produced every four years. Method 2 relies on hourly, real time data.

Method 1:
The first method will be to use the modeled CO emissions in the regional emissions analysis conducted every four years by the Central Lane MPO. If the modeled emissions are above the modeled baseline year emissions, CO survey monitoring will be started to determine whether the contingency requirements are triggered. Survey monitoring is done with an inexpensive non-FRM monitor.

Method 2:
The Portland, SE Lafayette CO monitor will be used as a surrogate. This provides real time monitoring data. If the Portland monitor reaches ½ the NAAQS, survey sampling will be started in Eugene to determine whether the contingency requirements are triggered. Survey monitoring is done with an inexpensive non-FRM monitor.

7.3 Alternative trigger for Klamath Falls PM_{10} Urban Growth Boundary

Contingency trigger requirements:
In October 2002, the Klamath Falls PM_{10} maintenance plan was finalized, installing a contingency plan that said:

Phase 1: Risk of Violation

> The County and DEQ will reconvene a planning group to develop an action plan if ambient concentrations (actual or estimated) equal or exceed 90% of the NAAQS concentration of PM_{10} (135µg/m3 for the 24 hour average or 45µg/m3 for an annual average) at Peterson School. The planning group will prepare an action plan that includes a schedule for implementation of additional strategies as necessary to prevent an exceedance or violation of PM_{10} standards. If the high PM_{10} concentration was determined to be a natural event based on EPA's policy or an exceptional event, no further action may be needed.

Phase 2: Actual Violation

> If a violation of the PM_{10} standard occurs and is validated by DEQ, the following contingency measures will automatically be implemented:

The problem:
DEQ had to discontinue PM_{10} monitoring due to budget cuts and low PM_{10} levels. The contingency plan relies on continued PM_{10} monitoring to compare to the trigger points. ODEQ needs to adopt a trigger point based on an alternative pollutant measure.

The Solution:
The PM_{10} alternative pollutant measure will be to use $PM_{2.5}$ monitoring as a surrogate. The $PM_{2.5}$ relationship to PM_{10} has been established in recent years with collocated PM_{10} and $PM_{2.5}$ monitors. Linear regression analysis was performed on the PM_{10} and $PM_{2.5}$ data

(Figure 3) and a linear regression equation was established (Table 6). Using this linear regression equation, ODEQ has determined the $PM_{2.5}$ concentration needed to trigger the PM_{10} "Risk of Violation" and "Actual Violation" levels discussed above, also shown in Table 6.

7.4 Alternative trigger for Grants Pass PM_{10} Urban Growth Boundary

Contingency trigger requirements:

In October 2002, the Grants Pass PM_{10} maintenance plan was finalized, installing a contingency plan that said:

> "DEQ will convene a planning group if the 24-hour PM_{10} concentration as measured at the Grants Pass PM_{10} monitor equals or exceeds 120µg/m^3. The planning group will assess the probable emissions event resulting in the elevated PM_{10} level and consider a range of measures with the potential to reduce emissions. However, if a violation of the 24-hour PM_{10} standard occurs, Lowest Achievable Emission Rate requirements, plus offsets, for major new industrial sources in the UGB will be restored and the exemption for offsets eliminated."

The problem:

ODEQ discontinued PM_{10} monitoring due to budget cuts and low PM_{10} levels. The contingency plan relies on continued PM_{10} monitoring to compare to the trigger points. ODEQ needs to adopt a trigger point based on an alternative pollutant measure.

The Solution:

The PM_{10} alternative pollutant measure will be to use $PM_{2.5}$ monitoring as a surrogate. The $PM_{2.5}$ relationship to PM_{10} has been established in recent years with collocated PM_{10} and $PM_{2.5}$ monitors. Linear regression analysis was performed on the PM_{10} and $PM_{2.5}$ data (Figure 3) and a linear regression equation was established (Table 6). Using this linear regression equation, DEQ has determined the $PM_{2.5}$ concentration needed to trigger the PM_{10} trigger of 120µg/m^3. This is shown in Table 6.

Table 6. Linear regression equations and ratios used to estimate PM_{10} using $PM_{2.5}$.

	Klamath Falls	Grants Pass
Linear Regression Equation	y = 1.4x + 3.2	y = 1.2x + 2.6
$PM_{2.5}$ trigger for "Risk of Violation"	94 µg/m^3	
$PM_{2.5}$ trigger for "Actual Violation"	105 µg/m^3	
$PM_{2.5}$ trigger for 120 µg/m^3 PM_{10}		101 µg/m^3

Y = PM_{10}, X = $PM_{2.5}$

8. Conclusion

Budget cuts have forced ODEQ and LRAPA to cut CO and PM_{10} monitoring where they are required by the maintenance plans for compliance determination and contingency measure triggers. Fortunately, the CO and PM_{10} levels are so far below the NAAQS that there is very little probability that the monitors would trigger the contingency plans. Regardless, the maintenance plans need ambient levels for comparison, so alternative methods are needed to estimate concentrations. The alternative contingency plans described in this document will

allow ODEQ and LRAPA to track CO and PM_{10} levels into the future. If levels start trending back up near the NAAQS, funding from other monitoring can be shifted and CO and PM_{10} monitors restarted. This is very unlikely however.

Finally, monitoring is only required during the first 20 years of the maintenance plan. The monitoring requirement for Eugene/Springfield CO expires in 2014. The monitoring requirements for Medford CO will expire in 2023 and for Grants Pass PM_{10} and Klamath Falls PM_{10}, the monitoring requirements will expire in 2023.

9. Reference

1. Air Quality Conformity Determination, Central Lane MPO FFY10-13 Metropolitan Transportation Improvement Program and 2007-2031 Regional Transportation Plan, October, 2010.
2. Air Quality Conformity Determination for 2010-2013. Metropolitan Transportation Improvement Program & 2009-2034 Regional Transportation Plan – Amended, Rogue Valley MPO, April, 2010.

Appendix 4

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

Air Quality Division – Technical Services Section

Inventory Preparation and Quality Assurance Plan for the Medford Urban Growth Boundary 2008 Carbon Monoxide (CO) Limited Maintenance Plan

February 2015

Oregon Department of the Environmental Quality

Inventory Preparation Plan/Quality Assurance Plan

for the

Medford Urban Growth Boundary

2008

Carbon Monoxide (CO)

Limited Maintenance Plan

Environmental Solutions Division, Technical Services Section

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1 INTRODUCTION

Medford Oregon was designated a nonattainment area for carbon monoxide (CO) in 1978 and classified as moderate upon enactment of the 1990 Clean Air Act Amendments (CAAA). The highest 8-hour carbon monoxide concentration recorded in Medford occurred in 1977 at level of 21.8 ppm. Due to hot spot problems within the downtown region of Medford in 1982 the nonattainment area was revised to include only the central business district. Following the CAAA, the nonattainment area was modified to the Medford Urban Growth Boundary (UGB) as recommended by Governor Roberts's March 15, 1991 letter to the EPA (57 FR 56762, November 30, 1992). By the late 1980's, maximum levels were closer to the standard level, and the last exceedances of the standard were in 1990.

The area was redesignated to attainment for the 8-hour CO standard in September 23, 2002, when EPA approved Oregon's redesignation request and the first maintenance plan designed to maintain compliance with the 8-hour CO standard through the year 2015 (67 FR 48388, July 24, 2002). This plan addresses the second 10-year maintenance period required under section 175A(b) of Act. Once approved by EPA, the second maintenance plan will fulfill the 20-year maintenance planning requirements of Clean Air Act section 175A. This Inventory Preparation Plan is in support of the development of the required second CO maintenance plan.

The maintenance area is the Medford UGB (Figure 1.1). Similar approach is recommended for the second maintenance plan. One of two CO monitors was located at the Brophy building location in downtown Medford. Measured CO levels were so low that the monitor was removed with EPA approval at the end of 2009. Because on-road mobile vehicle emissions are the primary source of CO in Medford (about 50%), Oregon DEQ has been tracking any increase in emissions for CO in Medford.

The Medford second maintenance plan qualifies for the Limited Maintenance Plan (LMP) approach because it satisfies all the requirements outlined in the Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas (Paisie memo, 1995). For the 8-hour CO, in the most recent two years of data, the maximum value of 2.6 ppm was recorded on January 18, 2008 and the second maximum value of 2.4 ppm was recorded on December 6, 2008. The risk to the community of exceeding the CO standard is low.

Oregon DEQ proposes using existing information from the EPA 2008 National Emission Inventory (NEI) to create the emissions inventory for CO sources in Medford. This document describes the planned approach to the Medford CO LMP EI and the basis for selecting that approach.

Geographic Area

The geographic area of the Medford UGB is shown in Figure 1-1. The 25-mile extension to the UGB area is shown in Figure 1-2; includes incorporated and unincorporated Jackson County and a part of Josephine County. Populated areas within the 25 mile buffer with large point sources included in this inventory are Medford, Rogue River and White City. The city is approximately 28 sq. miles in area, and the US Census 2008 population was 77,667. The elevation of the city is approximately 422 meters (1384 ft).

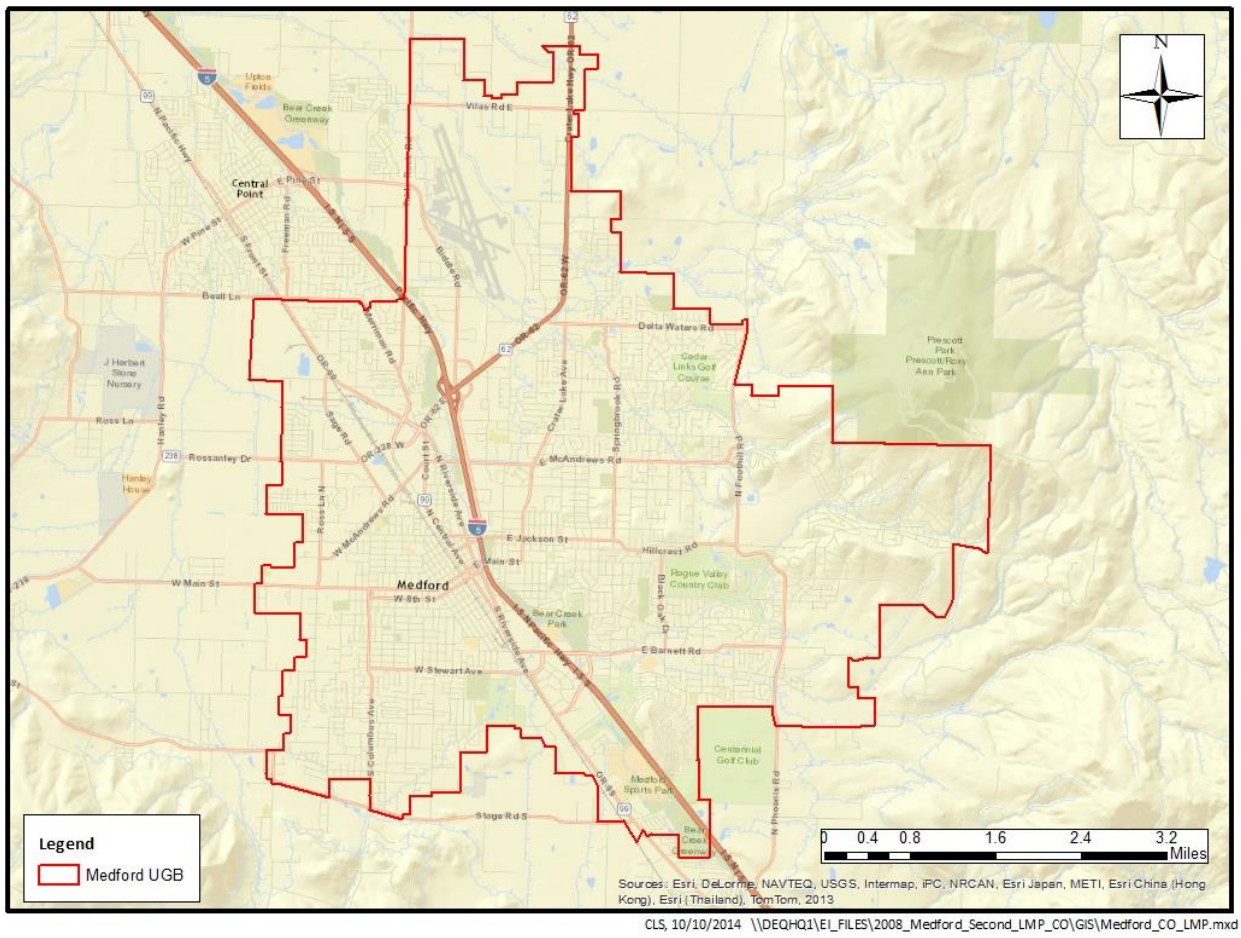

Figure 1-1. Medford UGB and CO Maintenance Area

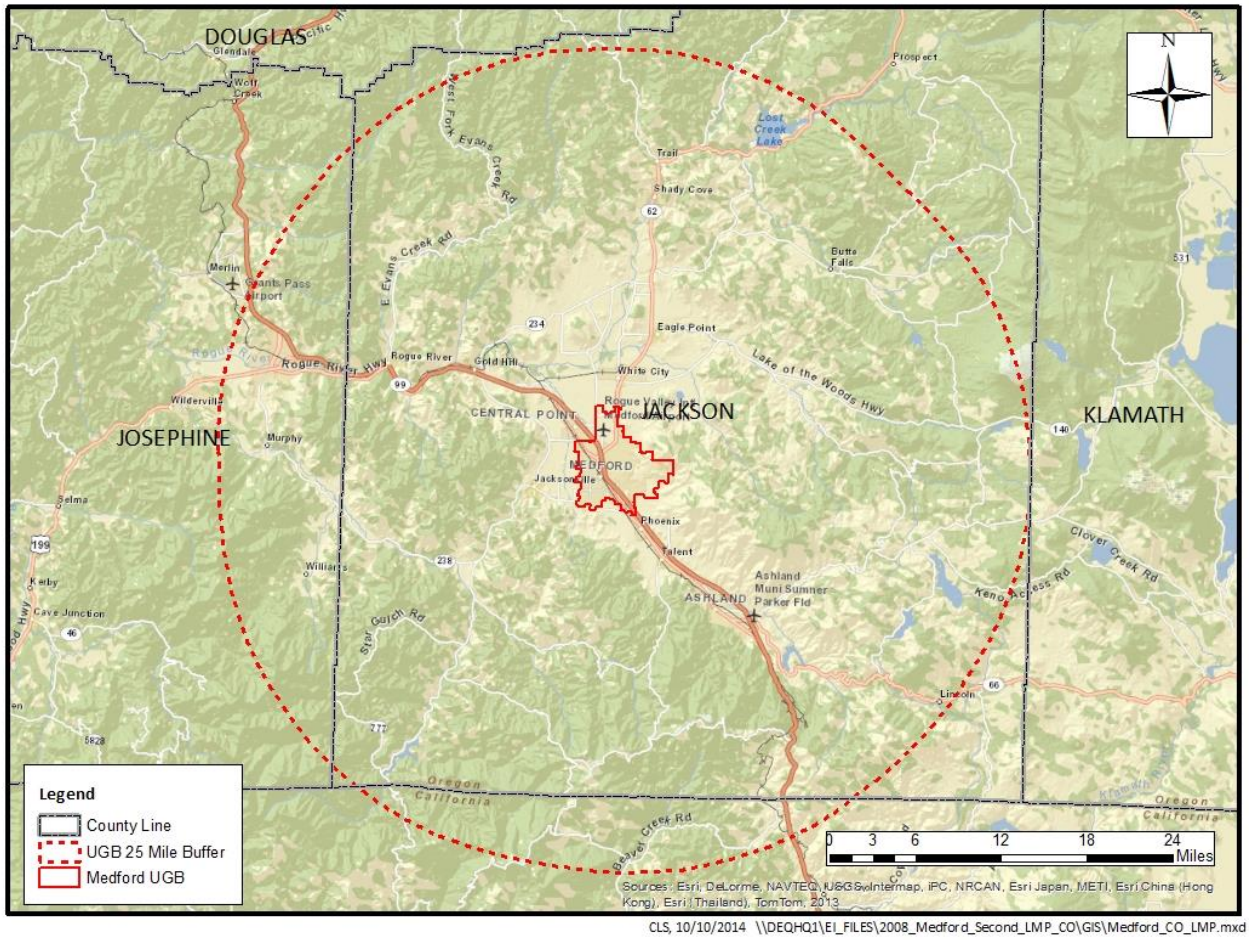

Figure 1-2. Medford 25 Mile Buffer for CO Sources >100 tons/year

Temporal Resolution

The CO season is defined as three consecutive months, December 1st through the end of February. As such, winter season day emissions will be included in the inventory. The unit of measure for winter season day emissions will be pounds per day (lb/day).

2 INVENTORY DEVELOPMENT

The DEQ will develop an emission inventory using EPA 2008 National Emissions Inventory (NEI) data for Jackson County. We will temporally allocate the EI data to CO season, and spatially allocate the county-wide NEI data to the Medford UGB, or to buffers around the UGB, depending on emissions category. All data sources and allocation methods will be documented. The emission inventory will be consistent with the 1993 inventory.

2.1 Data Categories

From the base year (1993) emission inventory for the maintenance plan, the most significant categories of CO emissions in the Medford UGB are on-road mobile vehicle exhaust, stationary area sources, permitted point sources, and nonroad vehicles and equipment. Table 2.1 shows the breakdown by category for CO Season day emissions in 1993.

Table 2.1. 1993 CO Season Day Emissions by Category

Emission Inventory Category	Emissions per Day (lb/day)	Percent of Daily Emissions
On-Road Mobile Sources	57,342	51%
Stationary Point Sources	28,516	25%
Stationary Area Sources	19,748	18%
Non-Road Mobile Sources	6,536	6%
	-------	-------
Total	112,143	100%

Emission Sectors

We propose 11 emission inventory source sectors be included in this LMP for the Medford UGB maintenance area. The sectors are based on a review of emission sectors listed in the 1993 maintenance plan, and an analysis of 2008 NEI data. Table 2.2 shows the breakdown by source category of average daily CO emissions in 1993 inventory; DEQ will use the same source categories as in the 1993 inventory with the exception of the small point sources which will be combined with the Permitted Point Sources category.

Table 2.2. 1993 CO Season Day Emissions by Source Category

Emission Source Category	Emissions per Day (lb/day)	Percent of Worst-Case Day Emissions
Permitted Point Sources	28,516	25.43%
Small Point Sources	13	0.01%
Open Burning	495	0.44%
Small Stationary Fossil Fuel Combustion[(a)]	390	0.35%
Residential Wood Combustion	18,648	16.63%

Emission Source Category	Emissions per Day (lb/day)	Percent of Worst-Case Day Emissions
Wildfires & Prescribed Burning	183	0.16%
Structure Fires	19	0.02%
Aircraft & Airport Related	2,773	2.47%
Locomotives	17	0.01%
Recreational Marine	0	0.00%
Nonroad Vehicles & Equipment	3,747	3.34%
Onroad Mobile: Exhaust	57,342	51.13%
	-------	--------
Total	112,143	100%

(a) Non-permitted stationary residential, industrial, commercial, and institutional fuel use

3 SPATIAL ALLOCATION METHODS

For emissions sources with specific coordinates, emissions will be mapped to either the UGB or other boundary, depending on emissions source category. For sources without specific coordinates, spatial surrogates will be used to approximate both the location and magnitude of emissions. Spatial surrogates are typically used to approximate emissions inside smaller boundaries from larger boundaries. For sources without specific coordinates, county-wide emissions will be spatially allocated to UGB using the formula:

$$E_{UGB} = E_{COUNTY} * Surrogate_{UGB} / Surrogate_{COUNTY}$$

Where E_{UGB} = emissions in UGB,

E_{COUNTY} = county-wide emissions

$Surrogate_{UGB}$ = surrogate activity in UGB

$Surrogate_{COUNTY}$ = surrogate activity in county

Data sources, spatial surrogates or boundaries used for each category of emissions are detailed in Table 3-1.

Table 3.1. Data Sources, Spatial Surrogates and Boundaries

Sector and Category	EI Data Source	Spatial Surrogate	Surrogate Data Source	Comment
Permitted Point	2008 NEI v.3	within 25-mi buffer of the UGB (consistent with 1993 EI)	DEQ GIS data	Source coordinates used
Nonpoint (Area)				
Open Burning	2008 DEQ Estimate	zoning and burn control area	DEQ and Jackson County	Residential and land-clearing open burning will be spatially allocated from county-wide to UGB using land zoning shapefile data. The location of additional categories of open burning will be determined via DEQ permitting and violation records from 2008.
Small Stationary Fossil Fuel Combustion	2008 NEI v.3	zoning	Jackson County zoning	non-permitted source fuel use
Residential Wood Combustion	2008 NEI v.3	Census block group	US Census	Census data used for allocation
Wildfires and Prescribed Burning	2008 v.3 & 2011 NEI	Average of two year's worth of data: fires within or adjacent to the Medford UGB[a]	2008 & 2011 NEI	Fire coordinates used: Average of two year's worth of data from the NEI
Structure Fires	2008 NEI v.3	population	US Census	2008 Census data
Nonroad				
Aircraft & Airport related	2008 NEI v.3	Facility location given Lat/Long decimal degrees	2008 NEI (airport location)	Two heliports and three airports are listed as being located in Medford
Locomotives				
Line-Haul (Road)	2008 NEI v.3	track miles	DEQ GIS	Active track miles only
Switching (Yard)	2008 NEI v.3	yard location (polygon)	DEQ GIS	
Marine (recreational)	2008 NEI v.3	boat use days by waterbody	Oregon State Marine Board	2008 Recreational boat use days from OSMB
Nonroad Vehicles & Equipment	2008 NEI v.3	zoning	Jackson County zoning	EPA Nonroad Model categories
Onroad Mobile				
Exhaust	2008 NEI v.3	VMT (b)	DEQ GIS	

(a) Fire spatial and temporal data has become increasingly sophisticated since the 1993 EI. The date, emissions, and coordinates of specific fires are now available in the 2008 and 2011 NEIs. The term "fires within or adjacent to the Medford UGB" is consistent with the 1993 EI.

(b A ratio of 2008 Medford UGB VMT to 2008 Jackson County VMT.

4 TEMPORAL ALLOCATION METHODS

Annual emissions will be adjusted from tons per year to lbs per season day for each source category. Methods for each category are described below, and all methods are consistent with the 1993 EI.

4.1 Permitted Point

Typical day emissions estimates will be calculated from annual emissions utilizing facility operating schedules taken from source permits. Seasonal adjustment may also be estimated from source annual reports, and DEQ point source emissions estimation reports.

4.2 Aircraft and Locomotives

Aircraft and locomotive activity will be considered uniform throughout the year. Annual emissions will be divided by 365 days to estimate season day emissions.

4.3 Nonpoint (area) and Nonroad Vehicles & Equipment

For nonpoint (area) and nonroad vehicles and equipment (excluding aircraft and locomotive), temporal allocation to season will follow the formula:

Annual to Typical Season Day = (Annual Emissions * SAF) / (weekly activity * 52 weeks/yr)

Where SAF = Seasonal Adjustment Factor =

= *(Season Activity * 12 months) / (Annual Activity * Season Months)*

(Reference: EPA-450/4-91-016, p. 5-22)

4.3.1 Open Burning

Open burning will be temporally allocated using SAF values and activity in days per week; DEQ may either verify the SAF values used in the 1993 EI or develop new SAF values based on the 2008 permitting and complaint data. Regardless, the method will be consistent with the 1993 EI.

4.3.2 Small Stationary Fossil Fuel Combustion

Annual emissions from small stationary fossil fuel combustion will be temporally allocated using SAF values and activity in days per week taken from the 1993 EI. SAF values for these sources in the 1993 EI were taken directly from EPA-450/4-91-016, Table 5.8-1, p. 5-18.

4.3.3 Residential Wood Combustion

Annual emissions from residential wood combustion will be temporally allocated using SAF values and activity in days per week taken from the 1993 EI. SAF values for these sources in the 1993 EI were taken directly from EPA-450/4-91-016, Table 5.8-1, p. 5-18.

4.3.4 Wildfires and Prescribed Burning

As wildfires and prescribed burning are date-specific events, DEQ will temporally allocate emissions from these sources using fire date data, available from the EPA National Emission Inventory (NEI). SAF values will be calculated using annual and seasonal fire dates.

4.3.5 Structure Fires

As structure fires are date-specific events, DEQ will temporally allocate emissions from these sources using fire date data. Fire data used by DEQ to estimate structure fire emissions for the NEI is supplied by the state fire marshal. A seasonal adjustment factor (SAF) will be estimated using annual and seasonal fire dates.

4.3.6 Nonroad Vehicles & Equipment Excluding Aircraft and Locomotives

Sources of emissions covered by the Nonroad model include the following categories:

- Recreational marine
- Agricultural
- Construction
- Light commercial
- Airport Ground Support Equipment (GSE)
- Railway maintenance
- Lawn & garden
- Industrial
- Logging

Emissions from these categories will be temporally allocated to season using SAFs and weekly activity taken from the 1993 emission inventory.

4.4 On-Road Mobile: Vehicle Exhaust

EPA provides 2008 on-road NEI data by month, allowing for calculation of an on-road seasonal adjustment factor for typical season day estimation.

5 QUALITY ASSURANCE AND QUALITY CONTROL

DEQ will be using existing data that has already been quality checked. DEQ staff will perform quality assurance for accuracy, completeness, and representativeness on the spatial and temporal allocation of emissions from the existing inventory. DEQ will be using EPA county database estimates from the 2008 NEI v.3 generated using MOVES2010b modeled emissions rates.

6 EXTERNAL AUDITS

DEQ is willing to be audited by the EPA, and make changes to this inventory preparation and quality assurance plan if warranted.

7 PERSONNEL

DEQ personnel responsible for the Medford CO Limited Maintenance Plan inventory include:

Wendy Wiles, DEQ Environmental Solutions Division Administrator

Jeffrey Stocum, Air Quality Technical Services Section Manager, 503-229-5506

Emission Inventory and Air Quality Information Systems

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Miyoung Park, Emission Inventory Specialist, 503-229-5178

Quality Assurance

Anthony Barnack, Air Monitoring Coordinator, 503-229-5713

David Collier, Air Quality Planning & Development Manager, 503-229-5177

Dave Nordberg, Air Quality Planner, 503-229-5519

8 SCHEDULE

Medford CO 2008 Limited Maintenance Plan

Draft Inventory Preparation Plan to EPA	Oct. 2014
Fast Track Checklist to EPA	Feb. 20, 2015
Final IPP with Schedule to EPA	Feb. 20, 2015
Draft Emissions Inventory to ODEQ	May 1, 2015
Draft Maint. Plan w/o E.I. to EPA	May 20, 2015
Final E.I. to ODEQ	June 16, 2015
EPA Comments on Draft Maint. Plan to ODEQ	June 22, 2015
Maintenance Plan with E.I. to EPA	July 1, 2015

EPA Comments on Plan & E.I. to ODEQ (if possible)	July 22, 2015
Public Comment Period Begins (email notice)	Aug. 17, 2015
Public Hearing (in Medford)	Sept. 17, 2015
Close of Comment Period	Sept. 21, 2015
Rule Adoption Staff Report to Director's Office	Oct. 29, 2015
Environmental Quality Commission Meeting	Dec. 9, 2015
ODEQ Submits SIP Rule Update to SOS	Dec. 14, 2015
Submit SIP Revision to EPA	Dec. 22, 2015
EPA Approves Adequacy Determination	Mar. 30, 2016