

## Portola Fine Particulate Matter (PM2.5) Attainment Plan



January 2017

This Page Intentionally Left Blank

## Contents

I.	Background	7
A.	Introduction	7
B.	Nonattainment Area Description	8
C.	History of Efforts to Address PM <sub>2.5</sub>	10
D.	National Ambient Air Quality Standard (NAAQS)	11
1.	Annual PM <sub>2.5</sub> standard	11
2.	24-hour PM <sub>2.5</sub> Standard	12
E.	Purpose of the Attainment Plan	12
II.	Ambient Air Quality Monitoring	12
A.	History of Air Quality Monitoring	12
B.	Design Values	14
C.	Nature of the Problem	15
1.	Chemical Composition	16
2.	Positive Matrix Factorization	19
3.	Strong Correlation between PM <sub>2.5</sub> Mass and Levoglucosan	20
4.	Diurnal Patterns	21
III.	Emission Inventory	21
A.	Emissions of PM <sub>2.5</sub> and Precursors	22
B.	Emission Inventory Structure and Function	23
C.	PM <sub>2.5</sub> Emissions Summary	23
D.	PM <sub>2.5</sub> Precursor Emissions Summary	24
IV.	Control Strategy and Implementation	25
A.	Determination of Primary Sources of PM <sub>2.5</sub> in the Nonattainment Area	26
B.	Development of Emission Reduction Strategy	27
C.	Incentive Measure and Enforceable Commitment	28
1.	Greater Portola Area Wood Stove Change-out Program	29
2.	Preparation for the Change-out Program	30
3.	Wood Stove Change-out Program Details	31
D.	City of Portola Wood Stove and Fireplace Ordinance	33
E.	Additional Strategies for Attainment	34

1.	Educational Campaign.....	34
2.	Voluntary Wood Burning Device Curtailment Program .....	35
3.	Distribution of Moisture Meters .....	36
4.	Regulation and Enforcement of Opacity Requirement.....	36
5.	Prohibit Open Burning During Winter.....	36
F.	Summary of Commitments and Estimated Reductions .....	37
V.	Attainment Demonstration.....	37
A.	Design Value Selection .....	40
B.	Background Concentrations .....	43
C.	Evaluation of Significant Precursors.....	46
1.	Concentration-based Contribution Analysis .....	48
2.	Sensitivity-based Contribution Analysis .....	52
3.	Conclusions .....	54
D.	Rollback Model.....	54
E.	Traditional Rollback.....	55
1.	PM <sub>2.5</sub> Source Categories .....	55
2.	PM <sub>2.5</sub> Emission Categories .....	56
3.	Relating Changes in Emissions to Changes in Concentrations .....	57
4.	Future Year Estimate .....	58
F.	Alternative Rollback .....	60
G.	Demonstrating Attainment of the 24-hour Standard .....	62
H.	Projected 2021 design values .....	65
I.	Unmonitored Area Analysis .....	65
VI.	Additional Plan Elements.....	66
A.	Quantitative Milestones and Reasonable Further Progress .....	66
B.	Contingency Measure .....	72
C.	Transportation Conformity.....	75
1.	PM <sub>2.5</sub> Requirements for Conformity .....	75
2.	The 2016 Final PM <sub>2.5</sub> Implementation Rule.....	76
3.	Factors for Determining Significance for Transportation Conformity.....	77
4.	Assessment of Significance .....	77
5.	Conformity Budgets .....	77

D. Reasonably Available Control Technology/Measures Analysis.....	78
1. Overview and Requirements.....	78
2. Reasonably Available Control Technology (RACT) .....	79
3. Reasonably Available Control Measure (RACM) .....	79
References.....	90
Acknowledgements .....	90

## List of Tables

Table 1. List of Monitoring Equipment at the Portola-Gulling Street Station.....	14
Table 2. Form of Molecular Species Assumed in this Report.....	17
Table 3. 2013 Annual Base Year Emissions of PM <sub>2.5</sub> and Precursors (tpd)* .....	24
Table 4. Control Measure Summary.....	37
Table 5. 2011-2015 Annual Statistics and Design Values.....	42
Table 6. Background PM <sub>2.5</sub> Concentrations for Portola .....	43
Table 7. Comparison of Portola NO <sub>x</sub> Emission to Other Areas in California.....	47
Table 8. Contribution to the PM <sub>2.5</sub> design value based on 2013-2014 chemical composition data.....	51
Table 9. Impact of Reducing Precursor Emissions on Attainment Year Design Value	53
Table 10. PM <sub>2.5</sub> Components, Background Concentrations, and Emission Categories used in Rollback Analysis. ....	56
Table 11. The Relationship between the Number of Stoves Changed out and 2021 Attainment Year Design Value. ....	57
Table 12. Annual Rollback .....	59
Table 13. Traditional 24-hour Rollback.....	63
Table 14. 2021 Projected Design Values .....	65
Table 15. Number of Stoves Changed-out per Year and Associated Emission Reductions. ....	68
Table 16. Directly Emitted PM <sub>2.5</sub> Inventory with Plan Control and RFP Calculations (tpd) .....	69
Table 17. Attainment Demonstration Strategy for Portola .....	70
Table 18. RFP Projected Emissions for Quantitative Milestone Years (tpd).....	72
Table 19. Emission Reductions Needed for Attainment and Contingency (tpd).....	73
Table 20. Calculating Average Reductions Achieved during the Last Three Years of the Wood Stove Change-out Program .....	73
Table 21. RFP Contingency Calculation.....	74
Table 22. 2021 Annual Average Conformity Budgets .....	78
Table 23. Adopted RACM Measures for Area Sources.....	81

## List of Figures

Figure 1. Plumas County, California.....	9
Figure 2. Plumas County PM <sub>2.5</sub> Federal Nonattainment Area .....	10
Figure 3. Portola PM <sub>2.5</sub> BAM1020 – Composite Monthly Graph, January 2012 .....	13
Figure 4. Trends in PM <sub>2.5</sub> Annual and 24-hour Design Values (DV).....	15
Figure 5. Monthly Average PM <sub>2.5</sub> Concentrations at Portola .....	16
Figure 6. Portola 2013-2014 Annual Average PM <sub>2.5</sub> Composition.....	18
Figure 7. Portola 2011-2014 Exceedance Day PM <sub>2.5</sub> Composition .....	18
Figure 8. Portola 2013-2014 Monthly Average PM <sub>2.5</sub> Composition .....	19
Figure 9. 2011-2015 Annual Average PM <sub>2.5</sub> Source Contribution .....	20
Figure 10. 2011-2015 PM <sub>2.5</sub> Exceedance Day Average Source Contribution .....	20
Figure 11. Correlation between PM <sub>2.5</sub> Mass and Levoglucosan at Portola.....	20
Figure 12. Diurnal Patterns in PM <sub>2.5</sub> Concentrations at Portola (2010-2012) .....	21
Figure 13. Portola Average Maximum Temperatures (2002-2015) .....	41
Figure 14. Portola Average Minimum Temperatures (2002-2015) .....	41
Figure 15. Portola Total Precipitation (2002-2015).....	42
Figure 16. Background PM <sub>2.5</sub> Concentrations for Portola.....	44
Figure 17. Comparison of Portola Seasonal Profiles to the Background Concentrations (2011-2013). .....	45
Figure 18. Comparison of PM <sub>2.5</sub> Concentrations at Portola and Bliss State Park.....	46
Figure 19. Make-up of 2013 Portola Nonattainment Area Baseline Emissions .....	47
Figure 20. 2013-2014 Annual Average Composition.....	48
Figure 21. Seasonal Patterns in Organic Carbon Concentrations at Portola and Bliss State Park. ....	51
Figure 22. Comparison of Background Concentrations to Measured Concentrations for Select Secondary Components.....	52
Figure 23. 5-Year Weighted Average Annual PMF Source Contribution.....	53
Figure 24. 2011-2015 Annual Average Source Contribution.....	56
Figure 25. 2011-2015 Exceedance Day Average Contribution .....	56
Figure 26. Alternative Annual Rollback. ....	61
Figure 27. Alternative 24-hour Rollback .....	64
Figure 28. Portola PM <sub>2.5</sub> Monitor in Relation to Housing Density.....	66
Figure 29. Relationship between Baseline Inventory, Inventory After Plan Control Strategy, and RFP Target. ....	70
Figure 30. Relationship between the Number of Stoves Changed-out and Annual Average PM <sub>2.5</sub> Concentrations. ....	71

## Appendices

- A. PMF Analysis
- B. Emission Inventory Methodology
- C. Report on Opportunities for Reducing Wood Smoke in the Portola, California Area
- D. Heating Survey
- E. Incentive Measure and Enforceable Commitment
- F. Guidance Document Greater Portola Wood Stove Change-out Program
- G. Work Plan for the Residential Wood Stove Change-out Project in the Plumas County PM<sub>2.5</sub> Nonattainment Area
- H. Wood Stove Change-out Request for Qualifications
- I. Retailer/Contractor Agreement
- J. Wood Stove Change-out Eligibility Requirement
- K. Memorandum of Understanding between the District and the City of Portola
- L. Wood Stove Change-out Process Flow Chart
- M. City of Portola Wood Stove and Fireplace Ordinance #344
- N. Example of Press Release
- O. Wood Stove Workshop Announcement
- P. Assessment of Significance for Transportation Conformity
- Q. Open Burning Public Education Materials

# I. Background

## A. Introduction

In December 2012, the U.S. Environmental Protection Agency (U.S. EPA) strengthened the annual PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS or standard) by lowering the level from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup> and retained the 24-hour standard of 35 µg/m<sup>3</sup>. The term PM<sub>2.5</sub> refers to fine particulate matter (PM) two and a half microns or less in diameter. Fine particulate matter contains microscopic solids or liquid droplets that are small enough to be inhaled deeply into the lungs where they accumulate and aggravate respiratory conditions, particularly asthma. Fine particulates are associated with heart and lung disease, increased respiratory symptoms and disease, decreased lung function, and premature death. Chronic exposure to fine particulates has also been implicated in increased risk for cardiac events. Populations especially at risk include children, the elderly, and those with existing health problems.

Title I of the Clean Air Act (CAA) requires the U.S. EPA to designate areas in the United States (US) as being in “attainment” or “nonattainment” following the adoption or revision of the NAAQS. The region is given a classification that describes the degree of nonattainment. This classification dictates specific planning requirements under the CAA, including the time provided to attain the standard. Effective April 15, 2016, the U.S. EPA designated the City of Portola (City) and surrounding areas of Plumas County (County), California as a federal Moderate nonattainment for the annual PM<sub>2.5</sub> standard of 12 µg/m<sup>3</sup>. The area is officially referred to as the Plumas County PM<sub>2.5</sub> Nonattainment Area (Nonattainment Area).

Following the nonattainment designation, the area is required to submit an attainment plan (Attainment Plan or Plan) to U.S. EPA by October 15, 2016, 18 months after the initial designation on January 15, 2015. Sections 189(a),(c), and (e) of the CAA require that Moderate area attainment plans contain the following: (i) an approved permit program for construction of new and modified major stationary sources (CAA section 189(a)(1)(A)); (ii) a demonstration that the plan provides for attainment no later than the applicable Moderate area attainment date or demonstration that attainment by that date is impracticable (CAA section 189(a)(1)(B)); (iii) provisions for the implementation of Reasonably Achievable Control Measures (RACM) and Reasonably Achievable Control Technologies (RACT) no later than four years after designation (CAA section 189(a)(1)(C)); (iv) quantitative milestones that will be used to evaluate compliance with the requirement to demonstrate Reasonable Further Progress (RFP) (CAA section 189(c)); and (v) evaluation and regulation of PM<sub>2.5</sub> precursors (in general to meet RACM and RACT and other attainment planning requirements, and as specifically provided for major stationary sources under CAA section 189(e)). In addition, the plan must include



the following subpart 1 elements: (i) a description of the expected annual incremental reductions in emissions that will demonstrate RFP (CAA section 172(c)(2)); (ii) emission inventories, as necessary (CAA section 172(c)(3)); (iii) other control measures (beside RACM and RACT) needed for attainment (CAA section 172(c)(6); and (iv) contingency measures (CAA section 172(c)(9)).

The Attainment Plan demonstrates that the Plumas County PM<sub>2.5</sub> Nonattainment Area will reach attainment by the applicable Moderate area attainment date, December 31, 2021. The Plumas County's nonattainment status will remain in effect until the PM<sub>2.5</sub> annual design value meets the annual PM<sub>2.5</sub> standard and when certain demonstrations and requirements are met.

## B. Nonattainment Area Description

The Plumas County PM<sub>2.5</sub> Nonattainment Area includes the City of Portola and the nearby communities of Iron Horse, Delleker, C-Road, Mohawk Vista, Plumas-Eureka, Blairsden-Graeagle, Gold Mountain, Whitehawk, Clio, Johnsville, and portions of Lake Davis. The nonattainment boundaries are consistent with previously established PM<sub>2.5</sub> nonattainment boundaries for California State PM<sub>2.5</sub> Standard. Air Resources Board (ARB) utilized hydrographic boundaries based on watersheds. A watershed boundary defines a ridge of high land that separates areas drained by different river systems. Specifically, ARB identified the Portola Valley State PM<sub>2.5</sub> Nonattainment Area as that portion of Plumas County within the following Super Planning Watersheds: Humbug Valley, Sulpher Creek, Frazier Creek, and Eureka Lake.

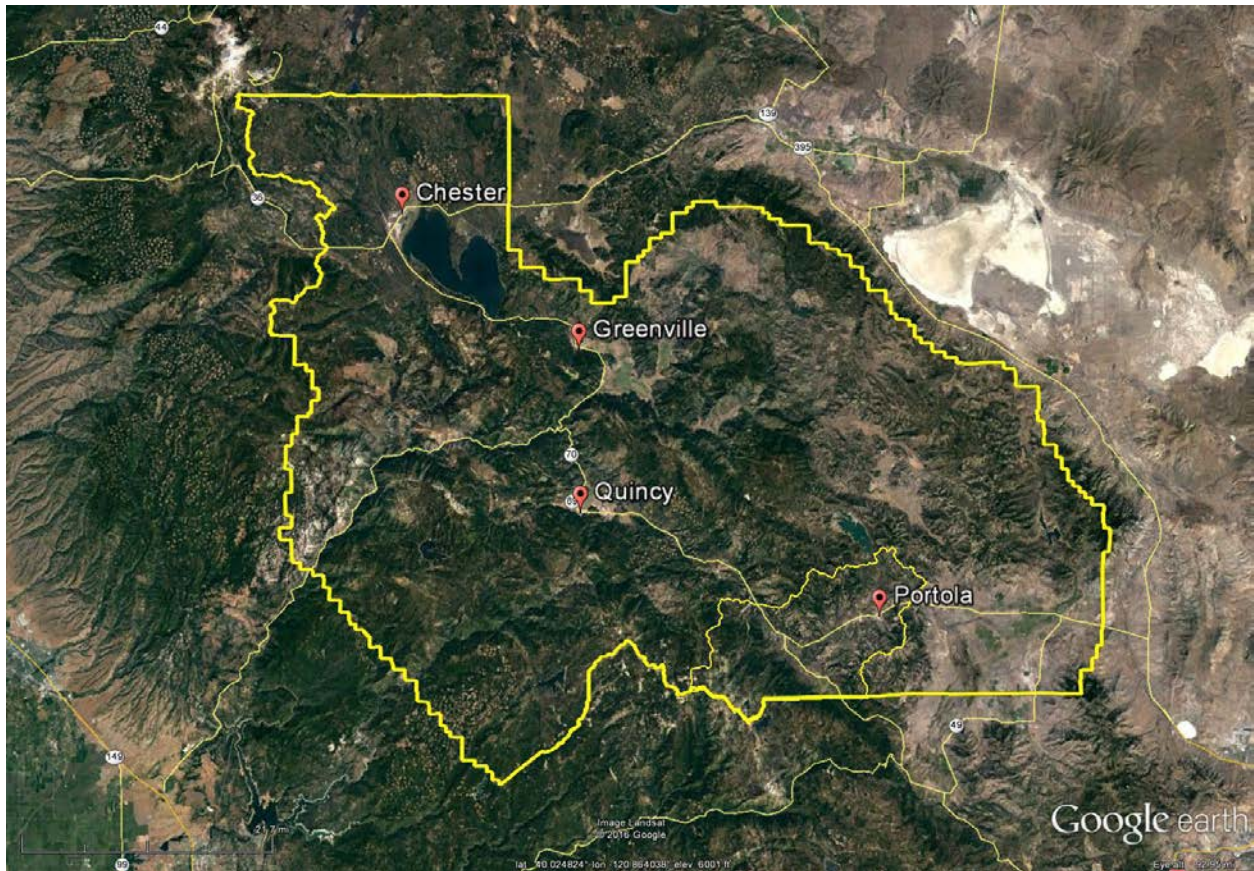
Plumas County is large, covering 2,613 square miles. The vast majority of the area is zoned as Timber Resource Land, with more than 75 percent of the county owned and managed by the federal government. Plumas County has approximately 20,000 residents with four main population centers, all rural in character and separated by mountainous terrain: Portola, Quincy, Greenville, and Chester (Figure 1). The Portola area is located in an intermountain basin isolated by rugged mountains, transitioning from conifer-dominated forests to the north, west and south, to grassland/high desert to the east. The mountain chains that dominate the topography of Plumas County drastically affect the climate of Portola. First, as Portola is on the leeward side of the Sierra range, it receives much less precipitation than areas further west and averages only 20 inches annually<sup>1</sup>. Even Quincy, less than 30 miles to the northwest receives twice the amount of precipitation, averaging 40 inches a year. Second, Portola's high elevation, 4,890 feet, affects the temperature and precipitation patterns. Third, the Portola area has very cold temperatures - the average daily low temperature for the

---

<sup>1</sup> Based on data from the Western Regional Climate Center (<http://www.wrcc.dri.edu/>) Cooperative Climatological Data Summaries (<http://www.wrcc.dri.edu/climatedata/climsum/>).

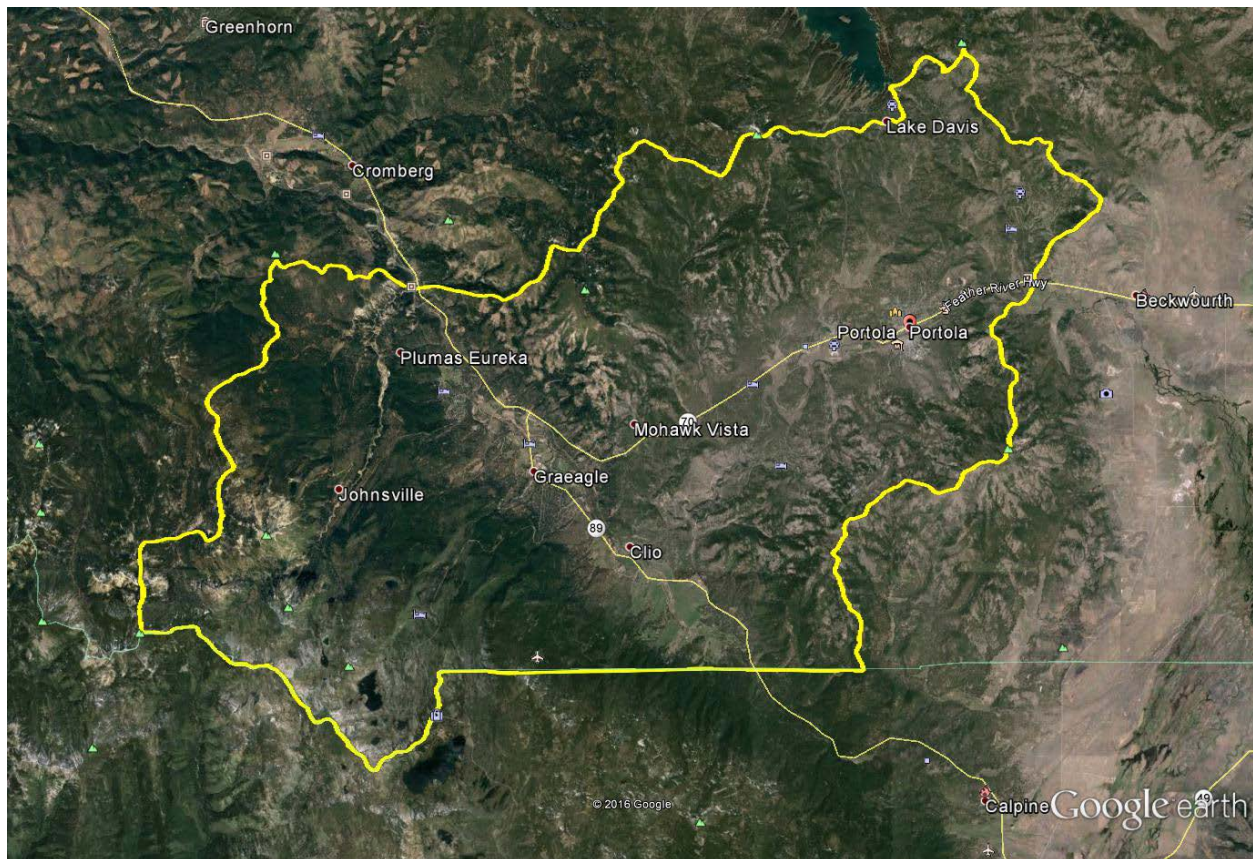
6-month period of October through March is 21.8 degrees Fahrenheit, and the Portola area sees frost an average of 218 days per year. Fourth, the simple fact that the Portola area is closely hemmed in on three sides by mountains impairs pollution dispersion, especially when there is a low temperature inversion, as is often the case in the winter.

Figure 1. Plumas County, California



The overwhelming majority of the population of the Nonattainment Area is within the City of Portola, the only incorporated city. The City has a total area of 5.4 square miles and is located on the Middle Fork of the Feather River in an isolated bowl formed by surrounding mountains where smoke can easily become trapped by wintertime inversion conditions. The City population is about 2,100. Figure 2 shows the Plumas County PM<sub>2.5</sub> Federal Nonattainment Area.

Figure 2. Plumas County PM<sub>2.5</sub> Federal Nonattainment Area



Prevailing winds in the Portola area are from the southwest during the day, and many days are quite windy. At night, however, the air is often very still, although there is sometimes a gentle breeze from the east that follows the Middle Fork of the Feather River downstream through a convoluted canyon system.

Portola's unemployment rate is well above the national and state averages, reaching 22.3 percent in 2010. The 2011 median home value was only 41 percent of the state median, and the median household income was approximately half (54 percent) that of the state. Although the City of Portola is considered economically challenged, nearby communities within the Nonattainment Area, considered resort/golf course communities, have higher median incomes.

### C. History of Efforts to Address PM<sub>2.5</sub>

Over the years the Plumas County PM<sub>2.5</sub> Nonattainment Area has made efforts towards reducing particulate matter pollution. The Northern Sierra Air Quality Management District (District) has implemented a mandatory District-wide no-burn/permissive burn day for outdoor residential burning for over 20 years and informs the public, on a daily

basis, whether predicted meteorological conditions will provide enough dispersion to allow for outdoor burning. In 2002, the City adopted a change-of-ownership city ordinance that requires replacement or removal of uncertified stoves when a home is sold. The uncertified stoves do not have pollution control systems built into them. Certified stoves, on the other hand, have been tested by an independent third party at the time of manufacture to assure they meet emissions performance standards. They carry a U.S. EPA certification sticker. The ordinance also requires that all newly installed wood burning appliances be U.S. EPA certified. In 2003, the Nonattainment Area was designated nonattainment for the State PM<sub>2.5</sub> standards. The State nonattainment designation prompted the District and the City to intensify efforts to reduce wood smoke.

The District has pursued numerous wood stove change out programs in Plumas County, with a focus in Portola, on two occasions; once in 2004 and again in 2008. The District offered a \$1,000 rebate to residents willing to replace an uncertified stove with an EPA-certified stove. Under these programs, the District managed to replace ten uncertified wood stoves in downtown Portola. Since 2009, the City also offered a \$1,000 rebate to residents to change-out uncertified stoves with U.S. EPA-certified stoves. Since over the years economic conditions in the area have changed for the worst, no wood stoves have been changed out under this latest program. The District concluded that due to the low income of many Portola residents, a \$1,000 rebate was not enough of an incentive to purchase an EPA-certified stove that can cost approximately \$3,500.

#### D. National Ambient Air Quality Standard (NAAQS)

In 2006, the U.S. EPA revised the PM<sub>2.5</sub> NAAQS to more accurately reflect the latest health information. The 24-hour standard was lowered from 65 µg/m<sup>3</sup> to 35 µg/m<sup>3</sup>, and the annual standard was retained at 15.0 µg/m<sup>3</sup>. However, in 2012, the U.S. EPA strengthened the annual fine particle standard to 12.0 µg/m<sup>3</sup>. Areas in violation of PM<sub>2.5</sub> standards, based on the most recent three years of data, are designated as “nonattainment” by the U.S. EPA.

##### 1. Annual PM<sub>2.5</sub> standard

The annual standard for PM<sub>2.5</sub> is met whenever the three-year average of the annual mean PM<sub>2.5</sub> concentrations for a designated monitor is less than or equal to 12 µg/m<sup>3</sup>. Since 2013, the PM<sub>2.5</sub> monitor located in Portola has exceeded the standard and currently has a design value of 14.9 µg/m<sup>3</sup>.

## 2. 24-hour PM<sub>2.5</sub> Standard

The 24-hour standard for PM<sub>2.5</sub> is met whenever the three-year average of the yearly 98<sup>th</sup> percentile of values at a monitoring site is less than or equal to 35 µg/m<sup>3</sup>. The 98<sup>th</sup> percentile is a concentration below which 98 percent of observations fall. This value is used for the 24-hour standard instead of the maximum observation for any given year. By doing so, U.S. EPA ensures infrequent peaks are ignored and a more robust value is used for comparison. Even though the area was not designated nonattainment for the 24-hour standard when the last round of designations for the 24-hour standard took place, the Plumas County PM<sub>2.5</sub> Nonattainment Area now violates the 24-hour standard of 35 µg/m<sup>3</sup> with a design value of 50 µg/m<sup>3</sup>. The current plan demonstrates that control measures designated to attain the annual standard will also reduce 24-hour concentrations and the area will attain both standards by December 31, 2021.

### E. Purpose of the Attainment Plan

This document provides a pathway for meeting the annual PM<sub>2.5</sub> standard by December 31, 2021. Although this plan was put in place to demonstrate the attainment of the annual standard, the control strategies will also reduce the 24-hour concentrations below the level of the 35 µg/m<sup>3</sup> standard by the end 2021. The attainment plan describes emissions contributing to the PM<sub>2.5</sub> problem and outlines emission reduction strategies. The plan demonstrates that these strategies will reduce PM<sub>2.5</sub> concentrations in the area below the levels of the annual and 24-hour standards by the end of 2021. This plan will be considered by ARB and, if adopted, submitted for approval to U.S. EPA.

## II. Ambient Air Quality Monitoring

The Plumas County PM<sub>2.5</sub> Nonattainment Area air pollution problems result from the interplay of wood smoke emissions from home heating devices, meteorological conditions adverse to the dispersion of those emissions, and mountain terrain that traps pollutants close to the source. This chapter describes the monitoring efforts in the area and summarizes PM<sub>2.5</sub> air quality trends and statistics. It also includes a summary of analyses which point to residential wood burning as the primary contributor to the PM<sub>2.5</sub> mass.

### A. History of Air Quality Monitoring

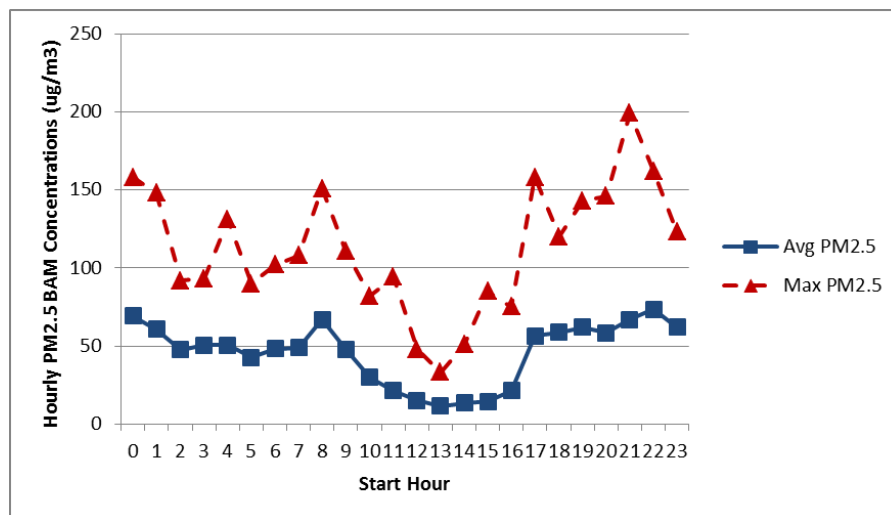
The PM monitoring in the area started early in 1995 to address City of Portola air quality concerns when the District started collecting PM<sub>10</sub> data using a Sierra Andersen Model 1200 monitor. This early data collection confirmed that PM<sub>10</sub>

concentrations were elevated during winter. Additionally, the monitor operator noted that filters were dark and gave off the distinctive heavy odor of wood smoke. This was in sharp contrast to summertime samples that were light gray in color, had no discernible smoke odor, and contained a low mass of PM<sub>10</sub>. This implied that wood combustion was a source of PM<sub>10</sub> on the sample filters. In 1997, the District enlisted ARB's help with more advanced sampling and filter analysis. For one year, from December 1997 to December 1998, the District operated an Andersen Dichotomous Sampler in parallel with the PM<sub>10</sub> sampler, which confirmed a significant contribution from fine PM<sub>2.5</sub> during winter, a strong indication of wood smoke impacts.

In late March of 1999, the District began operating an Andersen Sequential PM<sub>2.5</sub> Federal Reference Monitor (FRM) on a 1-in-3 day schedule and PM<sub>10</sub> sampling was subsequently considered unnecessary and discontinued in June of 2000. In January of 2003, in cooperation with ARB, the District began operating a Met One Beta Attenuation Monitor Model 1020 (BAM 1020) PM<sub>2.5</sub> monitor in parallel with the PM<sub>2.5</sub> FRM monitor. The BAM 1020 collects continuous diurnally resolved data. The BAM data confirmed a nocturnal elevation in PM<sub>2.5</sub> concentrations, further demonstrating that fluctuations of PM<sub>2.5</sub> in the air had the same daily pattern as the levels of wood use and atmospheric dispersion.

Figure 3 demonstrates a pattern seen in Portola nearly every day during the winter months. The blue solid line demonstrates a classic double-peak pattern typical of high particulate concentrations in mountainous wood burning communities and represents the average concentration for each hour for the entire month of January in 2012. The red dashed line indicates the highest concentration that occurred in that specific hour during the month of January in 2012.

Figure 3. Portola PM<sub>2.5</sub> BAM1020 – Composite Monthly Graph, January 2012



In January of 2003, the District began operating a Spiral Aerosol Speciation Sampler (SASS) at Portola as part of the State and Local Air Monitoring Station (SLAMS) Chemical Speciation Network (CSN). In April of 2009, as part of the nationwide effort to make carbon sampling more comparable to the Interagency Monitoring of Protected Visual Environments (IMPROVE) sampling, carbon sampling was switched to the URG 3000N. The data from those samplers are routinely analyzed by ARB.

From 2000 through early 2013, the Portola PM<sub>2.5</sub> monitoring site was located at 161 Nevada Street. Over the years, as the surroundings have changed, the site no longer met siting criteria and needed to be relocated. In 2013, the site was relocated to 420 Gulling Street. For the past three years (2013-2015), the data for the two sites have been combined into a single data stream for the purpose of calculating design values and tracking trends in PM<sub>2.5</sub> concentrations. The combined data for the two sites were used as the basis for the nonattainment determination and for SIP development. This site is the only PM<sub>2.5</sub> monitoring site in the Plumas County PM<sub>2.5</sub> Nonattainment Area and includes the monitors listed in Table 1.

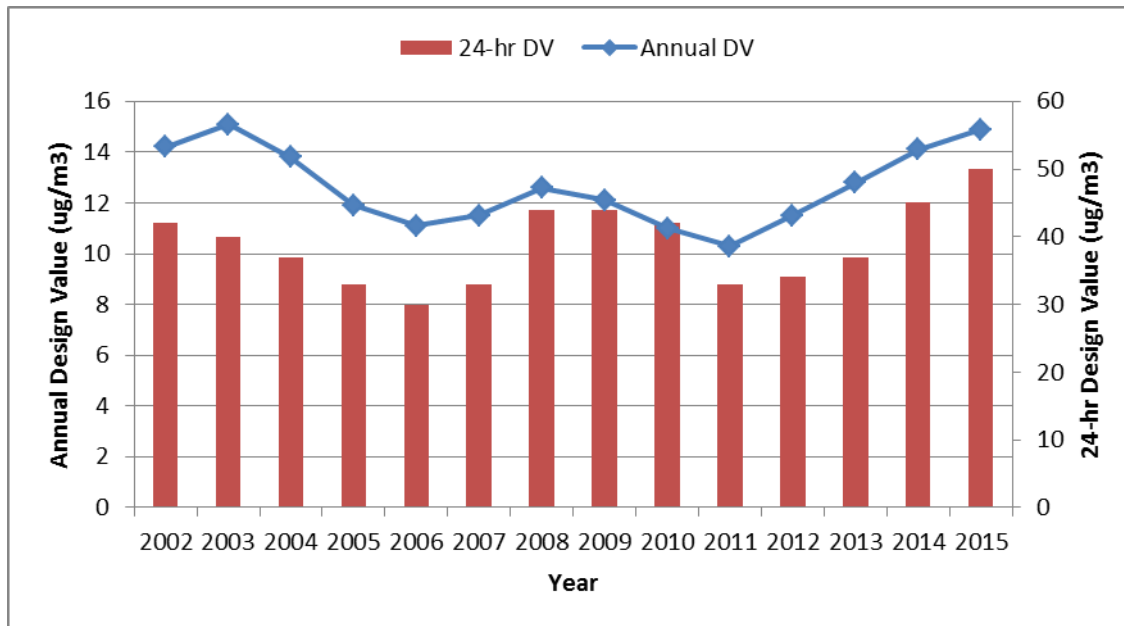
Table 1. List of Monitoring Equipment at the Portola-Gulling Street Station

Instrument	From	To	Sampling Schedule
R & P Model 2025 PM <sub>2.5</sub> Sequential Sampler	July 1, 2013	May, 2014	1-in-3
Thermo Scientific 2025i PM <sub>2.5</sub> Sequential Sampler - Primary	June, 2015	Present	1-in-3
Thermo Scientific 2025i PM <sub>2.5</sub> Sequential Sampler - Collocated	October, 2015	Present	1-in-12
Met One BAM1020 PM <sub>2.5</sub> Sampler	July, 2013	Present	Continuous
URG 3000N Carbon Sampler	July, 2013	Present	1-in-6
Met One Super SASS Speciation Sampler	July, 2013	Present	1-in-6

## B. Design Values

Between 2002 and 2015, annual PM<sub>2.5</sub> values ranged from 10.3 µg/m<sup>3</sup> to 14.9 µg/m<sup>3</sup> and the 24-hr design values ranged from 30 µg/m<sup>3</sup> to 50 µg/m<sup>3</sup> (Figure 4). The variation was mostly driven by meteorological variability, with temperature and precipitation being the main factors.

Figure 4. Trends in PM<sub>2.5</sub> Annual and 24-hour Design Values (DV)



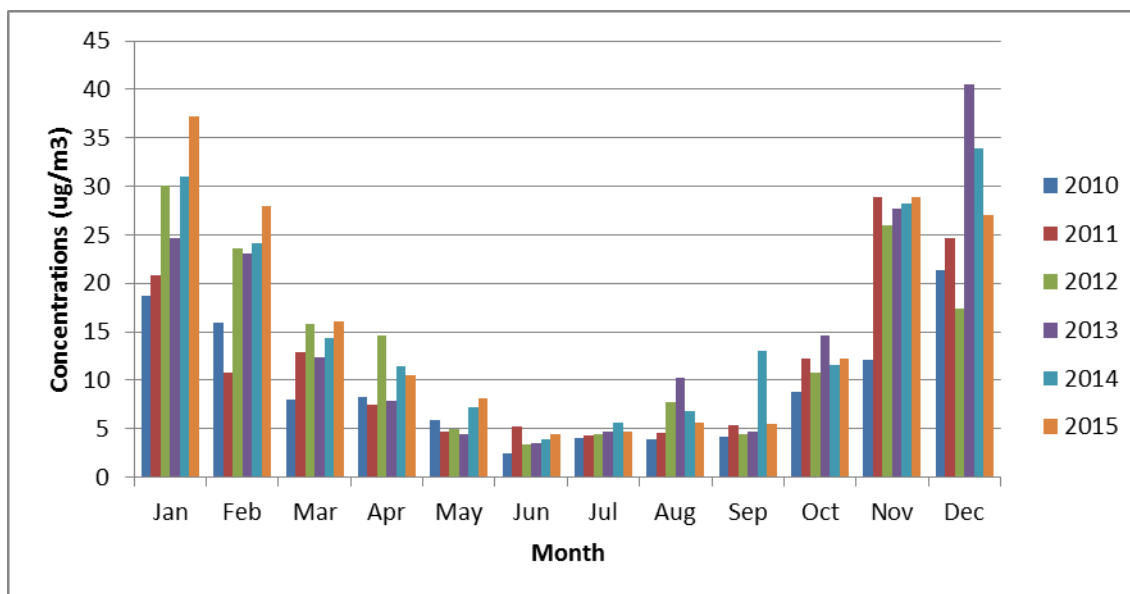
From the winter of 2012/2013 through 2014/2015, California was under a prolonged drought. There was very little precipitation and storms coming through the area were infrequent and weak. These conditions lead to prolonged stagnation with associated elevated PM concentrations.

### C. Nature of the Problem

As a result of its geography and climate, elevated PM<sub>2.5</sub> concentrations at Portola are limited to fall and winter (Figure 5). The area is susceptible to frequent surface temperature inversions, which play a major role in Portola’s air quality, especially during winter when these inversions are strongest. Portola Valley and its surrounding mountains act like a bowl, trapping a dense shallow layer of cold air under a layer of warm air. Warm air above cooler air acts like a lid, suppressing vertical mixing and trapping the cooler air at the surface. The strength and duration of the inversion will regulate PM<sub>2.5</sub> levels by confining them to a shallow vertical layer near the surface. Residents of the area typically burn wood for heat and the combined emissions from wood stoves, cooking stoves, and fireplaces are trapped in this shallow surface layer, leading to elevated PM<sub>2.5</sub> concentrations. Figure 5 illustrates seasonality in PM<sub>2.5</sub> concentrations as well as year-to-year variations driven by the strength and duration of the inversion and the recent extended drought. Depending on the year, the average December concentrations ranged from 17 µg/m<sup>3</sup> to 41 µg/m<sup>3</sup>.



Figure 5. Monthly Average PM<sub>2.5</sub> Concentrations at Portola



Although other sources of PM<sub>2.5</sub> concentrations may exist in the Portola area, these concentrations are dominated by emissions from wood burning as demonstrated by the following analyses:

- 1) Chemical composition data;
- 2) Positive Matrix Factorization (PMF) modeling;
- 3) Strong statistical correlations between PM<sub>2.5</sub> mass and levoglucosan; and
- 4) Diurnal patterns in PM<sub>2.5</sub> concentrations.

## 1. Chemical Composition

Ambient monitoring data from speciation samplers located at the Portola monitoring site were used to assess the chemical composition of PM<sub>2.5</sub>. Two samplers and multiple filter media are used to determine chemical speciation profiles. A SASS sampler is used to collect PM<sub>2.5</sub> constituents including ions (sulfate, nitrate, sodium, potassium, and ammonium) and numerous trace elements while a URG 3000N (URG) sampler is used for collecting elemental and organic carbon data. Both speciation samplers (SASS and URG) operate on a 1-in-6 day sampling schedule. PM<sub>2.5</sub> gravimetric mass and elements are measured by X-ray fluorescence (XRF) on Teflon-membrane filters. Ions are measured by ion chromatography on nylon-membrane filters. Organic and Elemental Carbon (OC and EC respectively) are measured by Total Optical Reflectance (TOR) method on quartz-fiber filters. The data are analyzed by ARB's Monitoring and Laboratory Division and reported to U.S. EPA's Air Quality Systems (AQS) database.

Currently applied measurement technology does not quantify all measured components, so the sum of the measured species is always less than the full measured mass. PM mass reconstruction applies multipliers to measured species to estimate unmeasured components. In order to reconstruct PM<sub>2.5</sub> mass concentrations using chemical composition data, assumptions about the molecular form of the species must be made. Table 2 presents assumptions used in this report. Sulfate and nitrate are assumed to be neutralized to ammonium sulfate [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>] and ammonium nitrate (NH<sub>4</sub>NO<sub>3</sub>) with the NH<sub>4</sub><sup>+</sup> fraction accounted for by applying stoichiometric multipliers as specified in Table 2.

One of the principal sources of uncertainty in PM<sub>2.5</sub> mass reconstruction is the organic carbon (OC) to organic matter (OM) conversion factor. OM is a complex mixture of hundreds of individual compounds with varying composition and concentration. Thermal optical methods are used to estimate the OC on the PM<sub>2.5</sub> filter. These methods, however, quantify only the carbon present in the samples, and not the total OM, which can include hydrogen, oxygen, nitrogen, and other elements in addition to carbon. Multiplicative factors have been used to estimate OM from OC measurements, but these factors represent average behavior and can vary substantially depending on the location or the season. In order to estimate the OM, we used a previously published value of 1.4, widely used in previous work in California (Solomon et al. (1989), Chow et al. (1994) and (1996)). To correct for possible OC sampling artifacts, the site specific monthly median of a field blank filter was subtracted from measured OC prior to converting to OM. EC is used without any multipliers. Geological material is estimated following the formula utilized by the IMPROVE Program. Elements are estimated by summing the remaining elements by XRF, excluding sulfur and geological elements. Reconstructed mass is then expressed as the sum of its representative chemical components, including ammonium nitrate, ammonium sulfate, organic matter, elemental carbon, geological material, and trace elements.

Table 2. Form of Molecular Species Assumed in this Report

Component	Formula
Ammonium Nitrate	1.29 x Nitrate
Ammonium Sulfate	1.38 x Sulfate
Organic Matter	1.4 x Organic Carbon
EC	As measured
Geological	2.2 x Aluminum + 2.49 x Silicon + 1.63 x Calcium + 2.42 x Iron + 1.94 x Titanium
Elements	Sum of remaining species (excluding S, Al, Si, Ca, Fe, and Ti)

During 2012, the Portola site experienced problems with its carbon sampler. Consequently, data from August 1, 2012 through November 19, 2012 was unavailable. Most of the analyses included in this report, therefore, are based on 2013 through 2014

data. Only the exceedance day analyses use all available data because complete data are not necessary for calculating average exceedance day composition. There was excellent agreement between the total and reconstructed mass with 98 percent of the mass accounted for using the reconstruction procedure summarized in Table 2.

Carbonaceous aerosols, which include OM and EC, are responsible for 88 percent of  $PM_{2.5}$  mass annually at Portola and 94 percent on an average exceedance day (Figure 6 and Figure 7). The combined contribution from all other components (geological material, elements, ammonium nitrate, and ammonium sulfate) was on average about  $2 \mu\text{g}/\text{m}^3$ .

Figure 6. Portola 2013-2014 Annual Average  $PM_{2.5}$  Composition

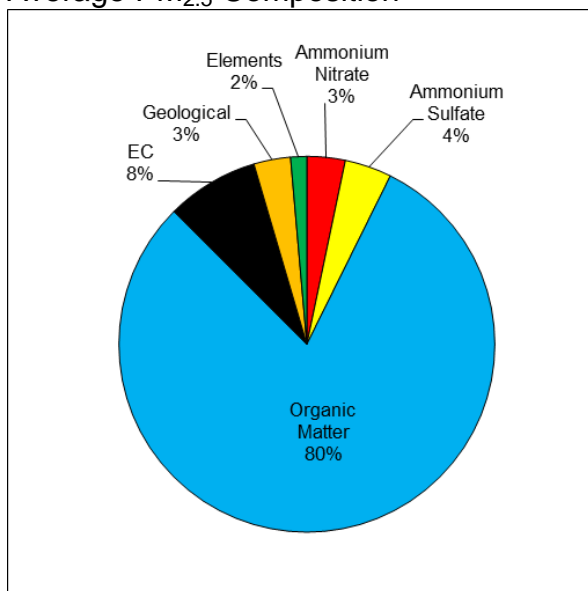
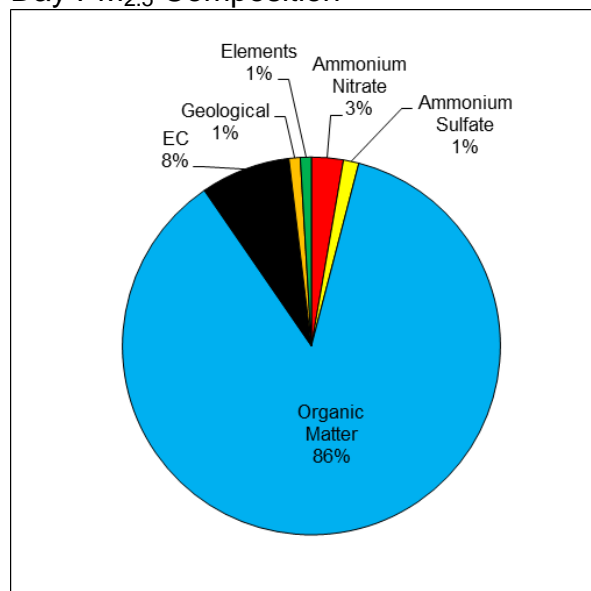
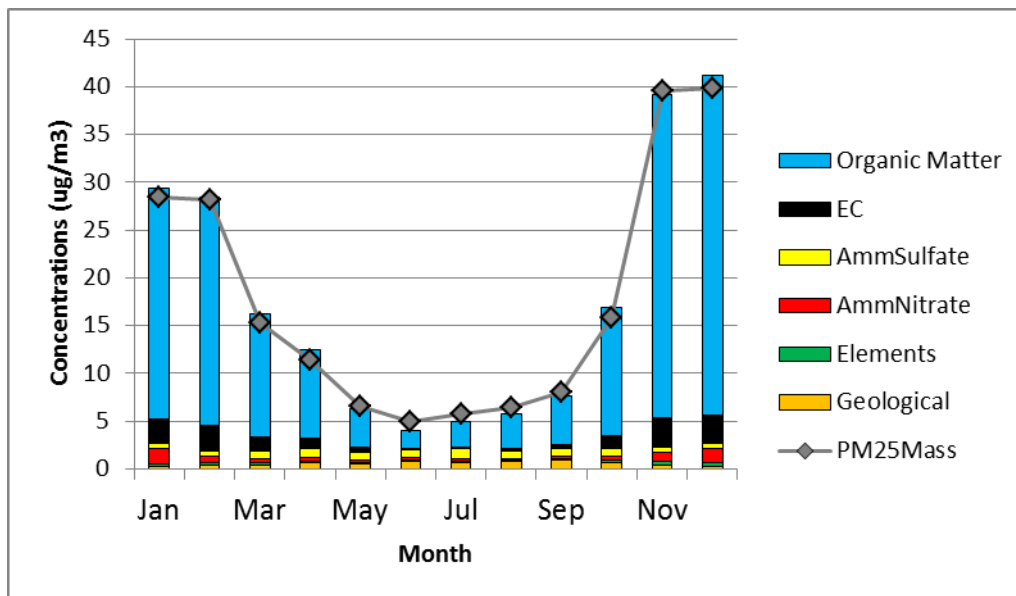


Figure 7. Portola 2011-2014 Exceedance Day  $PM_{2.5}$  Composition



The seasonal pattern further illustrates the overwhelming contribution from carbonaceous aerosols (Figure 8). Any increase in  $PM_{2.5}$  is driven by these aerosols while concentrations of all other components combined (ammonium nitrate, ammonium sulfate, geological material, and elements) are low, about  $2 \mu\text{g}/\text{m}^3$  on average, and remain fairly flat throughout the year. During the four winter months (November through February) carbonaceous aerosols are responsible for 93 percent of the mass.

Figure 8. Portola 2013-2014 Monthly Average PM<sub>2.5</sub> Composition



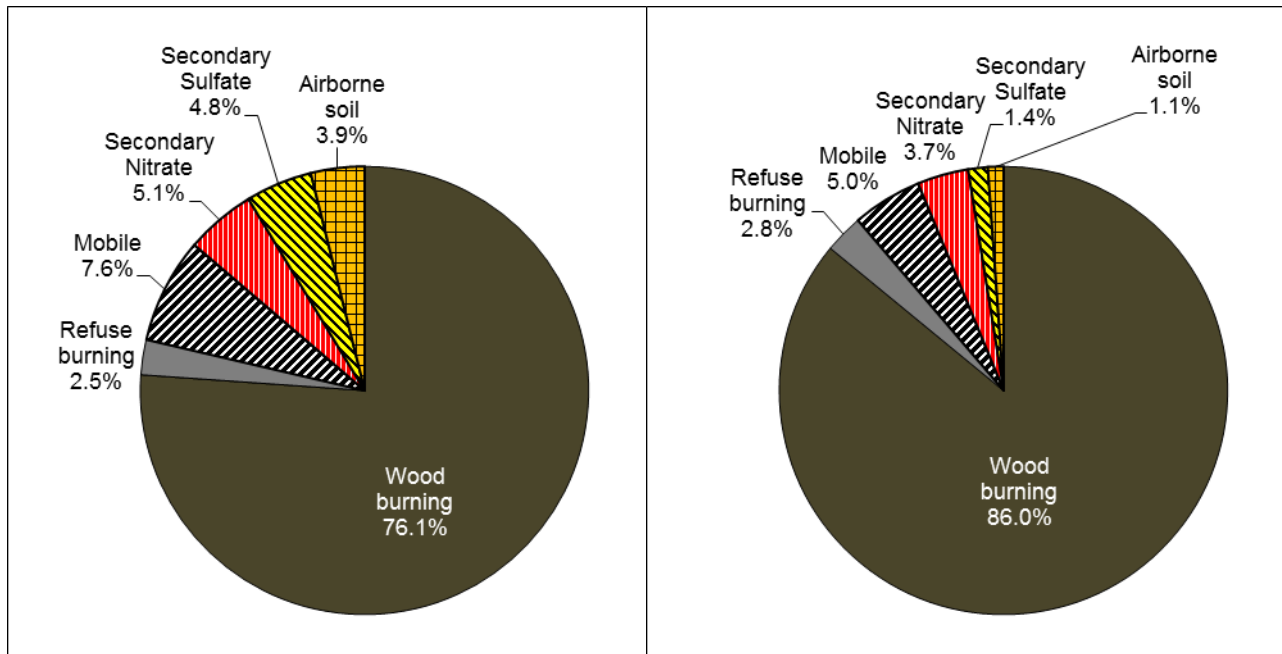
## 2. Positive Matrix Factorization

Positive matrix factorization (PMF) is a multivariate source apportionment method that attributes PM<sub>2.5</sub> observed concentrations to sources through statistical and meteorological interpretation of data. PMF is one of several EPA recommended receptor modeling methods for understanding of source impacts on ambient PM<sub>2.5</sub> levels. To identify major PM<sub>2.5</sub> sources affecting Portola monitoring site, PMF2 (a bilinear PMF model) was used in this study.

PMF contributions were calculated as a five-year weighted average to be consistent with the design value. Wood burning was identified as a major source of PM<sub>2.5</sub>, contributing 76.1 percent of the mass annually and 86 percent on an average exceedance day. Burning of garbage in stoves, fireplaces, or outside in open burn piles contributes another 3 percent of the mass. The two sources combined contribute almost 80 percent of the annual mass and 90 percent on the exceedance day. Figure 9 and Figure 10 illustrate annual and 24-hr source contributions, respectively, based on the PMF2 model and the full PMF report is included in Appendix A.

Figure 9. 2011-2015 Annual Average PM<sub>2.5</sub> Source Contribution

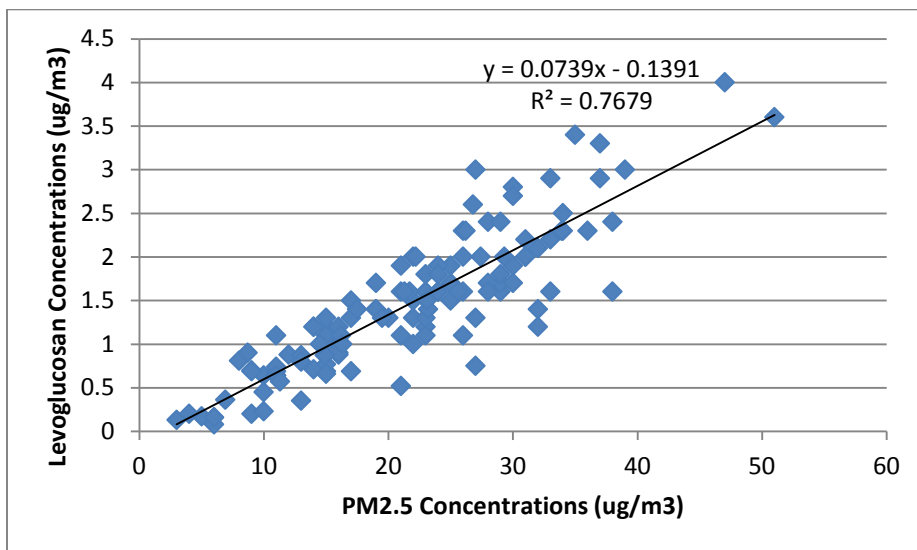
Figure 10. 2011-2015 PM<sub>2.5</sub> Exceedance Day Average Source Contribution



### 3. Strong Correlation between PM<sub>2.5</sub> Mass and Levoglucosan

High correlations between PM<sub>2.5</sub> concentrations and levoglucosan, a wood burning marker, further support the significant impact of wood burning emissions on local PM<sub>2.5</sub> concentrations (Figure 11).

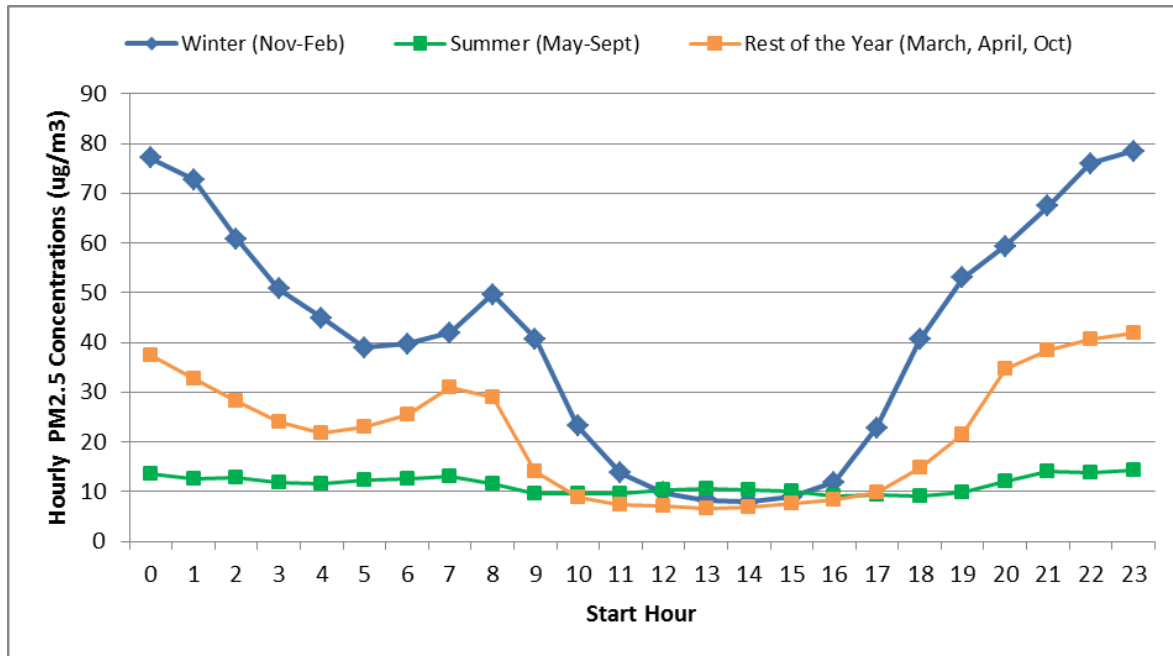
Figure 11. Correlation between PM<sub>2.5</sub> Mass and Levoglucosan at Portola



## 4. Diurnal Patterns

Diurnal patterns of PM<sub>2.5</sub> concentrations, based on the non-FEM data collected at the site, also implicate that wood burning is a major source of PM<sub>2.5</sub>. Residents of Portola burn wood for heat and the overall diurnal patterns in PM<sub>2.5</sub> concentrations are consistent with home heating use and subsequent atmospheric dispersion. Figure 12 illustrates these patterns by season. During summer, the PM<sub>2.5</sub> concentrations are nearly flat throughout the day. As temperatures drop in winter and people start burning wood for heat, morning and evening concentrations markedly increase with nighttime average concentrations up to eight times daytime values. However, even during winter, mid-day concentrations are low reflecting less wood use and improved dispersion. Vertical mixing (driven by solar radiation) and wind speed peak at mid-day. This, along with reduced emissions from wood smoke, results in mid-day minimums in PM<sub>2.5</sub>.

Figure 12. Diurnal Patterns in PM<sub>2.5</sub> Concentrations at Portola (2010-2012)



## III. Emission Inventory

This chapter summarizes directly emitted PM<sub>2.5</sub> and PM<sub>2.5</sub> precursor emissions that occurred in the Plumas County Nonattainment Area during the 2013 base year as well as projected emissions for the years 2019, 2021, and 2022. A more detailed description of emissions and methodologies is presented in Appendix B. Appendix B also includes annual average planning emissions by major source category.

## A. Emissions of PM<sub>2.5</sub> and Precursors

The Plumas County Nonattainment Area emissions inventory is not especially complicated, and is typical of a small, high elevation mountain community. There are no tribal lands, no major sources or large industries (existing or anticipated), no significant rush hour traffic, and no impact from offshore emissions or salt spray as observed in coastal areas.

Within the Nonattainment Area, there are two possible sources of wood smoke, either open burning or residential heating devices.

Open burning can be the burning of yard debris within open burn piles on residential properties, or land management burning for disposing of timber harvest waste, promoting fire safety and maintaining forest health. The District enforces a comprehensive open burning program. The District Open Burning Rules, 300 through 317, provide a framework for this program.<sup>2</sup>

On a daily basis, the District will make a declaration of either a Permissive Burn Day or a No-Burn Day for the public and land managers (Forest Service, Bureau of Land Management, State Parks, etc). These declarations are based upon a daily burn decision by ARB. These decisions are based on factors related to the ability of smoke from open burning to rise and disperse adequately, including surface and upper-air temperatures and wind velocities, relative humidity, and anticipated forecast changes. For example, the presence of a strong temperature inversion is likely to result in a No-Burn day determination, since the ability of smoke from open burning to rise and disperse adequately depends largely upon atmospheric stability at any given time and the influence of surrounding terrain.

The California Department of Forestry and Fire Protection (CalFIRE) generally declares a comprehensive ban on open burning during the summer months when fire danger is high. Thus, open burning only occurs during the spring, winter and fall months, when conditions are appropriate.

Smoke from residential wood burning devices (wood stoves and fireplaces) dominates the inventory, especially during the very cold winter months when many residents are using wood for heat. Wood burning emissions tend to be trapped near ground level by regular wintertime inversions, and since Portola (where the violating monitor is located) is in a basin along a gently meandering river, lateral dispersion is limited. This is the reason replacing old wood stoves is the backbone of the attainment strategy.

---

<sup>2</sup> The Open Burning Rules can be accessed on the ARB website at <https://www.arb.ca.gov/drdb/hsi/cur.htm>.

## B. Emission Inventory Structure and Function

The ARB maintains the emission inventory for the State as a whole, and this is divided into numerous smaller inventories for each county and each nonattainment area. There are over 1700 emission categories in the inventory, although source types associated with approximately two thirds of these categories do not exist in the Portola Nonattainment Area (or emit less than a tenth of a pound per day). The data used to create the inventories are based on factors such as population, surface area, road miles, American Community Survey data from the U.S. Census Bureau and so forth, as appropriate to the specific categories. Many of the categories are refined based on data supplied by individual air districts.

The emissions inventory is broadly split into sections of stationary, area-wide, and mobile sources. Stationary sources in the Nonattainment Area include a small aggregate mining and processing facility, a small concrete batch plant, three gas stations, and a closed landfill. Area-wide sources include consumer products, architectural coatings and solvents, asphalt usage, farming operations, construction, cooking, road dust, managed burning and various types of fuel combustion. Mobile sources include on-road mobile sources (cars, trucks, etc.), off-road mobile sources (construction equipment, recreational vehicles and farm equipment), trains, and lawn and garden equipment.

The annual emissions inventory is also split into winter and summer inventories, with winter being the months of October through March and summer being April through September. Aside from days influenced by wildfire emissions, the highest recorded PM<sub>2.5</sub> concentrations in the Nonattainment Area consistently occur during the winter.

The base year for the emissions inventory is 2013 and the attainment year is 2021. Anticipated changes in emissions, including forecast reductions from control measures, will basically be added to or subtracted from the base year and compared to the attainment year in establishing evidence of probable attainment (the “attainment demonstration”) no later than 2021, as well as to demonstrate reasonable further progress and quantitative milestones.

## C. PM<sub>2.5</sub> Emissions Summary

2013 base year emissions of directly emitted PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors are listed in Table 3. The pollutant of greatest concern in the Nonattainment Area is PM<sub>2.5</sub>. Following is a summary of annual PM<sub>2.5</sub> emissions for the 2013 base year, according to the emissions inventory.



Table 3. 2013 Annual Base Year Emissions of PM<sub>2.5</sub> and Precursors (tpd)\*

Pollutant	Areawide	Mobile	Stationary	Total
PM <sub>2.5</sub>	0.468	0.015	0.007	0.490
NO <sub>x</sub>	0.048	0.454	0.002	0.504
Ammonia	0.142	0.005	0.002	0.149
VOC	0.661	0.263	0.016	0.940
SO <sub>x</sub>	0.015	0.000	0.000	0.016
Total	1.334	0.738	0.026	2.099

\*tpd stands for tons per day. Numbers may not add up to the total due to rounding

Residential wood burning (using various wood burning appliances) dominates the PM<sub>2.5</sub> emissions inventory. This is especially true in the winter months (October through March), although many residents also heat their homes with wood on cool nights during the summer. Wood burning for reg/hr

sidential heat accounts for 68 percent of total PM<sub>2.5</sub> emissions annually (89 percent during the winter months and 20 percent during the summer).

In addition to residential wood burning, land management burning (for disposing of timber harvest waste, promoting fire safety, and maintaining forest health) and unpaved road dust are large parts of the annual inventory, comprising approximately 12 percent each. Unpaved road dust emissions are particularly high during the long, dry California summer (32 percent of the summer total). Most of the Nonattainment Area is owned by the federal government and managed by the U.S. Forest Service, with hundreds of miles of unpaved roads crisscrossing the forest.

Food preparation accounts for about 2 percent of the PM<sub>2.5</sub> annual inventory. Paved road dust, on-road motor vehicles and locomotives each emit about 1 percent, and collectively farm equipment, off-road equipment and off-road recreational vehicles emit about 1 percent. On-road motor vehicle emissions are surprisingly small, totaling only 0.0046 tons per day (tpd) – there is only one traffic light in the Nonattainment Area, which was installed for reasons of safety rather than traffic congestion.

The biogenic component of PM<sub>2.5</sub> (chiefly fungal spores and microorganisms) has not been quantified.

#### D. PM<sub>2.5</sub> Precursor Emissions Summary

Precursors to PM<sub>2.5</sub> are sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOC), and ammonia (NH<sub>3</sub>). By federal approval and precedent, California's emission inventory uses Reactive Organic Gases (ROG) instead of VOC's, although they are considered essentially interchangeable. The transformation of precursors to actual PM<sub>2.5</sub> depends primarily on air chemistry (including the presence of

ammonia), pollutant concentrations, and atmospheric conditions such as temperature and humidity. Precursor emission reductions are considered to be of negligible importance in bringing the area into attainment. This is for three reasons: Precursor emissions are small to begin with; the main source is residential fuel combustion, which will be reduced by the attainment plan (more efficient wood stoves burn less wood); and the largest remaining precursor sources could not reasonably be controlled (i.e. they are of biogenic origin or from sources already subject to strenuous controls at the State or national level). Following is a summary of annual precursor emissions for the 2013 base year, according to the emissions inventory.

**Total SO<sub>x</sub> emissions are a mere 0.016 tons per day (tpd).** SO<sub>x</sub> emission sources are mainly residential fuel combustion (79 percent, of which slightly more than half is from fuel oil used for residential heating, with the remainder being from wood burning appliances) and managed burning for disposal (18 percent). The remaining 3 percent of SO<sub>x</sub> emissions are from motor vehicles and trains.

**Total NO<sub>x</sub> emissions are 0.504 tpd.** 54 percent of NO<sub>x</sub> emissions are from off-road mobile sources, 36 percent from on-road mobile sources, 7 percent from residential wood combustion and managed burning, and the remaining 3 percent from other residential fuel combustion and assorted reciprocal internal combustion engines.

**Total VOC (ROG) emissions are 0.940 tpd.** The ROG inventory shows the largest source type to be residential wood combustion, accounting for 51 percent of the total. All other areawide emission sources total 19 percent, with farming operations being the largest of these. Gas stations are the only stationary sources emitting about 1 percent. On-road mobile sources and off-road recreational vehicles emit 11 and 9 percent, respectively. Off-road equipment and other mobile sources are responsible for the remaining 9 percent of ROG emissions. Biogenic ROG emissions from pine and fir trees (the dominant vegetation in the area), chaparral, and other vegetation have not been quantified, but are thought to be much greater than anthropogenic emissions.

**Ammonia (NH<sub>3</sub>) emissions are 0.149 tpd.** 70 percent of ammonia emissions are from livestock (mainly cattle). Residential wood combustion accounts for 13 percent. The remaining 17 percent are from miscellaneous processes (7 percent), managed burning (5 percent), motor vehicles (2 percent) and landfills (1 percent), with a tiny percentage from trains and sewage treatment. Biogenic ammonia emissions from natural decomposition processes have not been quantified.

## IV. Control Strategy and Implementation

Ever since the area had been designated Moderate nonattainment, the District started working on developing control strategy to achieve the annual PM<sub>2.5</sub> standard of 12 µg/m<sup>3</sup> by the end of 2021. Chapter III, Emission Inventory, describes the 2013 and

future year baseline (no additional actions beyond already adopted regulations) inventories in detail. The emissions of directly emitted PM<sub>2.5</sub> are projected to decrease slightly by 2021 due to the continued implementation of already adopted mobile source control measures. However, these reductions will provide only 7 percent of the total reductions needed to attain the standard. Since the high PM<sub>2.5</sub> levels are overwhelmingly due to the impacts of smoke from residential wood burning devices, the only way to demonstrate attainment was by controlling emissions from these devices.

This chapter outlines the proposed control strategy and the implementation schedule for the area to meet the standard by December 31, 2021. One of the key strategies is the Incentive Measure Enforceable Commitment to replace 600 uncertified stoves with cleaner burning devices by December 31, 2020. Aside from the ongoing reductions in mobile sector, this is the only measure for which emission reductions are factored into attainment demonstration. The Incentive Measure Enforceable Commitment and the future implementation of ongoing reductions in mobile sector will reduce PM<sub>2.5</sub> emissions and as described in Section V, Attainment Demonstration, show that the Plumas County PM<sub>2.5</sub> Nonattainment Area will reach attainment of the annual standard by the end of 2021.

Another key strategy is the adoption of a Portola City Wood Stove and Fireplace Ordinance (City Ordinance) on June 22, 2016. The City Ordinance represents a complete overhaul of current burning practices and the enacted changes are permanent, enforceable, and there are penalties for violating them. The City Ordinance will ensure that healthy air will be maintained well past the attainment date but it will not provide significant reductions prior to the attainment date. Therefore, reductions achieved by the City Ordinance were not factored into attainment demonstration.

In addition to the two key strategies, the District is developing other measures to reduce the impact of wood smoke on PM<sub>2.5</sub>. The District is conducting an aggressive outreach and educational campaign to help residents understand the benefits of changing from an old wood stove to a cleaner home heating device and the importance of clean burning. The District worked closely with the City of Portola and enlisted outreach partners such as the local hardware and grocery store, post office, library, senior community center, and schools to assist in the distribution of educational materials and advertise the change-out program.

### A. Determination of Primary Sources of PM<sub>2.5</sub> in the Nonattainment Area

PM<sub>2.5</sub> concentrations in the Plumas County PM<sub>2.5</sub> Nonattainment Area are dominated by emissions from wood burning as demonstrated by seasonal and diurnal patterns in PM<sub>2.5</sub> concentrations, chemical composition data, the PMF model, and statistical

correlations between PM<sub>2.5</sub> mass and levoglucosan, a wood burning tracer. Detailed analyses identifying wood smoke as a main source of PM<sub>2.5</sub> in the area are provided in Chapter II, Ambient Air Quality. The impact of wood burning on PM<sub>2.5</sub> mass was quantified using PMF modeling (Appendix A). The PMF model estimated that 76.1 percent of PM<sub>2.5</sub> mass annually is from wood burning. Burning of garbage in stoves, fireplaces, and in open burn piles contributes another 2.5 percent of the mass. On high PM<sub>2.5</sub> days contribution from wood and garbage burning combined increases to almost 90 percent.

Within the Nonattainment Area, wood smoke can originate from open burning or from home heating devices. Open burning can be conducted by the residents of the Nonattainment Area or by the land managers (Forest Service, Bureau of Land Management, State Parks, etc.). The residents occasionally dispose of yard debris by burning them in open piles. Land managers perform prescribed burns of timber harvest waste in order to promote fire safety and maintain forest health. Both residents and land managers have to request a burn permit prior to starting the fire. Open burning is allowed only on days with good dispersion. The District in coordination with ARB makes a declaration of either a permissive Burn Day or a No-Burn Day. The Districts and the ARB consider a number of factors in making burning declarations to ensure that smoke from open burning will rise and disperse rapidly. Open burning is mostly conducted during the day, between 9 A.M. and 3 P.M. Low PM<sub>2.5</sub> concentrations during the day, as illustrated previously in Figure 12 of Chapter II, demonstrate that the open burning program is managed well and does not unduly contribute to the PM<sub>2.5</sub> mass. Figure 12 illustrates that PM<sub>2.5</sub> concentrations are highest during evenings and throughout the night (i.e., 5:00 pm to 12:00 am) and again in the morning (i.e., 5:00 am to 8:00 am) when more people are home and using their wood stoves and fireplaces. Seasonal variations in PM<sub>2.5</sub> concentrations (Figure 5) and PM<sub>2.5</sub> composition (Figure 8) demonstrate that PM<sub>2.5</sub> concentrations are high during the winter-time heating season, further illustrating the impact of wood smoke from home heating on PM<sub>2.5</sub> levels.

## B. Development of Emission Reduction Strategy

In early 2015, the U.S. EPA contracted with the Environmental Finance Center (EFC) at the University of North Carolina to evaluate program alternatives that the District could use to reduce PM<sub>2.5</sub> in the Nonattainment Area without increasing the cost burden on low-income households. The resulting report, “Opportunities for Reducing Wood Smoke in the Portola, California Area” suggested that “the way to incentivize a household – especially a low-income household – to change out a working wood stove with a more efficient alternative is through a tiered strategic plan to not only address the financial barriers to wood stove change-outs but also to foster a spirit of civic responsibility to address these air quality challenges.” The report identified federal,

state and local assistance programs available for home weatherization, wood stove upgrades and energy assistance; Home Repair and Weatherization program by the U.S. Department of Agriculture (USDA), Low Income Home Energy Assistance Program (LIHEAP), U.S. Department of Energy weatherization program, Plumas County Housing and Rehabilitation Program, Liberty Utilities CARE and Energy Savings Assistance Programs, and the Plumas-Sierra Rural Electric Cooperative's Winter Rate Assistance Program (WRAP). The full report is available in Appendix C.

On March 2, 2015, the EFC, U.S. EPA and the District convened a residential wood smoke roundtable with key leaders from community, local organizations and businesses (environmental, health, financial, utility) and local, state, and federal government. This productive roundtable discussion concluded that a proactive, collaborative strategy for improving air quality must also include educational outreach, economic incentives, and community support in order to successfully change habits and reduce wood smoke in the area. Following the roundtable discussion, the District, working closely with the City of Portola and other local organizations, embarked on an aggressive outreach and educational campaign. At the same time the District was working hard on exploring potential funding sources.

In March and April 2015, the District administered a survey to assess the demographics of the community's residents, particularly as they relate to home heating including the type of fuel used for heating, the types of wood burning devices, and the amount of wood burned. The results of the survey were incorporated into ARB emission estimates of residential wood combustion. There are approximately 2,460 households in the Nonattainment Area. About half of the households use wood as a source of heat. Natural gas is not available anywhere in the Plumas County PM<sub>2.5</sub> Nonattainment Area, so that is not an option for residential heating. Although many of these houses might also have alternative heating source appliances (electric or propane) in the home, wood is abundant in Portola and many residents enjoy the ambiance, ease, and self-sufficiency of burning this renewable resource, especially because of its relative low cost. The Portola Area Residential Heating Survey is located in Appendix D.

The District, in partnership with ARB, U.S. EPA, and the City of Portola developed a strategy to drastically reduce smoke emissions from wood burning devices. This was accomplished by pairing a City Ordinance addressing wood stove and fireplace emissions with an incentive-based wood stove change-out program throughout the Nonattainment Area.

### C. Incentive Measure and Enforceable Commitment

Due to the overwhelming impact of wood smoke on PM<sub>2.5</sub> concentrations and the area's dependents on wood for home heating, the attainment demonstration for the Plumas

County PM<sub>2.5</sub> Nonattainment Area relies heavily on emission reductions projected to be achieved from a voluntary wood stove change-out program. In order to rely on discretionary incentive programs to satisfy the CAA emission reduction requirements, the District has to demonstrate that the reductions are real, enforceable, quantifiable, surplus, and permanent. The following elements are required as part of this demonstration:

- Integrity
- Commitment (Federal Enforceability)
- Technical Analyses
- Funding
- Resources
- Outreach and Public Disclosure
- Legal Authority

Details regarding each of these elements are included in Appendix E. The District developed strict and thorough guidelines to implement the wood stove change-out program. The guidelines are included in Appendix F and the work plan is included in Appendix G.

## 1. Greater Portola Area Wood Stove Change-out Program

There is strong evidence that wood stove change-out programs are a cost effective way to significantly improve air quality in communities where the use of wood stoves is widespread. However, Portola is economically disadvantaged and many of its residents cannot afford to pay even partial costs of changing out wood stoves. Portola's unemployment rate is well above the national and State averages, having reached 22.3 percent in 2010. The 2011 median home value was only 41 percent of the state average, and the median household income was approximately half (54 percent) of the state average. In the past, the District and the City of Portola offered a \$1,000 incentive for changing out old wood stoves. However, due to the socioeconomics of the area, there was very little interest, as the incentive amount would cover only a fraction of the total cost of change-out. It was the combination of the above economic facts that led the District to believe that funding adequate to cover 100 percent of the cost of changing out to cleaner wood stoves was needed, at least within the city limits of Portola.

The District received a \$2.48 million grant from the 2015 Targeted Air Shed Grant for a wood stove change-out program. The grant is intended to improve air quality in areas of the U.S. with the highest levels of pollution. The District also received a \$400,000 settlement fee from the company – H&S Performance (H&S). Pursuant to a December 17, 2015 Consent Agreement and Final Order between H&S and the U.S. EPA, H&S agreed to fund the replacement, retrofit, or upgrade at least 400

inefficient wood-burning appliances and to spend at least \$400,000 on such a program. The District contributed additional funds (up to \$60,000) from the Plumas County portion of the District's Assembly Bill 2766 Motor Vehicle Registration fee surcharge. Together these funds add up to about \$3,000,000. The District will use this funding to implement a comprehensive wood stove change out program in the Plumas County PM<sub>2.5</sub> Nonattainment Area. The District has sufficient funding to change out 600 of the estimated 664 uncertified stoves operating in the Nonattainment Area. In an effort to replace the old devices with the cleanest technology available, the District will offer an additional \$1,000 for every wood stove replaced with a pellet, propane, or kerosene device.

One of the important aspects of the program is to assure that the non-certified wood stoves removed from homes are destroyed so the stoves cannot be used at a different location. The District partnered with the City of Portola to assist with the temporary storage, destruction and removal of non-certified wood stoves.

## 2. Preparation for the Change-out Program

Prior to beginning the program, the District researched other wood stove change-out programs. The local chapter of the Hearth, Patio and Barbeque Association assisted the District with wood stove demonstration workshops as well as preparation for the significant task of replacing at least 600 uncertified wood stoves within five years.

The District utilized local county counsel to assist in developing and distributing a Request for Qualification (RFQ) to determine the final qualifying list of retailers which would participate in the program. This was distributed to wood stove retailers throughout the three counties within the District's jurisdiction: Nevada, Plumas, and Sierra. Additionally, the District distributed the RFQ to retailers in the Reno and Sacramento Valley areas. The District then carefully screened the applicants and developed a final agreement with the qualifying retailers. Retailers were required to meet the extensive requirements in the RFQ, pass a screening process, and sign an agreement with the District in order to participate in the program. Following the wide distribution of the RFQ, the District received two responses from local Plumas County wood stove retailers. These retailers then signed a Retailer/Contractor Agreement with the District. These two retailers; Wolf Creek Wood Stoves and Quincy Hot Spot were then included on the "List of Qualified Retailers". The list is maintained by the District and distributed to all qualifying applicants for the change-out program. The RFQ is located in Appendix H. A copy of the Retailer/Contractor Agreement is located in Appendix I.

The District worked with the City of Portola to develop the eligibility requirements for City residents. The District also worked with the City and a contracted technical

company to develop a Google-Earth based map of the eligible areas for the change-out program. This map is used to determine if an applicant is eligible for the program and the incentive amount. The eligibility criteria are located in Appendix J.

An important aspect of a wood stove change-out program is making sure that the old, uncertified stoves are permanently destroyed and disposed of properly. The City of Portola took on that responsibility as outlined in the Memorandum of Understanding (MOU) between the District and the City of Portola (Appendix K).

A particularly challenging legal issue was whether the State of California Prevailing Wage requirements applied to the change-out program. The District worked with the County Counsel and the State of California Department of Industrial Relations to determine that wood stove retailers were required to meet the prevailing wage requirements for business buildings, but not for residential homes.

Another challenge was assuring that all building permit requirements were met appropriately. There are three entities responsible for permitting homes within the Nonattainment Area:

- 1) City of Portola permits home within the city limit;
- 2) Plumas County permits homes outside of the city limit; and
- 3) State of California Department of Housing permits all manufactured and mobile homes.

The District works closely with each permitting facility to streamline the process and make sure that the change-out program proceeds according to schedule.

As previously discussed, in March and April 2015, the District administered a residential heating survey to assess the demographics of the community's residents, particularly as they related to heating sources and wood stoves. This survey was distributed to the general population in the Nonattainment Area by utilizing the internet and the manual distribution of the survey in various community areas, such as post offices, library, and grocery stores. The Portola Area Residential Heating Survey and its results are included in Appendix D.

### 3. Wood Stove Change-out Program Details

Over the next five years, 2016 through 2020, the District will administer a comprehensive wood stove change-out program. As part of this program, the District will offer incentives ranging from \$1,500 to \$4,500 to encourage owners of older uncertified stoves within the Nonattainment Area to switch to newer cleaner-burning devices. To qualify for this program, the uncertified stove must be operable and currently in use in the residence. The program provides residents within the Portola



City limits (Zone 1) up to \$3,500 to replace an uncertified stove with a certified wood stove or up to \$4,500 to replace an uncertified wood stove with one using alternative fuels such as pellet, propane or kerosene. For residents outside of the city limits, but still within the Nonattainment Area (Zone 2), the program provides a \$1,500 rebate to replace an uncertified wood stove with a certified wood stove or a \$3,000 rebate to replace an uncertified wood stove with an alternative fuel device, such as pellet, propane or kerosene-fueled stove. Additionally, any verified low income resident outside of the city limits but within the Nonattainment Area will be eligible for the same incentives as city residents, up to \$4,500.

Appendix L details the wood stove change-out process. To participate in the program the resident must complete an application, which is then reviewed by the District. Those who meet the qualifications for the USDA 504 Rural Grant Program are referred there for assistance. All other applicants are considered for the District Wood Stove Change-out Program. Once an application is approved by the District, the letter with further instructions is mailed to the applicant. All of the installations must be completed by a District-approved retailer, as listed in Appendix I. The resident is required to make an appointment with the retailer for in-home estimate. The retailer will visit the home to make sure that the wood burning device is eligible for the change-out program and helps the homeowner select the best replacement device for their needs. The retailer takes a photo of the old device and identifies it with tracking number on the application. The retailer then sends an estimate for costs to replace the device to the District and leaves a copy with the applicant. The retailer must have pre-approval from the District if the estimate is over the permitted amount depending on Zone and income. Additionally, an applicant is responsible for added cost of any upgrades. Once the District approves the retailer estimate, the retailer installs the new device, takes a photo of the new device, then transports the old device to the City of Portola Public Works Yard. One of the most important aspects of the program is to assure that the non-certified wood stoves removed from homes are destroyed and the City agreed to work with the District-approved retailers to collect all removed stoves. The District developed a MOU with the City of Portola to destroy the stoves. The City matches the stove with the program tracking number, cuts the stove in half with a plasma torch, and stores the stove in a locked yard. The City fills out and signs a verification of destruction form and submits it to the District. The form contains the tracking number and photo of the destroyed stove. The City then has the pieces of the stove removed by a scrap retailer. Once the installation has been inspected by the responsible party, the retailer submits the entire packet to the District for reimbursement. The District inspects the packet, and if approved, reimburses the retailer. The retailer follows up with in-home training on proper use of the newly installed device. This in-home training by the retailer is an important aspect of the program to ensure the maximum reductions in emissions. The retailer asks each resident to complete a survey. The importance of following the best

practices in wood burning is further reinforced when District staff visits the residence few months later to follow-up on the installation.

In order to meet the standard by December 31, 2021, the District needs to replace 600 stoves between 2016 and 2020. Since the change-out program is voluntary, the District took extra steps to ensure sufficient participation. From early on the District embarked on an aggressive outreach campaign to educate the residents on the importance of reducing PM<sub>2.5</sub> for their own health and the well-being of the community. The District widely advertised the change-out program throughout the community by distributing flyers and promoting program through the website and local newspapers. A key element of the advertising the campaign was a kick-off meeting which provided an opportunity for residents to complete applications on site and talk to the retailers. The District will conduct a similar event during each year of the program. To have a continuous presence in the community the District maintains a satellite office at Portola, with District staff providing assistance with filling applications and answering questions related to the program. The District also hired a translator to help communicate with the Spanish-speaking community.

#### D. City of Portola Wood Stove and Fireplace Ordinance

The Portola City Wood Stove and Fireplace Ordinance was previously adopted in 2002 as Portola Ordinance 298. On June 22, 2016, upon the District's request, the City of Portola adopted a new Ordinance, 344, to address the PM<sub>2.5</sub> pollution problem. The fully adopted City Ordinance is presented in Appendix M. The ordinance contains many different strategies to reduce emissions from wood burning heaters which are effective immediately upon adoption. The following PM<sub>2.5</sub> measures are currently being implemented at the local level to achieve compliance with the annual PM<sub>2.5</sub> NAAQS:

1. Existing homes
  - a. Prohibit the installation of uncertified heating devices.
  - b. Prohibit the installation of unqualified fireplaces.
  - c. Limit certified wood stoves to two per property
2. Change of ownership
  - a. Require removal or replacement of uncertified wood stoves.
  - b. Limit the number of certified wood heating devices to two per property.
3. New constructions
  - a. Require new constructions to offer non-wood heat.
4. New constructions or remodeling
  - a. Limit the number of certified wood stoves to two per property.
  - b. Limit the number of EPA-qualified fireplaces to one per home.
5. Prohibit the installation of wood fired boilers or hydronic heaters.

6. Restrict burning materials to seasoned wood, uncolored paper, pellets, and manufactured logs.
7. Require wood stove retailers to distribute educational materials provided by the District.

In addition to measures which took effect immediately, the ordinance includes a mandatory burning curtailment rule which will take effect on January 1, 2021. This rule will make it illegal to burn in an uncertified stove on days when high atmospheric stability would limit pollutant dispersion. The purpose of this rule is two-fold. First, the rule encourages owners of uncertified stoves to upgrade to certified stoves or risk not being able to heat their home. Second, the rule provides a mechanism for preventing PM<sub>2.5</sub> concentrations from reaching high levels on days when stable atmospheric conditions limit pollutant dispersion. The rule will take effect on January 1, 2021 to give homeowners enough time to change their stoves to EPA certified devices. The rule will make it illegal to burn wood when pollution is forecast to exceed 30 µg/m<sup>3</sup> unless an EPA-certified stove is used.

## E. Additional Strategies for Attainment

In addition to the wood stove change-out program and the requirements in the City's Wood Stove and Fireplace ordinance, the District is including the following strategies as part of the SIP.

### 1. Educational Campaign

Ever since Portola and the surrounding area have been designated nonattainment for the annual PM<sub>2.5</sub> standard, the District has been working with the community to inform them about the health effects of PM<sub>2.5</sub> and the implications of the nonattainment designation. The District staff reached out to the City Council and the District Board for support in working with the community. The District enlisted outreach partners such as the local hardware and grocery store, post office, library, senior community center, and schools to assist in the distribution of educational materials and advertise the change-out program. The District distributed press releases to local newspapers to inform the public about the problem. An example of a press release is included in Appendix N.

On March 19, 2015, the District hosted a wood stove workshop for Portola residents to discuss proper burning techniques and demonstrate new EPA-certified heating devices. Two local wood stove retailers demonstrated various models of EPA-certified wood, pellet, and propane stoves. The event included several presentations about the PM<sub>2.5</sub> designation status, health effects of PM<sub>2.5</sub>, and the District's plan to reduce PM<sub>2.5</sub> concentrations. The presenters included Gretchen Bennett, the District Executive

Director, John Crouch, Director of Public Affairs of the Hearth, Patio and Barbeque Association, Sue McCourt, Fire Prevention Specialist at the Plumas County Office of Emergency Services, and Mimi Hall, the Plumas County Health Officer. All speakers stressed the importance of the community working together to improve air quality and thereby improving health and quality of life. Portola Family Resource Center staff was on site to provide information on different assistance programs available to residents. The flier for the March 19, 2015 Workshop is in Appendix O. The District also used this opportunity to distribute *Burn Wise* brochures provided by the U.S. EPA.

District staff regularly attends City Hall meetings and Senior Community meetings to communicate the importance of using dry and seasoned wood and following the proper wood burning practices. The District also uses this opportunity to advertise the wood stove change-out program. The District partnered with various entities to display U.S. EPA's *Burn Wise* brochures at places which are frequently visited by the local residents including library, City Hall, local hardware and grocery stores, and the Portola Family Resource Center. The District regularly advertises in the local paper to educate residents about the proper burning techniques, storage of firewood, weatherization of homes and the wood stove change-out program. Local reporters have also printed news stories about the nonattainment status and the change-out program.

The District upgraded its website to advertise the wood stove change-out program and provide information about proper burning practices. Of note, one of the main tabs on the District's website now has information provided by the U.S. EPA's *Burn Wise* program. In addition, each resident applying to participate in a change-out program receives an informational pamphlet on the importance of good burning practices.

In the spring of 2016, the District hosted its first wood stove change-out kick off meeting. The District has committed to making this an annual event throughout the duration of the program.

The District installed and maintains a dedicated phone line for residents wishing to ask questions or participate in the change-out program and a part-time employee to assist the District with Spanish-speaking residents desiring a wood stove replacement or basic wood burning information.

## 2. Voluntary Wood Burning Device Curtailment Program

The District has committed to implementing a voluntary wood burning curtailment program in the winter of 2016/2017. This is a temporary measure to help reduce wood smoke while the change-out program is being implemented. Once the change-out program is completed and residents have had sufficient time and opportunity to replace uncertified stoves with cleaner burning devices, the voluntary program will be replaced

with a mandatory program. To ensure the success of the mandatory curtailment program, which will start on January 1, 2021 the District will have to develop enforcement capabilities and an air quality forecasting and public notification system. The voluntary program will serve as a training ground for the mandatory program. As a voluntary program, the enforcement aspect will not be needed, but the District will need to develop an ability to forecast air quality and notify the public about actions they are requested to take. The District is working towards developing these capabilities.

### 3. Distribution of Moisture Meters

Wood that is not seasoned properly will burn less efficiently and release more harmful pollutants. As part of the educational campaign, the District emphasizes the importance of burning dry, seasoned wood. In order to encourage residents to test wood to see if it is dry enough to burn, the District purchased 20 moisture meters and distributed them to the first 20 residents to attend the Wood Stove Change-out Fair. The District plans to hold an annual wood stove change-out fair and will distribute at least 20 moisture meters at each event for the next four years of the program.

### 4. Regulation and Enforcement of Opacity Requirement

To help control smoke from chimneys and to encourage cleaner burning techniques the District will enforce existing Rule 202. This rule states the following:

“A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three (3) minutes in any one (1) hour which is:

- A. As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or
- B. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (A) of this section.”

District Rule 202 was approved into the State Implementation Plan (SIP) on 9/16/1997 under 62 Federal Register 48480.

### 5. Prohibit Open Burning During Winter

To further reduce PM2.5 emissions during winter, the District commits to developing an open burning rule and taking it to the District Board for adoption by March 31, 2019. The District is currently assessing feasibility of establishing a green waste collection in the nonattainment area. This would allow the District to adopt an open burning rule

similar to the current District rule 318<sup>3</sup> which prohibits open burning in the American Valley region from November 15 to March 15.

## F. Summary of Commitments and Estimated Reductions

A summary of annual average PM<sub>2.5</sub> inventory and reductions for the proposed control measures is provided in Table 4. Emission reductions represent the difference between the projected 2013 baseline and the remaining 2019-2021 average emissions needed to demonstrate attainment. Emission reductions achieved from the wood stove change-out program vary from 0.045 tpd in 2019 to 0.077 tpd in 2021. The total reductions from the wood stove change-out program represent the 2019-2021 average emission reductions. This provides a conservative estimate of 2021 design value. If single year, 2021, was considered the reductions would be 0.083 tpd instead of 0.068 tpd.

Table 4. Control Measure Summary

Sources	PM2.5 Emissions (tpd)	Action	Implementation
2013 Baseline Emissions	0.490		
Emission Reduction Needed for Attainment			
ARB Mobile Source Programs	0.006	Ongoing	Ongoing
Wood stove Change-out Program	0.062 (2019-2021 Avg.)	2016	2016-2020
Total Reductions 2019-2021 Avg.	0.068		
2019-2021 Attainment Year Emissions	0.422		
Other Commitments			
Mandatory Wood Burning Curtailment	N/A	6/22/2016	1/1/2021
Other Provisions of City of Portola Wood Stove and Fireplace Ordinance	N/A	6/22/2016	6/22/2016
Voluntary Wood Burning Curtailment	N/A	2016	Winter 2016/2017
Educational Campaign	N/A	Ongoing	Ongoing
Enforcement of Opacity Rule	N/A	Ongoing	Ongoing
Distribution of moisture meters	N/A	Ongoing	Ongoing
Prohibit Open Burning During Winter	N/A	2019	2019

## V. Attainment Demonstration

Section 189(a)(1)(B) of the CAA requires that a moderate area nonattainment plan contains either a demonstration that the plan will provide for attainment by the applicable attainment date, or a demonstration that attainment by such date is impracticable. The attainment demonstration presented below describes how the

<sup>3</sup> Rule 318 can be accessed on the ARB website at <https://www.arb.ca.gov/drdb/hsi/cur.htm>

chosen control strategies would provide the emissions reductions needed to bring the area into attainment by the end of 2021.

The main problem causing the Portola area to violate the PM<sub>2.5</sub> standard is wood smoke. Wood burning is responsible for 76 percent of mass annually and 86 percent on a typical exceedance day. Wood heat is very popular in the area due to the lack of natural gas and availability of cheap, or even free, wood. Home wood burning devices include wood stoves, fireplace inserts, fireplaces, and wood burning furnaces. Each of these devices has different emission levels, with newer devices burning much cleaner and more efficiently than older devices. Since wood burning is a key source of PM<sub>2.5</sub> pollution in the area, the District developed a comprehensive wood smoke reduction strategy. While, as outlined in Section IV, there are many aspects of this strategy, the attainment demonstration relies only on the reductions from the wood stove change-out program and the ongoing reductions in directly emitted PM<sub>2.5</sub> from the mobile sector.

Since uncertified wood burning devices cause over 60 percent more pollution than certified devices, one of the proven solutions to reducing PM<sub>2.5</sub> is a program to replace old, highly polluting wood burning devices with much cleaner ones. Replacing uncertified devices with certified ones will reduce overall emissions from wood burning and prevent PM<sub>2.5</sub> pollution levels from reaching unhealthy levels, as well as reducing the need for additional curtailments. The District has about \$3 million to fund a change-out program for uncertified, highly polluting stoves. This current change-out program is scheduled to run for five years, from 2016 through the end of 2020. Reducing the number of uncertified devices will reduce PM<sub>2.5</sub> emission across the PM<sub>2.5</sub> Nonattainment Area. The program provides financial incentives to assist residents with the cost of removing and replacing their older, high emitting devices. Financial assistance is essential because many of the people who use wood heat are lower- and middle-income families trying to save money on heating costs. In order to demonstrate attainment the District has to encourage 600 of the 664 owners of uncertified stoves to participate in the program. The program also ensures that the uncertified devices are destroyed, thereby removing them from any secondary market. Change-out programs like this have proven successful in other parts of the country. The program is estimated to provide 93 and 96 percent of reductions needed to attain the annual and the 24-hour standards, respectively. As described in more detail in Section IV, Attainment Strategies, the District has both the funding and the program in place to achieve the estimated emission reductions. The remaining reductions will come from the ARB mobile program.

Because the plan relies on a voluntary measure to deliver the majority of reductions needed to attain the standard, the District and the ARB took significant precautions to ensure that the program is successful and delivers the estimated reductions. District's effort to ensure sufficient participation included the following:

1. Financial incentives, up to the full cost of replacing an uncertified home heating device with a cleaner, more efficient device.
2. A simple and streamlined application process, including help with filling out applications in English and Spanish.
3. On site staff to provide information and answer questions.
4. Heavy advertising campaign to spread the news about the program throughout the Nonattainment Area.
5. Partnerships with the City of Portola and local agencies to leverage funding and resources and further promote the program.

In addition to ensuring sufficient participation to meet the projected number of change-outs, emission reductions calculations included a significant safety buffer. The following factors make the estimated emission reductions and attainment demonstration conservative:

1. NO<sub>x</sub> emissions are projected to decline 28 percent between 2013 and 2021 but the attainment plan does not take any credit for these reductions due to an uncertainty about the NO<sub>x</sub> to nitrate response.
2. The plan demonstrates attainment by assuming that each uncertified stove will be replaced with a certified stove polluting 60 percent less. The District, however, provides additional incentives to encourage installation of pellet, propane, and kerosene stoves which have over 90 percent lower emissions. Furthermore, for those preferring to stay with a wood burning device, the retailer is responsible for selecting the cleanest device that would meet the resident's needs. In many cases the new devices pollute over 80 percent less than the old devices.
3. The attainment demonstration calculations factor in change-outs completed during the prior year. The retailers plan to complete most of the change-outs scheduled for a given year during summer. Therefore, the air quality during the second half of the year should reflect the change-outs completed during the summer as well as those of the prior year.
4. The full benefit of changing out 600 stoves, as planned under this program, will not be reflected until the 2023 design value. The 2023 design value will include three years, 2021, 2022, and 2023, when all 600 clean devices have been operating for a full year.
5. The attainment demonstration does not reflect any reductions from the aggressive educational campaign. Each replacement is accompanied by an educational session to instruct homeowners on the importance of using the right fuel and following the best practices in wood burning. Additionally, the District is reaching out to residents not participating in the change-out program to educate



them on the best practices in wood burning, buying, and storing as outlined in Section IV, Attainment Strategies.

6. The District is implementing a suite of other measures, as part of a long-term wood smoke reduction strategy, for which no credit was taken to demonstrate attainment. Starting with the winter of 2016/2017, the District will implement a voluntary wood burning curtailment program. This is a temporary measure to reduce wood smoke while the change-out program is being implemented, and will be replaced with a mandatory program starting on January 1, 2021, after residents had an opportunity to change-out their stoves. The comprehensive list of measures implemented as part of the long-term wood smoke reduction strategy is included in Section IV.G., Additional Strategies for Attainment.

## A. Design Value Selection

U.S. EPA guidance recommends the use of multiple year averages of design values, where appropriate, to dampen the effects of single year anomalies in the air quality trend due to factors such as adverse or favorable meteorology or radical changes in the local emissions profile. The drought conditions that have persisted in California over the past few years have negatively affected air quality in the area. Lack of rain diminished the cleansing effect of precipitation and with the reduced frequency of storms and related winds, there was less mixing of air pollutants into the atmosphere. Ultimately, limited pollutant washout, transport, and dispersion lead to stagnation and pollution buildup resulting in artificially high design values. To present a more balanced scenario, ARB has utilized a five-year weighted average design value as the starting point for demonstrating attainment.

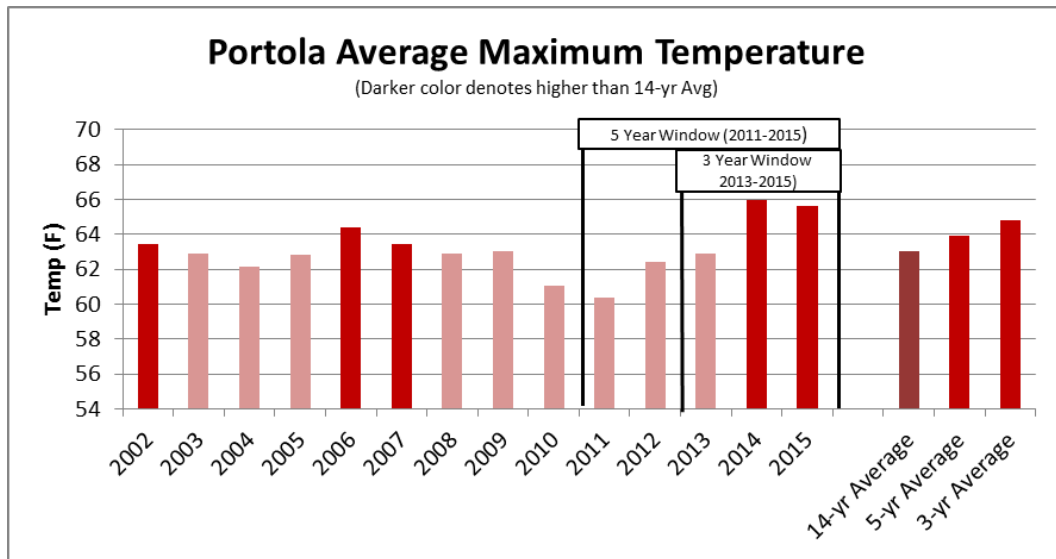
Meteorological data from the Western Regional Climate Center<sup>4</sup> show that the average temperatures at Portola have increased in recent years. The highest annual average temperatures since 2002 (both maximum and minimum) occurred in the last two years of what would normally be the three-year time frame used for weighted averages (Figure 13 and Figure 14). These two years follow the driest year (2013) observed in Portola since recording began in 1915<sup>5</sup>.

---

<sup>4</sup> Western Regional Climate Center (WRCC), Cooperative Climate Data Summaries (CCDS), <http://www.wrcc.dri.edu/cqi-bin/cliMAIN.pl?ca7085>

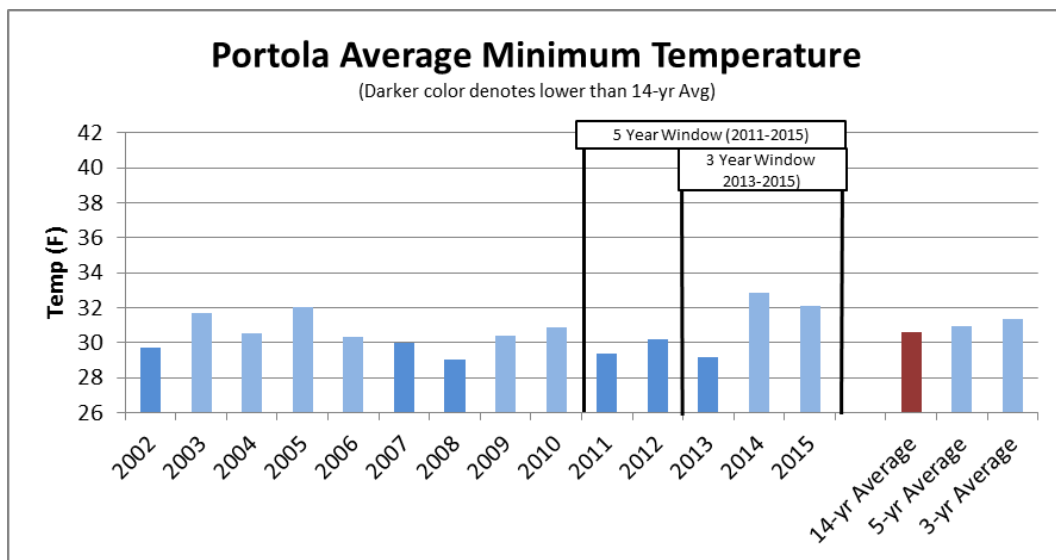
<sup>5</sup> Ibid

Figure 13. Portola Average Maximum Temperatures (2002-2015)



Data Source: WRCC, CCRS, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7085>

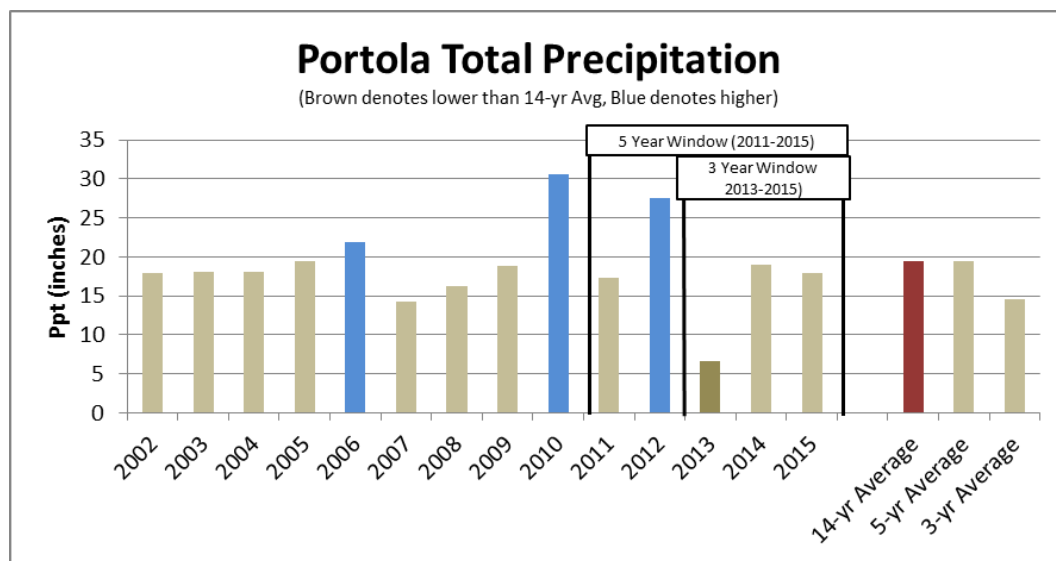
Figure 14. Portola Average Minimum Temperatures (2002-2015)



Data Source: WRCC, CCRS, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7085>

Precipitation data in recent years (since 2002) was divided into “wet” and “dry” categories, using the 2002-2015 mean as a benchmark. Years with total precipitation higher than this value were categorized as “wet” and those lower were designated as “dry” (Figure 15).

Figure 15. Portola Total Precipitation (2002-2015)



Data Source: WRCC, CCRS, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7085>

Using a three-year weighted average (2013-2015) would be comprised entirely of warm, dry years, including the driest year observed in the last century. Utilizing a slightly expanded timeframe that incorporates both “wet” and “dry” years smooths out the effects of year-to-year variability in meteorology and allows for a more representative view of air quality in the Portola Nonattainment Area.

In order to smooth out the effects of year-to-year variability in emissions and meteorology, a five-year weighted average design value was calculated. The weighted average was calculated as the average of 2011-2013, 2012-2014, and 2013-2015 design values. By averaging these design values, the value from 2013 is weighted three times, whereas, values for 2012 and 2014 are each weighted twice, and 2011 and 2015 are only weighted once. Table 5 lists 2011-2015 annual statistics.

Table 5. 2011-2015 Annual Statistics and Design Values

Statistics	Annual Statistics ( $\mu\text{g}/\text{m}^3$ )					3 Year Average ( $\mu\text{g}/\text{m}^3$ )			5 Year Weighted Average ( $\mu\text{g}/\text{m}^3$ )
	2011	2012	2013	2014	2015	2013	2014	2015	2011-2015
Annual Avg.	11.9	13	13.5	15.6	15.6	12.8	14.1	14.9	13.9
98th Percentile	32.4	35.5	44.4	53.8	50.4	37	45	50	44

Highlighted numbers are based on combined data from Portola-Nevada Street and Portola-Gulling Street

2013 is also an anchor year for the future year PM<sub>2.5</sub> projections because the use of the quarterly design values for a 5-year period centered around 2013 (listed in Table 5) continue to be used in the projection of the future year annual average PM<sub>2.5</sub> concentrations. The future year design value reflects the weighted quarterly average concentration calculated from the projections over five years (20 quarters).

## B. Background Concentrations

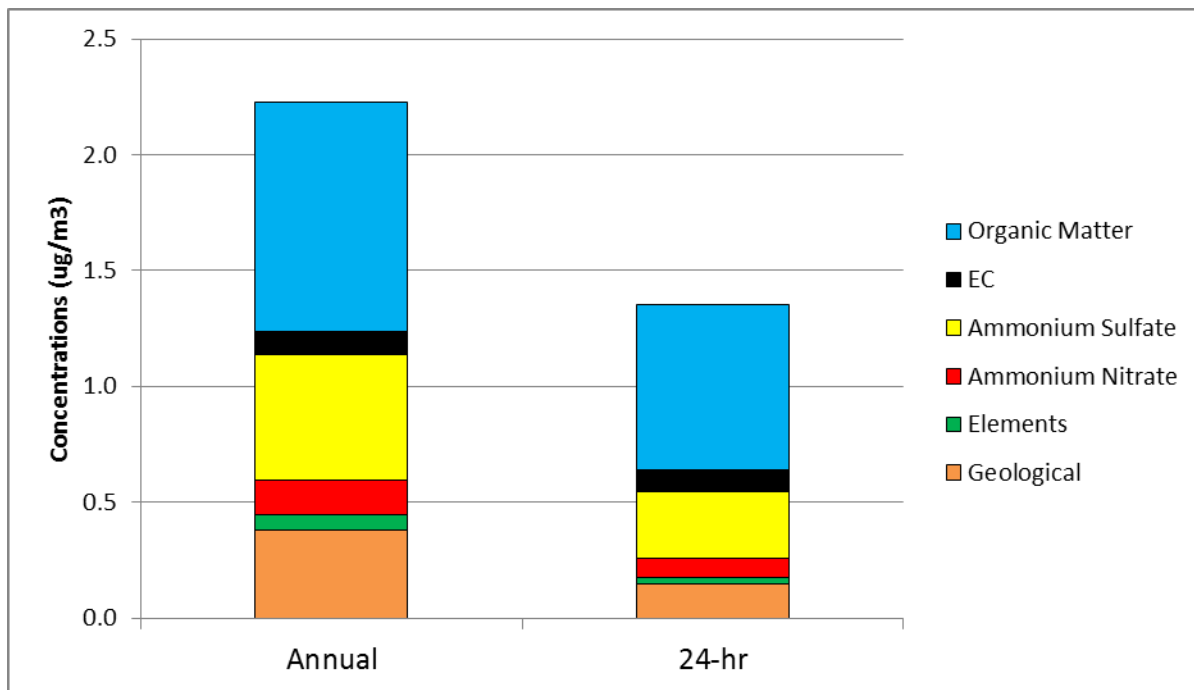
Background concentrations are concentrations that would occur in the airshed in the absence of local anthropogenic emissions and represent local natural emissions and transported pollutants. The rollback model assumes that atmospheric concentrations in excess of background are proportional to emissions. The purpose of this analysis is to determine what portion of the PM<sub>2.5</sub> mass at Portola could be subject to controls. This is calculated by subtracting background concentrations from PM<sub>2.5</sub> concentrations measured at the Portola site.

Background PM<sub>2.5</sub> concentrations were determined using IMPROVE data collected at the Bliss State Park monitoring site (AQS ID: 060179000), located on the western side of Lake Tahoe. The annual background concentrations were calculated based on 341 data points collected between 2011 and 2013. Prior to averaging, six data points collected between August 23, 2013 and September 7, 2013 were removed from the database as concentrations were impacted by emissions from the large Rim Fire south of the monitor. The 24-hr background concentration was calculated by averaging PM<sub>2.5</sub> data collected at the Bliss site on days when Portola exceeded the 24-hr standard of 35 µg/m<sup>3</sup>. Between 2011 and 2013 there were 19 exceedance days at Portola with coinciding chemical composition data for the Bliss site. Table 6 and Figure 16 show the annual and 24-hr background concentrations for Portola.

Table 6. Background PM<sub>2.5</sub> Concentrations for Portola

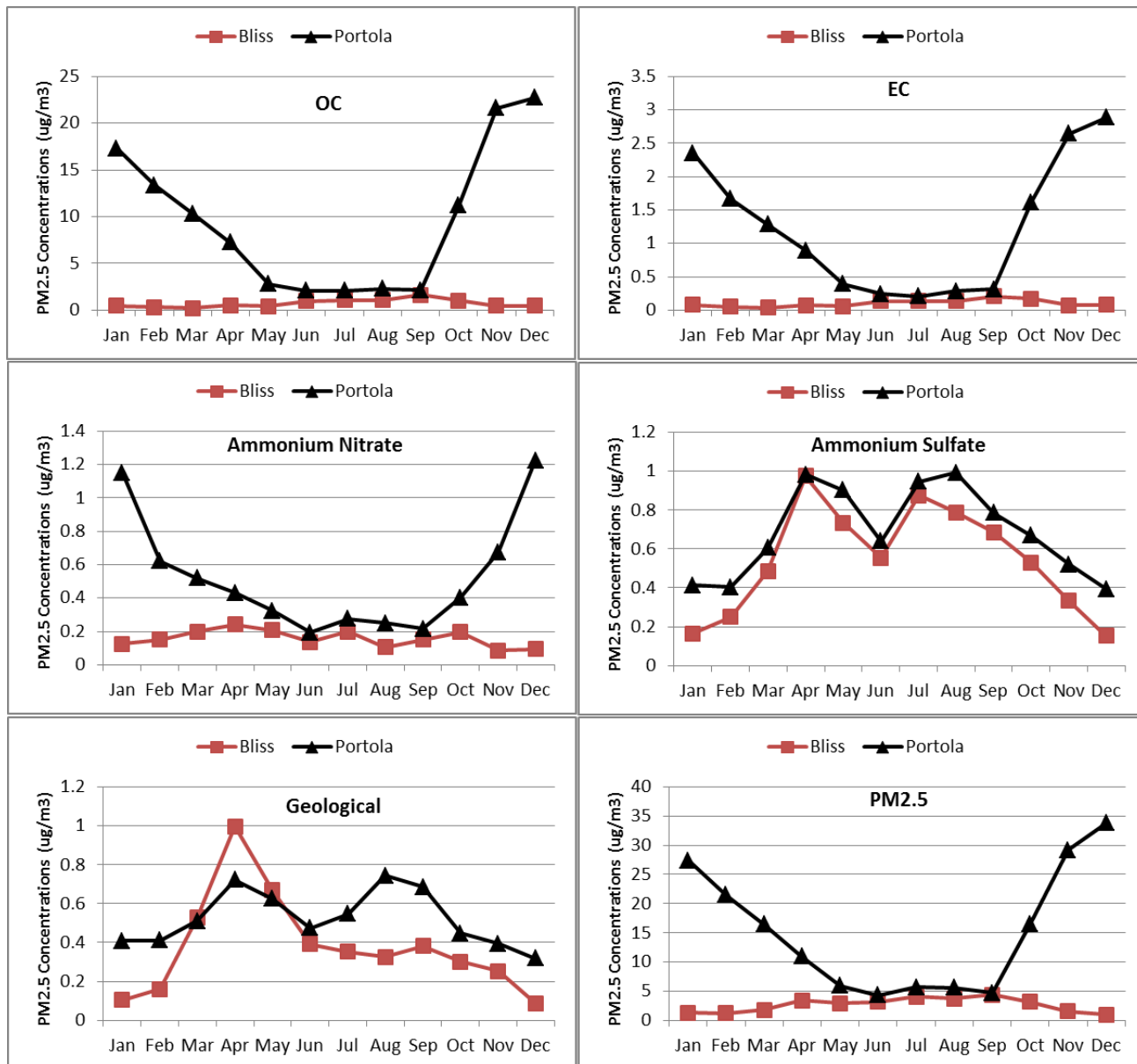
PM <sub>2.5</sub> Component	Annual (µg/m <sup>3</sup> )	24-hr (µg/m <sup>3</sup> )
Ammonium Nitrate	0.15	0.08
Ammonium Sulfate	0.54	0.29
Carbonaceous aerosols	1.09	0.81
OM	0.99	0.71
EC	0.10	0.10
Geological	0.38	0.15
Elements	0.06	0.03
Sum of Species	2.23	1.35

Figure 16. Background PM<sub>2.5</sub> Concentrations for Portola.



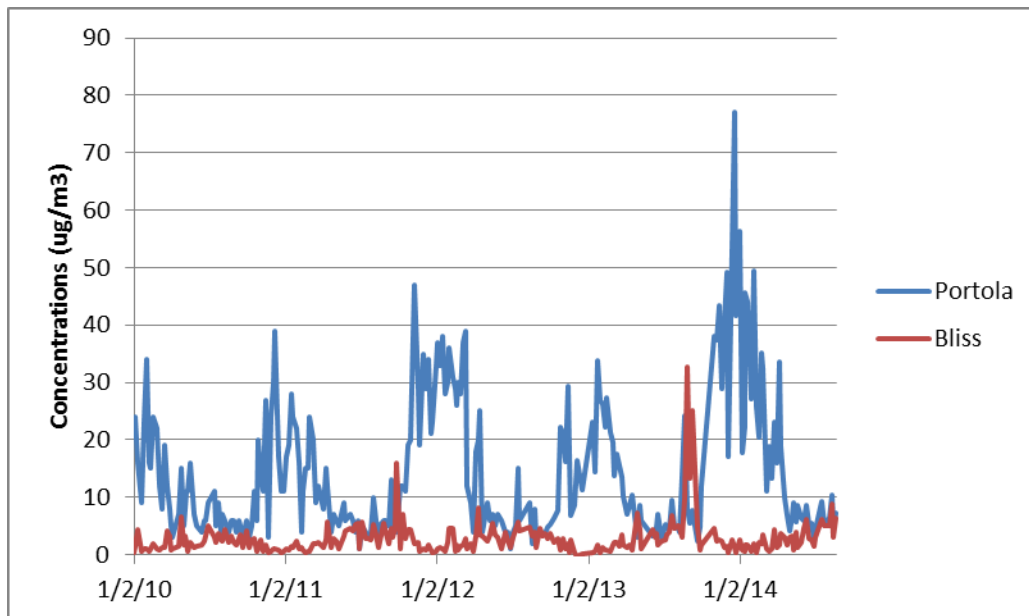
To further verify that ambient PM<sub>2.5</sub> concentrations measured at the Bliss site could serve as an accurate estimate of background concentrations for Portola, we compared monthly average concentrations for the PM<sub>2.5</sub> mass and its components for the two sites. The relationship varies depending on the component (Figure 17). Organic carbon, elemental carbon, and ammonium nitrate concentrations during summer months (June through September) are similar at the two sites. During winter, concentrations increase at Portola due to wood burning and localized temperature inversions which trap pollution close to the ground promoting the accumulation of OC and EC and the formation of ammonium nitrate. At the Bliss site concentrations remain low during the winter months. Ammonium sulfate concentrations have similar magnitudes and seasonal patterns, with concentrations only slightly higher at Portola. The two sites also have similar seasonal patterns in regard to geological material, with summer highs and winter lows; however, concentrations are influenced more by local sources so the two sites don't track as well as they do for other components.

Figure 17. Comparison of Portola Seasonal Profiles to the Background Concentrations (2011-2013).



Overall, the Bliss IMPROVE site is an appropriate background site for Portola. The two sites have similar concentrations during summer months, while winter concentrations increase at Portola but remain low at Bliss. Figure 18 further illustrates the daily differences between the two sites.

Figure 18. Comparison of PM<sub>2.5</sub> Concentrations at Portola and Bliss State Park

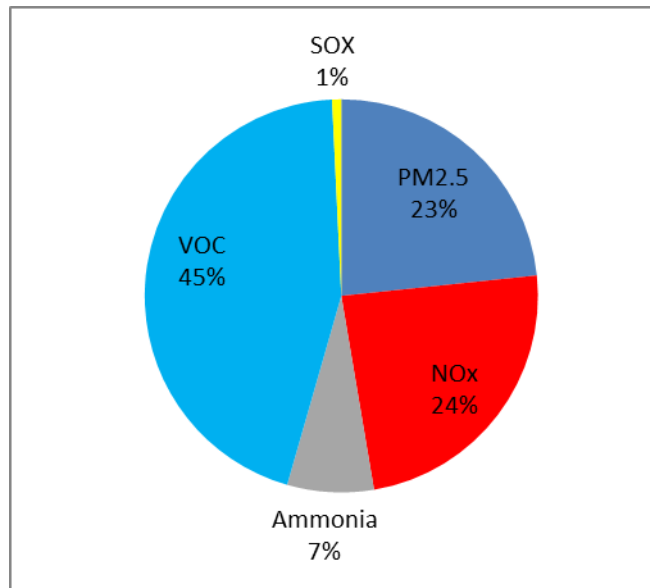


### C. Evaluation of Significant Precursors

In addition to direct emissions, particulate matter is formed in the atmosphere from precursors. Sulfur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOC) and ammonia (NH<sub>3</sub>) all contribute to the formation of particulate matter. For this analysis, ARB staff evaluated PM<sub>2.5</sub> precursors consistent with the PM<sub>2.5</sub> NAAQS Implementation Final Rule.<sup>6</sup> Specifically, ARB staff developed a technical demonstration indicating that emissions of a particular precursor do not significantly contribute to PM<sub>2.5</sub> levels. The PM<sub>2.5</sub> Implementation Rule recommends evaluating chemical speciation data and emissions inventories. However, in the case of Portola, evaluation of the emission inventories does not appropriately characterize main contributors to the PM<sub>2.5</sub> problem. As illustrated in Figure 19, emissions of directly emitted PM<sub>2.5</sub> are lower than emissions of NO<sub>x</sub> or VOC.

<sup>6</sup> <https://www.epa.gov/pm-pollution/pm25-naaqs-implementation-final-rule-and-fact-sheet-july-2016>

Figure 19. Make-up of 2013 Portola Nonattainment Area Baseline Emissions



The emission inventories suggest that PM<sub>2.5</sub> precursors, particularly VOC and NO<sub>x</sub>, are important contributors to the total emissions; however, chemical composition data suggests otherwise. Figure 19, for example, shows that approximately three quarters of the emissions are from precursors, but chemical composition data illustrated in Figure 20 indicates that only 7 percent of the mass is from secondary formation and the remaining 93 percent is from direct PM<sub>2.5</sub> emissions.<sup>7</sup> This apparent inconsistency is the result of meteorological conditions which favor accumulation of direct PM<sub>2.5</sub> over secondary formation. Furthermore, Portola precursor emissions are so low in comparison to other areas of the State, that there could be a lot of noise in the data. For example, Table 7 compares Portola NO<sub>x</sub> emissions to other areas of the State.

Table 7. Comparison of Portola NO<sub>x</sub> Emission to Other Areas in California

Area	NO <sub>x</sub> Emissions (tpd)
Portola Nonattainment Area	0.504
Sacramento County	46.565
Fresno County	77.086
Kern County	103.996

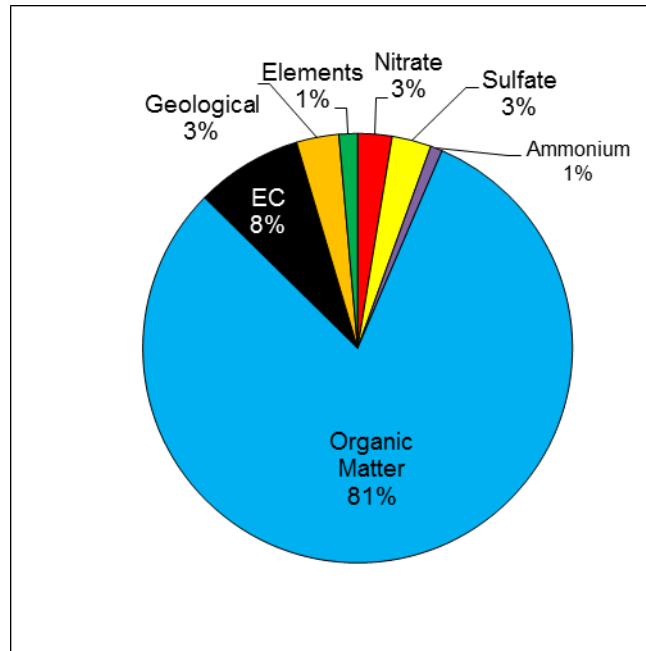
<sup>7</sup> 93 percent of PM<sub>2.5</sub> mass is directly emitted assuming that all of organic matter is primary in nature. Some organic matter is secondary in nature but since most of it originates from wood burning, control strategies aimed at reducing wood burning emissions will also reduce emissions of secondary organics.



## 1. Concentration-based Contribution Analysis

This section relies on chemical speciation data, summarized in Chapter II.C.1, Chemical Composition, to demonstrate contribution of a particular precursor to the  $PM_{2.5}$  design value. Figure 20 shows that directly emitted  $PM_{2.5}$  (organic matter, elemental carbon, geological material, and elements) contribute 93 percent of  $PM_{2.5}$  mass. For Portola it is appropriate to assume that most of the organic matter is directly emitted since diurnal profiles point to an overwhelming contribution of  $PM_{2.5}$  during nighttime hours, consistent with the time when the majority of people burn wood for heat. Although wood burning could lead to formation of Secondary Organic Aerosols (SOAs), relatively little is known about its formation, composition, and potential contribution to  $PM_{2.5}$  mass. It is safe to assume that controls aimed at reducing wood burning emissions would also reduce SOA formation. The paragraphs that follow examine each precursor.

Figure 20. 2013-2014 Annual Average Composition



### Sulfur Oxides - $SO_x$

Since sulfate can exist in the atmosphere in the form of sulfuric acid if it's not neutralized by ammonia, the  $SO_x$  contribution to  $PM_{2.5}$  design value is evaluated by estimating sulfate contribution to the  $PM_{2.5}$  design value. Sulfate contributes  $0.41 \mu\text{g}/\text{m}^3$  or 2.9 percent of the  $PM_{2.5}$  mass.

## Nitrogen Oxides - NO<sub>x</sub>

Since NO<sub>x</sub> contributes directly to ammonium nitrate formation, its impact on the PM<sub>2.5</sub> design value was evaluated by estimating the ammonium nitrate contribution.

Ammonium nitrate contributes 0.46 µg/m<sup>3</sup> or 3.3 percent to the PM<sub>2.5</sub> annual design value.

## Ammonia – NH<sub>3</sub>

Since in the absence of ammonia, nitrate would only exist as a gas, ammonia contribution to the PM<sub>2.5</sub> design value is represented by all measured ammonium plus nitrate ion. The two components together contribute 0.48 µg/m<sup>3</sup> or 3.4 percent to the PM<sub>2.5</sub> annual design value. Therefore, based on chemical speciation data, ammonia could potentially contribute 0.48 ug/m<sup>5</sup> or 3.4 percent to the annual design value.

## Volatile Organic Compounds - VOC

There are two routes by which VOCs can contribute to ambient PM<sub>2.5</sub>. The first is through various chemical reactions leading to the formation of SOAs. The second is through photochemical reactions that create oxidants such as ozone and hydroxyl radicals, which in turn oxidize NO<sub>x</sub> emissions leading to the formation of particulate ammonium nitrate. As noted above, ammonium nitrate is not a significant component of PM<sub>2.5</sub>. Therefore, the impact of VOC emissions on the PM<sub>2.5</sub> design value through nitrate formation is also insignificant. If there is any contribution of SOAs to ambient PM<sub>2.5</sub> levels, it would be mostly from biogenic emissions and mainly formed during summer when temperatures are warmer and concentrations are lowest. Man-made sources of SOA precursors include solvents, catalyst gasoline engines, wood smoke, and non-catalytic gasoline engines. Due to the lack of SOA data specific to Portola, we examined broader aspects of SOA concentrations in California:

- 1) San Joaquin Valley – ARB air quality modeling exercises conducted as part of the SJV 2008 PM<sub>2.5</sub> Plan attainment demonstration analysis using the CMAQ model showed that SOA derived from anthropogenic VOC emissions contribute three to five percent of the organic aerosol concentrations.<sup>8</sup> In Portola, the PMF model identified two sources of organic aerosols: wood burning and motor vehicles. Any controls targeting directly emitted PM<sub>2.5</sub> from wood burning would also reduce VOC emissions. Motor vehicle emissions contribute 1 µg/m<sup>3</sup> to the 5-year weighted design value. If three to five percent of that mass is from secondary formation, the total mass would be no more than 0.05 µg/m<sup>3</sup>.

---

<sup>8</sup> See Appendix A of ARB Review of San Joaquin Valley PM<sub>2.5</sub> State Implementation Plan (April 20, 2015): [http://www.arb.ca.gov/planning/sip/planarea/2015sjv/WOE\\_SJV\\_2015\\_PM25\\_Plan.pdf](http://www.arb.ca.gov/planning/sip/planarea/2015sjv/WOE_SJV_2015_PM25_Plan.pdf)

- 2) South Coast - Special study data collected in the South Coast Air Basin were used to estimate potential SOA concentrations in Portola.<sup>9</sup> The amount of SOA produced is related to both VOC emissions and meteorology. For the purpose of this estimate, ARB staff discounted the effect of meteorology, which results in a worst-case scenario estimate, and focused on comparing emissions. In Los Angeles, 304 tons per day of emissions could produce 0.65  $\mu\text{g}/\text{m}^3$  of SOA. In Riverside, 70 tons of emissions per day could produce 0.86  $\mu\text{g}/\text{m}^3$  of SOA. Since VOC emissions at Portola are less than 1 ton per day, it follows that the corresponding SOA concentrations should be less than 0.02  $\mu\text{g}/\text{m}^3$ .
- 3) IMPROVE Sites - The organic aerosol tracer tool located at the Western Regional Air Partnership (WRAP) Technical Support System (TSS) website (<http://vista.cira.colostate.edu/tss/>) can be used to investigate the contribution of primary and secondary anthropogenic and biogenic sources on modeled carbon at Class I areas. Annual average anthropogenic SOA concentrations at three California IMPROVE Sites (Bliss State Park, Trinity Alps, and Lava National Park) were estimated to be about 0.06  $\mu\text{g}/\text{m}^3$  for the 2002-2004 baseline.
- 4) There is discontinuity between the temporal patterns seen in SOA formation and  $\text{PM}_{2.5}$  concentrations at Portola. Both CMAQ model outputs and IMPROVE data demonstrate that SOA are formed mostly during summertime and are primarily derived from biogenic emission sources. During summer, when the conditions are optimal for SOA formation,  $\text{PM}_{2.5}$  organic carbon concentrations at Portola are very low and are essentially indistinguishable from background levels. Figure 21 compares Portola's monthly average OC concentrations to Bliss State Park. Based on this comparison, we may assume that the average SOA concentration at Portola is comparable to the 0.06  $\mu\text{g}/\text{m}^3$  estimated for the three IMPROVE sites.

---

<sup>9</sup> Heo, J.B., Dulger, M., Olson, M.R., McGinnis, J.E., Shelton, B.R., Matsunaga, A., Sioutas, C., Schauer, J.J., 2013. Source apportionments of  $\text{PM}_{2.5}$  organic carbon using molecular marker positive matrix factorization and comparison of results from different receptor models. *Atmos. Environ.* 73, 51-61.

Figure 21. Seasonal Patterns in Organic Carbon Concentrations at Portola and Bliss State Park.

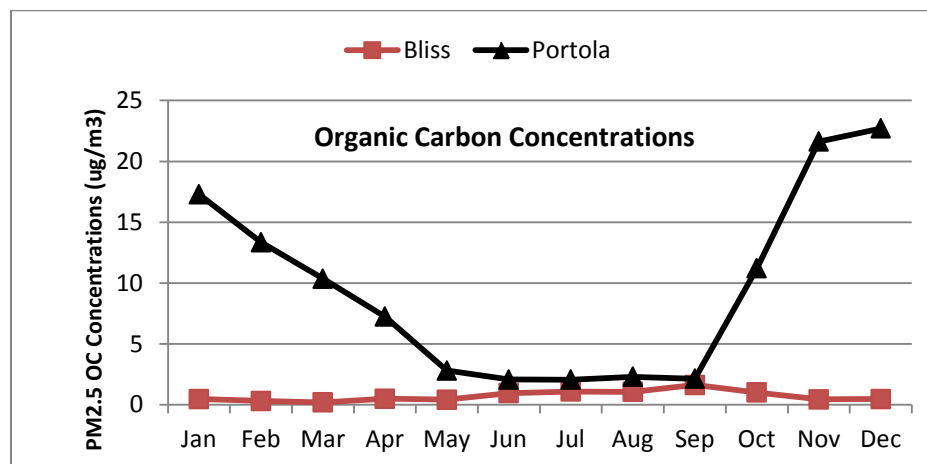


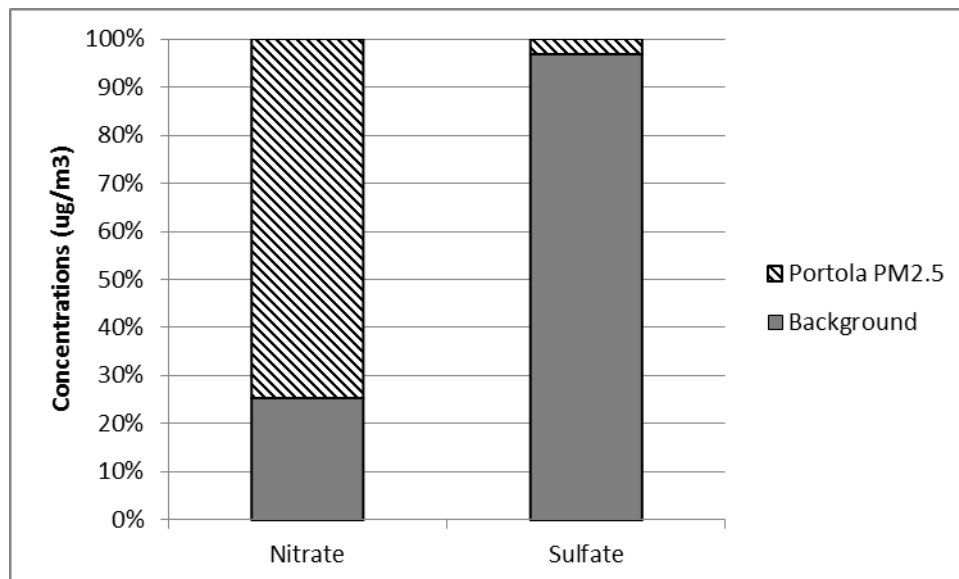
Table 8 summarizes each precursor contribution to the PM<sub>2.5</sub> design value.

Table 8. Contribution to the PM<sub>2.5</sub> design value based on 2013-2014 chemical composition data.

PM <sub>2.5</sub> Precursor	Assigned to PM <sub>2.5</sub> Species	Concentrations (µg/m <sup>3</sup> )	Scaled to DV (µg/m <sup>3</sup> )	% Of DV
NO <sub>x</sub>	Nitrate + Ammonium	0.58	0.46	3.3
SO <sub>x</sub>	Sulfate Ion	0.52	0.41	2.9
NH <sub>3</sub>	Ammonium	0.16	0.12	3.4
	Nitrate	0.45	0.35	
	Total	0.61	0.48	
VOC	SOA		0.06	0.4

It is important to note that concentrations of secondary components are close to the background levels and not likely to decrease much. As illustrated in Figure 22, background concentrations comprise 25 percent of nitrate and 97 percent of sulfate.

Figure 22. Comparison of Background Concentrations to Measured Concentrations for Select Secondary Components.



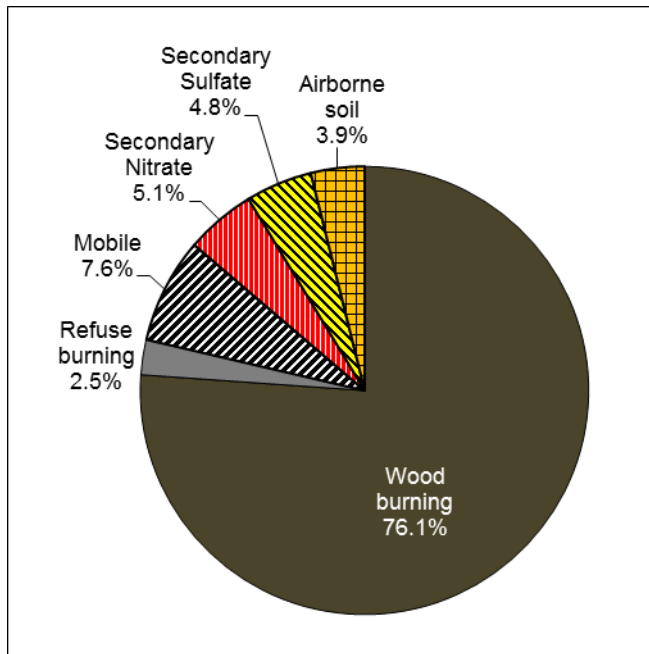
## 2. Sensitivity-based Contribution Analysis

The sensitivity-based analysis was used to demonstrate the degree to which concentrations in the Nonattainment Area are sensitive to decrease of a precursor. The PMF results which were used in the proportional rollback to demonstrate attainment are also used in the sensitivity analysis. PMF modeling identified two secondary components contributing to  $PM_{2.5}$  mass in Portola, secondary nitrate and secondary sulfate (Figure 23). As part of the sensitivity analysis, precursor emissions were reduced 10, 25, 30, 50, and 70 percent in the rollback model to evaluate the impact on the design value. Since PMF results do not separately include ammonium, ammonium was separated from ammonium nitrate and ammonium sulfate using stoichiometric proportions<sup>10</sup> and rolled against ammonia inventory. The same approach was used to estimate ammonium background concentrations using IMPROVE data.

---

<sup>10</sup> The ammonium fraction of ammonium nitrate is calculated as molecular weight of ammonium (18) divided by the molecular weight of ammonium nitrate (80). The ammonium fraction of ammonium sulfate is calculated as molecular weight of ammonium (36) divided by the molecular weight of ammonium sulfate (132). The combined ammonium fraction is the average of these two values.

Figure 23. 5-Year Weighted Average Annual PMF Source Contribution.



Assuming a 1-to-1 ratio for NO<sub>x</sub> to nitrate, SO<sub>x</sub> to sulfate, and ammonia to ammonium conversion, precursor emissions were reduced in the rollback model to evaluate the impact on the design value. As illustrated in Table 9, even significant reductions in ammonia and SO<sub>x</sub> emissions would have a negligible impact on the attainment year design value. NO<sub>x</sub> is the only precursor impacting the PM<sub>2.5</sub> design value. However the impact is very small, as a 30 percent reductions in NO<sub>x</sub> emissions would reduce the design value by only 0.16 µg/m<sup>3</sup>. If the 2021 attainment design concentrations were rounded, consistent with the NAAQS, 30 percent reductions in NO<sub>x</sub> emissions would yield 0.1 µg/m<sup>3</sup> reductions in design value. Furthermore, about 90 percent of NO<sub>x</sub> emissions in Portola come from the mobile sector that already has the most stringent controls in the nation. The remaining 10 percent comes from wood burning; a sector that will be targeted by the control measures included in this plan.

Table 9. Impact of Reducing Precursor Emissions on Attainment Year Design Value

Emission Reductions	Attainment Year Design Values (µg/m <sup>3</sup> )		
	NO <sub>x</sub>	SO <sub>x</sub>	Ammonia
10%	11.98	12.02	12.01
25%	11.89	12.00	11.99
30%	11.87	11.99	11.98
50%	11.75	11.97	11.95
70%	11.64	11.94	11.92

### 3. Conclusions

PM<sub>2.5</sub> concentrations in Portola are dominated by primary PM<sub>2.5</sub> emissions rather than by secondarily formed PM<sub>2.5</sub>. The comprehensive analysis of emissions, precursor contribution, and sensitivity-based contribution demonstrates that secondary formation is negligible compared with directly emitted PM<sub>2.5</sub> and reductions in emissions of PM<sub>2.5</sub> precursors would not expedite attainment. Portola will attain the standard by the end of 2021 by targeting directly emitted PM<sub>2.5</sub>. Implementing additional controls on precursors would not be effective in reducing PM<sub>2.5</sub> concentrations and would lead to insignificant air quality changes. We conclude that precursor controls do not need to be included in the evaluation of potential control measures.

#### D. Rollback Model

The method chosen to demonstrate attainment of the PM<sub>2.5</sub> annual and 24-hour NAAQS is a rollback proportional model. The proportional rollback model assumes a linear correlation between emissions and measured concentrations. It further assumes that any reductions from control strategies will result in corresponding reductions in emissions. As a result, concentrations in a future year (2021) can be predicted based on reductions in emissions, and their corresponding ambient concentrations, from the base year (2013). In the proportional rollback each source category is rolled individually against the corresponding emissions. The rollback model is an appropriate tool for demonstrating attainment in the Portola PM<sub>2.5</sub> Nonattainment Area for the following reasons:

- 1) The PM<sub>2.5</sub> mass in Portola is dominated by carbonaceous aerosols from wood smoke. Lack of natural gas and reliance on wood for heat combined with frequent temperature inversion and stagnant air leads to elevated PM<sub>2.5</sub> concentrations.
- 2) Photochemistry plays a minor role in PM<sub>2.5</sub> formation in Portola.
- 3) Secondary PM<sub>2.5</sub>, including sulfate, nitrate, and SOAs are minor constituents of the total PM mass.
- 4) Since the PM<sub>2.5</sub> problem in Portola is driven by local emissions sources and the small Nonattainment Area is located in a valley region with highly complex terrain, the use of a photochemical grid model is not appropriate. Specifically, the strong PM<sub>2.5</sub> spatial gradient resulting from local emissions sources and complex terrain would not be well characterized in a grid model and a model such as CMAQ would not reliably simulate the impacts of wood burning on PM<sub>2.5</sub> in the region.

Secondary PM<sub>2.5</sub>, including sulfate and nitrate will be included in the rollback model but with the assumption that any decline in emissions will not have any impact on PM<sub>2.5</sub> mass. However, any increase in emissions will result in a corresponding increase in PM<sub>2.5</sub>. This is the most conservative approach. The SOA was not identified as a separate source using PMF. Any contribution from SOA would be very small and it would be included as part of another source.

The attainment was demonstrated using both a standard and an alternative rollback model. Both models used the same data, but the alternative rollback used emission data in a limited capacity relying primarily on PM<sub>2.5</sub> source apportionment data.

## E. Traditional Rollback

### 1. PM<sub>2.5</sub> Source Categories

Thorough analysis of chemical composition data combined with analysis of diurnal and temporal patterns identified wood burning as the main contributor to the PM<sub>2.5</sub> mass. Section II summarizes analyses of ambient data. While analyses of ambient data can help identify major source categories, receptor models can provide quantitative information on ambient sources contributing to the observed PM<sub>2.5</sub>. In order to estimate source contributions at Portola, a PMF model was applied to 2011-2014 PM<sub>2.5</sub> speciated data. The model clearly identified six source types contributing to PM<sub>2.5</sub> in the area and assigned percent contributions to each source. For the purpose of the rollback, a five-year weighted average was calculated to match the design value calculation. The five-year average source contribution was scaled to the design value to estimate how much each component contributes to the design value. Figure 24 and Figure 25 illustrate annual and 24-hr source contributions, respectively, based on the PMF model results.



Figure 24. 2011-2015 Annual Average Source Contribution

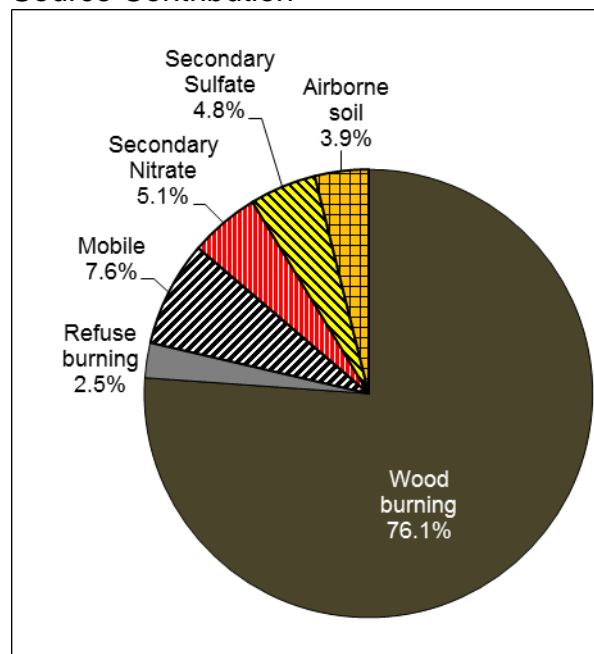
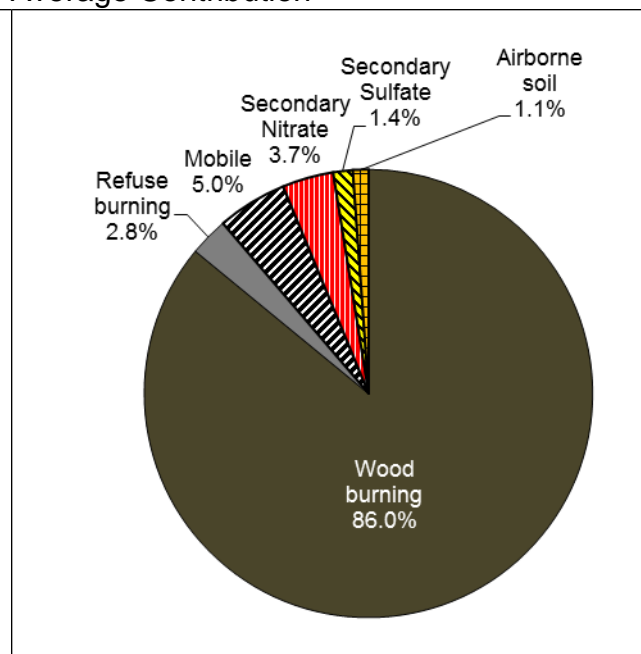


Figure 25. 2011-2015 Exceedance Day Average Contribution



## 2. PM<sub>2.5</sub> Emission Categories

Each PM<sub>2.5</sub> component was matched to the appropriate background concentrations and the corresponding emission categories as illustrated in Table 10.

Table 10. PM<sub>2.5</sub> Components, Background Concentrations, and Emission Categories used in Rollback Analysis.

PM <sub>2.5</sub> Component	PM <sub>2.5</sub> Contribution (µg/m <sup>3</sup> )	Background		Emission Category
		Component	Concentrations (µg/m <sup>3</sup> )	
Secondary nitrate	0.7	Ammonium Nitrate	0.15	NO <sub>x</sub>
Secondary sulfate	0.67	Ammonium Sulfate	0.54	SO <sub>x</sub>
Airborne soil	0.54	Fugitive Dust	0.38	PM <sub>2.5</sub> Airborne Soil
Mobile	1.06	EC	0.10	PM <sub>2.5</sub> Mobile
Wood burning	10.58	Organic Matter	0.99	PM <sub>2.5</sub> Total Burning
Refuse burning	0.35	N/A	N/A	Kept constant
Total	13.9		2.16	

### 3. Relating Changes in Emissions to Changes in Concentrations

The rollback model is based on the assumption that there is a direct correlation between emissions of a pollutant and measured concentrations of that pollutant in the same air shed, and that changes in emissions will result in corresponding changes in concentrations. This correlation is then used to predict future concentrations based on future emissions. The rollback model has two main parts: the emissions table and the concentrations table. The first step in calculating the attainment year PM<sub>2.5</sub> concentrations and design values is to estimate the anticipated increase or decrease in emissions from each source between 2013 (the base year) and 2021 (the attainment year). The same percentage of increase or decrease in emissions from each source is then applied to the base year contribution in order to estimate the attainment year contribution. The future PM<sub>2.5</sub> design value is determined by summing attainment year contributions for all of the components.

The major emission reductions necessary to demonstrate attainment will be achieved by implementing the wood stove change-out program. The EPA Burn Wise Wood Stove and Fireplace Emissions Calculator<sup>11</sup> was used to estimate the difference between PM<sub>2.5</sub> emissions of an uncertified wood stove and a U.S. EPA-certified wood stove. The inputs included the cumulative number of stoves changed-out (Table 11), the amount of wood burned per year (4.3 cords), and the wood density (1.04). The output included tons of PM<sub>2.5</sub> emissions saved annually. This value was divided by 365 days to estimate the tons of PM<sub>2.5</sub> emissions saved each day. The rollback was performed for each plan year separately to factor in the corresponding number of stoves credited towards attainment.

Table 11. The Relationship between the Number of Stoves Changed out and 2021 Attainment Year Design Value.

Year	Stoves Changed-out		Stoves Credited Towards Attainment	PM <sub>2.5</sub> Emission Avoided	
	Per Year	Cumulative		tons per year (tpy)	tons per day (tpd)
2016	100	100	0	0	0
2017	100	200	100	4.710	0.013
2018	150	350	200	9.423	0.026
2019	150	500	350	16.490	0.045
2020	100	600	500	23.557	0.065
2021	0	600	600	28.268	0.077
2022	0	600	600	28.268	0.077

<sup>11</sup> Currently available at [https://www.epa.gov/sites/production/files/2015-11/emissioncalculator\\_2.xlsx](https://www.epa.gov/sites/production/files/2015-11/emissioncalculator_2.xlsx)

#### 4. Future Year Estimate

Table 12 illustrates annual attainment demonstration using traditional proportional rollback model. The columns on the left list emissions, including 2013 base year emissions, 2021 projected attainment year emissions, anticipated reductions from the change-outs, and 2021 projected emissions with the change-outs. The percent change from the base year is calculated as follows:

$$\begin{aligned} & \textit{Percent Change from the Base Year} \\ &= (2013 \textit{ Base Year Emissions} - 2021 \textit{ Emissions with Change - outs}) \\ & \div 2013 \textit{ Base Year Emissions} \times 100\% \end{aligned}$$

The columns on the right show PM<sub>2.5</sub> concentrations for each component identified using PMF, scaled to the five year weighted average design value, followed by the background concentrations of that component. The mass available for rolling is estimated by subtracting background concentration from the mass assigned to each source. For example, the mass of ammonium nitrate (secondary nitrate) available for rolling is calculated by subtracting the background concentrations of ammonium nitrate. Concentrations of ammonium sulfate (secondary sulfate) available for rolling were calculated by subtracting ammonium sulfate background concentrations. Background concentrations of elemental carbon and organic matter were used to represent background concentrations for mobile sources and wood burning, respectively. Background concentrations of fugitive dust served as a background for airborne soil.

The future year contributions of each component were calculated by applying the percent change to the mass available for rolling and then adding background concentrations back, as shown in the equation below:

$$\begin{aligned} & \textit{Future Year Contribution} \\ &= \textit{Mass Available for Rolling} \times (1 - \textit{Percent Change from Base Year}) \\ & + \textit{Background Concentrations} \end{aligned}$$

The future year annual average concentrations were estimated by summing 'Future Year Contribution' for all of the components. The PM<sub>2.5</sub> concentrations for the last three years of the change-out program were averaged to estimate the 2021 design value. The small table at the bottom of Table 12 shows individual years included in calculating 2021 design value as well as the estimated design value.

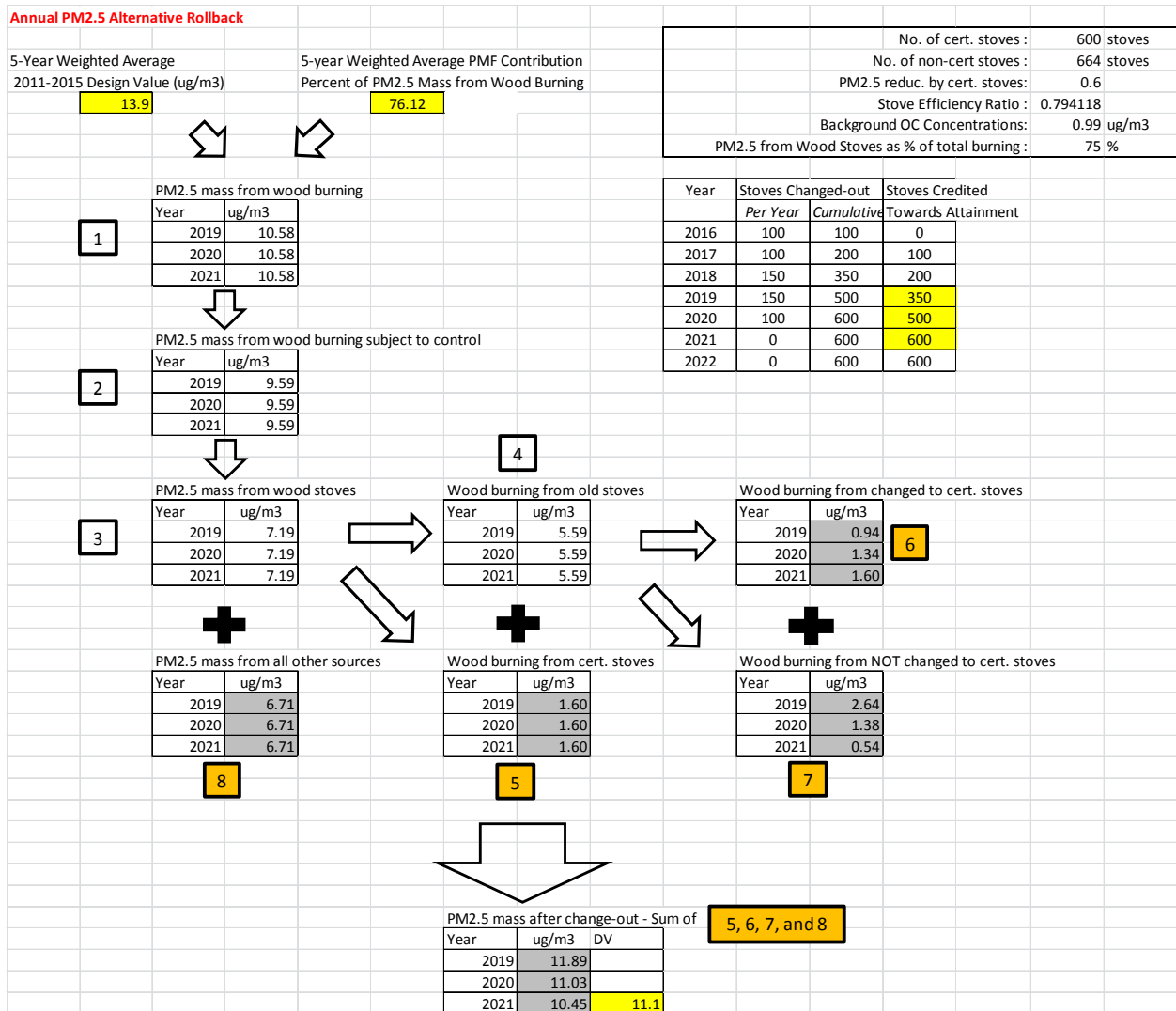
Table 12. Annual Rollback

PM2.5 Rollback for Demonstrating Attainment of the Annual Standard of 12 ug/m3										
Emissions (tpd)						Concentrations (ug/m3)				
	2013 Base Year (tpd)	2021 Projected Attainment Year (tpd)	Reduction from Changout (tpd)	2021 with Changeouts (tpd)	% Change from Base Year	Sources	PMF Contribution Scaled to DV	Background Conc.	Mass Available for Rolling	Future Year Contribution
<b>2017 - 100 Stoves Changed out</b>										
NOx	0.504	0.361		0.361	28.4%	Secondary nitrate	0.70	0.15	0.55	0.70
SOx	0.016	0.016		0.016	-1.3%	Secondary sulfate	0.67	0.54	0.12	0.67
Airborn Soil	0.076	0.079		0.079	-3.7%	Airborne soil	0.54	0.38	0.16	0.55
Mobile	0.015	0.009		0.009	39.2%	Mobile	1.06	0.10	0.96	0.68
Total Burning	0.399	0.399	0.013	0.386	3.3%	Wood burning	10.58	0.99	9.59	10.27
						Refuse Burning	0.35	N/A	0.35	0.35
						Total	13.90	2.16	11.74	13.22
<b>2018 - 200 Stoves Changed out</b>										
NOx	0.504	0.361		0.361	28.4%	Secondary nitrate	0.70	0.15	0.55	0.70
SOx	0.016	0.016		0.016	-1.3%	Secondary sulfate	0.67	0.54	0.12	0.67
Airborn Soil	0.076	0.079		0.079	-3.7%	Airborne soil	0.54	0.38	0.16	0.55
Mobile	0.015	0.009		0.009	39.2%	Mobile	1.06	0.10	0.96	0.68
Total Burning	0.399	0.399	0.026	0.373	6.5%	Wood burning	10.58	0.99	9.59	9.95
						Refuse Burning	0.35	N/A	0.35	0.35
						Total	13.90	2.16	11.74	12.91
<b>2019 - 350 Stoves Changed out</b>										
NOx	0.504	0.361		0.361	28.4%	Secondary nitrate	0.70	0.15	0.55	0.70
SOx	0.016	0.016		0.016	-1.3%	Secondary sulfate	0.67	0.54	0.12	0.67
Airborn Soil	0.076	0.079		0.079	-3.7%	Airborne soil	0.54	0.38	0.16	0.55
Mobile	0.015	0.009		0.009	39.2%	Mobile	1.06	0.10	0.96	0.68
Total Burning	0.399	0.399	0.045	0.354	11.3%	Wood burning	10.58	0.99	9.59	9.50
						Refuse Burning	0.35	N/A	0.35	0.35
						Total	13.90	2.16	11.74	12.45
<b>2020 - 500 Stoves Changed out</b>										
NOx	0.504	0.361		0.361	28.4%	Secondary nitrate	0.70	0.15	0.55	0.70
SOx	0.016	0.016		0.016	-1.3%	Secondary sulfate	0.67	0.54	0.12	0.67
Airborn Soil	0.076	0.079		0.079	-3.7%	Airborne soil	0.54	0.38	0.16	0.55
Mobile	0.015	0.009		0.009	39.2%	Mobile	1.06	0.10	0.96	0.68
Total Burning	0.399	0.399	0.065	0.334	16.3%	Wood burning	10.58	0.99	9.59	9.02
						Refuse Burning	0.35	N/A	0.35	0.35
						Total	13.90	2.16	11.74	11.97
<b>2021 - 600 Stoves Changed out</b>										
NOx	0.504	0.361		0.361	28.4%	Secondary nitrate	0.70	0.15	0.55	0.70
SOx	0.016	0.016		0.016	-1.3%	Secondary sulfate	0.67	0.54	0.12	0.67
Airborn Soil	0.076	0.079		0.079	-3.7%	Airborne soil	0.54	0.38	0.16	0.55
Mobile	0.015	0.009		0.009	39.2%	Mobile	1.06	0.10	0.96	0.68
Total Burning	0.399	0.399	0.077	0.322	19.3%	Wood burning	10.58	0.99	9.59	8.73
						Refuse Burning	0.35	N/A	0.35	0.35
			0.062			Total	13.90	2.16	11.74	11.68
The Design Value calculation is offset by one year to allow for full deployment of stoves in a prior year										
		Year	Stoves Credited	Annual Average (ug/m3)						
		2019	350	12.45						
		2020	500	11.97						
		2021	600	11.68						
		2021 DV		12.03						

## F. Alternative Rollback

In addition to the traditional rollback, attainment was also demonstrated using an alternative rollback model. The alternative rollback assumed that all of the sources remained constant between the base year and the attainment year except for wood stoves. Figure 26 illustrates annual attainment demonstration using the alternative rollback model. As a starting point, PM<sub>2.5</sub> mass from wood burning was estimated by multiplying the design value by the percent of PM<sub>2.5</sub> mass assigned to wood burning using PMF. The results of these calculations are presented in step 1. The goal of the next few steps was to determine the impact of planned change-outs on the PM<sub>2.5</sub> design value. First, since wood burning is the main source of organic matter in the area, background concentrations of organic matter were subtracted from the wood burning mass in step 1 and the results were presented in step 2. Since the wood burning category in PMF includes all potential sources of burning, including managed burning and disposal and burning in other devices like fireplaces, the next step involved subtracting PM<sub>2.5</sub> from non-wood stove sources from step 2. The wood stove contribution to the total PM<sub>2.5</sub> from wood burning was determined using the emission inventory data. The results are listed in step 3 and represent PM<sub>2.5</sub> concentrations that originate from wood stoves. These concentrations were further split between uncertified (step 4) and certified (step 5) stoves based on the emission inventory numbers. The PM<sub>2.5</sub> mass from the existing certified stoves in step 5 was kept constant while the PM<sub>2.5</sub> mass from the uncertified stoves in step 4 was recalculated for every year by factoring in the projected changes in the number of uncertified stoves due to the wood stove change-out program. The PM<sub>2.5</sub> mass generated by the stoves changed-out as part of the program was calculated in step 6 by applying 60 percent reductions in PM<sub>2.5</sub> and improvement in heating efficiency from 54 percent to 68 percent. Both of these numbers came from the EPA Burn Wise Wood Stove and Fireplace Emissions Calculator. The PM<sub>2.5</sub> mass generated by stoves not changed-out as part of the program was calculated in step 7. PM<sub>2.5</sub> mass from non-wood stove sources was calculated in step 8 as the difference between the design value and PM<sub>2.5</sub> mass from wood stoves. This mass includes all sources not related to wood burning, background concentrations, and wood burning from non-wood stove sources (managed burning and disposal and burning in fireplaces and pellet stoves.). The projected future design value was calculated by summing PM<sub>2.5</sub> concentrations from existing certified stoves (step 5), changed-out certified stoves (step 6), and old stoves remaining after the change-out has been completed (step 7), and non-wood stove PM<sub>2.5</sub> sources including background concentrations (step 8).

Figure 26. Alternative Annual Rollback.



## G. Demonstrating Attainment of the 24-hour Standard

While the Portola area has not been designated nonattainment for the 24-hour standard, the area's 24-hour design values have been above the standard since 2013. The current SIP demonstrates that while working towards attaining the annual standard, the area will also attain the 24-hour standard. The attainment of the 24-hour standard was demonstrated using both traditional and alternative rollbacks. The rollback methods were similar for the annual and the 24-hour attainment but the input data were selected to reflect 24-hour considerations as described below:

1. Since high PM<sub>2.5</sub> concentrations are limited to winter, winter emissions were used in the rollback.
2. Source contributions on a typical exceedance day were estimated using PMF.
3. PMF source contribution was scaled to 2013 five-year weighted average design value of 44 µg/m<sup>3</sup>.
4. Emission reductions associated with the wood stove change-out were calculated by multiplying annual emissions saved (estimated using EPA Burn Wise Wood Stove and Fireplace Emissions Calculator) by 18.2 percent to reflect contributions during peak winter months. The 18.2 percent was derived from the emission inventory seasonal profile for wood burning, indicating that peak winter months contribute 18.2 percent to the annual inventory. The monthly contribution estimated this way was divided by 31 days to estimate daily contribution.

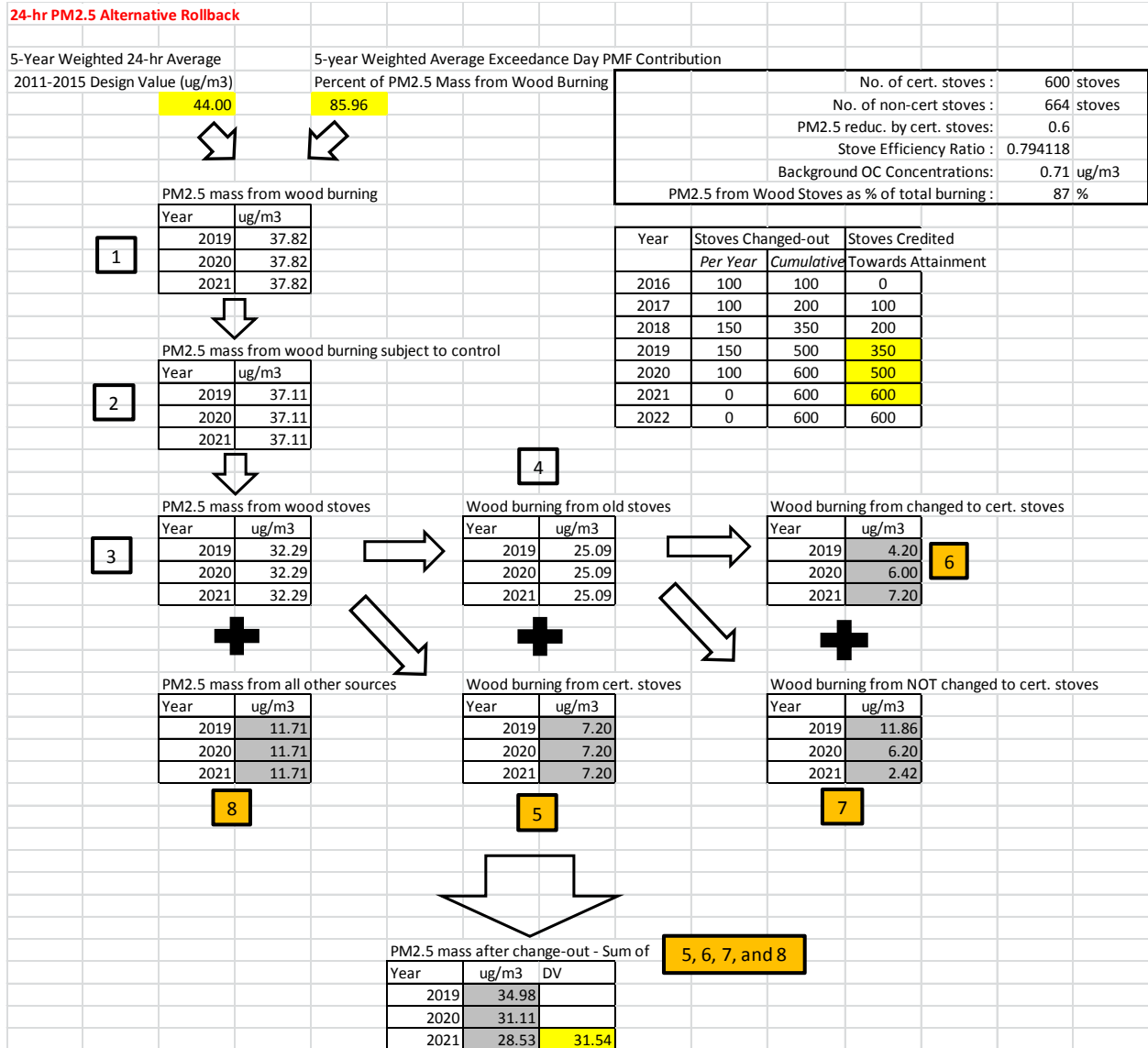
The remaining steps were similar for both the 24-hour and annual demonstrations. Results of traditional rollback are shown in Table 13 and alternative rollback in Figure 27.

Table 13. Traditional 24-hour Rollback

PM2.5 Rollback for Demonstrating Attainment of the 24-hr Standard of 35 ug/m3										
Emissions (tpd)					Concentrations (ug/m3)					
	2013 Base Year (tpd)	2021 Projected Attainment Year (tpd)	Reduction from Change-outs (tpd)	2021 with Change-outs (tpd)	% Change from Base Year	Sources	PMF Contribution Scaled to DV	Background Conc.	Mass Available for Rolling	Future Year Contribution
<b>2017 - 100 Stoves Changed out</b>										
NOx	0.548	0.401		0.401	26.9%	Secondary nitrate	1.62	0.08	1.54	1.62
SOx	0.024	0.024		0.024	-0.8%	Secondary sulfate	0.62	0.29	0.33	0.62
Airborn Soil	0.038	0.040		0.040	-6.4%	Airborne soil	0.50	0.15	0.35	0.52
Mobile	0.017	0.011		0.011	37.1%	Mobile	2.21	0.10	2.12	1.43
Total Burning	0.621	0.621	0.028	0.593	4.5%	Wood burning	37.82	0.71	37.11	36.16
						Refuse Burning	1.22	N/A	1.22	1.22
						Total	44	1.32	42.68	41.58
<b>2018 - 200 Stoves Changed out</b>										
NOx	0.548	0.401		0.401	26.9%	Secondary nitrate	1.62	0.08	1.54	1.62
SOx	0.024	0.024		0.024	-0.8%	Secondary sulfate	0.62	0.29	0.33	0.62
Airborn Soil	0.038	0.040		0.040	-6.4%	Airborne soil	0.50	0.15	0.35	0.52
Mobile	0.017	0.011		0.011	37.1%	Mobile	2.21	0.10	2.12	1.43
Total Burning	0.621	0.621	0.055	0.565	8.9%	Wood burning	37.82	0.71	37.11	34.50
						Refuse Burning	1.22	N/A	1.22	1.22
						Total	44	1.32	42.68	39.93
<b>2019 - 350 Stoves Changed out</b>										
NOx	0.548	0.401		0.401	26.9%	Secondary nitrate	1.62	0.08	1.54	1.62
SOx	0.024	0.024		0.024	-0.8%	Secondary sulfate	0.62	0.29	0.33	0.62
Airborn Soil	0.038	0.040		0.040	-6.4%	Airborne soil	0.50	0.15	0.35	0.52
Mobile	0.017	0.011		0.011	37.1%	Mobile	2.21	0.10	2.12	1.43
Total Burning	0.621	0.621	0.097	0.524	15.6%	Wood burning	37.82	0.71	37.11	32.02
						Refuse Burning	1.22	N/A	1.22	1.22
						Total	44	1.32	42.68	37.45
<b>2020- 500 Stoves Changed out</b>										
NOx	0.548	0.401		0.401	26.9%	Secondary nitrate	1.62	0.08	1.54	1.62
SOx	0.024	0.024		0.024	-0.8%	Secondary sulfate	0.62	0.29	0.33	0.62
Airborn Soil	0.038	0.040		0.040	-6.4%	Airborne soil	0.50	0.15	0.35	0.52
Mobile	0.017	0.011		0.011	37.1%	Mobile	2.21	0.10	2.12	1.43
Total Burning	0.621	0.621	0.138	0.482	22.3%	Wood burning	37.82	0.71	37.11	29.54
						Refuse Burning	1.22	N/A	1.22	1.22
						Total	44	1.32	42.68	34.97
<b>2021 -600 Stoves Changed out</b>										
NOx	0.548	0.401		0.401	26.9%	Secondary nitrate	1.62	0.08	1.54	1.62
SOx	0.024	0.024		0.024	-0.8%	Secondary sulfate	0.62	0.29	0.33	0.62
Airborn Soil	0.038	0.040		0.040	-6.4%	Airborne soil	0.50	0.15	0.35	0.52
Mobile	0.017	0.011		0.011	37.1%	Mobile	2.21	0.10	2.12	1.43
Total Burning	0.621	0.621	0.166	0.455	26.8%	Wood burning	37.82	0.71	37.11	27.89
						Refuse Burning	1.22	N/A	1.22	1.22
						Total	44	1.32	42.68	33.31
The Design Value calculation is offset by one year to allow for full deployment of stoves in a prior year										
		Year	Stoves Credited	98th Percetnile (ug/m3)						
		2019	350	37.45						
		2020	500	34.97						
		2021	600	33.31						
		2021 DV		35.24						



Figure 27. Alternative 24-hour Rollback



## H. Projected 2021 design values

Both the traditional rollback and alternative rollback demonstrate attainment of both PM<sub>2.5</sub> standards by December 31, 2021. The estimated 2021 design values are higher for the traditional rollback than the alternative. The traditional rollback relies on emission estimates while the alternative rollback relies primarily on the PM<sub>2.5</sub> data and uses the emission data in a limited capacity. Table 14 compares the 2021 design values calculated using the two methods. Since both methods demonstrate attainment of the standards, we can conclude that the area will attain the annual and the 24-hour standards by the end of 2021. The 2021 design values should be between 11.1 µg/m<sup>3</sup> and 12.0 µg/m<sup>3</sup> for the annual and between 32 µg/m<sup>3</sup> and 35 µg/m<sup>3</sup> for the 24-hour standards.

Table 14. 2021 Projected Design Values

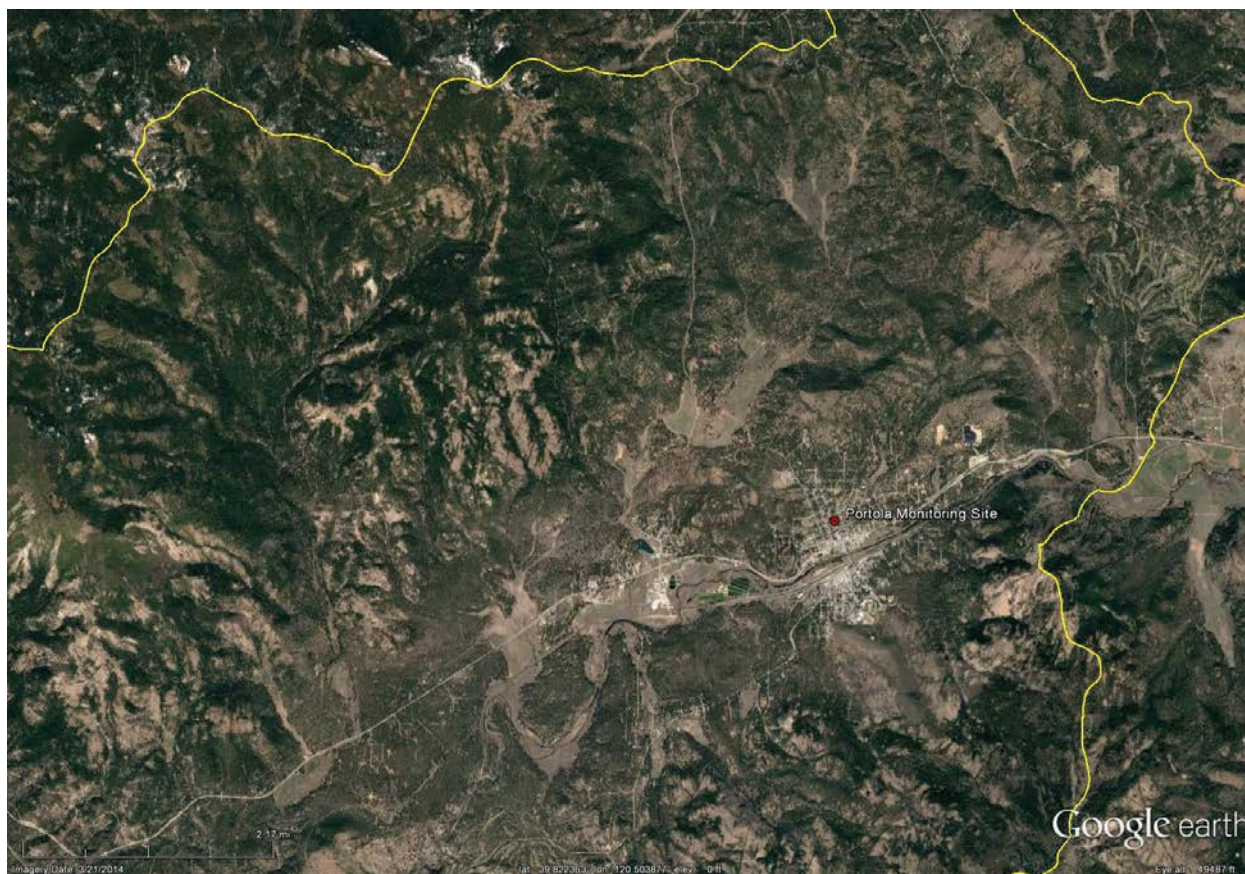
Rollback	Design Value (µg/m <sup>3</sup> )	
	Annual	24-hour
Traditional	12.0	35
Alternative	11.1	32

## I. Unmonitored Area Analysis

The PM<sub>2.5</sub> Implementation Rule requires the states to show attainment at all current and recent monitoring locations. The unmonitored area analysis is not required, but U.S. EPA recommends that all attainment demonstrations should contain an unmonitored area analysis. The District analyzed readily available geographic data to evaluate spatial variations in PM<sub>2.5</sub> emissions and concentrations.

Generally, emissions and concentrations are highest in area of highest population density. As illustrated in Figure 28, the housing is most dense in the City of Portola, where the monitor is located. The area outside of the City of Portola is sparsely populated.

Figure 28. Portola PM<sub>2.5</sub> Monitor in Relation to Housing Density



## VI. Additional Plan Elements

### A. Quantitative Milestones and Reasonable Further Progress

Under the PM<sub>2.5</sub> NAAQS Implementation Final Rule<sup>12</sup>, moderate area attainment plans must include the following:

- 1) An implementation schedule for control measures on sources in the Nonattainment Area.
- 2) RFP projected emissions for each applicable quantitative milestone year (for a moderate area at 4.5 years and 7.5 years after initial designation of the area).
- 3) An analysis that demonstrates that the schedule of emission changes achieves reasonable progress toward attainment between the applicable baseline year and the attainment year.

<sup>12</sup> <https://www.gpo.gov/fdsys/pkg/FR-2016-08-24/pdf/2016-18768.pdf>

Analyses for this plan demonstrate that 2021 is the most expeditious attainment date practicable for the Portola area. The baseline year is 2013 and the quantitative milestones years are 2019 and 2022.

This attainment plan is unusual because it is estimated that 93 percent of the reductions necessary for demonstrating attainment come from the wood stove change-out program. The remaining 7 percent originates from continuing reductions in direct PM<sub>2.5</sub> emissions from mobile sources. The District and the ARB began working towards improving air quality in the Portola area shortly after the PM<sub>2.5</sub> designations became effective in 2015. However, it was not until 2016 when the District finally had the necessary funding and the program infrastructure in place to reduce PM<sub>2.5</sub> through wood stove change-outs. By replacing 600 of the 664 uncertified wood stoves, the change-out program is anticipated to bring the area into attainment by the end of 2021. The District is implementing the program in a controlled manner necessary to accommodate the planned number of wood stove change-outs. The District is offering substantial financial incentives to homeowners in the Nonattainment Area for replacing an uncertified wood stove with an EPA certified stove. Recognizing that participation in the program is voluntary, the District has taken steps to induce local involvement. The District maintains a satellite office in Portola that will provide residents with direct, personal service, including assistance with filling out applications in English and Spanish. The District organized a series of community events, published information in papers and on the District website, and distributed flyers to advertise the program.

On June 8, 2016, the District adopted a rule which would make it illegal to burn in an uncertified stove when meteorological conditions favor PM<sub>2.5</sub> accumulation. This rule was designed to encourage owners of uncertified stoves to upgrade to certified stoves or risk not being able to heat their homes. The rule will take effect on January 1, 2021 to give homeowners enough time to change their stoves. To ensure steady progress towards attainment, the District is planning to change a set number of stoves per year, ranging from 100 to 150 as outlined in Table 15. As of July 12, 2016 approximately 30 installations, out of 100 scheduled for 2016, have been completed. Table 15 also lists the emission reduction to be accomplished as a result of wood stove change-out program.

Table 15. Number of Stoves Changed-out per Year and Associated Emission Reductions.

Year	Stoves Changed-out		Stoves Credited Towards Attainment	PM <sub>2.5</sub> Emission Avoided	
	Per Year	Cumulative		tpy	tpd
2016	100	100	0	0	0
2017	100	200	100	4.710	0.013
2018	150	350	200	9.423	0.026
2019	150	500	350	16.490	0.045
2020	100	600	500	23.557	0.065
2021	0	600	600	28.268	0.077
2022	0	600	600	28.268	0.077

In order to conservatively project the number of stoves changed out and the corresponding avoided emissions, we assumed that an uncertified stove is replaced with a standard Phase II EPA certified stove with 60 percent lower emissions. Most of the stoves that are being installed as part of this program are actually cleaner with 80 percent lower emissions; therefore, the actual emission reductions should be higher than projected. Since the majority of the change-outs will be completed during the summer months when homeowners are not heating their homes, concentrations during the second half of the year should be lower due to change-outs accomplished during summer. However, in order to come up with conservative reductions, only the change-outs accomplished during the prior year were factored into the projected emission reductions and the corresponding air quality benefits. This resulted in a one-year offset in projected reductions.

Due to the nature of the PM<sub>2.5</sub> problem in the area, the progress towards attaining the standards will be a combination of stepwise and linear progressions. The PM<sub>2.5</sub> Implementation Rule allows demonstrating slower than “generally linear” reductions for certain periods followed by sharp reductions. The analysis presented below demonstrates that after a period of fairly flat emissions during the development stage, between 2013 and 2016, the area will experience significant emission reductions during the phased-in implementation stage, between 2016 and 2021. The reductions will start to be seen in 2017 when the effects of the first year of change-outs will be reflected in the air quality and will continue through 2021 in a linear fashion. A complete wood stove change-out program involves an intensive effort to identify and educate potential applicants, review and process completed applications, coordinate the installation of new stoves along with the removal and destruction of the old stoves, and track the progress of the program at every step. Limited district resources, as well as initial public hesitance, necessitate a program that will replace the existing wood stoves in a

controlled and consistent manner. Table 16 shows projected annual changes in emissions from baseline year through the last milestone year, 2022.

Table 16. Directly Emitted PM<sub>2.5</sub> Inventory with Plan Control and RFP Calculations (tpd)

Description	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Baseline Inventory	0.490	0.490	0.490	0.489	0.489	0.487	0.487	0.486	0.486	0.487
Subtract Wood Stove Change-out	0.000	0.000	0.000	0.000	0.013	0.026	0.045	0.065	0.077	0.077
PM <sub>2.5</sub> Inventory After Plan Control Strategy	0.490	0.490	0.490	0.489	0.476	0.461	0.442	0.422	0.409	0.410
RFP Target	0.490	0.490	0.490	0.489	0.474	0.457	0.441	0.425	0.409	0.409
Emission Shortfall							0		0	0.0007

The baseline inventory of direct PM<sub>2.5</sub> emissions includes continuing reductions from the mobile sources control strategy. The emissions saved by changing-out wood stoves are subtracted from the baseline emissions to estimate PM<sub>2.5</sub> inventory after the plan control strategy. The difference between baseline emissions (0.490 tpd) and 2021 PM<sub>2.5</sub> inventory after plan control strategy (0.409) was divided by five years to estimate the daily emission reductions, assuming a uniform rate of progress over a five year window. We refer to this value as RFP increment. The following formula was used to calculate the RFP increment:

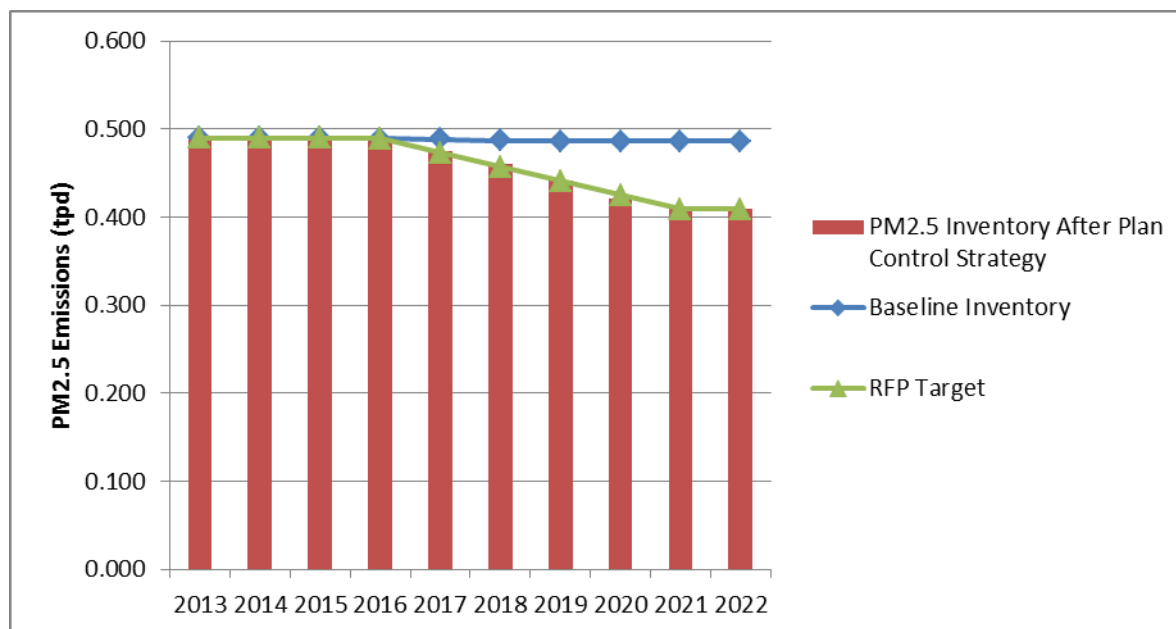
$$RFP \text{ Increment} = (2013 \text{ Baseline Emissions} - 2021 \text{ Attainment Emissions}) \div 5 \text{ Years}$$

The RFP increment includes the effects of motor vehicle controls built into the baseline emission inventory and the effects of wood stove change-outs. The RFP increment represents annual emission reductions required for demonstrating linear progress between the start of the wood stove change-out program and the attainment year. The RFP target, on the other hand, represents maximum total emissions meeting the demands of linear progress. The RFP target was calculated by multiplying the RFP increment by the number of years that passed since the start of the wood stove change-out and subtracting this value from the 2013 baseline inventory (0.490 tpd). For example, the RFP target for 2019 was calculated as follows:

$$2019 \text{ RFP Target} = 2013 \text{ Baseline Emissions} - RFP \text{ Increment} \times 3 \text{ Years}$$

Figure 29 compares the baseline emission inventory, inventory after control strategies are implemented, and RFP target. As illustrated in Figure 29, the progress is generally linear between 2016 and 2021. The very small increase in emissions in 2022 would have negligible impact on emissions, and emissions should remain fairly flat between the attainment year and the second milestone year, 2022.

Figure 29. Relationship between Baseline Inventory, Inventory After Plan Control Strategy, and RFP Target.



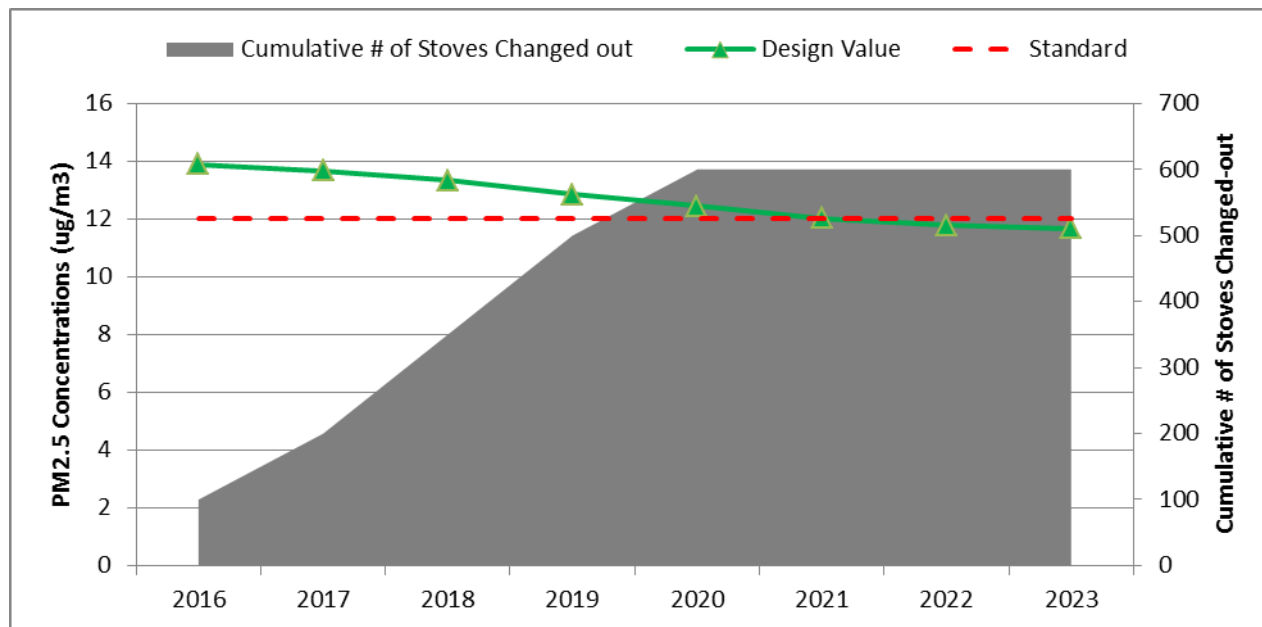
The control strategies included in the attainment plan were projected to provide direct PM<sub>2.5</sub> air quality benefits resulting in a 1.87 µg/m<sup>3</sup> reduction in the annual design value, to a 2021 modeled value of 12.03 µg/m<sup>3</sup>. Table 17 lists estimated PM<sub>2.5</sub> emissions and ambient concentration reductions by sector.

Table 17. Attainment Demonstration Strategy for Portola

Control Strategy	Projected Emission Reductions (tpd)
Baseline Design Value (2013)	
Wood stove change-out (2019-2021 Avg)	0.062
Mobile Strategies	0.006
Future Design Value (2021)	

Figure 30 illustrates the relationship between the number of stoves changed-out and the reductions in PM<sub>2.5</sub> design values. The area is projected to attain the standard with the 2021 estimated design value of 12 µg/m<sup>3</sup>. The design value will continue to decrease through 2023 at which point it is estimated to be 11.7 µg/m<sup>3</sup>.

Figure 30. Relationship between the Number of Stoves Changed-out and Annual Average PM<sub>2.5</sub> Concentrations.



U.S. EPA requires that all Moderate area PM<sub>2.5</sub> attainment plans must define appropriate quantitative milestones to be achieved 4.5 years and 7.5 years following designation of the area. In case of Plumas County PM<sub>2.5</sub> Nonattainment Area the quantitative milestones must be achieved by October 2019 and October 2022 and the reports are due to the U.S. EPA 90 days later, January 2020 and January 2023, for the first and second milestone, respectively. The District commits to tracking, quantifying, and reporting to the U.S. EPA progress toward attainment and adherence to milestone obligations 90 days after a given milestone (January 2020 and January 2023, respectively). Each report will include the following information:

- Certification that the SIP strategy is being implemented consistent with the RFP,
- Technical support, including calculations to document completion statistics for each quantitative milestone, and
- Discussion of whether the PM<sub>2.5</sub> NAAQS will be attained by the projected attainment day.

The first report due January 2020 will include a report on whether RACT/RACM controls have been fully implemented within four years of designation. Table 18 summarizes projected emissions for each quantitative milestone year by sector on a pollutant-by-pollutant basis, as required by the Implementation Rule. Since all of the reductions needed to attain the standard will come from directly emitted PM<sub>2.5</sub>, Table 18 includes only directly emitted PM<sub>2.5</sub>.



Table 18. RFP Projected Emissions for Quantitative Milestone Years (tpd)

Sector	2019	2022
Wood Stove Change-out	0.045	0.077
Total	0.045	0.077

The area is expected to reduce emissions of directly emitted PM<sub>2.5</sub> by 0.045 tpd by 2019 and 0.77 tpd by 2022. These milestones could be met by changing-out fewer stoves but replacing them with much cleaner devices. The District and the State are committed to implementing the wood stove change-out program and continuing the ongoing reductions in the mobile sector in order to achieve milestone and attainment obligations. The portion of the milestone associated with the wood stove change-out reflects enforceable commitments as outlined in Section IV.C. The small reductions in the mobile sector reflect the future implementation of ongoing State mobile source control programs.

In summary, the Portola Nonattainment Area faces a unique challenge, with 93 percent of reductions needed to meet the standard in 2021 achieved through the wood stove change-out program. In 2016 the District embarked on a comprehensive wood stove change-out program with a goal of changing out 600 of 664 uncertified stoves in the area. Due to the nature of the PM<sub>2.5</sub> problem in the area, the progress towards attaining the standards will be a combination of stepwise and linear progression. Between the baseline year and 2016, emissions remained flat while the District was setting up the wood stove change-out program. The program is estimated to bring a steady decrease in directly emitted PM<sub>2.5</sub> between 2016 and 2021. By the first milestone, 2019, the area is expected to reduce directly emitted PM<sub>2.5</sub> by 0.045 tpd. By the second milestone, 2022, the reductions will increase to 0.077 tpd.

## B. Contingency Measure

The District must identify contingency measures to be implemented in the event that the Plumas County PM<sub>2.5</sub> Nonattainment Area does not meet RFP or attain the 2012 annual PM<sub>2.5</sub> standard by the end of 2021. Attainment of this standard is determined based upon the 2021 annual PM<sub>2.5</sub> design values from the Portola monitor. The contingency measures for the attainment demonstration must provide for one year of reductions needed for RFP, based on the overall level of reductions needed to demonstrate attainment divided by the number of years from the base year to the attainment year.

The Plumas County PM<sub>2.5</sub> Nonattainment area will rely on reductions from the wood stove change-out program to deliver the majority of reductions needed to attain the standard. In addition, there will be a small reduction in PM<sub>2.5</sub> emissions from the future implementation of reductions in mobile sector. As shown in Table 19, the reductions

achieved between the base year, 2013, and the attainment year, 2021, are divided by eight years that span the period from the base year to the attainment year.

Table 19. Emission Reductions Needed for Attainment and Contingency (tpd)

Sector	Base Year 2013	Attainment Year 2021	Difference (2013 minus 2021)
Mobile Sector	0.015	0.009	0.006
Wood Stoves	0.332	0.270	0.062
Total	0.347	0.279	0.068
Contingency Requirement (1/8 <sup>th</sup> of the total reductions)			0.0085

Since the wood stove change-out program will be phased in over a five year period, annual emission reductions achieved during the last three years of the program are averaged to calculate emission reductions necessary to demonstrate attainment (Table 20).

Table 20. Calculating Average Reductions Achieved during the Last Three Years of the Wood Stove Change-out Program

Year	Stoves Changed-out		Stoves Credited Towards Attainment	PM <sub>2.5</sub> Emission Avoided	
	Per Year	Cumulative		tpy	tpd
2019	150	500	350	16.490	0.045
2020	100	600	500	23.557	0.065
2021	0	600	600	28.268	0.077
2019-2021 Average				22.772	0.062

The attainment demonstration discussed in Chapter V projects the area will attain the standard by the end of 2021. The District has identified control measures not included in the regional attainment demonstration modeling for the 2012 annual PM<sub>2.5</sub> standard to fulfill the contingency requirement should the area fail to demonstrate attainment by 2021. Attainment in 2021 is based on air quality data for 2019, 2020, and 2021. If air quality data through 2020 shows that they will fail to attain the standard in 2021, the District will implement the contingency measure. Starting on January 1, 2021 the District will implement a mandatory burning curtailment program. The goal of the mandatory burning curtailment program is to reduce accumulation of PM<sub>2.5</sub> on days with limited atmospheric dispersion. If the dispersion is limited and PM<sub>2.5</sub> has a potential to exceed 30 µg/m<sup>3</sup> the District will call a 'No Burn Day'. On a 'No Burn Day' burning will be prohibited unless certified stove will be utilized. In order to calculate whether the potential reductions from mandatory wood burning curtailment can provide enough emissions to satisfy attainment year contingency, the District assumed that the last 200 stoves can't be changed out as planned. This could potentially happen if the last 200

owners of uncertified stoves are opposed to having their old wood stoves replaced. Using the EPA Burn Wise Wood Stove and Fireplace Emissions Calculator<sup>13</sup> the District estimated that 200 uncertified stoves emit 13.68 tons of directly emitted PM<sub>2.5</sub> annually. Based on the PM<sub>2.5</sub> BAM data collected between January 1, 2013 and December 31, 2015 26 percent of days met the 30 µg/m<sup>3</sup> threshold for mandatory wood burning curtailment. Therefore, the estimated annual emissions would be reduced 26 percent, which equals to 3.56 tons. The annual reductions were divided by 365 days in a year to calculate the emission reductions in tons per day. The estimated reduction of 0.01 tons per day that could be achieved from the mandatory wood burning curtailment will serve as an attainment year contingency.

The attainment was demonstrated on a premise that an uncertified stove is replaced with a 60 percent cleaner certified stove. The District will adopt a policy that by October 31, 2018 the District will evaluate the progress towards meeting the RFP and attaining the standard by the end of 2021. If the District estimates that the emission reductions are short of projections and the District will not meet the 2019 RFP, the District will only incentivize pellet stoves, propane stoves, and wood stoves meeting the U.S. EPA Step 2 emission limits. The Step 2 test emission limits are 2 grams/hour (g/hr). For the purpose of estimating contingency measure, it was assumed that the actual emissions are 3 g/hr (50 percent higher compared to test emission). The emission rate of 3 g/hr is equal to emission factor of 4 lb/ton assuming a burn rate of 1.5 kg/hr. According to the wood stove change-out deployment schedule, 250 stoves are scheduled to be changed-out in 2019 and 2020. Using the emission factors of 30.6 lb/ton, 12 lb/ton, and 4 lb/ton for uncertified, Phase II certified, and Step 2 certified stoves, respectively, the District estimated that the difference between replacing 250 uncertified stoves with Phase II certified stove and Step 2 certified stove is 0.01 tpd. This difference will serve as 2019 milestone contingency. Table 21 lists data used in RFP contingency estimates.

Table 21. RFP Contingency Calculation

Certification	Emission Factor	Number of Stoves	Emissions	
			Annual tpy	Daily tpd
Uncertified	30.6	250	13.68	0.037
Phase II	12	250	5.37	0.015
Step 2	4	250	1.79	0.005
Difference between Phase II and Step 2			3.58	0.010

<sup>13</sup> Currently available at [https://www.epa.gov/sites/production/files/2015-11/emissioncalculator\\_2.xlsx](https://www.epa.gov/sites/production/files/2015-11/emissioncalculator_2.xlsx)

## C. Transportation Conformity

Section 176(c) of the CAA establishes transportation conformity requirements which are intended to ensure that transportation activities do not interfere with air quality progress. The CAA requires that transportation plans, programs, and projects that obtain federal funds or approvals *conform to* applicable SIP before being approved by a Metropolitan Planning Organization (MPO). Conformity to a SIP means that proposed activities must not:

- 1) Cause or contribute to any new violation of any standard,
- 2) Increase the frequency or severity of any existing violation of any standard in any area, or
- 3) Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

A SIP analyzes the region's total emissions inventory from all sources for purposes of demonstrating RFP, attainment, or maintenance. The portion of the total emissions inventory from on-road highway and transit vehicles in these analyses becomes the "motor vehicle emissions budget."<sup>14</sup> Motor vehicle emissions budgets are the mechanism for ensuring that transportation planning activities conform to the SIP. Budgets are set for each criteria pollutant or its precursors, and it is set for each RFP milestone year and the attainment year. Subsequent transportation plans and programs produced by transportation planning agencies are required to conform to the SIP by demonstrating that the emissions from the proposed plan, program, or project do not exceed the budget levels established in the applicable SIP.

### 1. PM<sub>2.5</sub> Requirements for Conformity

On April 25, 2007 EPA published in the Federal Register the *Clean Air Fine Particle Implementation Rule* (Final Rule) implementing the 1997 PM<sub>2.5</sub> NAAQS (see 72 FR 20586). The Final Rule addresses the types of motor vehicle emissions that must be addressed when setting transportation conformity budgets. In the Final Rule, EPA notes that: "RFP plans, attainment demonstrations, and maintenance plans must include a budget for direct PM<sub>2.5</sub> emissions, except for certain cases as described below. All PM<sub>2.5</sub> SIP budgets would include directly emitted PM<sub>2.5</sub> motor vehicle emissions from tailpipe, brake wear, and tire wear. States should also consider whether re-entrained road dust or highway and transit construction dust are significant

---

<sup>14</sup> Federal transportation conformity regulations are found in 40 CFR Part 51, subpart T – Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. of the Federal Transit Laws. Part 93, subpart A of this chapter was revised by the EPA in the August 15, 1997 Federal Register.

contributors and should be included in the PM<sub>2.5</sub> budget.” (72 FR 20645) The rule goes on to state that: ‘Under certain circumstances, directly emitted PM<sub>2.5</sub> from on-road mobile sources may be found an insignificant contributor to the air quality problem and NAAQS.’

The conformity rule applies for particles with aerodynamic diameter less than or equal to a nominal 2.5 micrometers (PM<sub>2.5</sub>). NO<sub>x</sub> must also be addressed as a precursor unless there is a finding of insignificance.

Section 93.102(b)(2)(iv and v) of the conformity rule also identifies VOC, SO<sub>x</sub>, and/or ammonia as PM<sub>2.5</sub> precursor pollutants that must also have a motor vehicle emissions budget if that precursor is deemed significant. In addition, Section 93.102(b)(3) identifies re-entrained road dust from paved and unpaved roads as PM<sub>2.5</sub> emissions that must also have a motor vehicle emissions budget if deemed significant. While the applicability section of the rule does not address fugitive dust from road construction specifically, the rule does indicate that the interagency consultation process should be used during the development of PM<sub>2.5</sub> SIPs to determine when construction emissions are a significant contributor.

## 2. The 2016 Final PM<sub>2.5</sub> Implementation Rule

On August 24, 2016 U.S. EPA published in the Federal Register (81 Fed. Reg. 58009) its Final PM<sub>2.5</sub> Implementation Rule (2016 Implementation Rule) establishing requirements for implementing the PM<sub>2.5</sub> NAAQS. The rule applies to areas designated nonattainment under the 1997, 2006 and 2012 PM<sub>2.5</sub> NAAQS, as well as to areas designated nonattainment under any future PM<sub>2.5</sub> NAAQS. The rule interprets statutory requirements that apply to such nonattainment areas under subparts 1 and 4 of the CAA. Under the 2016 Implementation Rule, SO<sub>x</sub>, NO<sub>x</sub>, VOC and ammonia are identified as PM<sub>2.5</sub> precursors to be presumptively addressed in attainment planning and permitting.

The 2016 Implementation Rule provides that precursors can be found insignificant through a comprehensive precursor analysis that examines the contribution of a precursor on the design value and its contribution to the emissions inventory, among other factors. Precursors found insignificant through the comprehensive precursor analysis process are presumed insignificant for transportation conformity and need no further analysis. Because the 2016 Implementation Rule did not amend the conformity regulations, the SIP can still determine that the remaining significant precursors in the on road emissions inventory are insignificant for transportation conformity by examining the precursors in light of the factors described below.

### 3. Factors for Determining Significance for Transportation Conformity

The conformity rule states that the following factors will be considered in making significance or insignificance findings for PM<sub>2.5</sub> precursors: the contribution of on-road emissions of the precursor to the total 2013 baseline SIP inventory; the current state of air quality for the area; the results of speciation monitoring for the area; the likelihood that future motor vehicle control measures will be implemented for a given precursor; and projections of future on-road emissions of the precursor.

Significance findings for re-entrained road dust emissions will be based on a review of the following factors: the contribution of road dust to current and future PM<sub>2.5</sub> nonattainment; an area's current design value for the PM<sub>2.5</sub> standard; whether control of road dust appears necessary to reach attainment; and whether increases in re-entrained dust emissions may interfere with attainment. Such a review would include consideration of local air quality data, air quality modeling results, or emissions modeling results.

### 4. Assessment of Significance

An analysis of precursors and their influence for transportation conformity in the Portola PM<sub>2.5</sub> nonattainment area (Portola NAA) concludes that VOC, SO<sub>x</sub>, NO<sub>x</sub>, Paved and Unpaved road dust, road construction dust and ammonia are insignificant precursors in the Portola NAA area and therefore this plan does not establish budgets for these pollutants. For directly emitted PM<sub>2.5</sub> from on road exhaust and tire and brake wear, the analysis concludes that although they contribute very little to the design value, the control of this precursor is necessary to demonstrate attainment. Therefore, this plan establishes motor vehicle emission budgets for primary emissions of PM<sub>2.5</sub> from vehicle exhaust, tire and brake wear. For further details regarding precursor significance, please see the detailed precursor analysis in Appendix P

### 5. Conformity Budgets

This plan includes an attainment demonstration for 2021. Annual average daily emissions are used in the plan consistent with the way the standard is measured. Consequently, conformity budgets have been set with annual average daily emissions in the attainment year of 2021.

The transportation conformity budgets developed for this plan are calculated with the California motor vehicle emissions model, EMFAC2014. U.S. EPA approved EMFAC2014 for use in transportation conformity and SIPs in December 2015. The budget was calculated by taking the default EMFAC output for Plumas County for 2021 and applying a factor to estimate the portion of emissions from the Plumas County

PM<sub>2.5</sub> Nonattainment Area. This factor is based on the ratio of inventory grid cells in the Nonattainment Area to the total number of inventory grid cells in the Plumas County, and is equal to 0.14. The result is then rounded upwards to the nearest 0.001 ton to obtain the budget.

The budget is consistent with the attainment demonstration with the additional 0.0004 ton per day of emissions from rounding. This is due to conservative assumptions in the attainment demonstration about future and current control measure effectiveness. Sections IV and V include detailed discussion about control strategy and attainment demonstration.

Table 22. 2021 Annual Average Conformity Budgets

Category	PM2.5 (tpd)
Direct exhaust, tire, and brake wear from on road vehicles*	0.0026
<b>Total</b>	<b>0.0026</b>
<b>Conformity Budget**</b>	<b>0.003</b>

\* Calculated from default EMFAC2014 v.1.07 output for Plumas county adjusted to reflect only the emissions from the Plumas County PM<sub>2.5</sub> Nonattainment Area. See text.

\*\* Budgets are rounded up to the nearest 0.001 ton.

The Plumas County PM<sub>2.5</sub> Nonattainment Area does not lie within, or share a border with any MPO, nor does any MPO model any projects within the Nonattainment Area. Therefore, the Nonattainment Area meets the definition in the transportation conformity rule for an isolated rural nonattainment area. The California Department of Transportation (Caltrans) performs many of the functions in isolated rural nonattainment areas that the conformity rule requires of MPOs. Isolated rural nonattainment areas have no federally required transportation plan or program. A regional emissions analysis is required only when a regionally significant project is proposed in the isolated rural area. For further details on isolated rural nonattainment areas and the transportation conformity requirements in those areas, see sections 93.101 and 93.109(g) of the federal transportation conformity rule.

## D. Reasonably Available Control Technology/Measures Analysis

### 1. Overview and Requirements

The CAA requires a demonstration that control measures in particulate matter nonattainment areas classified as moderate meet a control level known as Reasonable Available Control Technology (RACT) or Reasonable Available Control Measures (RACM).

42 U.S.C. Section 7502(c)(1) (Section 172(c)(1) of the CAA requires states with nonattainment areas to submit SIPs implementing emission controls that are economically and technologically feasible. Specifically, Section 172(c)(1) of the CAA states:

“in general – such plan provisions shall provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology).”

The District often uses the term “strategies” interchangeably with the term RACM. For the nonattainment area, the District is required to show it is implementing all RACM measures necessary to demonstrate attainment as expeditiously as practicable and within four years of nonattainment designation. Since the District determined that the Nonattainment Area can meet the standard by December 31, 2021, only a limited RACM analysis is required. (72 FR 20612).

The first step in considering RACT/RACM is the evaluation of sources contributing to the PM<sub>2.5</sub> problem in the area.

## 2. Reasonably Available Control Technology (RACT)

Emissions control technologies that meet EPA criteria for major stationary sources are known as RACT. The emission inventory analysis, conducted as part of RACT analysis, confirmed that there are no major stationary sources located in the Plumas County PM<sub>2.5</sub> Nonattainment Area; therefore there is no need to implement additional RACT controls

## 3. Reasonably Available Control Measure (RACM)

A reasonably available control measure, or RACM, is defined by the U.S. EPA as any potential control measure for application to area and mobile emission sources categories that is technologically and economically feasible, does not cause substantial widespread and long-term adverse impacts, and is not absurd, unenforceable, or impracticable. The Plumas County PM<sub>2.5</sub> Nonattainment Area RACM analysis was conducted to fulfill the requirements of Section (c)(1) of the CAA.

As demonstrated in Section V.C., Evaluation of Significant Precursors, precursors were found to contribute negligible amount to the PM<sub>2.5</sub> design value. Therefore, RACM analysis is not required for PM<sub>2.5</sub> precursors and will focus on directly emitted PM<sub>2.5</sub>. The PMF analysis identified three main sources of directly emitted PM<sub>2.5</sub>: residential burning contributing 78.6 percent of the design value (76.1 percent from wood burning and another 2.5 percent from refuse burning), mobile sources contributing 7.6 percent



of the design value, and airborne soil contributing 3.9 percent of the design value. Residential burning and mobile sources are clearly two categories that need to be considered as part of RACM analysis. When it comes to airborne soil, about 70 percent of concentrations measured at Portola originate outside of the Nonattainment Area and represent background concentrations. Therefore, anthropogenic emissions of airborne soil that could be subject to control in the Nonattainment Area are estimated to contribute  $0.16 \mu\text{g}/\text{m}^3$  or one percent to the annual design value. That contribution is considered insignificant and RACM analysis is not needed for the fugitive dust category. In the end, the RACM analysis needs to consider only burning and mobile sources.

With the focus on residential burning, a total of 26 potential control measures were compiled and reviewed to determine whether any of these measures could be considered RACM. The District and the City of Portola evaluated the potential measures, and identified many that did not meet all the RACM criteria; those that did meet the criteria are identified in Table 23. These measures do not result in severely disruptive socioeconomic impacts, particularly when addressing residential heating.

Table 23. Adopted RACM Measures for Area Sources

Strategy	Effective Date	Rule Number	Sources Affected
Wood Stove Change Out Program in Nonattainment Area	Apr-16	NA	Wood Burning Appliances
Prohibit the installation of uncertified devices in homes in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Prohibit the installation of EPA unqualified fireplaces in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Limit the number of EPA unqualified fireplaces in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Remove uncertified stoves upon the sale of a home in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Prohibit the sole source of heat as a wood burning device in new construction in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Prohibit the installation of hydronic heaters in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Limit the number of EPA certified wood stove to no more than two devices in new construction in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Limit the number of EPA certified wood stoves to no more than two in homes in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Prohibit the burning of garbage or unseasoned wood in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Require wood stove retailers to provide public education material to residents in Portola	Jun-16	Ordinance No. 344	Wood Burning Appliances
Mandatory curtailment of uncertified wood burning appliances on predicted poor air quality days in Portola	Jan-21	Ordinance No. 344	Wood Burning Appliances
District Open Burning Rules in Nonattainment Area	Oct-91	NSAQMD Rule 300 - 317	Outdoor Open Burning

## *Open Burning*

### **Current Control Measure – Open Burning**

The District enforces a mandatory open burning requirement through the District’s Open Burning Rules (Rules 300 – 317)<sup>15</sup>. The District smoke management program ensures that burning occurs on days with good dispersion to minimize the impact from PM<sub>2.5</sub> concentrations. These rules have been previously submitted to the U.S. EPA as part of the State-wide SIP.

The District’s open burning rules have requirements specific to different categories of allowed open burning; agricultural, range improvement, forest management, wildland vegetation management, land development clearing, road maintenance, hazard

<sup>15</sup> The Open Burning Rules can be accessed on the ARB website at <https://www.arb.ca.gov/drdb/hsi/cur.htm>.

reduction, and residential maintenance. Open burning can be the burning of yard debris in open burn piles on residential properties, or the disposal of timber harvest waste, promoting fire safety and maintaining forest health for land management burning (Forest Service, Bureau of Land Management, State Parks, etc.). The District enforces these regulations by issuing notices of violations to residents which include monetary penalties.

In general, open burning is only allowed on a permissive burn day (Rule 313) and it is illegal to cause a smoke nuisance (Rule 315). The District declares each day either a permissive burn day or a “no-burn” day for all open burning. These declarations are based upon a daily burn decision by the California Air Resources Board’s (CARB’s) Meteorology section. ARB makes these decisions based upon factors related to the ability of smoke from open burning to rise and disperse adequately. These factors include surface and upper-air temperatures and wind velocities, relative humidity, and anticipated forecast changes. For example, the presence of a strong temperature inversion is likely to result in a No-Burn day determination. The ability of smoke from open burning to rise and disperse adequately depends largely upon atmospheric stability at any given time and the influence of surrounding terrain.

Smoke Management Plans are required for burning over 10 acres in one day (Rule 316). It is prohibited for anyone to transport material from one location to another for the purpose of burning (Rule 311). It is prohibited to burn vegetation which has not undergone a minimum drying time (Rule 314) or to burn garbage (Rule 302).

### **Promoting Alternatives to Open Burning**

The District has proactively worked with local biomass facilities and waste management agencies and fire agencies to reduce the smoke impacts from open burning. Sierra Pacific Industries located in Loyalton was a biomass facility located just 26 miles from the nonattainment area. Due to the Air District’s recommendation, this facility received and processed yard waste from local residents until the facility shut down in 2011. Due to a recommendation from the Air District, the U.S. Forest Service purchased a large industrial grinder to process forest waste in lieu of burning specifically for land within the nonattainment area. Currently, there is no green waste curbside pick-up program in the Nonattainment Area.

### **Public Education for Open Burning**

The District has an extensive residential open burning public education program which discusses open burn requirements, proper methods of burning, alternatives to burning, and a focus on the illegal burning of garbage. To disseminate this information, the District regularly pays for advertisements in local papers, distributes various educational brochures throughout local fire agencies and community sites, and maintains extensive

public education information on the District website. On a daily basis, the District works with the ARB Meteorology Section to determine dispersion conditions and declares the burn day status on dedicated phone lines and posts the information on the District website. The District also includes general burning requirements and public information announcements on the same dedicated phone lines and website location to reach the audience that intends to open burn. Examples of the District's public education fliers are located in Appendix Q.

### **Future Control Measure – Prohibit Open Burning in the Nonattainment Area During Winter**

To further reduce PM<sub>2.5</sub> emissions during winter, the District commits to developing an open burning rule and taking it to the District Board by March 31, 2019. The District is currently assessing feasibility of establishing a green waste collection in the nonattainment area. This would allow the District to adopt an open burning rule similar to the current District rule 318<sup>16</sup> which prohibits open burning in the American Valley region from November 15 to March 15.

### **Open Burning Rules in Other Air Districts**

The Northern Sierra AQMD has a stricter rule that applies to the American Valley part of the District. Under this rule no open burning is allowed in the portion of the Valley known as Quincy and East Quincy. In the remainder of the Valley, no burning is allowed from November 15 through March 15. The District is planning to adopt a similar rule, prohibiting open burning during winter, in the Nonattainment Area in 2019. One issue that needs to be resolved is the green waste collection in the Nonattainment Area. In the portion of the District where the open burning is prohibited, green waste collection system is available. Plumas County PM<sub>2.5</sub> Nonattainment Area does not have a green waste collection system.

#### San Joaquin Valley APCD Rule 413

The San Joaquin Valley APCD Rule 4103 prohibits burning on days when PM<sub>2.5</sub> concentrations are projected to exceed 20 µg/m<sup>3</sup>. Once the District adopts the rule prohibiting open burning during winter, the new rule will be more stringent than Rule 4103.

#### Sacramento Metropolitan AQMD Rule 407

Rule 407 prohibits open burning in urbanized area but allows burning on a permissive burn days outside of the urbanized areas. The District rules are as strict as Rule 407.

---

<sup>16</sup> Rule 318 can be accessed on the ARB website at <https://www.arb.ca.gov/drdb/hsi/cur.htm>

## *Residential Fuel Combustion*

### **Current Control Measure – Wood Stove Change-out Program**

The District is conducting a comprehensive incentive-based wood stove change-out program. Between 2016 and 2020 600 uncertified wood stoves will be removed, destroyed, and replaced with cleaner burning units such as certified wood, pellet, propane, or kerosene stoves. Considering the socioeconomics of the area, the District is offering the most generous incentives offered by any district, up to full cost of change-out.

### **Wood Stove Change-out Programs in Other Districts**

Many districts throughout California have offered incentives for changing-out uncertified stoves. Most districts offered up to \$1,000 in incentives. Butte County APCD had the most generous program offering up to \$3,000 to income qualified individuals. The Northern Sierra APCD is offering the most generous incentives to date.

### **Current Control Measure - Portola City Ordinance 344– Regulation of Wood Stoves and Fireplaces**

On June 22, 2016, the Portola City Council adopted an ordinance for the regulation of wood stoves and fireplaces within the city limits. The ordinance established requirements for the sale, operation, and installation of wood burning devices. Under Ordinance 344, only U.S. EPA certified wood and U.S. EPA qualified fireplaces are allowed to be installed in new developments and remodels. The number of wood burning appliances in new homes is limited to one fireplace and two wood stoves. Wood is no longer allowed to be the only source of heat in new homes. Upon the sale of home all uncertified devices have to be removed from the property and destroyed. Installation of wood fired broilers and hydronic heaters is prohibited. The Ordinance dictates that only seasoned wood, manufactured logs, pellets and uncolored paper could be burned in wood stoves, fireplaces, and fire pits. Installers of wood burning devices are required to disseminate educational materials provided by the district on proper wood burning practices to their customers. Ordinance 344 also includes a mandatory wood burning curtailment program. The program will go into effect on January 1, 2021. Under this program burning in uncertified devices will be prohibited if air quality is forecast to exceed  $30 \mu\text{g}/\text{m}^3$ .

### **Expanding Ordinance 344 to the Entire Nonattainment Area**

At this moment, expanding the Ordinance 344 to the entire Nonattainment Area was not feasible. The District does not have sufficient funding to offer incentives that would cover the full cost of change-outs outside of the City of Portola. Residents may not

have sufficient resources to change-out stoves if incentives cover only partial cost of change-out. Setting burning restrictions in this area may jeopardize their health. In the future, expanding Ordinance 344 outside of the City limit will be contingent upon availability of more generous incentives for people residing outside the City limit. If additional funding becomes available in the future, the District will offer more generous incentives to residents living outside the City limit and consider expanding mandatory burning curtailment to the entire nonattainment area.

### Federal Regulations

On February 3, 2015, U.S. EPA finalized the amendments for New Source Performance Standards (NSPS) for New Residential Wood Heaters (40 CFR Part 60 Subpart AA). The 2015 NSPS significantly lowers the certification emission limits for wood burning heaters to 4.5 g/hr in Step 1 and 2.0 g/hr in Step 2. Ordinance 344 points to the NSPS for emission standards applicable to U.S. EPA certified wood stoves and is therefore as stringent as NSPS.

### **Similar Rules in Other Air Districts**

#### Burning Materials

The main difference between other district's rules and Ordinance 344 is that other districts list materials that can't be burned in a wood burning device while the Ordinance 344 lists only the materials that could be burned. Districts that list prohibited materials include Placer County APCD, Feather River APCD, Butte County APSC, Bay Area AQMD, and South Coast AQMD. Ordinance 344 accomplishes the same goal as other district's rules.

#### Sale of Unseasoned Wood

Ordinance 344 does not prohibit sale of unseasoned wood. South Coast AQMD is the only district which prohibits commercial wood sellers from selling unseasoned wood from July 1 through the end of February the following year. Most districts have regulations requiring that firewood offered for sale as seasoned wood must have no more than 20 percent moisture content. Bay Area AQMD requires that sale of unseasoned wood be accompanied by instructions on how to dry out the wood before combustion. Ordinance 344 instead focuses on the materials that could be burned in wood stove or fireplace. If a resident chooses to buy unseasoned wood, he or she is responsible for seasoning wood prior to burning. The District and the wood stove installers are responsible for educating public about the importance of burning seasoned wood and process of drying-out wood. Ordinance 344 is as strict as rules in other Districts.

## Mandatory Burning Curtailment

Under the San Joaquin Valley Air Pollution Control District Rule 4901 burning in uncertified devices is prohibited if PM<sub>2.5</sub> concentrations are forecasted to be between 20 µg/m<sup>3</sup> and 65 µg/m<sup>3</sup>. However, the wood burning curtailment does not apply to areas where natural gas is not available or to households where wood is a sole source of heat. Since the entire Nonattainment Area does not have access to the natural gas, the curtailment would not apply to this area. Ordinance 344 is stricter than the San Joaquin Valley APCD Rule 4901 because it prohibits burning in uncertified devices despite the fact that there is no natural gas in the Nonattainment Area. The South Coast Air Quality Management District Rule 445 establishes level of 30 µg/m<sup>3</sup> for mandatory wood burning curtailment. The rule prohibits all burning but the areas where wood is a sole source of heat are exempt, therefore the rule is not more stringent than Ordinance 344.

## Limits on the Number and the Type of Devices

The limits on the number and the type of devices are similar to other district's rules and appropriate for the area that does not have access to natural gas.

## *RACM Analysis for Mobile Source Control Program*

### **RACM Requirements at the State Level**

Subpart 1, section 172(c)(1) of the Act requires SIPs to provide for the implementation of RACM as expeditiously as practicable. U.S. EPA has interpreted RACM to be those emission control measures that are technologically and economically feasible and when considered in aggregate, would advance the attainment date by at least one year. Subpart 4, section 189(a)(1)(C) requires that states ensure that moderate nonattainment areas have RACM in place no later than four years after designation.

At the State level, ARB is responsible for measures to reduce emissions from mobile sources. This section will discuss how California's measures for these categories meet RACM requirements.

Given the severity of California's air quality challenges, ARB has implemented the most stringent mobile source emissions control program in the nation. ARB's comprehensive strategy to reduce emissions from mobile sources includes stringent emissions standards for new vehicles, in-use programs to reduce emissions from existing vehicle and equipment fleets, cleaner fuels that minimize emissions, and incentive programs to accelerate the penetration of the cleanest vehicles beyond that achieved by regulations alone. Taken together, California's mobile program meets RACM requirements in the context of ozone nonattainment.

## **Waiver Approvals**

While the Act preempts most states from adopting emission standards and other emission-related requirements for new motor vehicles and engines, it allows California to seek a waiver or authorization from the federal preemption to enact emission standards and other emission-related requirements for new motor vehicles and engines and new and in-use off-road vehicles and engines that are at least as protective as applicable federal standards, except for locomotives and engines used in farm and construction equipment which are less than 175 horsepower (hp).

Over the years, California has received waivers and authorizations for over 100 regulations. The most recent California standards and regulations that have received waivers and authorizations are Advanced Clean Cars (including ZEV and LEV III) for light-duty vehicles, and On-Board Diagnostics, Heavy-Duty Idling, Malfunction and Diagnostics System, In-Use Off-Road Diesel Fleets, Large Spark Ignition Fleet, Mobile Cargo Handling Equipment for heavy-duty engines. Other authorizations include Off-Highway Recreational Vehicles and the Portable Equipment Registration Program.

Finally, ARB obtained an authorization from U.S. EPA to enforce adopted emission standards for off-road engines used in yard trucks and two-engine sweepers. ARB adopted the off-road emission standards as part of its “Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles,” (Truck and Bus Regulation). The bulk of the regulation applies to in-use heavy-duty diesel on-road motor vehicles with a gross vehicle weight rating in excess of 14,000 pounds, which are not subject to preemption under section 209(a) of the Act and do not require a waiver under section 209(b).

## **Light- and Medium-Duty Vehicles**

Light- and medium-duty vehicles are currently regulated under California’s Advanced Clean Cars program including the Low-Emission Vehicle III (LEV III) and Zero-Emission Vehicle (ZEV) programs. Other California programs such as the 2012 Governor Brown Executive Order to put 1.5 million zero-emission vehicles on the road by 2025, and California’s Reformulated Gasoline program (CaRFG) will produce substantial and cost-effective emission reductions from gasoline-powered vehicles.

ARB is also active in implementing programs for owners of older dirtier vehicles to retire them early. The “car scrap” programs, like the Enhanced Fleet Modernization Program, and Clean Vehicle Rebate Project provide monetary incentives to replace old vehicles with zero-emission vehicles. The Air Quality Improvement Program (AQIP), is a voluntary incentive program to fund clean vehicles.



Taken together, California's emission standards, fuel specifications, and incentive programs for on-road light- and medium-duty vehicles represent all measures that are technologically and economically feasible in the context of a RACM assessment.

### **Heavy-Duty Vehicles**

California's heavy-duty vehicle emissions control program includes requirements for increasingly tighter new engine standards and address vehicle idling, certification procedures, on-board diagnostics, emissions control device verification, and in-use vehicles. This program is designed to achieve an on-road heavy-duty diesel fleet with 2010 engines emitting 98 percent less NO<sub>x</sub> and PM<sub>2.5</sub> than trucks sold in 1986.

Most recently in the ongoing efforts to go beyond federal standards and achieve further reductions, ARB adopted the Optional Reduced Emissions Standards for Heavy-Duty Engines regulation in 2014 that establishes the new generation of optional NO<sub>x</sub> emission standards for heavy-duty engines.

The recent in-use control measures include On-Road Heavy-Duty Diesel Vehicle (In-Use) Regulation, Drayage (Port or Rail Yard) Regulation, Public Agency and Utilities Regulation, Solid Waste Collection Vehicle Regulation, Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation, ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Heavy-Duty Diesel Vehicle Inspection Program, Periodic Smoke Inspection Program, Fleet Rule for Transit Agencies, Lower-Emission School Bus Program, and Heavy-Duty Truck Idling Requirements. In addition, ARB's significant investment in incentive programs provides an additional mechanism to achieve maximum emission reductions from this source sector.

Taken together, California's emission standards, fuel specifications, and incentive programs for heavy-duty vehicles represent all measures that are technologically and economically feasible in the context of a RACM assessment.

### **Off-Road Vehicles and Engines**

California regulations for off-road equipment include not only increasingly stringent standards for new off-road diesel engines, but also in-use requirements and idling restrictions. The Off-Road Regulation is an extensive program designed to accelerate the penetration of the cleanest equipment into California's fleets, and impose idling limits on off-road diesel vehicles. The program goes beyond emission standards for new engines through comprehensive in-use requirements for legacy fleets.

Engines and equipment used in agricultural processes are unique to each process and are often re-designed and tailored to their particular use. Fleet turnover to cleaner engines is the focus for these engines.

Taken together, California's comprehensive suite of emission standards, fuel specifications, and incentive programs for off-road vehicles and engines represent all measures that are technologically and economically feasible in the context of a RACM assessment.

### **Other Sources and Fuels**

The emission limits established for other mobile source categories, coupled with U.S. EPA waivers and authorization of preemption establish that California's programs for motorcycles, recreational boats and off-road recreational vehicles meet the requirements for RACM.

Cleaner burning fuels also play an important role in reducing emissions from motor vehicles and engines as ARB has adopted a number of more stringent standards for fuels sold in California, including the Reformulated Gasoline program, low sulfur diesel requirements, and the Low Carbon Fuel Standard. These fuel standards, in combination with engine technology requirements, ensure that California's transportation system achieves the most effective emission reductions possible.

Taken together, California's emission standards, fuel specifications, and incentive programs for other mobile sources and fuels represent all measures that are technologically and economically feasible in the context of a RACM assessment.

### **Mobile Source Summary**

California's long history of comprehensive and innovative emissions control has resulted in the most stringent mobile source control program in the nation. U.S. EPA has previously acknowledged the strength of the program in their approval of ARB's regulations and through the waiver process. In its 2011 approval of the San Joaquin Valley's 8-hour ozone plan which included the State's current program and new measure commitments, U.S. EPA found that there were no further reasonably available control measures that would advance attainment of the standard in the San Joaquin Valley.

In addition, U.S. EPA has provided past determinations that ARB's mobile source control programs meet Best Available Control Measure (BACM) requirements, which are more stringent than RACM, as part of their 2004 approval of the San Joaquin Valley's 2003 PM10 Plan:

“We believe that the State’s control programs constitute BACM at this time for the mobile source and fuels categories, since the State’s measures reflect the most stringent emission control programs currently available, taking into account economic and technological feasibility.”

Over time, ARB has continued to substantially enhance and accelerate reductions from our mobile source control programs through the implementation of more stringent engine emissions standards, in-use requirements, incentive funding, and other policies and initiatives as described in the preceding sections. The ARB process for developing the proposed State measures included an extensive public process and is consistent with U.S. EPA RACM guidance. Through this process, ARB found that there are no additional control measures reasonably available that would advance attainment of the 12 µg/m<sup>3</sup> PM<sub>2.5</sub> standard in the Portola PM<sub>2.5</sub> nonattainment area from emissions reductions associated with unused regulatory control measures. As a result, California’s mobile source control programs fully meet the requirements for RACM.

## References

Chow, J.C.; Watson, J.G.; Fujita, E.M.; Lu, Z.; Lawson, D.R.; Ashbaugh, L.L. (1994b). Temporal and spatial variations of PM<sub>2.5</sub> and PM10 aerosol in the Southern California Air Quality Study. *Atmos. Environ.*, **28**(12):2061-2080.

Chow, J.C.; Watson, J.G.; Lu, Z.; Lowenthal, D.H.; Frazier, C.A.; Solomon, P.A.; Thuillier, R.H.; Magliano, K.L. (1996). Descriptive analysis of PM<sub>2.5</sub> and PM10 at regionally representative locations during SJVAQS/AUSPEX. *Atmos. Environ.*, **30**(12):2079-2112.

Solomon, P.A.; Fall, T.; Salmon, L.G.; Cass, G.R.; Gray, H.A.; Davidson, A. (1989). Chemical characteristics of PM10 aerosols collected in the Los Angeles area. *J. Air Poll. Control Assoc.*, **39**(2):154-163.  
[http://pubs.awma.org/gsearch/journal/1989/2/39\\_02\\_154.pdf](http://pubs.awma.org/gsearch/journal/1989/2/39_02_154.pdf).

Weiss, Jennifer; (April 30, 2015). Opportunities for Reducing Smoke in The Portola, California Area. Prepared under fixed price purchase orders for EC/R Incorporated (prime contractor) EPA Contract EP-D-10-096, Work Assignments 5-04.

## Acknowledgements

The Northern Sierra Air Quality Management District would like to thank the members of the Portola City Council and the Portola Advisory Committee for their efforts at developing and adopting the City of Portola Wood Stove and Fireplace Ordinance aimed at reducing PM2.5 emissions in the community.

**Portola City Council Members**

- Bill Powers, Mayor
- John Larrieu, Mayor Pro Tem
- Michelle Gault, Council member
- Phil Oels, Council member
- Pat Morton, Council member

**Portola Advisory Committee Members**

- Robert Meacher, City of Portola City Manager
- Bill Powers, City of Portola Mayor
- Todd Roberts, City of Portola Public Works Director
- Karen Downs, City Planner
- Cal Patterson, City of Portola, Planning Commission

**Contributors to Technical Document**

***Northern Sierra Air Quality Management District***

- Gretchen Bennitt, Executive Director
- Julie Ruiz, Air Pollution Specialist II
- Sam Longmire, Air Pollution Specialist III
- Joe Fish, Deputy Executive Director

***State of California Air Resources Board***

- Kasia Turkiewicz, Air Resources Engineer
- Webster Tasat, Manager, Central Valley Air Quality Planning Section
- Sylvia Vanderspek, Branch Chief, Air Quality Planning Branch
- Eugene Kim, Air Resources Engineer
- Theresa Najita, Air Pollution Specialist
- Gabe Ruiz, Manager, Toxics Inventory and Special Projects Section
- Dennis Wade, Air Pollution Specialist

## Appendix A

### Positive Matrix Factorization Report

## Technical Report

### Source Apportionment of PM<sub>2.5</sub> Measured at the Portola Monitoring Site

Positive matrix factorization (PMF) is a multivariate source apportionment method that deduces source profiles as well as contributions from PM<sub>2.5</sub> speciation data. PMF is one of several EPA recommended receptor modeling methods (U.S. EPA, 2008). To identify major PM<sub>2.5</sub> sources affecting Portola monitoring site, PMF2 (bilinear PMF) was used in this study.

#### 1. Sample Collection and Data Screening

The analyzed PM<sub>2.5</sub> speciation samples were collected by Spiral Aerosol Speciation Samplers (SASS; Met One Instruments, Grants Pass, OR) at Portola SLAMS (State and Local Air Monitoring Stations) network monitoring site located in the Plumas County.

Comparing PM<sub>2.5</sub> data measured by the speciation sampler and the collocated Federal Reference Method (FRM) sampler in Figure 1 shows reasonable agreement using 205 data between 2011 and 2014 (*slope* = 1.10, *Intercept* = 0.45,  $r^2$  = 0.98).

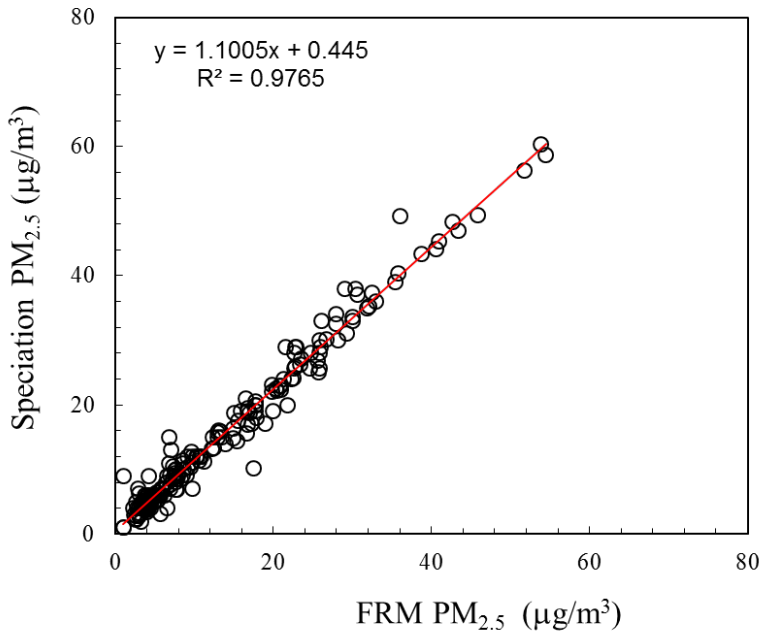


Figure 1. FRM PM<sub>2.5</sub> versus Speciation PM<sub>2.5</sub> between 2011 and 2014.

Since a carbon denuder that minimizes positive sampling artifact caused by adsorption of gaseous organic materials was not included upstream of quartz filter in the SASS samplers, a positive organic carbon (OC) artifact concentration was estimated utilizing the intercept of the regression of OC concentrations against PM<sub>2.5</sub> concentrations (Tolocka et al. 2001, Kim et al. 2005). Samples for which PM<sub>2.5</sub> or OC concentration had an error flag and samples for which

the PM<sub>2.5</sub> or OC data were not available were excluded from the regression analysis between PM<sub>2.5</sub> and OC concentration. Using 208 samples out of 289 samples between 2011 and 2014, the intercept -1.07 μg/m<sup>3</sup> in PM<sub>2.5</sub> regression against OC concentration indicates no positive OC artifact at the Portola site (Figure 2).

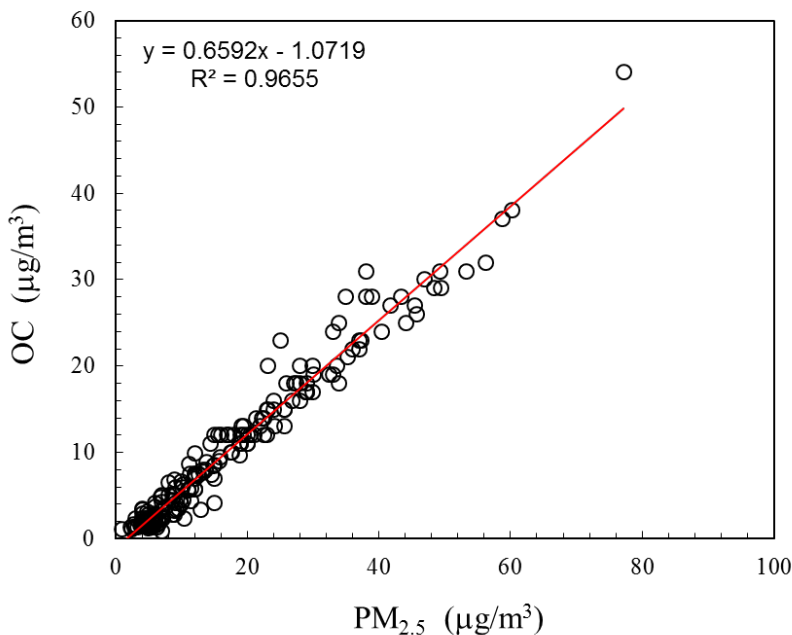


Figure 2. OC artifact estimation: PM<sub>2.5</sub> concentrations versus OC concentrations.

For the source apportionment, 93 samples out of 289 samples were excluded from the data set for which the PM<sub>2.5</sub>, OC, or EC data had an error flag, or for which PM<sub>2.5</sub>, OC or EC data were not available. 14 samples for which sum of all measured species were larger than PM<sub>2.5</sub> concentrations or sum of all measured species were less than 50% of PM<sub>2.5</sub> concentrations were excluded. Overall, 37% of the data were excluded in this study.

For the chemical species screening, X-Ray Fluorescence (XRF) S was excluded from the analyses to prevent double counting of mass concentrations since XRF S and Ion Chromatography (IC) SO<sub>4</sub><sup>2-</sup> were highly correlated (*slope* = 2.77, *r*<sup>2</sup> = 0.96). Due to the higher analytical precision compared to XRF K, IC K<sup>+</sup> were included in the analyses. 17 chemical species below minimum detection level (MDL) values more than 90% were excluded. XRF Mn that has Signal-to-Noise (*S/N*) ratio below 0.2 was excluded (Paatero and Hopke, 2003). Thus, a total of 182 samples and 16 species including PM<sub>2.5</sub> mass concentrations collected between 2011 and 2014 were analyzed. A summary of PM<sub>2.5</sub> speciation data is provided in Tables 1.

Table 1. Summary of PM<sub>2.5</sub> species mass concentrations at Portola.

Species	Arithmetic mean ( $\mu\text{g}/\text{m}^3$ )	Geometric mean ( $\mu\text{g}/\text{m}^3$ )	Minimum ( $\mu\text{g}/\text{m}^3$ )	Maximum ( $\mu\text{g}/\text{m}^3$ )	Number of below MDL <sup>1</sup> values (%)	S/N ratio <sup>2</sup>
PM <sub>2.5</sub>	17.4154	12.5563	2.4000	77.2000	0	NA <sup>3</sup>
OC	10.4044	6.5457	1.1000	54.0000	0	NA
EC	1.3912	0.8275	0.1000	6.2000	0	NA
SO <sub>4</sub>	0.4999	0.4157	0.0900	2.3000	5.5	49.6
NO <sub>3</sub> <sup>-</sup>	0.4410	0.3166	0.0570	4.4300	0	NA
NH <sub>4</sub> <sup>+</sup>	0.1585	0.1071	0.0250	1.2000	19.2	15.9
Al	0.0223	0.0145	0.0075	0.1800	62.1	1.7
Br	0.0014	0.0011	0.0010	0.0050	75.8	0.4
Ca	0.0318	0.0257	0.0035	0.2000	1.6	270.2
Cl	0.0252	0.0138	0.0035	0.1500	27.5	12.4
Cr	0.0021	0.0017	0.0015	0.0510	89.0	0.3
Fe	0.0453	0.0360	0.0060	0.2300	0	NA
K <sup>+</sup>	0.0862	0.0770	0.0650	0.4230	84.1	0.3
Si	0.1245	0.0940	0.0110	0.6300	0	NA
Ti	0.0039	0.0029	0.0020	0.0220	55.5	1.2
Zn	0.0041	0.0030	0.0010	0.0180	25.3	7.6

<sup>1</sup> Minimum detection level

<sup>2</sup> Signal-to-noise ratio (Paatero and Hopke, 2003)

<sup>3</sup> not available (infinite S/N ratio caused by no below average MDL value)

The application of PMF2 depends on the estimated uncertainties based on the analytical uncertainties for each of the measured data. Since the SLAMS data were not accompanied by analytical uncertainties, the fractional uncertainties suggested for PMF2 analysis by Kim et al (2005) were used (Table 2).

Table 2. Estimated fractional uncertainties<sup>1</sup> for SLAMS data at Portola.

Species	Fractional uncertainty	Species	Fractional uncertainty
---------	------------------------	---------	------------------------



OC	0.07	Cl	0.10
EC	0.07	Cr	0.05
SO <sub>4</sub>	0.07	Fe	0.05
NO <sub>3</sub> <sup>-</sup>	0.07	K <sup>+</sup>	0.07
NH <sub>4</sub> <sup>+</sup>	0.07	Si	0.10
Al	0.10	Ti	0.05
Br	0.05	Zn	0.05
Ca	0.11		

<sup>1</sup> Kim et al. (2005)

To assign input data for PMF2, the procedure of Polissar et al. (1998) is used. The measurement values are used for the input concentration data, and the sum of the analytical uncertainty and one-third of the detection limit value is used as the input uncertainty data assigned to each measured value. Concentration values below the detection limit are replaced by half of the detection limit values, and their input uncertainties are set at five-sixth of the detection limit values. Missing values are replaced by the geometric mean of the measured values for each species, and to down-weight these replaced data and then to reduce their influence on the solution, their accompanying uncertainties are set at four times of this geometric mean value.

## 2. Results and Discussions

The final solutions were chosen based on the evaluation of the resulting source profiles as well as the quality of the chemical species fits by testing different numbers of sources, different species down-weighting, and different rotational parameter (FPEAK) values (Paatero et al., 2002). The global optimums of the solutions were tested by using twenty random starts in the iterative fitting process.

A six-source model without matrix rotation (rotational parameter FPEAK = 0) provided the most physically interpretable sources for the Portola site: Wood burning, mobile, secondary nitrate, secondary sulfate, airborne soil, and refuse burning. As recommended by Paatero and Hopke (2003), which is to down-weight the variable in the analysis so that the noise does not compromise the solution, the estimated uncertainties of Al, Br, Cr, K<sup>+</sup>, and Ti that have S/N (Signal-to-noise) ratios between 0.2 and 2 (weak variable) were increased by a factor of five. Mobile and refuse smoke were merged in a source in the five-source model. In the seven-source model, an uninterpretable source was separated from the refuse smoke.

Figure 3 and Table 3 present average source contributions, percentiles and mass concentrations, respectively. The pie chart showing increased wood burning contributions on high (> 35 µg/m<sup>3</sup>) PM<sub>2.5</sub> days indicates that wood burning leads to high (> 35 µg/m<sup>3</sup>) PM<sub>2.5</sub> days at Portola.

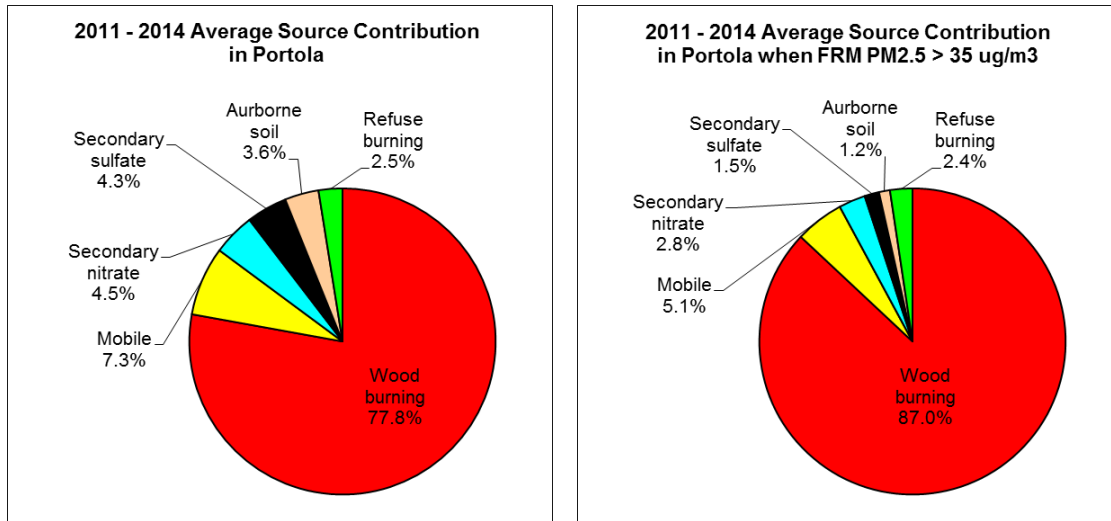


Figure 3. Average source contributions between 2011 and 2014.

Comparisons of the reconstructed  $PM_{2.5}$  mass contributions (sum of contributions from all sources) with measured  $PM_{2.5}$  mass concentrations in Figure 4 shows that the resolved sources effectively reproduce the measured values and account for most of the variation in the  $PM_{2.5}$  mass concentrations ( $slope = 0.92, r^2 = 0.97$ ). The source profiles, corresponding source contributions, monthly variations of source contributions, and weekday/weekend variations are presented in Figures 6 through 9.

Table 3. Average source contributions ( $\mu g/m^3$ ) to  $PM_{2.5}$  mass concentration.

Sources	Average source contribution ( $\pm$ 95 % distribution)
Wood burning	13.12 (1.80)
Mobile	1.23 (0.22)
Secondary nitrate	0.75 (0.17)
Secondary sulfate	0.72 (0.09)
Airborne soil	0.60 (0.08)
Refuse burning	0.42 (0.07)
Estimated $PM_{2.5}$ ( $\mu g/m^3$ )	16.85 (1.92)
Measured $PM_{2.5}$ ( $\mu g/m^3$ )	17.42 (2.06)

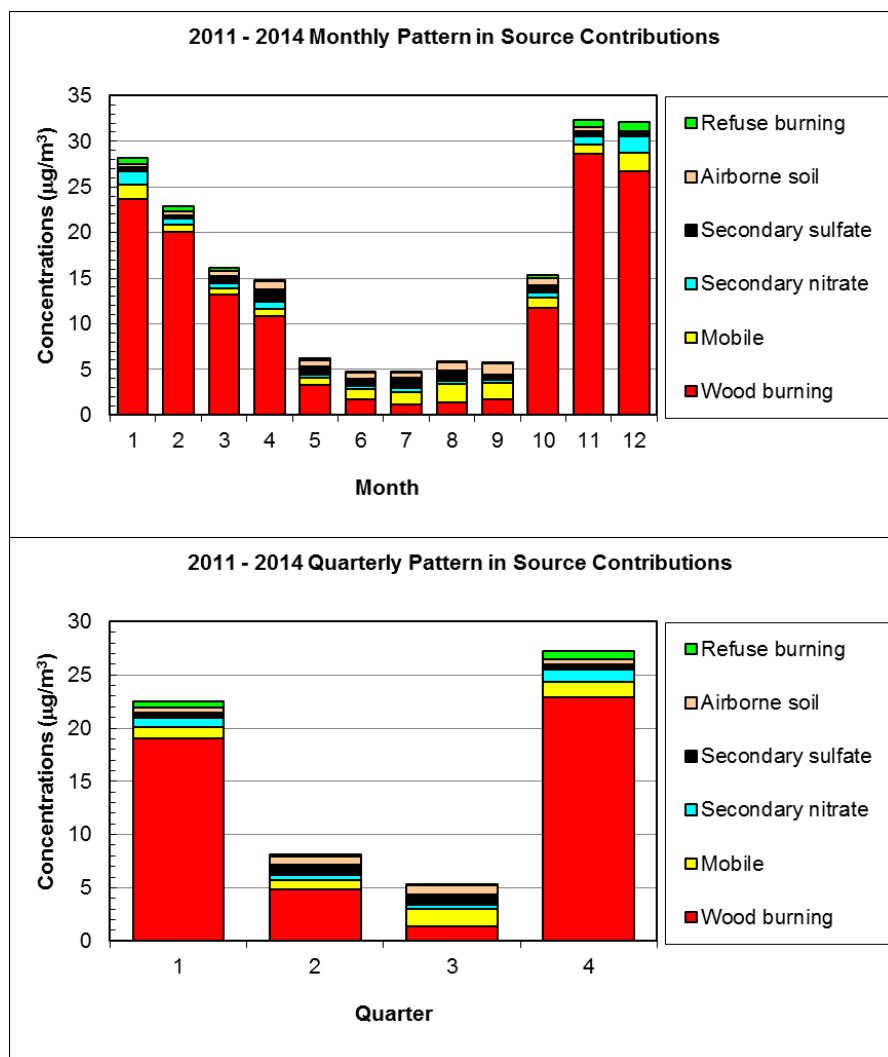


Figure 4. Monthly and quarterly average source contributions between 2011 and 2014.

Wood burning contributed the most accounting for 77.8% of the  $PM_{2.5}$  concentration at Portola between 2011 and 2014. It was a predominant  $PM_{2.5}$  source contributing 10 times more than the next major source (i.e., Mobile) at Portola. Wood burning was characterized by OC, EC, and  $K^+$  (Watson et al., 2001). Wood burning category reflects contributions from residential wood burning and cooking. Wood burning shows a winter-high trend suggesting that it was mostly contributed by wood burning for residential heating. Wood burning at Portola shows weak weekend-high contribution trends.

Mobile source was identified by its high concentration of OC and EC, and minor species such as Fe (Watson et al., 1994). The average contributions from mobile source to  $PM_{2.5}$  concentration was 7.3% at Portola. Mobile source shows summer (August) and winter (December-January)-high seasonal trends. It does not show weekday/weekend variation.

Secondary nitrate has high concentrations of  $NO_3^-$  and  $NH_4^+$ . It consists of  $NH_4NO_3$  and several minor species such as secondary OC and EC that transport together. It contributed 4.5% of the  $PM_{2.5}$  concentrations. Secondary sulfate has high concentrations of  $SO_4^{2-}$  and  $NH_4^+$  and accounts for 4.3% of the  $PM_{2.5}$  concentration at Portola. Secondary nitrate has winter-high trend.

In contrast, secondary sulfate shows strong seasonal variation with higher concentrations in summer when the photochemical activity is highest. Both secondary particles do not show weekday/weekend variations.

Airborne soil has high concentrations of Si, Fe, Al and Ca. It contributed 3.6% of the  $PM_{2.5}$  concentration at Portola. The airborne soil category reflects wind-blown dust as well as re-suspended crustal materials by road traffic as indicated by the presence of EC and  $SO_4^{2-}$  in the source profile in Figure 6. Airborne soil contribution at Portola showed spring and fall high variation (Figure 8). The weekday high variation shown in Figure 9 indicates the airborne soil at Portola mostly came from anthropogenic activities.

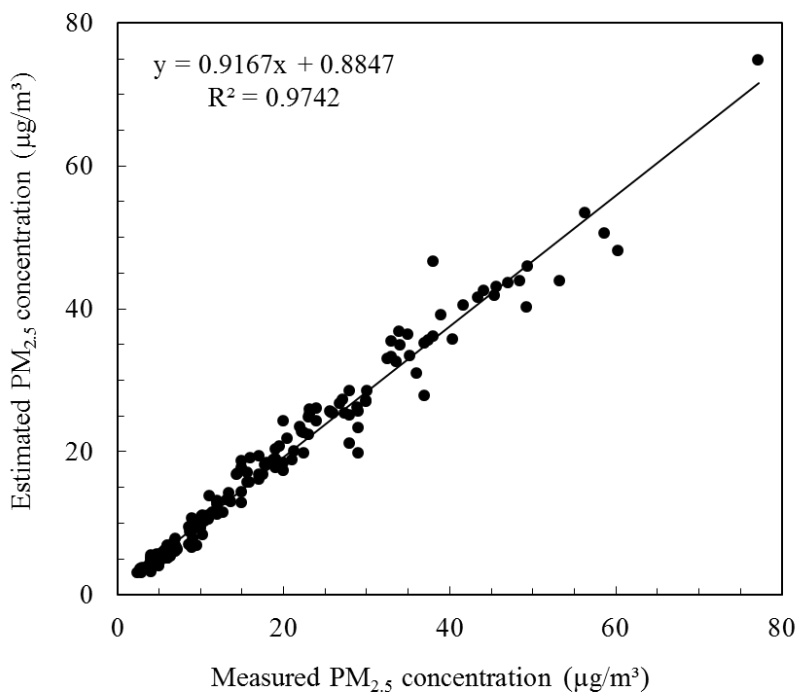


Figure 5. Measured versus PMF2 predicted  $PM_{2.5}$  mass concentrations.

Refuse burning is characterized by OC, Cl, and  $K^+$  (Christian et al., 2010; Hodzic et al., 2012; Li et al., 2012). Refuse burning category reflects contributions from burning of wood as well as garbage. The high Cl concentration in this source likely reflects burning of polyvinyl chloride in garbage. Higher contributions from refuse burning in winter shown in Figure 8 indicate that it mostly came from heating sources. It contributed 2.5% to the  $PM_{2.5}$  mass concentration at Portola and does not show weekday/weekend variations.

### 3. Conclusions

$PM_{2.5}$  speciation data collected at the Portola monitoring site between 2011 and 2014 were analyzed. Using PMF2, the multivariate source apportionment tool, six major  $PM_{2.5}$  sources were identified: Wood burning, mobile, secondary nitrate, secondary sulfate, airborne soil, and refuse burning. This analysis showed that most of the  $PM_{2.5}$  at Portola was originated from wood burning.

#### 4. References

- Christian, T. J., Yokelson, R. J., Cárdenas, B., Molina, L. T., Engling, G., Hsu, S.-C., Trace gas and particle emissions from domestic and industrial biofuel use and garbage burning in central Mexico, *Atmos. Chem. Phys.*, 10, 565–584, 2010.
- Hodzic, A., Wiedinmyer, C., Salcedo, D., Jimenez, J.L., Impact of Trash Burning on Air Quality in Mexico City, *Environmental Science and Technology*, 46, 4950-4957, 2012.
- Kim, E., Hopke, P.K. and Qin, Y. Estimation of organic carbon blank values and error structures of the speciation trends network data for source apportionments, *Journal of Air and Waste Management Association* 55, 1190–1199, 2005.
- Li, G., Lei, W., Bei, N., and Molina, L. T., Contribution of garbage burning to chloride and PM<sub>2.5</sub> in Mexico City, *Atmos. Chem. Phys.*, 12, 8751–8761, 2012.
- Paatero, P., Hopke, P.K., Song, X.H., and Ramadan, Z. Understanding and Controlling Rotations in Factor Analytic Models, *Chemometrics and Intelligent Laboratory Systems*, 60, 253e264, 2002.
- Paatero, P., Hopke, P.K. Discarding or downweighting high-noise variables in factor analytic models, *Analytica Chimica Acta*, 490, 277-289, 2003.
- Polissar, A.V., Hopke, P.K., Paatero, P., Malm, W.C. and Sisler, J.F. Atmospheric Aerosol over Alaska 2. Elemental Composition and Sources, *Journal of Geophysical Research*, 103, 19045-19057, 1998.
- Tolocka, M.P., Solomon, P.A., Mitchell, W., Norris, G.A., Gemmill, D.B., Wiener, R.W., Vanderpool, R.W., Homolya, J.B. and Rice, J. East versus west in the US: Chemical characteristics of PM<sub>2.5</sub> during the winter of 1999, *Aerosol Science and Technology* 34, 88-96, 2001.
- US Environmental Protection Agency. EPA Positive Matrix Factorization (PMF) 3.0 Fundamentals & User Guide (EPA 600/R-08/108). Research Triangle Park, NC. July 2008. Available on Internet at [http://www.epa.gov/heads/documents/EPA\\_PMF\\_3.0\\_User\\_Guide.pdf](http://www.epa.gov/heads/documents/EPA_PMF_3.0_User_Guide.pdf)
- Watson, J.G., Chow, J.C., Lowenthal, D.H., Pritchett, L.C. and Frazier, C.A. Differences in the carbon composition of source profiles for diesel and gasoline powered vehicles, *Atmospheric Environment* 28(15), 2493-2505, 1994.
- Watson, J.G., Chow, J.C., Houck, J.E., PM<sub>2.5</sub> chemical source profiles for vehicle exhaust, vegetative burning, geological material, and coal burning in northwestern Colorado during 1995, *Chemosphere*, 43, 1141–1151, 2001.

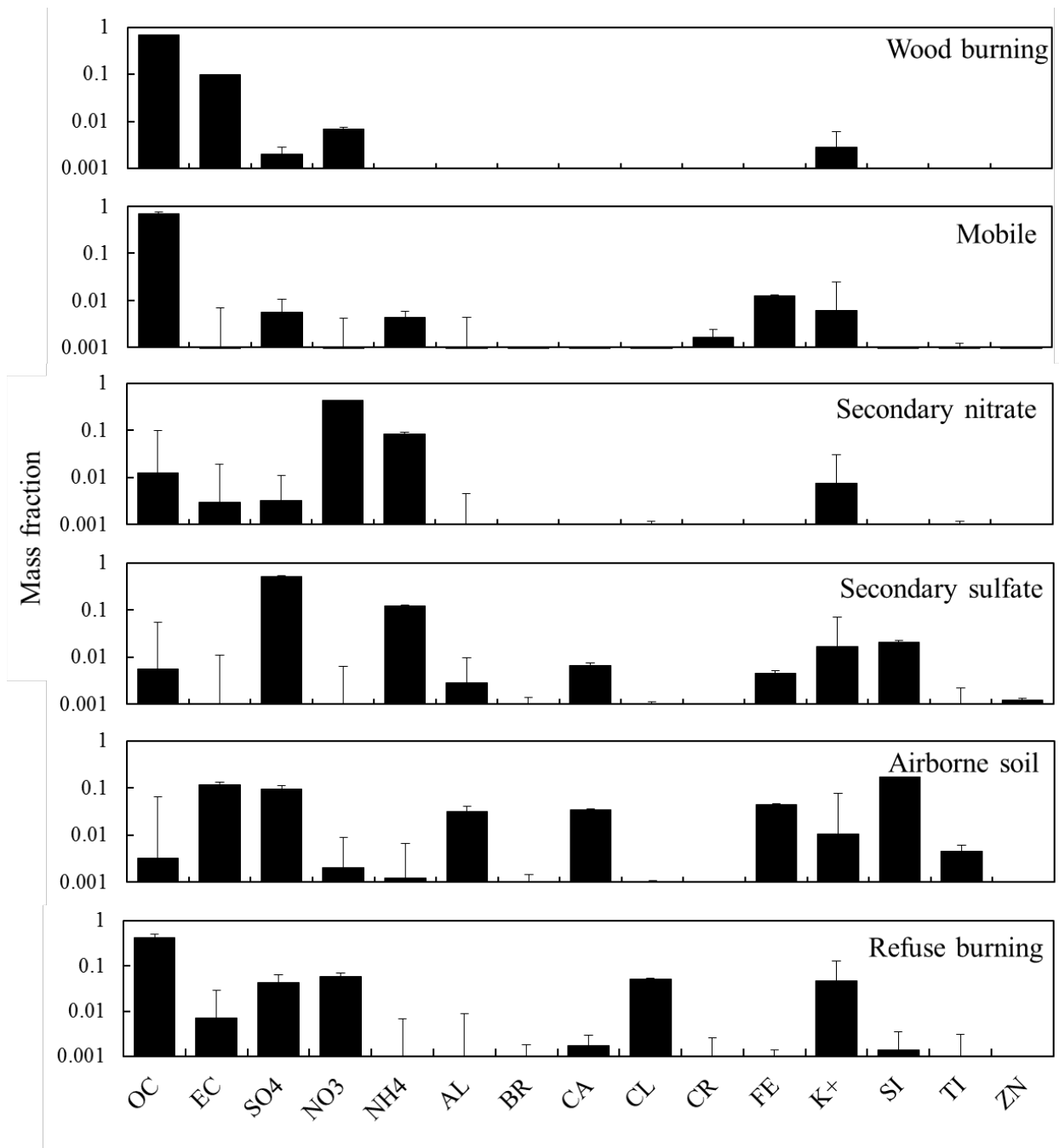


Figure 6. Source profiles deduced from PM<sub>2.5</sub> samples measured at Portola (prediction ± standard deviation).

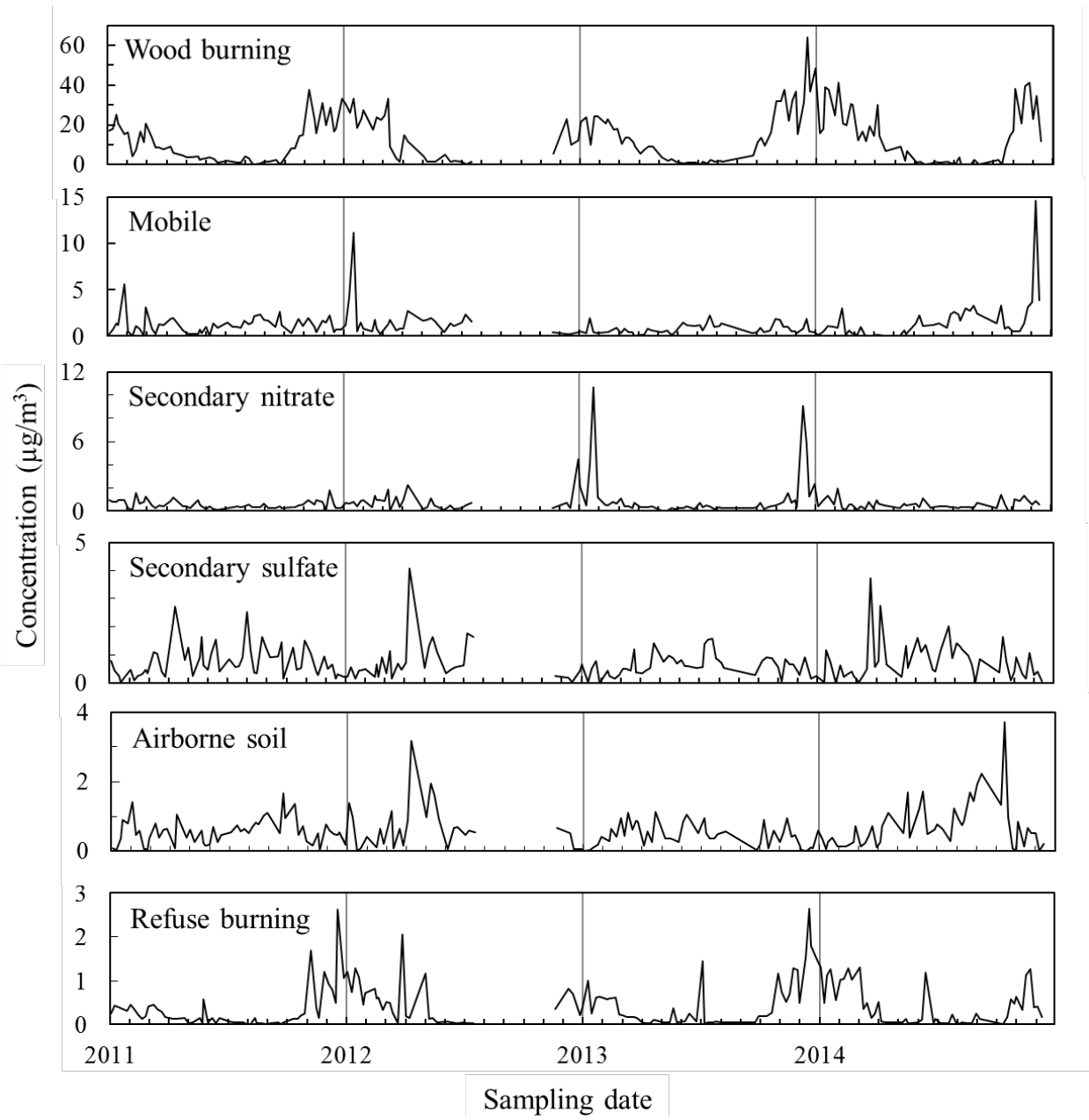


Figure 7. Source contributions deduced from PM<sub>2.5</sub> samples measured at Portola.

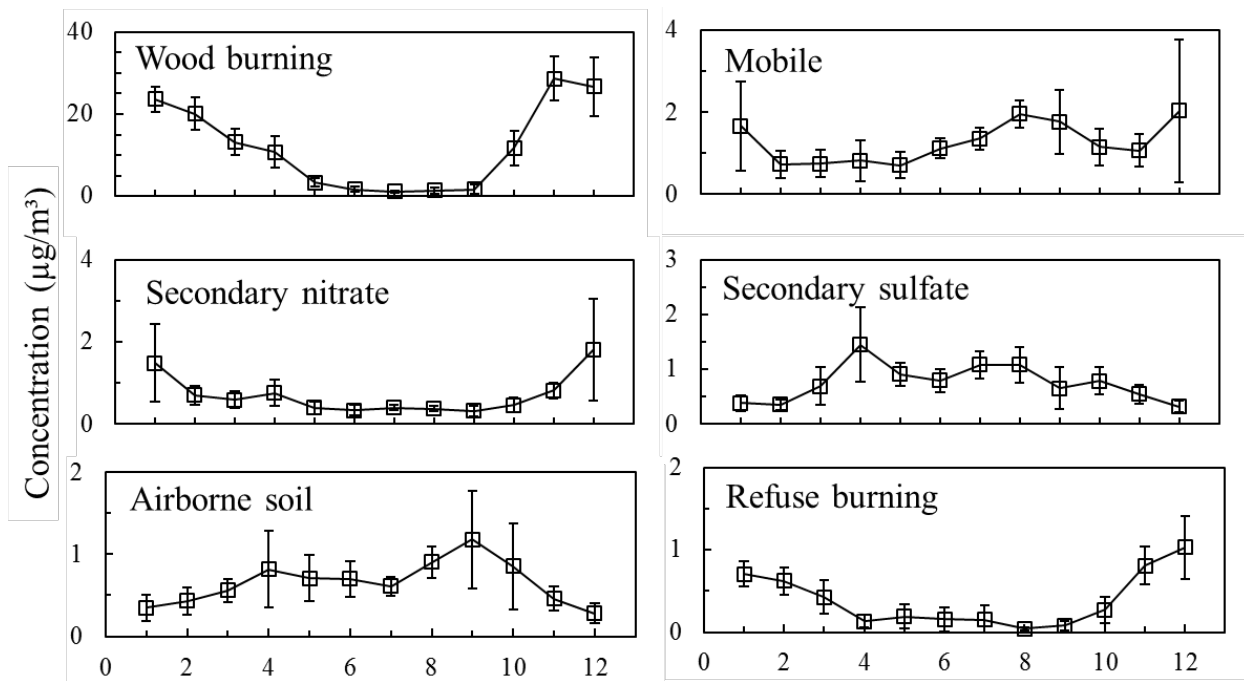


Figure 8. Monthly variations of source contributions to PM<sub>2.5</sub> mass concentration at Portola (mean ± 95 % distribution).



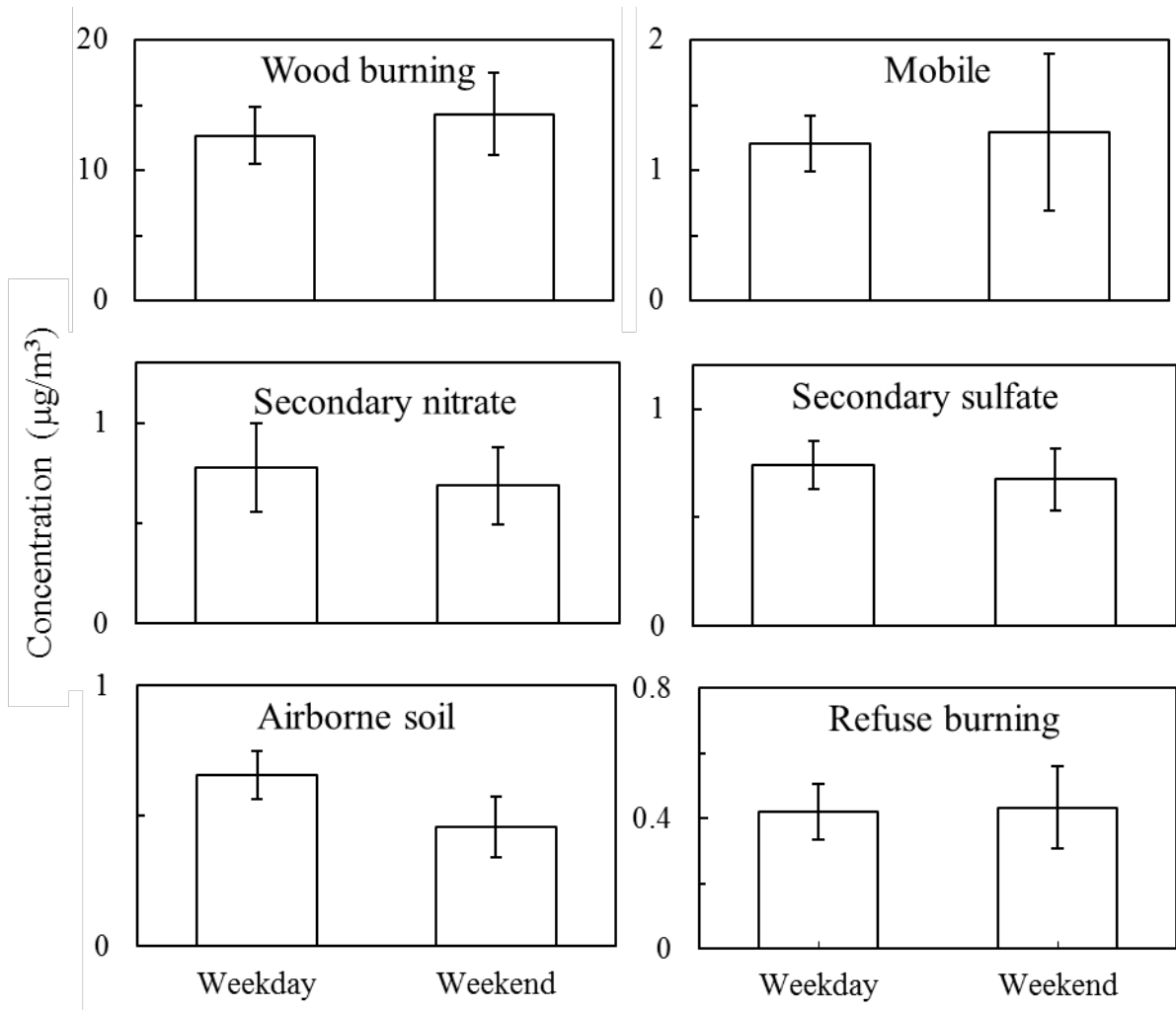


Figure 9. Weekday/weekend variations of source contributions to PM<sub>2.5</sub> mass concentration at Portola (mean ± 95 % distribution).

## Appendix B

### Emission Inventory Methodology

## **Emissions Inventory Documentation for the Plumas County PM<sub>2.5</sub> Nonattainment Area State Implementation Plan**

Emissions inventories are one of the fundamental building blocks in the development of a State Implementation Plan (SIP or Plan). In simple terms, an emissions inventory is a systematic listing of the sources of air pollution along with the amount of pollution emitted from each source or category over a given time period. This document presents a summary of the data sources, along with revisions and improvements made to the emissions inventory included in the Plumas County PM<sub>2.5</sub> Nonattainment Area Plan.

The California Air Resources Board (ARB) and Northern Sierra Air Quality Management District (District) have developed a comprehensive, accurate, and current emissions inventory consistent with the requirements set forth in Section 182(a)(1) of the federal Clean Air Act. ARB and District staff conducted a thorough review of the inventory to ensure that the emission estimates reflect accurate emission reports for point sources, and that estimates for mobile and area-wide sources are based on the most recent models and methodologies. Staff also reviewed the growth profiles for point and areawide source categories, and updated them as necessary to ensure that the emission projections are based on data that reflect historical trends, current conditions, and recent economic and demographic forecasts.

### **Emissions Inventory Overview**

Emissions inventories are estimates of the amount and type of pollutants emitted into the atmosphere by industrial facilities, mobile sources, and areawide sources such as consumer products and paint. They are fundamental components of an air quality plan, and serve critical functions such as:

- 1) the primary input to air quality modeling used in attainment demonstrations;
- 2) the emissions data used for developing control strategies; and
- 3) a means to track progress in meeting the emission reduction commitments.

The United States Environmental Protection Agency (U.S. EPA) regulations require that the emissions inventory contain emissions data for directly emitted PM<sub>2.5</sub> and its precursors: oxides of nitrogen (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), volatile organic compounds (VOC), and ammonia (NH<sub>3</sub>). The inventory included in this plan substitutes VOC with reactive organic gases (ROG), which in general represent a slightly broader group of compounds than those in U.S. EPA's list of VOCs.

### **Agency Responsibilities**

ARB and District staff worked jointly to develop the emissions inventory for Plumas County and the Plumas County PM<sub>2.5</sub> Nonattainment Area. The District worked closely

with operators of stationary facilities in their jurisdiction to develop the point source emission estimates. ARB staff developed the emission inventory for mobile sources, both on-road and off-road. The District and ARB shared responsibility for developing estimates for the nonpoint (areawide) sources such as paved road dust and agricultural burning. ARB worked with several State and local agencies such as the Department of Transportation (Caltrans), the Department of Motor Vehicles (DMV), the Department of Pesticide Regulation (DPR), and the California Energy Commission (CEC) to assemble activity information necessary to develop the mobile and area-wide source emission estimates.

### **Inventory Base Year**

The base year inventory forms the basis for all future year projections and also establishes the emission levels against which progress in emission reductions will be measured. U.S. EPA regulations establish that the base year inventory should be preferably consistent with the triennial reporting schedule required under the Air Emissions Reporting Requirements (AERR) rule. However, U.S. EPA allows a different year to be selected if justified by the state. ARB worked with the local air districts to determine the base year that should be used across the State. Since the South Coast Air Quality Management District typically aligns their base year inventory with the data collection period for their Multiple Air Toxics Exposure Study, which was last conducted in 2012, ARB selected 2012 as the base year to maintain consistency across the various plans being developed in the State.

### **Forecasted Inventories**

In addition to a base year inventory, U.S. EPA regulations also require future year inventory projections for specific milestone years. Forecasted inventories are a projection of the base year inventory that reflects expected growth trends for each source category and emission reductions due to adopted control measures. ARB develops emission forecasts by applying growth and control profiles to the base year inventory.

Growth profiles for point and areawide sources are derived from surrogates such as economic activity, fuel usage, population, housing units, etc., that best reflect the expected growth trends for each specific source category. Growth projections were obtained primarily from government entities with expertise in developing forecasts for specific sectors, or in some cases, from econometric models. Control profiles, which account for emission reductions resulting from adopted rules and regulations, are derived from data provided by the regulatory agencies responsible for the affected emission categories.

Projections for mobile source emissions are generated by models that predict activity rates and vehicle fleet turnover by vehicle model year. As with stationary sources, the mobile source models include control algorithms that account for all adopted regulatory actions.

## **Temporal Resolution**

Planning inventories typically include annual as well as seasonal (summer and winter) emission estimates. Annual emission inventories represent the total emissions over an entire year (tons per year), or the daily emissions produced on an average day (tons per day). Seasonal inventories account for temporal activity variations throughout the year, as determined by category-specific temporal profiles. Since PM<sub>2.5</sub> concentrations tend to be highest during the winter months, the emission inventory used in the Plan is based on the winter season (November through April).

## **Geographical Scope**

The inventories presented in this Plan consist of emissions for the Plumas County PM<sub>2.5</sub> Nonattainment Area, which represents a portion of Plumas County. Typically, emission inventories are developed at a county-level geographical resolution. The county level emissions were allocated to the nonattainment area using the approach described below.

**Stationary Sources.** Emissions from stationary sources were designated as being inside or outside the nonattainment area based on a GIS analysis of each facility's geographical coordinates (latitude and longitude) overlaid on a digitized map of the nonattainment area.

**Areawide Sources.** District staff conducted a thorough review of the areawide categories to determine those that actually occur in the nonattainment area, and their emissions were allocated based on spatial surrogates (e.g., paved road miles, forest land acreage, human population, etc.) that best reflect the expected distribution of these sources.

**On-Road Mobile Sources.** Emissions from on-road mobile sources were estimated at the county level using California's on-road motor vehicle model, EMFAC2014. The allocation to the nonattainment area was accomplished using the Direct Travel Impact Model (DTIM) to produce gridded emission estimates, and then using these estimates as a gridded spatial surrogate to distribute EMFAC2014 NO<sub>x</sub> emissions among grid cells inside and outside the nonattainment area. Emissions for other pollutants (ROG, PM<sub>2.5</sub>, SO<sub>x</sub>, and ammonia) were assigned the same spatial distribution as NO<sub>x</sub>.

**Off-Road Mobile Sources.** As with areawide sources, District staff conducted a review of the off-road categories to determine those that do not occur in the nonattainment area and should be zeroed out. Of the remaining off-road categories, locomotive emissions were allocated based on rail miles, and the other sources were allocated based on human population.

The emission inventory allocation methods are summarized in Table 1 below.

**Table 1**  
**Methods for the Spatial Allocation of Emissions to the**  
**Plumas County PM<sub>2.5</sub> Nonattainment Area**

<b>Source Category</b>	<b>Allocation Method</b>
Stationary Point Sources	GIS Analysis
Areawide Sources	
<i>I.C. Reciprocating Engines</i>	Human Population
<i>Residential Wood Combustion</i>	District Survey
<i>Farming Operations</i>	Human Population
<i>Paved Road Dust</i>	Paved Road Miles
<i>Unpaved Road Dust</i>	Unpaved Road Miles
<i>Managed Burning</i>	Forest Land
<i>Commercial Cooking</i>	Number of Restaurants
On-Road Mobile Sources	Direct Travel Impact Model Analysis
Off-Road Mobile Sources	
<i>Locomotives</i>	Rail Miles
<i>Other Off-Road Sources</i>	Human Population

### **Quality Assurance and Quality Control**

ARB has established a quality assurance and quality control (QA/QC) process involving ARB and District staff to ensure the integrity and accuracy of the emissions inventories used in the development of air quality plans. QA/QC occurs at the various stages of SIP emission inventory development. Base year emissions are assembled and maintained in the California Emission Inventory Development and Reporting System (CEIDARS). ARB inventory staff works with District staff, who are responsible for developing and reporting point source emission estimates, to verify these data are accurate. The locations of point sources, including stacks, are checked to ensure they are valid. Area-wide source emission estimates are reviewed by ARB and District staff before their inclusion in the emission inventory. Additionally, CEIDARS is designed with automatic system checks to prevent errors such as double counting of emission sources. The system also makes various reports available to assist staff in their efforts to identify and reconcile anomalous emissions.

Future year emissions are estimated using the California Emission Projection Analysis Model (CEPAM). Growth and control factors are reviewed for each category and year along with the resulting emission projections. Year to year trends are compared to similar and past datasets to ensure general consistency. Emissions for specific categories are checked to confirm they reflect the anticipated effects of applicable

control measures. Mobile categories are verified with mobile source staff for consistency with the on-road and off-road emission models.

A summary of the information supporting the Plumas County PM<sub>2.5</sub> Nonattainment Area SIP emissions inventory is presented in the sections below.

### Point Sources

The nonattainment area contains only a limited number of facilities that generate direct PM<sub>2.5</sub> emissions or other PM<sub>2.5</sub> precursors such as NO<sub>x</sub>, SO<sub>x</sub>, ROG, and ammonia. The inventory reflects actual emissions from industrial point sources reported to the District by the facility operators through calendar year 2012, in accordance with the requirements set forth in U.S. EPA's AERR rule. The data elements in the 2012 baseline inventory are consistent with the data elements required by the AERR rule. Estimation methods include source testing, direct measurement by continuous emissions monitoring systems, or engineering calculations.

The point source categories that occur in the PM<sub>2.5</sub> nonattainment area are listed in Table 2.

**Table 2  
Point Source Categories**

<b>Source Category</b>	<b>Subcategory</b>
Fuel Combustion	Other (Fuel Combustion)
Waste Disposal	Sewage Treatment
	Landfills
Cleaning and Surface Coatings	Laundrying
Petroleum Production and Marketing	Petroleum Marketing
Industrial Processes	Food and Agriculture
	Mineral Processes

The point source inventory includes emissions from stationary area sources, which are categories such as internal combustion engines and gasoline dispensing facilities that are not inventoried individually, but are estimated as a group and reported as an aggregated total. Estimates for the following categories were developed by ARB:

#### *Stationary Nonagricultural Diesel Engines*

This category includes emissions from backup and prime generators and pumps, air compressors, and other miscellaneous stationary diesel engines that are widely used throughout the industrial, service, institutional, and commercial sectors. The emission

estimates, including emission forecasts, are based on a 2003 ARB methodology derived from the OFFROAD model. Additional information on this methodology is available at: <http://www.arb.ca.gov/ei/areasrc/FULLPDF/FULL1-2.pdf>

### *Oil and Gas Production*

ARB staff updated the emission inventory for oil and natural gas production, which included the revision of emission estimates and the addition of emission categories that previously were not estimated. The revised emissions were calculated with a software tool developed by U.S. EPA that generates county-level emissions for upstream oil and gas activity. This tool uses 2011 as the base year, with activity data taken from the California Division of Oil, Gas, and Geothermal Resources (DOGGR) and an industry database, and default emission factors provided in an associated report. Staff incorporated data from ARB's 2007 Oil and Gas Industry Survey (e.g., typical component counts) and feedback from individual air districts (e.g., minimum controls required to operate in a certain district, with associated control factors) to improve these parameters and further adjust the tool's output. Emissions estimates for 2012 and other years were forecasted using the historical trend in statewide oil production from DOGGR, which assumes a 2.2 percent annual decline.

### *Gasoline Dispensing Facilities*

ARB staff developed an updated methodology to estimate emissions from fuel transfer and storage operations at gasoline dispensing facilities (GDFs). The methodology addresses emissions from underground storage tanks, vapor displacement during vehicle refueling, customer spillage, and hose permeation. The updated methodology uses emission factors developed by ARB staff that reflect more current in-use test data and also accounts for the emission reduction benefits of onboard refueling vapor recovery (ORVR) systems. The emission estimates are based the 2012 statewide gasoline sales data from the California Board of Equalization that were apportioned to the county level using fuel consumption estimates from ARB's on-road mobile sources model (EMFAC). Additional information on this category is available at: <http://www.arb.ca.gov/ei/areasrc/arbpetprodmarkpm.htm>



## Areawide Sources

Areawide sources are categories such as consumer products, fireplaces, and prescribed burning (see Table 3) for which emissions occur over a wide geographic area. Emissions for these categories are estimated by both ARB and the local air districts using various models and methodologies.

**Table 3**  
**Areawide Sources**

Source Category	Subcategory
Solvent Evaporation	Consumer Products
	Architectural Coatings and Related Solvents
	Pesticides/Fertilizers
	Asphalt Paving and Roofing
Miscellaneous Processes	Residential Fuel Combustion
	Farming Operations
	Construction And Demolition
	Paved Road Dust
	Unpaved Road Dust
	Fugitive Windblown Dust
	Managed Burning and Disposal
	Cooking

A summary of the areawide methodologies is presented below:

### *Consumer Products*

The consumer products category reflects the three most recent surveys conducted by ARB staff for the years 2003, 2006, and 2008. Together these surveys collected updated product information and ingredient information for approximately 350 product categories. Based on the survey data, ARB staff determined the total product sales and total VOC emissions for the various product categories. The growth trend for most consumer product subcategories is based on the latest DOF human population growth projections, except for aerosol coatings. Staff determined that a no-growth profile would be more appropriate for aerosol coatings based on survey data that show relatively flat sales of these products over the last decade. Additional information on ARB's consumer products surveys is available at:

<http://www.arb.ca.gov/consprod/survey/survey.htm>.

### *Architectural Coatings*

The architectural coatings category reflects emission estimates based on a comprehensive ARB survey for the 2004 calendar year. The emission estimates include benefits of the 2003 and 2007 ARB Suggested Control Measures. These emissions are grown based on the growth in housing units. Additional information about ARB's architectural coatings program is available at: <http://www.arb.ca.gov/coatings/arch/arch.htm>

### *Pesticides*

The Department of Pesticide Regulation (DPR) develops month-specific emission estimates for agricultural and structural pesticides. Each calendar year, DPR updates the inventory based on the Pesticides Use Report, which provides updated information from 1990 to the most current data year available. The inventory includes estimates through the 2012 calendar year. Emission forecasts for years 2013 and beyond are based on the average of the most recent five years.

### *Asphalt Paving/Roofing*

Asphalt paving emissions for 2012 were estimated using a District methodology, and asphalt roofing emissions were grown from a 2005 estimate. Emissions are estimated based on tons of asphalt applied and a default emission factor for each type of asphalt operation. The growth profile for both categories is based on construction employment from the REMI forecasting model. Additional information on the District's methodology is available at: <http://www.arb.ca.gov/ei/areasrc/distsolevapaspav.htm>

### *Residential Wood Combustion*

The residential wood combustion estimates are based on a survey conducted by the District in the nonattainment area. The survey collected information on the type of fuel used for heating by the local households, the types of wood burning devices used, and the amount of wood burned. The emission estimates reflect emission factors from U.S. EPA's National Emission Inventory. Additional information on this methodology is available at: <http://www.arb.ca.gov/ei/areasrc/arbmiscprocrsfuelcom.htm>

### *Farming Operations*

The livestock emission estimates are based on population data from the U.S. Department of Agriculture's 2007 Census of Agriculture. The emissions reflect a no-growth assumption based on an analysis of livestock population trends that found no significant growth. Additional information on ARB's methodology is available at: <http://www.arb.ca.gov/ei/areasrc/arbmiscproclivestock.htm>

### *Construction and Demolition*

Emission estimates for building construction and road construction were grown from ARB estimates developed in 2002 and 1997, respectively. The growth profile for both categories is based on construction employment from the REMI forecasting model.

Additional information on this methodology is available at:  
<http://www.arb.ca.gov/ei/areasrc/arbmiscproconstdem.htm>

#### *Paved Road Dust*

Paved road dust emissions for 2012 were estimated using an ARB methodology consistent with the current U.S. EPA method (AP-42). The emission estimates are based on vehicle miles traveled (VMT) from EMFAC2014, California-specific silt loading values, updated VMT distribution (travel fractions) for various paved road categories, and a Plumas County specific rain adjustment. Emissions were grown using VMT projections from EMFAC2014. Additional information is available at:  
<http://www.arb.ca.gov/ei/areasrc/arbmiscprocpaverddst.htm>

#### *Unpaved Nonfarm Road Dust*

Emissions from unpaved nonfarm roads were estimated from 2008 unpaved road data collected from the California Statewide Local Streets and Roads Needs Assessment, the California Department of Transportation, and local agencies. Dust emissions were calculated using an emission factor derived from tests conducted by the University of California, Davis, and the Desert Research Institute. Staff assumed no growth for this category based on the assumption that existing unpaved roads tend to get paved as vehicle traffic on them increases, which counteracts any additional emissions from new unpaved roads. Additional information on this methodology is available at:  
<http://www.arb.ca.gov/ei/areasrc/arbmiscprocunpaverddst.htm>

#### *Windblown Dust from Unpaved Roads*

Emissions for this source category were estimated based on a 1997 ARB methodology reflecting unpaved road mileage and local parameters that affect wind erosion. The estimates assume no growth. Additional information on this methodology is available at: <http://www.arb.ca.gov/ei/areasrc/arbmiscprocufugwbdst.htm>

#### *Managed Burning & Disposal*

Emission estimates for wildfires and prescribed burning are based on a ten-year average of the annual emissions. These estimates reflect wildfire and prescribed burning data compiled by the California Department of Forestry and Fire Protection for the years 1999 to 2008. ARB assumes no growth for these categories. The methodology for managed burning is available at: <http://www.arb.ca.gov/ei/see/see.htm>.

#### *Commercial Cooking*

The commercial cooking emissions were grown from a 2005 estimate. The emissions estimates were developed from the number of restaurants, the number and types of cooking equipment, the food type, and default emission factors. The growth profile reflects the latest population projections provided by the California Department of Finance (DOF).

### *Ammonia Emissions*

Ammonia emissions from miscellaneous domestic processes (human respiration and perspiration, smoking, pets, untreated human waste, etc.) were grown from a 2005 ARB estimate using DOF population projections. Ammonia emissions for other categories such as residential wood combustion, livestock husbandry, managed burning, on-road motor vehicles, were estimated as part of the methodologies for those specific area source categories.

### **Point and Areawide Source Emissions Forecasting**

Emission forecasts (2013 and subsequent years) are based on growth profiles that in many cases incorporate historical trends up to the base year or beyond. The growth surrogates used to forecast the emissions from these categories are presented in Table 4 below.

**Table 4  
Growth Surrogates for Point and Areawide Sources**

<b>Source Category</b>	<b>Subcategory</b>	<b>Growth Surrogate</b>
Other (Fuel Combustion)	I.C. Reciprocating Engines	ARB emission model output
Landfills	Municipal Waste Disposal	DOF population
Laundering	Dry Cleaning	DOF population
Petroleum Marketing	All	EMFAC2014 gasoline consumption projections
Mineral Processes	All	REMI industry-specific outputs
Consumer Products	Consumer Products	DOF population
	Aerosol Coatings	No-growth
Architectural Coatings and Related Process Solvents	All	DOF households
Pesticides/Fertilizers	Agricultural Pesticides	Harvested acreage
Asphalt Paving / Roofing	All	REMI construction employment
Residential Fuel Combustion	Wood	DOF households projection
	Other Fuels	U.S. EIA - Annual Energy Outlook (AEO 2011)
Farming Operations	Livestock Husbandry	No growth
Construction and Demolition	All	REMI industry-specific employment and outputs
Paved Road Dust	All	EMFAC2014 VMT data
Unpaved Road Dust	Farm Roads	Harvested acreage
	Others	No growth
Fugitive Windblown Dust	Unpaved Roads	Unpaved road VMT

**Table 4  
Growth Surrogates for Point and Areawide Sources**

<b>Source Category</b>	<b>Subcategory</b>	<b>Growth Surrogate</b>
Managed Burning and Disposal	Forest Management	No growth
	Non-Ag Open Burning	DOF population
Cooking	All	DOF population
Other (Miscellaneous Processes)	All	DOF population

### **On-Road Mobile Sources**

Emissions from on-road mobile sources, which include passenger vehicles, buses, and trucks, were estimated using default outputs from ARB's EMFAC2014 model.

EMFAC2014 includes data on California's car and truck fleets and travel activity. Light-duty motor vehicle fleet age, vehicle type, and vehicle population were updated based on 2012 California Department of Motor Vehicles data. The model also reflects the emissions benefits of ARB's recent rulemakings such as the Pavley Standards and Advanced Clean Cars Program, and includes the emissions benefits of ARB's Truck and Bus Rule and previously adopted rules for other on-road diesel fleets.

EMFAC2014 utilizes a socio-econometric regression modeling approach to forecast new vehicle sales and to estimate future fleet mix. Light-duty passenger vehicle population includes 2012 Department of Motor Vehicles (DMV) registration data along with updates to mileage accrual using Smog Check data. Updates to heavy-duty trucks include model year specific emission factors based on new test data, and population estimates using DMV data for in-state trucks and International Registration Plan (IRP) data for out-of-state trucks.

Additional information and documentation on the EMFAC2014 model is available at: <http://www.arb.ca.gov/msei/categories.htm#emfac2014>

### **Off-Road Mobile Sources**

Emissions from off-road sources were estimated using a suite of category-specific models or, where a new model was not available, the OFFROAD2007 model. Many of the newer models were developed to support recent regulations, including in-use off-road equipment, ocean-going vessels and others. The sections below summarize the updates made to specific off-road categories.

### *Oil and Gas Wells: Workover Rigs, Drill Rigs and Support Equipment Allocation*

The allocation of drill and work-over rigs and support equipment (such as pumps) for oil and gas wells was updated to reflect the physical location of wells instead of the registration location. The physical location and count of wells was updated using Division of Oil, Gas and Geothermal Resources (DOGGR) Well Finder data from September, 2013. (DOGGR data are available at: <http://www.conservation.ca.gov/dog/Pages/Wellfinder.aspx>)

### *Pleasure Craft and Recreational Vehicles*

A new model was developed in 2011 to estimate emissions from pleasure craft and recreational vehicles. In both cases, population, activity, and emission factors were re-assessed using new surveys, registration information, and emissions testing. Additional information is available at:

[http://www.arb.ca.gov/msei/categories.htm#offroad\\_motor\\_vehicles](http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles). Plumas County PM<sub>2.5</sub> Nonattainment Area does not include any locations where pleasure crafts are operated, therefore only evaporative emissions are included in the inventory.

### *In-Use Off-Road Equipment*

ARB developed this model in 2010 to support the analysis for amendments to the In-Use Off-Road Diesel Fueled Fleets Regulation. Staff updated the underlying activity forecast to reflect more recent economic forecast data, which suggests a slower rate of recovery through 2024 than previously anticipated. Additional information is available at: [http://www.arb.ca.gov/msei/categories.htm#offroad\\_motor\\_vehicles](http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles)

### *Locomotives*

In 2014, ARB developed a revised inventory for line-haul locomotive activity in California. The new model is based primarily on activity data reported to ARB by the major rail lines for calendar year 2011. To estimate emissions, ARB used duty cycle, fuel consumption and activity data reported by the rail lines. Activity is forecasted for individual train types and is consistent with ARB's ocean-going vessel and truck growth rates. Fuel efficiency improvements are projected to follow Federal Railroad Association projections and turnover assumptions are consistent with U.S. EPA projections. Additional information is available at:

[http://www.arb.ca.gov/msei/categories.htm#offroad\\_motor\\_vehicles](http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles)

### *Transport Refrigeration Units (TRU)*

This model reflects updates to activity, population, growth and turn-over data, and emission factors developed to support the 2011 amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units. Additional information is available at:

[http://www.arb.ca.gov/msei/categories.htm#offroad\\_motor\\_vehicles](http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles)

### *Fuel Storage and Handling*

Emissions for fuel storage and handling were estimated using the OFFROAD2007 model. Additional information is available at:

[http://www.arb.ca.gov/msei/categories.htm#offroad\\_motor\\_vehicles](http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles)

### *Diesel Agricultural Equipment*

The inventory for agricultural diesel equipment (such as tractors, harvesters, combines, sprayers and others) was revised based on a 2008 survey of thousands of farmers, custom operators, and first processors. The survey data, along with information from the 2007 USDA Farm Census, was used to revise almost every aspect of the agricultural inventory, including population, activity, age distribution, fuel use, and allocation. This updated inventory replaces general information on farm equipment in the United States with one specific to California farms and practices. The updated inventory was compared against other available data sources such as Board of Equalization fuel reports, USDA tractor populations and age, and Eastern Research Group tractor ages and activity, to ensure the results were reasonable and compared well against outside data sources. Agricultural growth rates through 2050 were developed through a contract with URS Corp and UC Davis, in cooperation with the San Joaquin Valley agricultural community. Additional information is available at:

[http://www.arb.ca.gov/msei/categories.htm#offroad\\_motor\\_vehicles](http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles)

### **Mobile Source Forecasting**

The table below summarizes the data and methods used to forecast future-year mobile source emissions by broad source category groupings.

**Table 5  
Growth Surrogates for Mobile Sources**

<b>Category</b>	<b>Growth Methodology</b>
<b>On-Road Sources</b>	
All	Default VMT projections in EMFAC 2014
<b>Off-Road Gasoline Fueled Equipment</b>	
Lawn & Garden	Household growth projection
Off-Road Equipment	Employment growth projection
Recreational Boats	Housing starts (short-term) and human population growth (long-term)
Recreational Vehicles	Housing starts (short-term) and human population growth (long-term)
<b>Off-Road Diesel-Fueled Equipment</b>	
Construction and Mining	California construction employment data from U.S. Bureau of Labor Statistics

**Table 5  
Growth Surrogates for Mobile Sources**

<b>Category</b>	<b>Growth Methodology</b>
Farm Equipment	2011 study of forecasted growth by URS Corp, with SJV Advisory Committee funding.
Industrial Equipment	California construction employment data from Bureau of Labor Statistics
Oil Drilling	California oil and gas extraction gross domestic product from the U.S. Bureau of Economic analysis, oil company diesel fuel use published by the U.S. Energy Information Administration, California rotary rig counts from Baker Hughes, and California oil and gas extraction employment from the U.S. Bureau of Labor Statistics
Trains (line haul)	International/premium train growth tied to OGV forecast; Domestic train growth tied truck growth
Transport Refrigeration Units	Projection of historical Truck/Trailer TRU sales from ACT Research, adjusted for recession.

Tables 6 through 14 list annual and winter emission inventory for directly emitted PM<sub>2.5</sub> and precursors.



## Annual Emission Inventories

<b>Table 6. Annual Ammonia Emissions (tons per day)</b>											
<b>TYPE/CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
WASTE DISPOSAL	SEWAGE TREATMENT	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
WASTE DISPOSAL	LANDFILLS	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.0197	0.0198	0.0198	0.0198	0.0197	0.0197	0.0197	0.0197	0.0197	0.0198
MISCELLANEOUS PROCESSES	FARMING OPERATIONS	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044	0.1044
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076
MISCELLANEOUS PROCESSES	OTHER (MISCELLANEOUS PROCESSES)	0.0104	0.0104	0.0102	0.0102	0.0102	0.0101	0.0101	0.0101	0.0102	0.0102
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0012
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0014	0.0014	0.0013	0.0013	0.0012	0.0012	0.0012	0.0011	0.0011	0.0011
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0016	0.0015	0.0015	0.0014	0.0014	0.0013	0.0012	0.0012	0.0011	0.001
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0005	0.0004	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0003	0.0002
OTHER MOBILE SOURCES	TRAINS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
<b>TOTAL</b>		<b>0.1492</b>	<b>0.1491</b>	<b>0.1487</b>	<b>0.1485</b>	<b>0.1483</b>	<b>0.148</b>	<b>0.1478</b>	<b>0.1477</b>	<b>0.1477</b>	<b>0.1475</b>

<b>Table 7. Annual NOx Emissions (tons per day)</b>											
<b>TYPE/CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	0.0016	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015	0.0012	0.0012	0.0012
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.0468	0.0469	0.0469	0.0469	0.0468	0.0467	0.0467	0.0467	0.0468	0.045
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0137	0.0125	0.0115	0.0104	0.0094	0.0085	0.0076	0.0068	0.0062	0.0057
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0114	0.0102	0.0091	0.0079	0.0069	0.0058	0.0049	0.0042	0.0035	0.0031
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0199	0.0184	0.0168	0.0153	0.0138	0.0124	0.011	0.0099	0.0089	0.008
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.029	0.0276	0.0261	0.0245	0.0229	0.0213	0.0197	0.0183	0.0167	0.0151
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0107	0.0101	0.0096	0.009	0.0084	0.0079	0.0073	0.0068	0.0063	0.0059
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.0006	0.0006	0.0005	0.0005	0.0004	0.0004	0.0003	0.0003	0.0003	0.0002
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.0021	0.0018	0.0016	0.0014	0.0013	0.0012	0.0011	0.0009	0.0009	0.0007
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.0008	0.0006	0.0005	0.0003	0.0003	0.0003	0.0002	0.0002	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0402	0.0382	0.0358	0.0334	0.0308	0.028	0.0254	0.0228	0.0204	0.0182
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0063	0.0059	0.0055	0.005	0.0046	0.0041	0.0036	0.0032	0.0028	0.0024
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.011	0.0099	0.0088	0.0086	0.0083	0.0078	0.007	0.0059	0.0051	0.0049
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.028	0.0266	0.0254	0.0243	0.0231	0.0224	0.0219	0.0208	0.0198	0.019
ON-ROAD MOTOR VEHICLES	MOTORCYCLES (MCY)	0.0011	0.0011	0.0012	0.0012	0.0011	0.0011	0.0011	0.001	0.001	0.001
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0032	0.003	0.0028	0.0026	0.0024	0.0021	0.0019	0.0017	0.0016	0.0014
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS URBAN BUSES (UB)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	SCHOOL BUSES - DIESEL (SBD)	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
ON-ROAD MOTOR VEHICLES	OTHER BUSES - GAS (OBG)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	OTHER BUSES - MOTOR COACH - DIESEL (OBC)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	ALL OTHER BUSES - DIESEL (OBD)	0.0006	0.0006	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	MOTOR HOMES (MH)	0.0013	0.0012	0.0011	0.001	0.001	0.0008	0.0006	0.0006	0.0006	0.0005
OTHER MOBILE SOURCES	TRAINS	0.164	0.1692	0.1722	0.1737	0.172	0.1689	0.1654	0.1616	0.1577	0.1535
OTHER MOBILE SOURCES	OFF-ROAD RECREATIONAL VEHICLES	0.0019	0.0022	0.0025	0.0031	0.0033	0.0037	0.0039	0.0041	0.0043	0.0044
OTHER MOBILE SOURCES	OFF-ROAD EQUIPMENT	0.0869	0.0811	0.0734	0.0659	0.0594	0.0534	0.0485	0.0442	0.0406	0.0371
OTHER MOBILE SOURCES	FARM EQUIPMENT	0.0199	0.0193	0.0184	0.0175	0.0168	0.0162	0.0153	0.0143	0.0135	0.0125
<b>TOTAL</b>		<b>0.5037</b>	<b>0.4912</b>	<b>0.4743</b>	<b>0.4571</b>	<b>0.4374</b>	<b>0.4173</b>	<b>0.3977</b>	<b>0.3782</b>	<b>0.3609</b>	<b>0.3425</b>

<b>Table 8. Annual PM2.5 Emissions (tons per day)</b>											
<b>TYPE/CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
INDUSTRIAL PROCESSES	MINERAL PROCESSES	0.0069	0.0071	0.0073	0.0078	0.0081	0.0084	0.0087	0.0088	0.0089	0.009
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.3319	0.3327	0.3334	0.3327	0.3319	0.3312	0.3316	0.3316	0.3319	0.3323
MISCELLANEOUS PROCESSES	CONSTRUCTION AND DEMOLITION	0.0036	0.0036	0.0036	0.0036	0.0037	0.0038	0.0038	0.0038	0.0038	0.0038
MISCELLANEOUS PROCESSES	PAVED ROAD DUST	0.0061	0.0063	0.0063	0.0064	0.0066	0.0066	0.0066	0.0066	0.0067	0.0067
MISCELLANEOUS PROCESSES	UNPAVED ROAD DUST	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0552
MISCELLANEOUS PROCESSES	FUGITIVE WINDBLOWN DUST	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0579	0.0579	0.0579	0.0579	0.0579	0.0579	0.0579	0.0579	0.0579	0.0579
MISCELLANEOUS PROCESSES	COOKING	0.0087	0.0086	0.0085	0.0085	0.0085	0.0084	0.0084	0.0085	0.0085	0.0085
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0008	0.0008	0.0009	0.0009	0.0009	0.001	0.001	0.001	0.0011	0.0011
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0003	0.0003	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0002	0.0002	0.0001	0	0	0	0	0	0	0
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.0004	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0	0.0001
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.001	0.0007	0.0006	0.0006	0.0004	0.0001	0.0001	0	0	0
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0	0	0	0
OTHER MOBILE SOURCES	TRAINS	0.0034	0.0035	0.0035	0.0035	0.0034	0.0033	0.0032	0.0031	0.003	0.0029
OTHER MOBILE SOURCES	OFF-ROAD RECREATIONAL VEHICLES	0.0019	0.0019	0.0018	0.0017	0.0017	0.0016	0.0016	0.0015	0.0015	0.0015
OTHER MOBILE SOURCES	OFF-ROAD EQUIPMENT	0.0045	0.0041	0.0038	0.0033	0.0031	0.0027	0.0022	0.0019	0.0017	0.0016
OTHER MOBILE SOURCES	FARM EQUIPMENT	0.0009	0.0009	0.0009	0.0009	0.0009	0.0007	0.0006	0.0005	0.0005	0.0005
<b>TOTAL</b>		<b>0.4897</b>	<b>0.49</b>	<b>0.4901</b>	<b>0.4893</b>	<b>0.4885</b>	<b>0.4869</b>	<b>0.4866</b>	<b>0.4861</b>	<b>0.4863</b>	<b>0.4866</b>

<b>Table 9. Annual ROG Emissions (tons per day)</b>											
<b>TYPE/CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
CLEANING AND SURFACE COATING	LAUNDERING	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PETROLEUM PRODUCTION AND REFINING	OIL AND GAS PRODUCTION	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
PETROLEUM PRODUCTION AND REFINING	PETROLEUM MARKETING	0.0153	0.0149	0.0144	0.014	0.0136	0.0126	0.0122	0.0115	0.011	0.0107
INDUSTRIAL PROCESSES	FOOD AND AGRICULTURE	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
<b>AREAWIDE</b>											
SOLVENT EVAPORATION	CONSUMER PRODUCTS	0.0294	0.0293	0.029	0.0289	0.0288	0.0285	0.0286	0.0287	0.0288	0.0289
SOLVENT EVAPORATION	ARCHITECTURAL COATINGS AND RELATED PRODUCTS	0.0195	0.0195	0.0195	0.0195	0.0195	0.0195	0.0195	0.0195	0.0195	0.0195
SOLVENT EVAPORATION	PESTICIDES/FERTILIZERS	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
SOLVENT EVAPORATION	ASPHALT PAVING / ROOFING	0.0048	0.0048	0.0048	0.0048	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.483	0.484	0.4851	0.484	0.483	0.4819	0.4824	0.4824	0.483	0.4835
MISCELLANEOUS PROCESSES	FARMING OPERATIONS	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0531	0.0531	0.0531	0.0531	0.0531	0.0531	0.0531	0.0531	0.0531	0.0531
MISCELLANEOUS PROCESSES	COOKING	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0174	0.0153	0.0137	0.0124	0.0111	0.01	0.0088	0.0082	0.0074	0.007
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0181	0.0162	0.0147	0.0128	0.011	0.0097	0.0084	0.0073	0.0064	0.0057
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0174	0.016	0.0151	0.0141	0.0133	0.0122	0.0114	0.0107	0.0102	0.0097
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0214	0.0206	0.0199	0.0193	0.0187	0.018	0.0174	0.0167	0.0157	0.0147
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0111	0.0108	0.0102	0.0097	0.0093	0.009	0.0087	0.0083	0.008	0.0077
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.0005	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0002	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.0024	0.0019	0.0016	0.0014	0.0008	0.0008	0.0007	0.0005	0.0005	0.0005
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.0008	0.0005	0.0004	0.0001	0.0001	0	0	0	0	0
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0017	0.0016	0.0015	0.0015	0.0014	0.0013	0.0012	0.0011	0.001	0.0009
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.001	0.0009	0.0007	0.0006	0.0004	0.0004	0.0003	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.0021	0.0019	0.0014	0.0012	0.001	0.0004	0.0003	0.0003	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	MOTORCYCLES (MCY)	0.0057	0.0056	0.0054	0.0052	0.0051	0.0051	0.0049	0.0048	0.0046	0.0046
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	OTHER BUSES - GAS (OBG)	0.0001	0.0001	0	0	0	0	0	0	0	0
ON-ROAD MOTOR VEHICLES	MOTOR HOMES (MH)	0.0004	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
OTHER MOBILE SOURCES	TRAINS	0.0092	0.009	0.0086	0.0083	0.0081	0.0078	0.0075	0.0072	0.007	0.0067
OTHER MOBILE SOURCES	RECREATIONAL BOATS	0.0116	0.0116	0.0112	0.0112	0.0105	0.0103	0.01	0.0098	0.0096	0.0091
OTHER MOBILE SOURCES	OFF-ROAD RECREATIONAL VEHICLES	0.0882	0.0848	0.0832	0.081	0.079	0.0768	0.0743	0.0721	0.0698	0.068
OTHER MOBILE SOURCES	OFF-ROAD EQUIPMENT	0.0473	0.0462	0.045	0.0438	0.0427	0.0419	0.041	0.0401	0.04	0.0396
OTHER MOBILE SOURCES	FARM EQUIPMENT	0.0036	0.0036	0.0032	0.003	0.0028	0.0027	0.0026	0.0026	0.0024	0.0024
OTHER MOBILE SOURCES	FUEL STORAGE AND HANDLING	0.0025	0.0023	0.0022	0.0021	0.002	0.0018	0.0018	0.0017	0.0016	0.0016
<b>TOTAL</b>		<b>0.9402</b>	<b>0.9278</b>	<b>0.917</b>	<b>0.9051</b>	<b>0.8931</b>	<b>0.8816</b>	<b>0.8729</b>	<b>0.8642</b>	<b>0.8574</b>	<b>0.8517</b>

Table 10. Annual SOx Emissions (tons per day)		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
TYPE/CATEGORY	SUB CATEGORY										
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
OTHER MOBILE SOURCES	TRAINS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
<b>TOTAL</b>		<b>0.0158</b>	<b>0.0158</b>	<b>0.0159</b>	<b>0.0159</b>	<b>0.0159</b>	<b>0.0159</b>	<b>0.0159</b>	<b>0.016</b>	<b>0.016</b>	<b>0.016</b>

## Winter Emission Inventory

Table 11. Winter Ammonia Emissions (tons per day)		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CATEGORY	SUB CATEGORY										
<b>STATIONARY</b>											
WASTE DISPOSAL	SEWAGE TREATMENT	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
WASTE DISPOSAL	LANDFILLS	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.0358	0.0359	0.036	0.0359	0.0358	0.0358	0.0358	0.0358	0.0358	0.0359
MISCELLANEOUS PROCESSES	FARMING OPERATIONS	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
MISCELLANEOUS PROCESSES	OTHER (MISCELLANEOUS PROCESSES)	0.0104	0.0104	0.0102	0.0102	0.0102	0.0101	0.0101	0.0101	0.0101	0.0102
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0012
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0014	0.0014	0.0013	0.0013	0.0012	0.0012	0.0012	0.0011	0.0011	0.0011
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0016	0.0015	0.0015	0.0014	0.0014	0.0013	0.0012	0.0012	0.0011	0.001
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0005	0.0004	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0003	0.0002
OTHER MOBILE SOURCES	TRAINS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
<b>TOTAL</b>		<b>0.1587</b>	<b>0.1586</b>	<b>0.1583</b>	<b>0.158</b>	<b>0.1578</b>	<b>0.1575</b>	<b>0.1573</b>	<b>0.1572</b>	<b>0.1571</b>	<b>0.157</b>

<b>Table 12. Winter NOx Emissions (tons per day)</b>											
<b>CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	0.0015	0.0015	0.0013	0.0013	0.0013	0.0013	0.0013	0.0011	0.0011	0.0011
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.0849	0.085	0.0853	0.085	0.0849	0.0848	0.0848	0.0848	0.0849	0.0818
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0152	0.014	0.0128	0.0116	0.0104	0.0095	0.0084	0.0076	0.0069	0.0063
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0126	0.0113	0.0101	0.0089	0.0077	0.0064	0.0055	0.0047	0.0041	0.0034
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0222	0.0204	0.0187	0.0171	0.0154	0.0137	0.0123	0.0111	0.01	0.0089
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0323	0.0306	0.029	0.0273	0.0255	0.0237	0.0219	0.0204	0.0186	0.0168
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0116	0.0109	0.0103	0.0097	0.0091	0.0085	0.008	0.0074	0.0069	0.0063
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.0006	0.0006	0.0006	0.0005	0.0005	0.0004	0.0003	0.0003	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.0022	0.0021	0.0018	0.0016	0.0014	0.0013	0.0011	0.0011	0.0009	0.0008
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.001	0.0006	0.0005	0.0004	0.0003	0.0003	0.0003	0.0002	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0405	0.0385	0.0361	0.0336	0.0311	0.0283	0.0256	0.0229	0.0206	0.0184
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0064	0.006	0.0055	0.0051	0.0046	0.0041	0.0036	0.0032	0.0028	0.0024
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.0112	0.01	0.0088	0.0088	0.0081	0.0077	0.0071	0.0059	0.0051	0.005
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.028	0.0264	0.0254	0.0245	0.0234	0.0226	0.022	0.021	0.0199	0.0191
ON-ROAD MOTOR VEHICLES	MOTORCYCLES (MCY)	0.0013	0.0013	0.0012	0.0012	0.0012	0.0011	0.0011	0.0011	0.0011	0.001
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0033	0.003	0.0028	0.0026	0.0024	0.0022	0.0019	0.0017	0.0016	0.0014
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS URBAN BUSES (UB)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	SCHOOL BUSES - DIESEL (SBD)	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
ON-ROAD MOTOR VEHICLES	OTHER BUSES - GAS (OBG)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	OTHER BUSES - MOTOR COACH - DIESEL (OBC)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	ALL OTHER BUSES - DIESEL (OBD)	0.0006	0.0006	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	MOTOR HOMES (MH)	0.0014	0.0012	0.0012	0.0011	0.001	0.0008	0.0007	0.0006	0.0006	0.0005
OTHER MOBILE SOURCES	TRAINS	0.164	0.1692	0.1722	0.1737	0.172	0.1689	0.1654	0.1616	0.1577	0.1535
OTHER MOBILE SOURCES	OFF-ROAD RECREATIONAL VEHICLES	0.003	0.0034	0.0039	0.0045	0.0048	0.0054	0.0058	0.006	0.0066	0.0071
OTHER MOBILE SOURCES	OFF-ROAD EQUIPMENT	0.09	0.084	0.0759	0.0671	0.0605	0.054	0.0492	0.0444	0.0408	0.0369
OTHER MOBILE SOURCES	FARM EQUIPMENT	0.0123	0.0118	0.0113	0.0107	0.0105	0.01	0.0095	0.0089	0.0085	0.0081
<b>TOTAL</b>		<b>0.5477</b>	<b>0.5339</b>	<b>0.5167</b>	<b>0.4983</b>	<b>0.4779</b>	<b>0.4567</b>	<b>0.4375</b>	<b>0.4176</b>	<b>0.4006</b>	<b>0.3807</b>

<b>Table 12. Winter PM2.5 Emissions (tons per day)</b>											
<b>CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
INDUSTRIAL PROCESSES	MINERAL PROCESSES	0.0069	0.0071	0.0073	0.0077	0.008	0.0085	0.0087	0.0088	0.0089	0.009
<b>AREAWIDE</b>											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.6035	0.6049	0.6062	0.6049	0.6035	0.6022	0.6029	0.6029	0.6035	0.6041
MISCELLANEOUS PROCESSES	CONSTRUCTION AND DEMOLITION	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0034	0.0034	0.0034	0.0034
MISCELLANEOUS PROCESSES	PAVED ROAD DUST	0.0059	0.0059	0.0061	0.0061	0.0063	0.0063	0.0063	0.0063	0.0063	0.0063
MISCELLANEOUS PROCESSES	UNPAVED ROAD DUST	0.0202	0.0202	0.0202	0.0202	0.0202	0.0201	0.0201	0.0201	0.0201	0.0201
MISCELLANEOUS PROCESSES	FUGITIVE WINDBLOWN DUST	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0087	0.0087	0.0087	0.0087	0.0087	0.0087	0.0087	0.0087	0.0087	0.0087
MISCELLANEOUS PROCESSES	COOKING	0.0087	0.0086	0.0085	0.0085	0.0085	0.0084	0.0084	0.0084	0.0085	0.0085
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0008	0.0008	0.0009	0.0009	0.0009	0.001	0.001	0.001	0.0011	0.0011
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0003	0.0003	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0002	0.0002	0.0001	0	0	0	0	0	0	0
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.0004	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0	0.0001
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.001	0.0008	0.0007	0.0006	0.0004	0.0001	0.0001	0	0	0
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0	0	0	0
OTHER MOBILE SOURCES	TRAINS	0.0034	0.0035	0.0035	0.0035	0.0034	0.0033	0.0032	0.0031	0.003	0.0029
OTHER MOBILE SOURCES	OFF-ROAD RECREATIONAL VEHICLES	0.0037	0.0036	0.0035	0.0034	0.0033	0.0032	0.0031	0.0029	0.0029	0.0028
OTHER MOBILE SOURCES	OFF-ROAD EQUIPMENT	0.0047	0.0042	0.0038	0.0033	0.003	0.0027	0.0023	0.002	0.0018	0.0017
OTHER MOBILE SOURCES	FARM EQUIPMENT	0.0006	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
<b>TOTAL</b>		<b>0.6756</b>	<b>0.676</b>	<b>0.6768</b>	<b>0.6751</b>	<b>0.6734</b>	<b>0.6715</b>	<b>0.6716</b>	<b>0.671</b>	<b>0.6715</b>	<b>0.672</b>

<b>Table 13. Winter ROG Emissions (tons per day)</b>											
<b>CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>STATIONARY</b>											
FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
CLEANING AND SURFACE CO	LAUNDERING	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PETROLEUM PRODUCTION A	OIL AND GAS PRODUCTION	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
PETROLEUM PRODUCTION A	PETROLEUM MARKETING	0.0152	0.0147	0.0143	0.014	0.0134	0.0125	0.012	0.0114	0.0109	0.0104
INDUSTRIAL PROCESSES	FOOD AND AGRICULTURE	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
<b>AREAWIDE</b>											
SOLVENT EVAPORATION	CONSUMER PRODUCTS	0.0294	0.0293	0.029	0.0289	0.0287	0.0285	0.0286	0.0286	0.0287	0.0289
SOLVENT EVAPORATION	ARCHITECTURAL COATINGS AND RELATED PROC	0.0165	0.0165	0.0165	0.0165	0.0165	0.0163	0.0163	0.0163	0.0165	0.0165
SOLVENT EVAPORATION	PESTICIDES/FERTILIZERS	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
SOLVENT EVAPORATION	ASPHALT PAVING / ROOFING	0.0039	0.0039	0.0039	0.0039	0.004	0.004	0.004	0.004	0.004	0.004
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.8781	0.88	0.882	0.88	0.8781	0.8762	0.8771	0.8771	0.8781	0.8789
MISCELLANEOUS PROCESSES	FARMING OPERATIONS	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
MISCELLANEOUS PROCESSES	COOKING	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013
<b>MOBILE</b>											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0181	0.016	0.0144	0.0129	0.0116	0.0102	0.009	0.0083	0.0076	0.0072
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	0.0201	0.0179	0.016	0.0142	0.0124	0.0107	0.0092	0.0079	0.007	0.0063
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0191	0.0179	0.0167	0.0158	0.0144	0.0135	0.0124	0.0119	0.0112	0.0106
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0237	0.0229	0.022	0.0212	0.0207	0.0197	0.0191	0.0185	0.0174	0.0162
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0121	0.0116	0.0111	0.0106	0.0102	0.0099	0.0096	0.0092	0.0087	0.0084
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.0005	0.0005	0.0005	0.0004	0.0003	0.0003	0.0003	0.0002	0.0002	0.0001
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.0025	0.0022	0.0016	0.0014	0.001	0.0008	0.0007	0.0007	0.0005	0.0005
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.0008	0.0006	0.0004	0.0002	0.0001	0	0	0	0	0
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0017	0.0016	0.0015	0.0015	0.0014	0.0013	0.0012	0.0011	0.001	0.0009
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.001	0.0009	0.0007	0.0006	0.0004	0.0004	0.0003	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.0021	0.0019	0.0015	0.0012	0.001	0.0004	0.0003	0.0003	0.0003	0.0003
ON-ROAD MOTOR VEHICLES	MOTORCYCLES (MCY)	0.0062	0.006	0.0059	0.0056	0.0054	0.0053	0.005	0.0049	0.0047	0.0046
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	OTHER BUSES - GAS (OBG)	0.0001	0.0001	0.0001	0.0001	0	0	0	0	0	0
ON-ROAD MOTOR VEHICLES	MOTOR HOMES (MH)	0.0004	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
OTHER MOBILE SOURCES	TRAINS	0.0092	0.009	0.0086	0.0083	0.0081	0.0078	0.0075	0.0072	0.007	0.0067
OTHER MOBILE SOURCES	RECREATIONAL BOATS	0.0066	0.0065	0.0064	0.0064	0.0062	0.0062	0.0059	0.0056	0.0054	0.0054
OTHER MOBILE SOURCES	OFF-ROAD RECREATIONAL VEHICLES	0.1573	0.1509	0.1477	0.1442	0.1405	0.1361	0.1313	0.1272	0.1233	0.1188
OTHER MOBILE SOURCES	OFF-ROAD EQUIPMENT	0.0487	0.0475	0.0467	0.0455	0.0446	0.0437	0.0431	0.0423	0.0421	0.0417
OTHER MOBILE SOURCES	FARM EQUIPMENT	0.0028	0.0028	0.0026	0.0024	0.0023	0.002	0.0018	0.0017	0.0017	0.0017
OTHER MOBILE SOURCES	FUEL STORAGE AND HANDLING	0.0023	0.0021	0.002	0.0019	0.0018	0.0017	0.0016	0.0016	0.0015	0.0014
<b>TOTAL</b>		<b>1.3587</b>	<b>1.3438</b>	<b>1.3326</b>	<b>1.3181</b>	<b>1.3034</b>	<b>1.2878</b>	<b>1.2766</b>	<b>1.2663</b>	<b>1.2581</b>	<b>1.2498</b>



<b>Table 14. Winter SOx Emissions (tons per day)</b>											
<b>CATEGORY</b>	<b>SUB CATEGORY</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
AREAWIDE											
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.0228	0.0229	0.0229	0.0229	0.0228	0.0228	0.0228	0.0228	0.0228	0.0229
MISCELLANEOUS PROCESSES	MANAGED BURNING AND DISPOSAL	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
MOBILE											
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
OTHER MOBILE SOURCES	TRAINS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002
<b>TOTAL</b>		<b>0.0236</b>	<b>0.0237</b>	<b>0.0237</b>	<b>0.0238</b>	<b>0.0237</b>	<b>0.0237</b>	<b>0.0237</b>	<b>0.0238</b>	<b>0.0238</b>	<b>0.0239</b>

## Appendix C

### Report on Opportunities for Reducing Wood Smoke in Portola, California Area

# OPPORTUNITIES FOR REDUCING WOOD SMOKE IN THE PORTOLA, CALIFORNIA AREA

April 30, 2015

Prepared by Jennifer Weiss

Prepared under fixed price purchase orders for EC/R Incorporated (prime contractor)  
EPA Contract EP-D-10-096, Work Assignment 5-04

# TABLE OF CONTENTS

Introduction .....	2
Research Objectives and Methods .....	3
Background.....	4
Assistance Programs Available .....	9
Home Repair and Weatherization Programs .....	9
USDA 504 Rural Repair and Rehabilitation Grants and Loans .....	9
Low-Income Home Energy Assistance Programs (LIHEAP) .....	10
U.S. Department of Energy Weatherization Program.....	11
Plumas County Housing Rehabilitation Program.....	11
Liberty Utilities Energy Savings Assistance Program .....	11
Energy Assistance Programs.....	12
Target Markets .....	12
Low-Income households .....	13
Senior Population.....	14
Financial Feasibility Evaluation.....	14
Tier One: Woodstove Replacement Program for Income-Qualified Residents.....	15
Tier Two: Pooled Fund for Woodstove Replacement.....	16
Tier Three: Woodstove Replacement Loan Program .....	18
Other Programs.....	19
Overcoming Challenges and Barriers.....	20
Education and Outreach.....	21
Moving Forward: Recommendations and Conclusions .....	23
Appendix A – Acknowledgements .....	25
Appendix B – Map of Greater Portola Nonattainment Area .....	26
Appendix C – Portola, CA Wood Stove and Fireplace Ordinance .....	27
Appendix D – Portola Area Residential Heating Survey .....	31

## INTRODUCTION

Household wood combustion is a major contributor to ambient fine particle levels in the United States. Roughly one-half to two-thirds of the residential wood combustion in the United States occurs in wood stoves.<sup>1</sup> Particulate matter (PM) is formed during combustion reactions in wood stoves, with PM measuring a diameter of 2.5 micrometers ( $\mu\text{m}$ ) or less ( $\text{PM}_{2.5}$ ) being the primary form of particulate emissions from residential wood stoves.  $\text{PM}_{2.5}$  is associated with increased incidence of asthma attacks<sup>2</sup> and other upper respiratory problems<sup>3</sup> as well as increased acute and chronic mortality rates<sup>4</sup> due to long-term exposure. Many rural mountain valley communities experience elevated levels of  $\text{PM}_{2.5}$  in the winter because of smoke from wood-burning appliances and the sustained temperature inversions that occur during the cold season.

The United States Environmental Protection Agency (EPA) works with state, tribal, and local air quality agencies to monitor air quality in the U.S. and issues National Ambient Air Quality Standards (NAAQS or “standards”) for air quality that must be maintained by states in order to provide public health protection. The EPA has established annual and 24-hour  $\text{PM}_{2.5}$  standards of 12 and 35 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), respectively. In January 2015, the EPA designated and initially classified 14 areas across the country, including the City of Portola and surrounding parts of Plumas County, California (referred to as Greater Portola) as a “[nonattainment area](#)” for the annual  $\text{PM}_{2.5}$  standard due to unhealthy levels of fine particulate emissions during the three-year period from 2011-2013. This nonattainment designation triggers requirements for the community to begin taking action as quickly as possible to reduce pollution levels so that the Portola area can attain the  $\text{PM}_{2.5}$  standard by the end of 2021. Portola’s nonattainment status will remain in effect until the three-year average levels of  $\text{PM}_{2.5}$  can be shown to meet the air quality standards and certain demonstrations and requirements are met. The area is also currently not meeting the 24-hour  $\text{PM}_{2.5}$  standard.

This evaluation is an analysis of program alternatives that the Northern Sierra Air Quality Management District (NSAQMD) can use to reduce  $\text{PM}_{2.5}$  in the Greater Portola nonattainment area without increasing the cost burden on low-income and low-wage earning households. NSAQMD is a regional air quality agency with a mission to preserve air quality and protect public health and welfare in Nevada, Plumas and Sierra counties. NSAQMD is responsible for conducting outreach and administering programs that will help bring the area back into attainment, and it is working closely with Portola city officials, local community organizations, and state and federal government organizations to outline a plan to reach attainment by 2021.

---

<sup>1</sup> P. M. Fine, G.R. Cass, and B.R.T Simoneit “Chemical Characterization of Fine Particle Emissions from the Wood Stove Combustion of Prevalent United States Tree Species” *Environmental Engineering Science* (2004) 24 (6), pp 705 - 721

<sup>2</sup> J.C. Slaughter, T. Lumley, L. Sheppard, J.Q. Koenig, G.G. Shapiro “Effects of ambient air pollution on symptom severity and medication use in children with asthma” *Annals of Allergy, Asthma, & Immunology*, 91 (4) (2003), pp. 346–353.

<sup>3</sup> D.H. Jaffe, M.E. Singer, A.A. Rimm “Air pollution and emergency department visits for asthma among Ohio Medicaid recipients, 1991–1996” *Environmental Research*, 91 (1) (2003), pp. 21–28.

<sup>4</sup> F. Laden, J. Schwartz, F.E. Speizer, D.W. Dockery “Reduction in fine particulate air pollution and mortality: extended follow-up of the Harvard Six Cities Study” *American Journal of Respiratory and Critical Care Medicine*, 173 (6) (2006), pp. 667–672.

To help residents reduce smoke and unhealthy particulate emissions, the EPA provides wood-burning tips on its [Burn Wise](#) website, which offers efficient wood burning techniques and recommends that households upgrade older wood stoves to cleaner-burning [EPA-certified wood stoves](#), gas, propane, or electric appliances. However, this advice creates a new challenge for a small community like Portola. Given that a wood stove or heating appliance can cost between \$3,000 and \$5,000, the Portola community faces a financial challenge in its effort to clean up the air. How do you incentivize a household – especially a low-income household – to change out a working wood stove with a more efficient alternative? It can only happen through a coordination of existing resources and the development of a tiered strategic plan to address not only the financial barriers to wood stove changeouts, but also to foster a spirit of civic responsibility to address these air quality challenges.

## RESEARCH OBJECTIVES AND METHODS

The objectives of this evaluation are first to identify potential wood stove replacement assistance program options and second to evaluate the financial viability of each alternative. To accomplish these objectives, a number of research methods were utilized. First, the research team compiled lists of key individuals and organizations to interview in Portola and the Plumas County region regarding existing air quality, weatherization and utility programs and potential funding sources for wood stove replacement assistance programs. The team then conducted phone and in person interviews with roughly 10 of these individuals over a six-week time frame (See Appendix A for a complete list of interviewees and key stakeholders). The team developed a set of questions to compile information from these individual's perspectives on program aims, costs, key challenges, and other relevant information. Next, these preliminary findings were discussed with EPA and NSAQMD staff to get feedback and provide strategic direction for analysis of program alternatives.

In early March, the Environmental Finance Center at The University of North Carolina (EFC), the EPA and NSAQMD convened a residential wood smoke roundtable with key leaders from community, environmental, health, financial, utility and local, state, and federal governmental organizations in the Portola and Plumas County area to review what the group already knew about wood stoves and demographics in the area. In addition, the group discussed outreach and financial assistance strategies for encouraging wood stove changeouts that could ultimately reduce wood smoke in the area and help move the area towards attainment. In the final phase of this evaluation, the research team evaluated three program alternatives and developed financial models to analyze each alternative's financial feasibility and associated number of potential wood stove changeouts. This report provides an evaluation of the program alternatives and recommends the education and outreach steps necessary to move forward with program development.

## BACKGROUND

Based on the California Air Resource Board (CARB)'s most recent air quality data for the 2012-2014 period, the Greater Portola area is exceeding both the annual and 24-hr PM<sub>2.5</sub> standards by 18 percent and 29 percent respectively. Analysis provided by CARB indicates that the Greater Portola area's high PM<sub>2.5</sub> levels are mostly due to the impacts of residential wood smoke occurring primarily during the fall and winter months. The highest pollution levels occur during the evening and at night (i.e., 5:00 pm to 12:00 am) and in the morning (i.e., 5:00 am to 8:00 am) when more people are home and using their wood stoves and fireplaces. The Greater Portola nonattainment area lies approximately 50 miles northwest of Reno, Nevada. It covers the City of Portola and parts of surrounding Plumas County. A map of the nonattainment area can be found in Appendix B.

According to census data, there are approximately 2,723 housing units in the Greater Portola nonattainment area, and NSAQMD estimates that 1,239 (46 percent) use an uncertified wood burning appliance as their primary or secondary source of heat. The actual number of wood stoves in use in the nonattainment area is likely much higher, with some homes using multiple wood stoves. Although many of these houses might also have alternative heating source appliances (electric or propane) in the home, wood is abundant in Portola and many residents enjoy the ambiance, ease, and self-sufficiency of burning this renewable resource, especially because of its relative low cost and ready availability.

### *REGULATING WOOD SMOKE IN THE GREATER PORTOLA AREA*

The Greater Portola nonattainment area does not currently have any regulations or ordinances in place to regulate the burning of wood in residential homes. During the times that the air does not meet federal health standards, CARB does issue a burn ban for open burning of green waste. A burn ban is a mandatory, yet temporary, order that prohibits the outdoor burning of green waste. In the last three years, the number of forecasted burn ban days in the Plumas County community were approximately 181 days annually, or 50 percent of total days each year.

In addition to the burn bans for open burning, in 2002 the Portola City Council approved a Woodstove and Fireplace Ordinance designed to restrict the types of new wood stoves that can be installed in homes and requires the inspection of wood stoves upon sale of a home to certify compliance with the EPA's wood heater emission standards. If an existing wood stove or fireplace does not comply, the appliance must be removed from the home and replaced with a certified appliance. The complete ordinance can be found in Appendix C.

### *PRIOR WOOD STOVE REPLACEMENT PROGRAMS*

The NSAQMD has a long history of supporting wood stove replacement programs within their three county district. Most of these programs have utilized a \$1,000 rebate incentive to encourage residents to update an older, inefficient wood stove.

- 1999 Nevada, Sierra and Plumas County Woodstove Changeout Program - \$15,000.
- 2002-2003 Lake Almanor Basin Woodstove Changeout Program - \$50,000.
- 2003-2004 Plumas and Sierra County Woodstove Changeout Program - \$40,000.
- 2004-2005 Greater Portola Area Woodstove Changeout Program - \$25,000.
- 2004-2005 Plumas and Sierra County Woodstove Changeout Program - \$30,000.

A total of 140 stoves in all three counties were changed out using the funds that were allocated for woodstove changeout programs. With the exception of the 2004-2005 Greater Portola program, all allocated money was spent. Although \$25,000 was allocated in 2004 for a woodstove changeout program specifically for the Greater Portola area, only \$10,000 was utilized (changing out 10 woodstoves). Of the \$15,000 of unspent funds, \$10,000 has been allocated to the Greater Portola nonattainment area and \$5,000 of the unspent funds has been allocated to the City of Portola's woodstove changeout program.

### *MARCH 2, 2015 ROUNDTABLE DISCUSSION*

In March 2015, the EFC, EPA and NSAQMD convened a residential wood smoke roundtable with key leaders from community, environmental, health, financial, utility and local, state, and federal governmental organizations in the Portola and Plumas County area. Representatives from the EPA, CARB, USDA Rural Development, U.S. Forest Services, Liberty Utilities, Plumas-Sierra Rural Electric Cooperative, Plumas Crisis Intervention and Resource Center, Portola Family Resource Center, Plumas County Public Health Agency and Plumas Bank joined NSAQMD and the City of Portola to brainstorm solutions and form a collaborative plan.

The objective for the day was to review what the group already knew about wood stoves and demographics in the area and discuss outreach and financial assistance strategies for encouraging wood stove changeouts that could ultimately reduce wood smoke in the area and help move the community toward attainment of the air quality standard. Through the discussions, it became clear that the financial “how you pay for it” question was only one piece of the puzzle. A proactive, collaborative strategy for improving air quality must also include educational outreach, economic incentives and community support in order to successfully change habits and reduce wood smoke in the area.



### *MARCH 19, 2015 WOOD STOVE WORKSHOP*

To help educate residents on proper wood burning techniques and demonstrate new EPA-certified wood stoves, the NSAQMD hosted a wood stove workshop for Portola residents on March 19, 2015. About 50 local residents attended the workshop and were entered into a drawing for two \$1,000 gift certificates to the two wood stove retailers who were on hand to conduct wood stove demonstrations at the event. One of the winners noted that his home was built in 1927 and he does not have an EPA certified stove. In addition to a presentation on proper wood-burning techniques from a representative from the Hearth, Patio and Barbecue Association and wood stove demonstrations from local retailers, representatives were available from local fire agencies to discuss wood stove safety and from the Plumas County Public Health Agency to share information about the health impacts of particulate matter. All speakers stressed the importance of the community working together to improve air quality and thereby improving health and quality of life.



*Photos courtesy of Julie Ruiz, Northern Sierra Air Quality Management District and Katie Stewart, EPA*

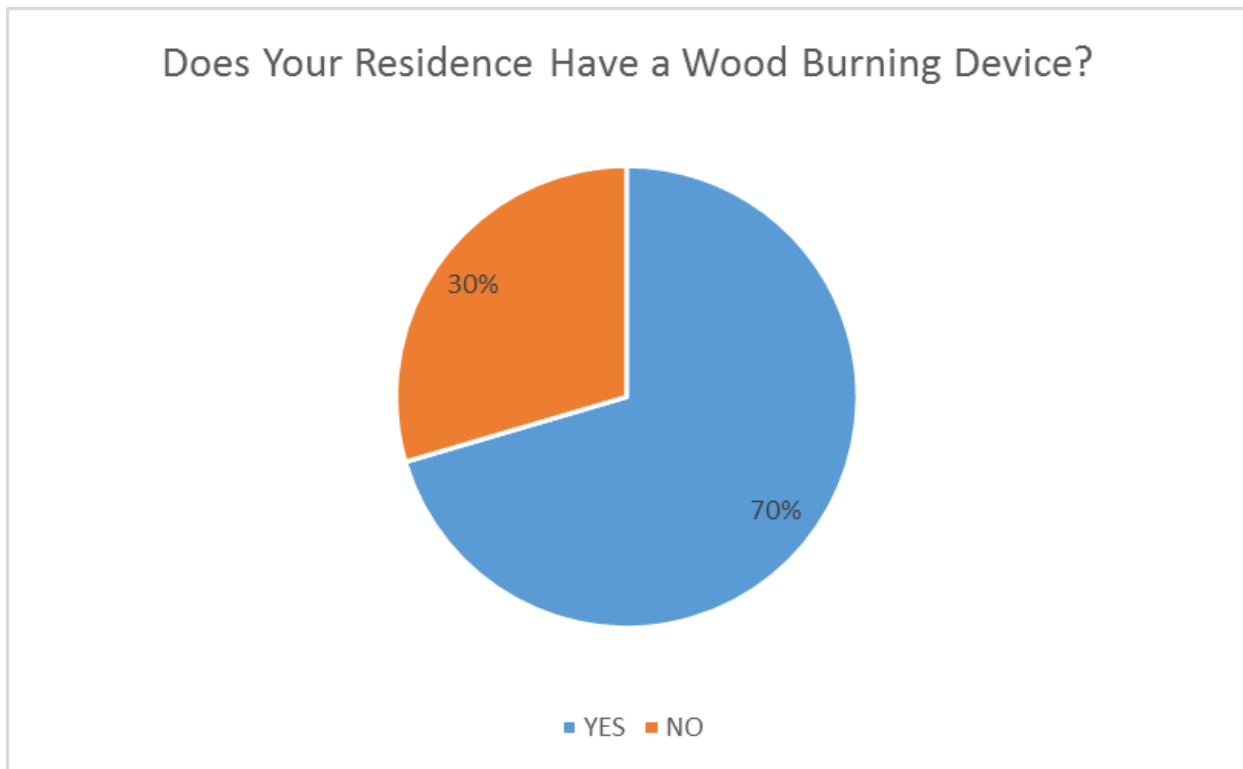
### *PORTOLA AREA RESIDENTIAL HEATING SURVEY*

In March and April 2015, the NSAQMD administered a survey to assess the demographics of the community's residents, particularly as they relate to heating sources and wood stoves. Eighty-nine surveys were received, 39 of which were collected at the March 19 wood stove workshop, 30 from drop boxes located around the city, 11 picked up from homebound residents and the remaining nine collected online and via fax. The complete survey can be found in Appendix D.

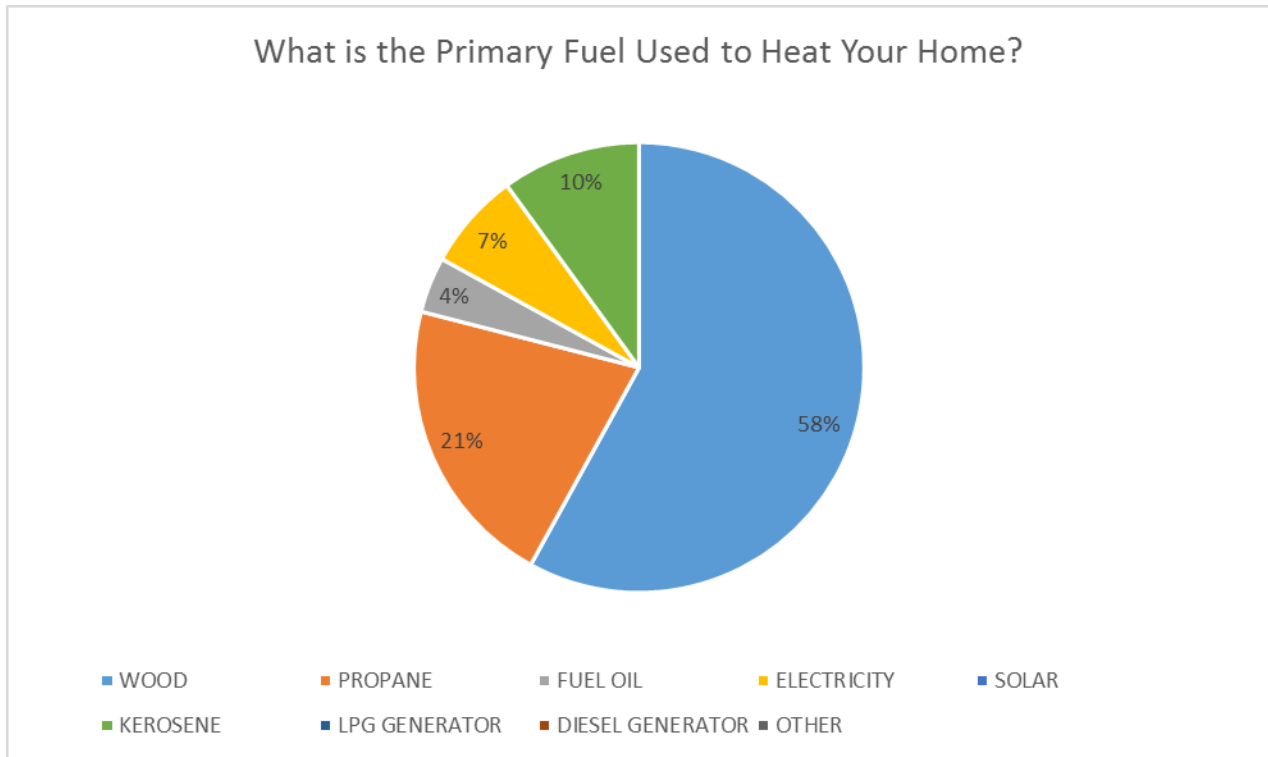
Preliminary results from the survey reveal demographic characteristics of the Portola residents that will be useful as the community moves forward with a wood stove replacement program:

- **Home Ownership:** 71 percent of survey respondents own their home.
- **Wood Burning Devices:** 62 respondents (70 percent) have a wood-burning device in the home and 55 (82 percent) of these devices are wood stoves.
- **Sources of Heat:** 58 percent of the respondents use wood as the primary source of heat, followed by propane (21 percent) and kerosene (10 percent). Although electricity as a primary source of heat was found in only 7 percent of respondents' homes, 25 percent of the homes used electricity as a secondary heating source.
- **Health and Age Demographics:** 29 percent of respondents have someone in the home diagnosed with asthma or another respiratory/breathing disorder. 25 percent of respondents had K-12 children in the home and 65 percent had at least one senior over 55 years old living in the home.

**FIGURE 1: QUESTION 1, PORTOLA AREA RESIDENTIAL HEATING SURVEY, APRIL 2015 (N=89)**



**FIGURE 2: QUESTION 10, PORTOLA AREA RESIDENTIAL HEATING SURVEY, APRIL 2015 (N=89)**



***PORTOLA WOOD STOVE REPLACEMENT GOAL***

The California Air Resources Board provided a preliminary estimate of how many wood stoves operating in the Portola PM<sub>2.5</sub> nonattainment area would have to be replaced with EPA-certified stoves to improve air quality and help move the area towards attainment. The CARB preliminary analysis estimates that the minimum number of stoves to target for replacement in the nonattainment area is 600 stoves, or 50 percent of the estimated number of uncertified wood stoves in the nonattainment area. With an estimated replacement cost of \$3,500 per stove, it is estimated that a woodstove replacement program designed to significantly move the area towards attainment would cost, at a minimum, \$2,100,000, not including program implementation, outreach, and education costs.

## ASSISTANCE PROGRAMS AVAILABLE

There are a number of programs established to help address the weatherization and energy assistance needs of Portola and Plumas County residents, particularly for households qualifying as low-income (defined in Table 2 below) and seniors (over 62 years of age). These programs include home repair programs, weatherization programs and energy assistance programs.

### HOME REPAIR AND WEATHERIZATION PROGRAMS

State, federal and utility programs are currently available to assist low-income residents of Portola and Plumas County with weatherization of homes to improve a home's efficiency and/or repair a safety or health hazard in the home. While not all of the programs allow for a wood stove changeout as a qualified use of funds, all will provide energy efficiency improvements that will reduce the resident's heating requirements, lowering the cost of heating the home by an alternative source (electricity/gas/propane). In addition to weatherization improvements, some programs will also allow for the changeout of a wood stove as summarized in Table 1 below. All programs have income qualifying limits as outlined in Table 2.

**TABLE 1: SUMMARY OF HOME REPAIR/WEATHERIZATION PROGRAMS AVAILABLE FOR PLUMAS CO.\***

Program	Funds Available (Plumas County)	Target Audience	Weatherization (Y/N)	Wood-Stove (Y/N)
USDA Rural Repair and Rehabilitation Grants	\$1.23 million**	Very Low Income Over 62 years	Y	Y
USDA Rural Repair and Rehabilitation Loans	\$1.28 million**	Very Low Income	Y	Y
LIHEAP Weatherization	\$130,000	Low Income	Y	N
LIHEAP Energy Crisis Intervention	\$27,000	Low Income	Y	Y
U.S. DOE Weatherization	\$16,800	Low Income	Y	Y
Plumas County Housing Rehabilitation	\$140,000	Low Income	Y	N
Liberty Utilities Energy Savings Assistance	N/A	Low Income	Y	N

\* Program data as of March 2, 2015.

\*\* Fund availability for the USDA Rural Repair and Rehabilitation programs are for the State of California.

### USDA 504 RURAL REPAIR AND REHABILITATION GRANTS AND LOANS

The USDA Rural Development Office Rural Repair and Rehabilitation program provides loans and grants to very low-income homeowners located in a rural area to repair, improve, or modernize their dwellings or to remove health and safety hazards. This includes weatherization of a home in addition to the repair or replacement of a heating appliance (including wood) to improve health and safety. This program does not include rentals. There are two components to the program:

- Up to **\$7,500 in grant funds** are available to qualifying homeowners in rural areas. Grant funds may be used only to pay for repairs and improvements resulting in the removal of health and safety hazards. Qualifying homeowners must be over 62 years of age, meet the income limits outlined below and be unable to obtain affordable credit elsewhere.
- **Loans of up to \$20,000** are available to income-qualifying homeowners (no age restrictions). Loans are for up to 20 years at 1 percent interest. A real estate mortgage and full title service are required for loans of \$7,500 or more.

Both programs are administered through the USDA Rural Development office in Redding, CA. Program funds are currently offered on a first-come, first-served basis to all qualifying California residents with approximately \$1.234 million available in California for grants and \$1.28 million available for loans.

**TABLE 2: INCOME LIMITS FOR INCOME-QUALIFYING PROGRAMS\***

Number in Household	Portola / Plumas County Income Limits				
	USDA Rural Repair	LIHEAP <sup>5</sup>	Plumas Co. Housing Rehabilitation	Liberty Utilities Programs	Plumas-Sierra Rural Electric Co-op
1	\$21,700	\$23,963	\$31,000	\$31,460	\$31,020
2	\$24,800	\$31,336	\$35,400	\$31,460	\$31,020
3	\$27,900	\$38,709	\$39,850	\$39,580	\$39,060
4	\$31,000	\$46,082	\$44,250	\$47,700	\$47,100
5	\$33,500	\$53,455	\$47,800	\$55,820	\$55,140
6	\$36,000	\$60,828	\$51,350	\$63,940	\$63,180
7	\$38,450	\$62,211	\$54,900	\$72,060	\$71,220
8	\$40,950	\$63,593	\$58,450	\$80,180	\$79,260

\* Program data as of March 2, 2015.

### *LOW-INCOME HOME ENERGY ASSISTANCE PROGRAMS (LIHEAP)*

The California Department of Community Services and Development (CSD) helps low-income residents reduce energy costs through federally-funded Low-Income Home Energy Assistance Programs:

- The **LIHEAP Weatherization Program** provides services to improve a household's energy efficiency by providing weatherization services (weather-stripping, insulation, caulking, water heater blankets, heating/cooling system repairs, energy-efficient lighting and other measures). While this program does not include wood stove replacements, it can make a house more energy efficient and reduce heating and cooling costs for residents.
- The **LIHEAP Energy Crisis Intervention Program (ECIP)** provides assistance to low-income households in a crisis situation, such as receiving a notice to disconnect or terminate utility services or an energy-related emergency created by a natural disaster. The **ECIP Heating and**

<sup>5</sup> California Department of Community Services and Development website, accessed 4/1/15.  
<http://www.csd.ca.gov/Services/HelpPayingUtilityBills/EnergyIncomeGuidelines.aspx>

**Cooling Services (HCS)** program can also provide for the emergency repair or replacement of a home heating and/or cooling system, including a wood stove replacement.

In Portola and Plumas County, the LIHEAP program is administered through the Plumas County Community Development Commission (PCCDC). The PCCDC currently has approximately \$130,000 available for LIHEAP weatherization and \$27,000 available for Energy Crisis Intervention, which may include wood stove replacements in homes with a non-working or unsafe heating appliance. All LIHEAP assistance is distributed based on income, need, energy burden and other qualifications.

#### *U.S. DEPARTMENT OF ENERGY WEATHERIZATION PROGRAM*

The PCCDC was awarded \$16,800 in funding from the U.S. Department of Energy for the weatherization homes in the Plumas County area. With remaining funds available, this could include the changeout of approximately three wood stoves.

#### *PLUMAS COUNTY HOUSING REHABILITATION PROGRAM*

The Plumas County Housing Rehabilitation Program provides low-interest loans to income-qualifying homeowners and eligible landlords (a landlord with a qualifying tenant) in Plumas County (although not within Portola city limits). Funds for the program are provided through a Community Development Block Grant revolving loan fund:

- Loans are for home repairs to improve health and safety building code violations
- Low-interest loans between 1 to 5 percent, depending on income
- Payments amortized for up to 20 years (owner-occupants or owner/investor)
- Homeowner must meet minimum income requirements (see Table 2 below)

The Plumas County Housing Rehabilitation Program is administered by the Plumas County Community Development Commission. The PCCDC currently has up to \$140,000 available for this loan program available only for homes outside of Portola city limits.

#### *LIBERTY UTILITIES ENERGY SAVINGS ASSISTANCE PROGRAM*

Liberty Utilities provides electricity to homes within Portola city limits. The utility offers a weatherization assistance program to all income-qualifying homeowners (see Table 2 above) in Portola that have an electric heat source in the house and meet other qualification requirements for specific measures. Alternative heat sources such as wood may be in use in the home with the electric heat source present and still qualify for the program. This program may – if an electric heat source is present – fix or upgrade an existing electric heat source, but it will not help with wood stove replacements. Other improvements available at no cost may include weatherization, insulation, minor home repairs and refrigerator replacements. This program does apply to renters with landlord authorization. The program is funded through rate-payer funds as approved by the California Public Utilities Commission.

## ENERGY ASSISTANCE PROGRAMS

In addition to the home repair and weatherization programs available to Portola and Plumas County residents, there are energy assistance programs that can help residents reduce the amount of their monthly energy bills. These programs include federal and utility programs and some include wood as a heat source.

The **LIHEAP Home Energy Assistance Program (HEAP)** provides financial assistance annually to states to help offset home heating and/or cooling costs for low-income households (defined as below 60% of the state's median income) based on need, energy burden and other qualifications. The PCCDC currently has approximately \$184,000 available for HEAP for wood, wood pellets, electric, gas, propane and oil.

The **Liberty Utilities California Alternative Rates for Energy (CARE) Program** is a program mandated by the California Public Utilities Commission to offer energy assistance to low income households within Portola City limits. The CARE program offers a 20 percent discount on a rate-payer's electric bill each month, if the household meets the income guidelines outlined in Table 2.

Plumas-Sierra Rural Electric Cooperative **Winter Rate Assistance Program (WRAP)** offers a \$0.02 per kilowatt-hour (14 percent) rate discount during the winter heating season to rate-payers in the Plumas-Sierra territory (in non-attainment area, but not in Portola). Program eligibility is based on family income as summarized in Table 2, using an annual income of 200 percent of the federal poverty standard as the income limit. The utility also offers energy efficiency rebates (no income qualification) for heat pumps and ductless systems.

## TARGET MARKETS

While it is difficult to estimate the exact number of households that actually use their wood-burning device on a regular basis, the NSAQMD used U.S. Census Block Group data to estimate the number of wood stoves in the Greater Portola nonattainment area. NSAQMD estimates that there are 2,723 households in the nonattainment area (Table 3). Using the April 2015 residential heating survey results indicating that 70 percent of respondents have a wood stove in the home and the assumption that 35 percent of the existing wood stoves are already EPA-compliant, the District estimates that there are approximately **1,239 households** in the nonattainment area that own an uncertified wood stove as either a primary or secondary heating source. These are self-reported numbers and do not count more than one wood-burning device per home, therefore the number of wood stoves in the area's homes is likely higher.

**TABLE 3: GREATER PORTOLA NONATTAINMENT AREA DEMOGRAPHIC INFORMATION**

Map Label	Designated Area Name	Total Population	Age Over 64	Total Households	Household Median Income
<b>Greater Portola Nonattainment Area</b>		<b>5,825</b>	<b>963</b>	<b>2,723</b>	<b>\$44,996</b>
Block Group 2, Census Tract 3	Plumas County, CA	1,360	295	709	\$37,737
Block Group 4, Census Tract 3 (partial)	Plumas County, CA	42	3	20	\$49,219
Block Group 1, Census Tract 3	Plumas County, CA	966	114	491	\$29,750
Block Group 3, Census Tract 3	Plumas County, CA	1,862	167	709	\$32,264
Block Group 1, Census Tract 2.02 (partial)	Plumas County, CA	6	1	3	\$54,688
Block Group 1, Census Tract 2.01 (partial)	Plumas County, CA	678	46	310	\$54,334
Block Group 2, Census Tract 2.01	Plumas County, CA	910	337	482	\$56,979

Source: U.S. Census Bureau's American Community Survey 2006-2010 File Geodatabase for Block Groups, U.S. EPA Office of Environmental Information (OEI) - Office of Information Analysis and Access (OIAA) (2011)

Using demographic averages in the area, the area's median household income and age of household can be further broken down into the following groupings:

#### *LOW-INCOME HOUSEHOLDS*

The median household income (MHI) in Portola in 2013 was \$34,942.<sup>6</sup> 186 households (16 percent) have income less than \$15,000, which falls well below the income qualifications for all of the state, federal and utility programs and approximately 50% of the households (584) have MHI less than \$35,000. In zip code 96122, which includes Portola and the surrounding area, 16 percent (313) of the households have income below \$15,000 and 43 percent (829) have income below \$35,000.

**TABLE 4: HOUSEHOLD INCOME SUMMARY FOR PORTOLA AND PLUMAS COUNTY**

Income	City of Portola		Zip 96122		Plumas County	
Median HH Income	\$34,942		\$40,313		\$45,794	
< \$15,000	186	16%	313	16%	1,417	16%
\$15,000 - \$35,000	398	34%	516	27%	2,162	24%
\$35,000 - \$50,000	183	16%	295	16%	1,257	14%
\$50,000 - \$75,000	193	17%	371	20%	1,730	19%
\$75,000 - \$100,000	101	9%	213	11%	1,090	12%
> \$100,000	94	8%	193	10%	1,341	15%
Total Households	1,155		1,901		8,997	

Source: U.S. Census 2009-2013 American Community Survey 5-year estimates

<sup>6</sup> U.S. Census 2009-2013 American Community Survey 5-year estimates for Portola, CA, Zip 96122 and Plumas County, CA.



## SENIOR POPULATION

According to the U.S. Census data, 18 percent of Portola’s residents (587) are over 62 years of age.<sup>7</sup> In zip code 96122, the percentage of residents over 62 years is 22 percent (1,048) and in Plumas County, this number increases to 27.5 percent:

**TABLE 5: POPULATION AGE SUMMARY FOR PORTOLA AND PLUMAS COUNTY**

Age of Resident	City of Portola		Zip 96122		Plumas County	
Average Age	40.2 years		40.9 years		49.9 years	
Under 18 years	669	23%	1,100	24%	3,558	18%
18 to 61 years	1,684	59%	2,549	54%	10,638	54%
62 years and over	587	18%	1,048	22%	5,390	28%

Source: U.S. Census 2009-2013 American Community Survey 5-year estimates

Using these numbers and the assumption that 35 percent of the existing wood stoves are already EPA-compliant, it is estimated that the number of residents in the nonattainment area that might qualify for each of the existing programs could be as high as 600:

**TABLE 6: TOTAL POTENTIAL TARGET GROUP FOR LOW-INCOME WOOD STOVE CHANGEOUTS**

Number of households with a wood stove	1,907	
Estimated number that are already EPA-compliant stoves	35%	1,239
Estimated number that are in very low-income households (<\$15k)	16%	198
Estimated number that are in low-income households (\$15-35k)	27%	334
Estimated number that are in senior households (>62 years)	22%	272
Estimated overlap (percentage of seniors that are very low-income)	75%	(204)
<b>Total potential target group for low-income change-outs</b>	<b>600</b>	

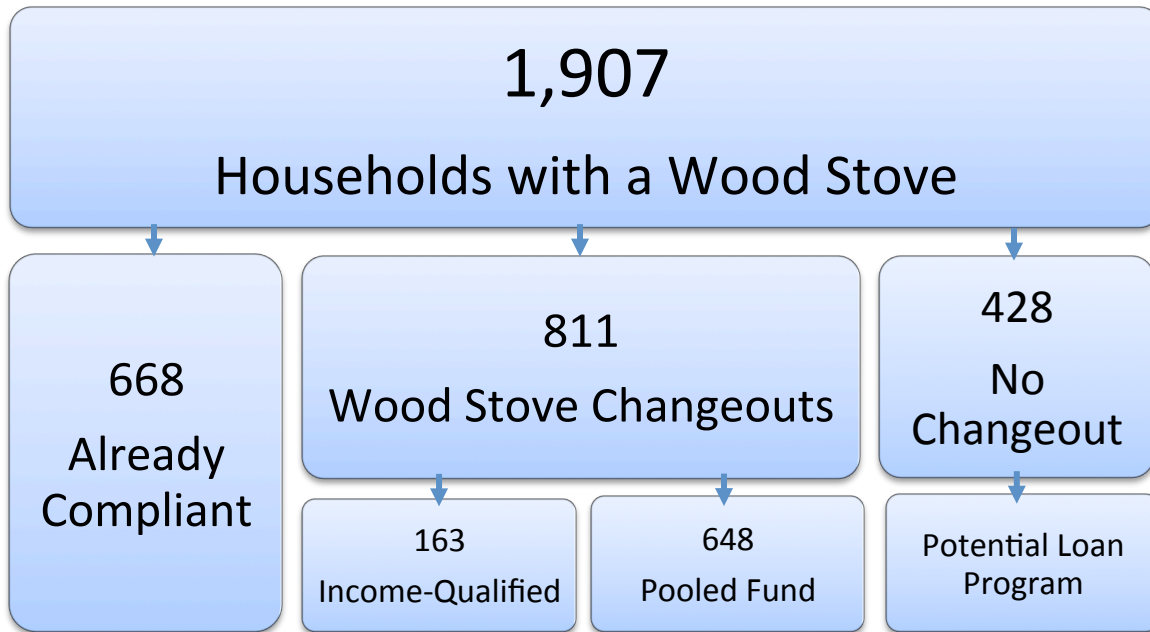
## FINANCIAL FEASIBILITY EVALUATION

To assess the financial feasibility of the wood stove changeout financial assistance programs, a series of Excel-based financial models were developed. Key inputs to the models are based on data provided in the U.S. Census Bureau 2009-2013 American Community Survey and information provided by the NSAQMD, EPA and CARB. The analysis takes a tiered approach to wood stove changeouts. The first tier is to use existing programs to fund 100 percent of changeout costs for the income-qualified residents, including very low-income, low-income and senior households. Funds may be used either for a new wood, pellet or gas stove or to repair an existing electric heat source. The next tier is to utilize a \$3.0 million pooled wood stove changeout fund for all income levels that utilizes money from other federal, state, local, or foundation programs (as it becomes available) for a rebate incentive program. The third tier layers on a woodstove replacement loan program for all income levels to assist with the upfront cost of a wood stove changeout.

<sup>7</sup> U.S. Census 2009-2013 American Community Survey 5-year estimates for Portola, CA, Zip 96122 and Plumas County, CA.

Based on the assumptions in the financial model, a comprehensive woodstove changeout program is summarized in Figure 3 below. Assuming that 35 percent of the estimated 1,907 households with a woodstove in the nonattainment area are already EPA-certified wood stoves and 25 percent of the households would choose not to participate in a wood stove changeout program, an estimated 811 stoves could be changed out, meeting the preliminary changeout goal for the program.

**FIGURE 3: NUMBER OF HOUSEHOLDS IN NONATTAINMENT AREA PARTICIPATING IN WOOD STOVE REPLACEMENT PROGRAMS (ESTIMATED)**



**TIER ONE: WOODSTOVE REPLACEMENT PROGRAM FOR INCOME-QUALIFIED RESIDENTS**

Federal assistance programs – including USDA’s Rural Repair and Rehabilitation Grants, the LIHEAP ECIP program and U.S. Dept. of Energy’s low-income weatherization program – are already in place to assist low-income households with energy-related repairs to existing homes. Therefore, this is the first source of funds that should be used to encourage changeouts in the nonattainment area. Assuming that 75 percent of households meeting income and age eligibility requirements for the USDA program participate and funds remain available, 163 wood stove changeouts could be completed, with a total cost of \$570,500.

Target Population:	Income-qualified and senior (over 62 years) residents
Dollar Amount:	Full grant for wood-stove changeout (estimated at \$3,500).
Funding Source:	USDA, LIHEAP, DOE
Number of Changeouts:	163 wood stoves
Total Cost of Programs:	\$570,500

**TABLE 7: PARTICIPATION IN INCOME-QUALIFYING WOOD STOVE CHANGEOUT PROGRAMS**

<b>Program Name</b>	<b>Estimated Households Eligible*</b>	<b>Participation Rate</b>	<b>Number of Changeouts</b>	<b>Total Cost</b>
Very Low Income Repair and Rehabilitation Grants (USDA)	204	75%	153	\$535,500
Low Income Energy Crisis Intervention Program (LIHEAP ECIP)	7	100%	7	\$24,500
Low Income Weatherization Program (U.S. Dept. of Energy)	3	100%	3	\$10,500
<b>TOTALS</b>	<b>214</b>	<b>76%</b>	<b>163</b>	<b>\$570,500</b>

\* Eligibility for program based on income and age restrictions (USDA) and funding amounts (LIHEAP and DOE).

The income-qualified programs are contingent upon availability of funds and the community’s ability to target eligible households that meet both the income and age requirements of the funding programs. As education and outreach continue through outreach partners, these programs should be considered first for wood stove changeout assistance.

**TIER TWO: POOLED FUND FOR WOODSTOVE REPLACEMENT (ALL INCOME LEVELS)**

Even with existing programs in place for income-qualifying and senior residents, there are many residents who will not qualify for existing programs, but are unable to afford a new wood stove or electric heating appliance. For these households, a pooled fund could be developed using funds from new grants and funding opportunities as they are identified. Based on our analysis, a \$3 million fund has the potential to replace 648 wood stoves with more efficient wood or alternative heat source appliances. This estimate includes a 20 percent administration fee to cover the cost of implementing the program (either by NSAQMD or PCCDC) and a 65 percent participation rate.

Target Population:	All wood-stove owning residents in nonattainment area that do not qualify for the Tier One program outlined above.
Dollar Amount:	Full grant for wood stove changeout (estimated at \$3,500) or replacement with an alternative heating appliance (estimated at \$5,000).
Potential Funding Sources:	EPA 2015 Targeted Air Shed Grant Program, Community Development Block Grants, LIHEAP REACH program, future settlement funds, development / mitigation fees (see program detail below)
Number of Changeouts:	648 wood stoves
Total Cost of Program:	\$2,838,240

Although the NSAQMD does not currently have funding for a pooled loan program, there are a few potential sources of funds that should be considered for the program:

1. **2015 Targeted Air Shed Grant Program**, U.S. Environmental Protection Agency. This program will assist local, state and/or tribal air control agencies in developing plans, conducting demonstrations, and implementing projects in order to reduce air pollution in nonattainment areas that EPA determines as the top five most polluted areas relative to ozone or PM<sub>2.5</sub>. This is a competitive opportunity with maximum federal funding per applicant of \$3 million. Deadline for applications is June 1, 2015.
2. **Community Development Block Grants**, California Department of Housing and Community Development. This program provides funding for a variety of economic and community development activities for low- to moderate-income Californians, including Housing Rehabilitation programs and projects. Although the 2015 application deadline has passed (April 10, 2015), a grant application for the 2016 round of funding might be considered to help fund a wood stove changeout program if current CDBG funds can be spent prior to the 2016 application deadline.
3. **LIHEAP's Residential Energy Assistance Challenge (REACH) program**, U.S. Department of Health and Human Services. Though not currently offered as a LIHEAP allocation, the U.S. Department of Health and Human Services has in prior years offered supplemental LIHEAP funding for the implementation of innovative plans to help LIHEAP eligible households reduce their energy vulnerability. If announced as a future program, the Plumas County Community Development Commission could apply for wood stove changeout funding in addition to the regular LIHEAP allocation.
4. **Supplemental Environmental (SEP) and/or Mitigation Funds**, U.S. Environmental Protection Agency or California Environmental Protection Agency. In some cases, air pollution prevention programs (including wood stove changeout programs) have been partially funded by settlements agreements for violation of federal and state environmental laws. Although there is not currently a settlement in the Portola-Plumas County nonattainment area, it remains a potential source of funds if a settlement case were to arise at a future date.
5. **Development / Mitigation Offset Fees**, City of Portola. As the Portola-Plumas County area develops new housing units, the city could adopt a development fee to be used as a mitigation fund for new wood stoves in the area. This fee could be incorporated into the pooled fund and used to replace existing wood stoves in the area.
6. **Foundations** – There are a variety of private foundations that fund air quality projects, including local foundations like the Eastern Plumas Hospital Foundation that might offer cost-share funding in conjunction with any of the previously mentioned funding sources.

### TIER THREE: WOODSTOVE REPLACEMENT LOAN PROGRAM (ALL INCOME LEVELS)

If money for a pooled fund is unavailable or not sufficient to help address the number of wood stove changeouts needed to reach attainment, the Greater Portola nonattainment area could consider a wood stove replacement loan program as a third tier of financing. In order to meet the needs of all income levels, this loan program should be developed as a coordinated effort between the USDA Rural Repair and Rehabilitation Loan program for low-income households and a local bank loan program for low to moderate-income households.

Target Population:	All wood-stove owning residents in nonattainment area that do not qualify for the Tier One program outlined above.
Dollar Amount:	Up to \$10,000 per loan (for EPA certified wood, pellet, gas, or electric heater and install)
Potential Funding Sources:	USDA Rural Repair and Rehabilitation Loan Program; and Plumas Bank
Number of Changeouts:	TBD
Total Cost of Program:	TBD

For income-qualifying homeowners (see Table 2), the USDA Rural Repair and Rehabilitation loan currently offers up to \$20,000 to repair and improve a home and must result in the removal of health and safety hazards. Wood stoves do qualify for this loan program. Loans are for up to 20 years at 1 percent interest. For homeowners that do not meet the income requirements of the USDA loan program, there is the potential to work with a local bank to develop a loan program for wood stove replacements, perhaps even broadening the offering to include any “green improvement” like weatherization or energy efficient appliances.

#### *PLUMAS BANK WOOD STOVE LOAN PROGRAM*

Plumas Bank, a local bank serving Plumas, Lassen, Modoc, Shasta, Placer, Nevada and Sierra counties, has approved an unsecured consumer loan product to assist qualifying homeowners in the Greater Portola nonattainment area finance the cost of a wood stove replacement.

**Type of financing:** Unsecured consumer loan

**Amount of loan:** \$1,000 - \$10,000. The amount of the loan will depend on the type of device the homeowner chooses as a replacement.

**Type of rate:** 7.25 – 11.25 percent fixed rate. The rate is dependent upon the applicant’s credit score and the requested loan amount.

**Term of loan:** 24 to 48 months.

**Loan Fees:** \$75 documentation fee.

### *FUTURE LOAN PROGRAM CONSIDERATIONS*

Currently, the proposed loan program is available only for wood stove changeouts. If weatherization and/or a new electric appliance is included in the loan offering, it might be possible to work with a local utility to offer on-bill repayment, however this will only be possible for homeowners with electric heating appliances and requires coordination between the utility and the financial institution. Another consideration is to use a credit enhancement (loan loss reserve or interest rate buy down) to fix the interest rate for all borrowers and expand the availability of credit to more risky borrowers with lower credit scores or poor repayment history. The establishment of a loan loss reserve fund (5-10 percent) may be required to offset the additional risk. Considering the small loan amounts and credit risk profile of the households, the additional transaction cost may require an operating subsidy for the lender as well.

### *LOAN PROGRAM EXAMPLE*

Using the assumption that 1,239 households in the Greater Portola nonattainment area need to changeout a wood stove and very low participation rates (1 to 5 percent) in a loan program, a bank could develop a \$250,000 loan fund that would assist with the changeout of at least 112 wood stoves. A lower rate (like the USDA's loan program) or additional incentives from a retailer or manufacturer might help to increase participation rates in the loan program. It should be noted that this program is only necessary if the pooled loan fund in Tier 2 is not large enough to achieve the necessary number of changeouts to reach attainment.

**FIGURE 4: EXAMPLE OF A WOOD STOVE REPLACEMENT LOAN PROGRAM**

Wood Stove Replacement loan program - Annual Cost Estimates							
Total Number of HDDs	1,239			Input Value			
<b>INPUTS</b>				<b>PROGRAM SUMMARY</b>			
<b>Participation Rates</b>				<b>Total households</b>			
Year 1 - 2015	5%			112			
Year 2 - 2016	3%			<b>Percentage of qualified households</b>			
Year 3 - 2017	1%			9%			
<b>Source of Funds</b>				<b>3 Year cost of program</b>			
(Enter source of funds)	\$ 250,000			\$ 468,720			
<b>Loan Program Inputs</b>				<b>Average cost per household</b>			
Average cost to replace appliance	\$3,500			\$ 4,200			
Interest rate on loans	9.25%						
Length of loan term (years)	2						
Administrative Costs (% of total costs)	20%						
				Amount of funding is sufficient			

### **OTHER PROGRAMS**

For all residents and income levels, weatherization programs should be recommended and encouraged in conjunction with all wood stove changeout programs. The LIHEAP and Liberty Utilities weatherization programs can be used for low-income households and the utility assistance programs can be used to help reduce energy costs for households that are interested in changing the primary heat source to electricity.

## OVERCOMING CHALLENGES AND BARRIERS

Even with well-developed financing programs in place for wood stove changeouts – including programs that cover 100 percent of the cost of a changeout – there are still a number of barriers and challenges associated with a successful wood smoke reduction program. Behavior-based challenges are inherent in any change program. In the Greater Portola nonattainment area, the roundtable group identified a few key challenges and barriers that will need to be addressed in conjunction with the roll-out of a wood stove changeout program.

### *“I LIKE THE AMBIANCE OF MY OLD WOOD STOVE”*

Many residents in the area choose wood as their primary source of heat not only because it is low-cost and plentiful in the area, but also because of its ambient qualities. The newer, EPA-certified wood stoves can offer the same aesthetically-pleasing characteristics of an older, inefficient wood stove. Wood stove demonstrations, as were done in the March 19 wood stove workshop and peer-to-peer champions will be essential in helping the community overcome this barrier to changeouts.

### *“WOOD SMOKE ISN'T A PROBLEM IN PORTOLA”*

A common misperception of residents in areas with large amounts of wood smoke is that if the smoke can't be seen (for example, at night when many wood stoves are in use), then there isn't a wood smoke problem. This perception challenge can make outreach and education about the importance of wood stove changeouts very difficult. Overcoming this type of challenge will need to focus on educational efforts that explain the actual air quality data in easy-to-understand ways. A comparison with peer communities that have less severe wood smoke problem would also be helpful in changing the perceptions about wood smoke. Implementing an air quality flag program and finding other innovative ways to communicate air quality data could also help raise awareness about air pollution levels in the community.

### *“I DON'T WANT A HANDOUT”*

Many of the programs identified in this evaluation are available to income-qualifying homeowners; however, some homeowners might not be interested in taking advantage of them because they consider the funding a government handout. One way to overcome this potential barrier is to stress the benefits to all residents of a community-based solution for improving air quality. Working together toward a common community goal could help to persuade reluctant homeowners to be part of the “solution.”

### *“I DON'T WANT SOMEONE IN MY HOME”*

Even with funding for a new wood stove or other heating appliance, a few homeowners may be reluctant to let others in their home to change-out the stove due to possible permitting or other issues. Most of the federally-funded programs – including the USDA and LIHEAP programs – have funds available to assist homeowners with repairing health and safety hazards in the home and could be used to fix some permitting issues. Education around the health and maintenance benefits of a wood stove changeout might be helpful in overcoming this objection.

## EDUCATION AND OUTREACH

From the previous section on overcoming challenges, it is clear that a key to launching a successful wood stove changeout program will be the education and outreach to Portola and Plumas County residents. NSAQMD has already begun a public outreach strategy in Portola to support the increased use of air quality management practices in the region. The strategy consists of distributing EPA's Burn Wise educational pamphlets to residents, providing a link on the District's website to the Burn Wise webpage and other relevant resources, developing advertisements and fact sheets to promote proper burning practices, facilitating woodstove workshops to help residents learn about wood stoves and proper burning practices, offering incentives to residents to attend workshops, distributing informational surveys, translating literature and other materials into Spanish for the Spanish-speaking residents of Portola, and other educational campaigns. When a full-blown wood stove replacement campaign is launched, these outreach strategies as well as some of the key elements outlined below will be important to the continued success of the program.

### KEY ELEMENTS OF PORTOLA'S STRATEGIC COMMUNICATION PLAN:

---

- ✓ Include air quality educational components consistently and ubiquitously throughout the community on all printed materials, websites, emails and other marketing mediums.
  - ✓ Identify the local populations most affected by fine particulate emissions – including seniors and children.
  - ✓ Help local residents learn and educate each other about the health and economic benefits of efficiently burning wood.
  - ✓ Conduct outreach and host workshops for the community to demonstrate proper burning techniques and the benefits of cleaner, more efficient wood stoves.
  - ✓ Utilize existing government and utility financial assistance programs for income-qualified homeowners to help with wood stove changeouts and weatherization of homes.
  - ✓ Develop strategic partnerships with local wood stove retailers and financial institutions to offer financing alternatives for new wood stoves.
  - ✓ Establish long-term, consistent outreach and education through local schools, fire departments, and community volunteer organizations.
  - ✓ Provide daily data on air quality and educate residents about how to find the information on their own. This could include utilizing the "[Air Now](#)" flag program at schools and community buildings.
-



## POTENTIAL TARGET GROUPS

Five groups should be considered as educational targets as part of the community's outreach strategy. Some of these groups will directly benefit from air quality improvements and others might appreciate the economic benefits of more efficient homes and reduced energy use:

1. **Known wood stove users** – In conjunction with the 3/19 wood stove workshop, NSAQMD collected 89 surveys from local residents. Seventy percent of these surveys indicate that the household has one or more wood-burning device. Visual identification of wood-burning homes could also be used for outreach purposes.
2. **Homebound Portola residents** – The Plumas County Public Health Agency estimates that at least 200 of the city's residents are homebound, the majority of which are seniors.
3. **School age children** – There are approximately 600 school-aged kids in the Portola area. Households with kids could be targeted for health messaging and school projects and education in classes will assist in outreach to all community members.
4. **Liberty Utilities "Green Cross" Program** – The utility offers a discounted per kilowatt-hour rate for households that have large medical equipment installations in their homes. These households might be good candidates for weatherization and wood stove replacement if warranted.
5. **LIHEAP, Liberty Utilities CARE and Plumas Sierra WRAP enrollees** – Both local utilities provide utility assistance programs to income-qualifying households. These households, in addition to the homes that receive LIHEAP utility assistance, are perfect target groups for weatherization and wood stove replacement outreach.

## POTENTIAL OUTREACH PARTNERS:

In addition to the target groups summarized above, there are other channels for reaching a diverse set of community members, many of whom have wood stoves in their homes. These partners exist today, and with a minimal amount of education they can become strong allies and champions in the outreach effort:

- Community Connections volunteers (includes 200 junior members)
- Churches, Schools, PTAs
- Wood cutters, chimney sweeps, HEAP wood vendors
- Chamber of Commerce, Rotary Club
- Retailers, including stove retailers, Natural Foods Store
- Sports / Bicycling organizations

In addition, the development of an advisory committee of key community stakeholders (church and business leaders, doctors and teachers) can help communicate the economic and health importance of a community-wide wood stove replacement program.

## MOVING FORWARD: RECOMMENDATIONS AND CONCLUSIONS

Working with key stakeholders from the Portola and Plumas County community, the EPA and CARB, the NSAQMD has already taken steps towards the development of a comprehensive strategy to bring the Greater Portola area back into attainment. While there is no silver bullet for ensuring that the target levels of PM<sub>2.5</sub> will be attained, the community's multi-faceted approach to education and outreach, data collection and financing solutions are the cornerstones to a successful wood stove changeout program. In addition, there is a strong desire by all key stakeholders and community leaders to join together to implement a successful program and many of the critical elements are already in place.

The NSAQMD has developed expertise and proven methods for achieving success in improving air quality in the region. The City of Portola and its community partners, the Plumas County Community Development Commission, the Plumas Crisis Intervention and Resource Center and the Plumas County Public Health Agency have fine-tuned mechanisms for public outreach and education, especially for the low-income and senior population. Local utilities, particularly Liberty Utilities and Plumas-Sierra Rural Electric Cooperative, are already partnering with the community to provide energy savings and utility assistance programs. Other key stakeholders such as state and federal agencies and the local branch of Plumas Bank are all aware of the program needs and have expressed interest in moving forward with discussions to develop additional program support.

Given the demographics of the Greater Portola residents and this evaluation of opportunities for providing financial assistance to reduce PM<sub>2.5</sub> levels in the Greater Portola nonattainment area, the EFC recommends the following tiered approach to financing wood stove changeouts:

- Tier 1: Use existing state, federal and utility programs to change out at least 163 wood stoves for low income and senior residents in the Portola-Plumas County nonattainment area.
- Tier 2: Apply for funding from EPA's 2015 Targeted Air Shed Grant Program or other funding sources to develop a \$3 million pooled fund to change out at almost 650 wood stoves for residents of all income levels.
- Tier 3: Develop a coordinated wood stove replacement loan program in partnership with USDA Rural Services and Plumas Bank to provide funds for any additional wood stove changeout and/or weatherization needs within the community.

In addition, by utilizing existing relationships with partner organizations in the area, the NSAQMD can leverage the outreach it does to residents about air quality and the impacts of wood smoke. With a thorough understanding of the target audiences and the diverse set of challenges and needs of different demographic groups, the District can pull together the partners and develop a comprehensive outreach strategy that includes the following key elements:

- Include air quality educational components consistently and ubiquitously throughout the community on all printed materials, websites, emails and other marketing mediums.
- Facilitate outreach and host workshops for the community to demonstrate proper burning techniques and the economic and health benefits of cleaner, more efficient wood stoves.
- Identify peer-to-peer champions that can help educate others within the community.
- Encourage long-term, consistent outreach and education through local schools and community organizations.
- Disseminate daily air quality data through different communication channels to help educate residents about the air quality problem.
- Provide easy access to information on financing alternatives and education on fuel-switching options.
- Consistently monitor compliance with existing regulations (burn ban days) and ordinances (Woodstove and Fireplace Ordinance).

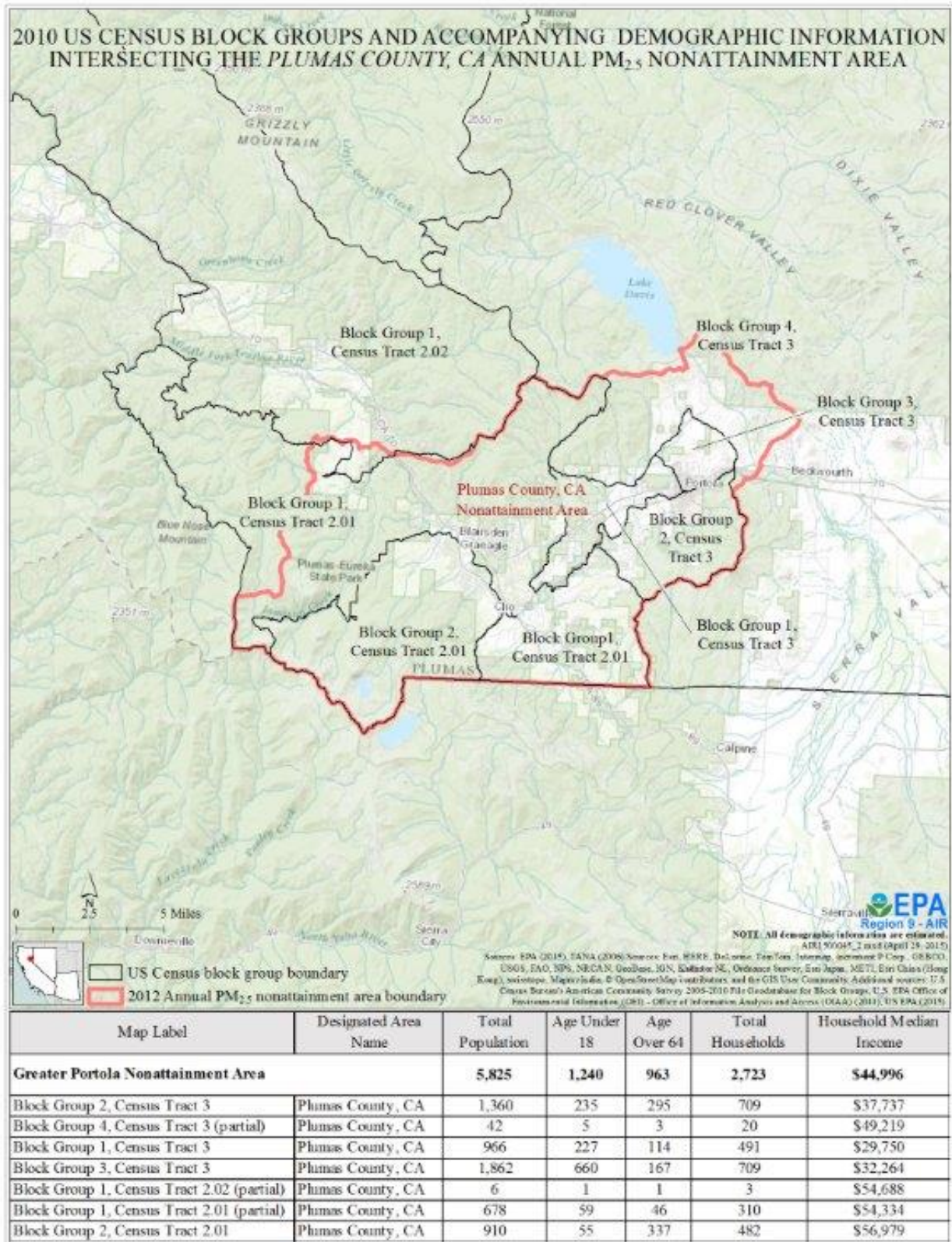
Ultimately, it is the coordination of existing resources and the development of a tiered strategic financial plan that will help the community address not only the financial barriers to wood stove changeouts, but also encourage a community-wide effort to address the air quality challenges. Working together, these elements will help to bring the Greater Portola area back into attainment.

## APPENDIX A – ACKNOWLEDGEMENTS

The authors of this report would like to thank the following people for their contribution to this program evaluation:

Name	Job Title	Organization
<b>Larry Brockman</b>	Residential Wood Smoke Reduction Initiative	Environmental Protection Agency – Office of Air and Radiation
<b>Leigh Herrington</b>	Residential Wood Smoke Reduction Initiative	Environmental Protection Agency – Office of Air and Radiation
<b>Katie Stewart</b>	Community Toxics Coordinator	EPA – Region 9 – Air Division
<b>John Ungvarsky</b>	Environmental Scientist, Planning Office	EPA – Region 9 – Air Division
<b>Graham Fitzsimons</b>	Managing Partner	EC/R Incorporated
<b>Gretchen Bennitt</b>	Executive Director	Northern Sierra Air Quality Management District
<b>Julie Ruiz</b>	Air Pollution Control Specialist	Northern Sierra Air Quality Management District
<b>Sam Longmire</b>	Air Pollution Control Specialist III	Northern Sierra Air Quality Management District
<b>Kasia Turkiewicz</b>	Air Quality Planning	California Air Resources Board
<b>Robert Meacher</b>	City Manager	City of Portola
<b>Karen Downs</b>	City Planner	City of Portola
<b>Todd Roberts</b>	Building Department	City of Portola
<b>Lori Williams</b>	Program Manager, EE	Liberty Utilities
<b>Corby Erwin</b>	Member and Energy Services Manager	Plumas-Sierra Rural Electric Cooperative
<b>Tom Yagerhofer</b>	Interim Executive Director	Plumas County Community Development Commission
<b>David Mitchell</b>	Weatherization Program Manager	Plumas County Community Development Commission
<b>Mimi Hall</b>	Director, Public Health Officer	Plumas County Public Health Agency
<b>Johanna Downey</b>	Executive Director	Plumas Crisis Intervention and Resource Center (PCIRC)
<b>Leah Irons</b>	Greenville and Quincy Office	PCIRC
<b>Nayeli Macias</b>	Quincy Office	PCIRC
<b>Michelle Peralta</b>	Portola Family Resource Center	PCIRC
<b>Michelle Ridley</b>	Portola Family Resource Center	PCIRC
<b>Ryan Bauer</b>	Forest Fuels Officer	U.S. Forest Service
<b>Cheri Skudlarek</b>	Area Specialist	USDA Rural Development, Redding Office
<b>Kathy Andry</b>		California Dept. of Community Services and Development
<b>Rochelle Ramelli</b>	VP, Branch Manager	Plumas Bank, Portola Branch

## APPENDIX B – MAP OF GREATER PORTOLA NONATTAINMENT AREA



## APPENDIX C – PORTOLA, CA WOOD STOVE AND FIREPLACE ORDINANCE

Portola, California, Code of Ordinances >>- PORTOLA, CALIFORNIA MUNICIPAL CODE>> Title  
15- BUILDINGS AND CONSTRUCTION >> Chapter 15.10 -WOOD STOVE AND FIREPLACE ORDINANCE >>

15 10.010- Purpose.

15 10020 - Definitions

15 10.030 -Installation of solid fuel burning appliances.

15.10.040- Existing wood stove/fireplace Insert-Replacement.

1510.050- Violations.

### **15.10.010- Purpose.**

A. This chapter shall be cited as the "Wood Stove and Fireplace Ordinance."

B. This chapter is enacted for the purpose of improving the air quality within the city limits and protecting the health and general welfare of the citizens and residents of the city of Portola. The city council finds there is a need to regulate and reduce harmful emissions of exhaust gases from wood-burning stoves and fireplaces, and that an appropriate method of regulation is a wood stove and fireplace ordinance.

### **15.10.020- Definitions.**

As used in this chapter:

"City approved solid fuel burning appliance" means and includes any of the following:

1. Any appliances which are certified in accordance with current standards adopted by the U.S. Environmental Protection Agency ("EPA") as Phase II requirements and/or which appear on the city of Portola official list of certified wood stoves, if the city of Portola chooses to establish and maintain such a list. Appliances meeting these standards shall be deemed "certified" for purposes of this chapter;
2. A wood stove installed in the kitchen which is primarily designed for cooking and has a stove top and an oven. It may also be equipped with gas burners;
3. An open masonry fireplace that burns natural or liquid propane gas as its fuel through a ceramic or otherwise noncombustible gas log that is permanently installed in the fireplace;
4. A pellet-fueled heater, comprising a forced draft heater with an automatic feed which supplies appropriately sized feed material or compressed pellets of wood, coal or other biomass material to the firebox;
5. A zero clearance fireplace that does not meet the EPA Phase II requirements, but is approved for use by the Northern Sierra Air Quality Management District or a successor entity;
6. A "wood stove/fireplace insert," which may be a wood heater, pellet stove, prefabricated zero clearance fireplace or a fireplace heat form with doors or other accessories which

cause the fireplace to function as a wood heater. Wood stoves/fireplace inserts do not include open masonry fireplaces, barbecue devices, portable fire pits, gas-fired fireplaces or cook stoves.

"Control officer" means the city administrator of the city of Portola, or his or her designee.

"Fireplace" means an open hearth or fire chamber or similar prepared place in which a fire may be made and which is built in conjunction with a chimney. It may have doors, provided they are not designed with gaskets, air intake controls or other modifications which create an air starved operating condition. Fireplaces without such modifications are exempt from the emission standards and requirements of Sections 15.10.050 and 15.10.060. Wood-burning devices initially classified as a wood heater (See "Wood heater" definition below) may not be modified to meet the fireplace definition.

"Uncertified" means a wood stove/fireplace insert that cannot be verified as meeting the certified standards and/or does not appear on the city of Portola official list of certified/exempt wood stoves.

"Wood heater" means an enclosed wood-burning appliance capable of, and intended for space heating, domestic water heating or indoor cooking and which has an air-to-fuel ratio of less than thirty-five to one in the low burn cycle. It also must have a usable firebox volume less than twenty cubic feet, weigh less than eight hundred kilograms and have a minimum burn rate less than five kilograms per hour. Appliances that are described as prefabricated fireplaces and are designed to accommodate doors or other accessories that would create the air starved operating conditions of a wood heater, must meet the emission standards if they meet the criteria in the above definition with those accessories in place.

### **15.10.030- Installation of solid fuel burning appliances.**

A. Emission Standard. It is prohibited for any person to advertise, except when restrictions are noted, sell, offer to sell, or install any wood stove/fireplace insert to any person for installation in any residence or other structure within the city limits if it emits more than seven and one-half grams of particulate matter per hour for a non-catalytic appliance or 4.1 grams of particulate matter per hour for a catalytic appliance. If the U.S. Environmental Protection Agency adopts a wood stove/fireplace emission standard which is more stringent, that emission standard supersedes the standard in this section and becomes effective on the date that the U.S. Environmental Protection Agency standard becomes effective.

B. Enforcement.

1. No local government authority within the city limits may issue a building permit to any person to install an uncertified wood stove/fireplace insert.
2. The control officer shall make available to the public a list of all certified appliances by brand name and model allowed for sale within the city limits.

#### **15.10.040- Existing wood stove/fireplace Insert-Replacement**

A. It is prohibited for any person to complete, or allow the completion of any:

1. Escrow transaction; and/or
2. Title change on any residence or mobile home, or other parcel containing a structure, for the transfer or conveyance of any previously occupied residence, mobile home, or other parcel containing a structure unless the residence, mobile home, or other parcel containing a structure has been certified by the control officer as being in compliance with the wood stove/fireplace certification requirements of these regulations.

B. The buyer and seller of any real property shall observe this section and any disclosure statements supplied by the real estate agents relating to the requirement under this regulation for the inspection of any wood-burning device installed in a residence, mobile home, or structure on the property.

C. Upon inspection of a residence, mobile home, or other structure, the control officer will issue a certificate of compliance if each woodstove/fireplace insert is certified. If the residence, mobile home, or other structure does not contain an uncertified solid fuel burning device, or if special circumstances exist which would make the enforcement of this ordinance impractical or unnecessary the buyer and seller may apply to the city for an exemption. Exemptions shall be granted or denied by the city in its sole discretion, although the city may consult with the control officer in considering an application for exemption.

D. If the report indicates that a wood stove/fireplace insert is uncertified, the wood stove/fireplace insert must be removed from the residence and reinspection is required prior to issuance of a certificate of compliance. If an uncertified wood stove/fireplace insert is removed from a residence, the device must not be stored or installed at any other location on the real property or elsewhere within the city limits without the approval of the control officer.

E. The control officer may issue a certificate of compliance for a residence if a person provides evidence that the certified wood stove/fireplace insert has been installed in compliance with all applicable building, fire and other codes.

F. A certificate of compliance issued pursuant to this section:

1. Remains valid until the residence is transferred or conveyed to a new owner or for nine months, whichever comes sooner.
2. Does not constitute a warranty or guarantee by the control officer that the wood stove/fireplace insert within the residence meets any other standards of operation, efficiency or safety, except the emission standards contained in these regulations.



G.If a residence is to be sold and does not contain a wood stove/fireplace insert, a form approved by the control officer, containing the signatures of both the buyer and seller, attesting to that fact, may be accepted in lieu of an inspection, and a notice of exemption may be issued. The completed notice of exemption shall be submitted to the control officer within ten days of close of escrow. If the residential property contains a wood stove/fireplace insert which is not certified and must be removed, the form must not be executed by either the buyer or seller until the removal has been completed. On any subsequent sale, a new notice of exemption is required.

#### **15.10.050- Violations.**

Any person who violates any of the requirements of this chapter, or who falsely attests as to information as part of compliance with this chapter, is subject to penalties and punishments as set forth in Chapter 1.10 of this municipal code, may be subjected to the applicable penalties and punishments prescribed by law for perjury, and may have any license or permit issued by the city be revoked, including but not limited to a building permit or certificate of occupancy.

# APPENDIX D – PORTOLA AREA RESIDENTIAL HEATING SURVEY

## Portola Area Residential Heating Survey (One Survey per Household)

**BRING THIS SURVEY TO THE WOOD STOVE WORKSHOP ON MARCH 19 (see reverse) OR**

**Return this survey to the Northern Sierra Air Quality Management District (NSAQMD) using any of the following:  
Portola drop boxes at Plumas Rural Services (171 Nevada St.), Portola Family Resource Center (165 Ridge St.) or the  
Portola Library OR Fax to 530-832-0101 OR complete the survey online at [www.mvairdistrict.com](http://www.mvairdistrict.com).**

**Completed surveys received by April 15, 2015 will be entered in a drawing for a \$100 gift card to Ace Hardware.**

Please circle or fill in answers below.

1. Status of home ownership:    OWNER            RENTER
2. What year was this home built (approximately)? \_\_\_\_\_
3. Is this home your primary or secondary residence?    PRIMARY    SECONDARY
4. Does your residence have a wood burning device?    YES        NO (skip to #10)
5. If yes, circle the type of device it is (if more than one, the one you use most):

Winters can be very cold... Your answers will help the NSAQMD develop voluntary programs to improve home heating in Portola, saving residents time and money.

WOOD STOVE    FIREPLACE    PELLET STOVE    FIREPLACE INSERT    OUTDOOR WOOD BOILER

If your home has a second wood burning device, please indicate the type from the list above:

6. If burning wood, where is it obtained?                    CUT                    BUY
7. If purchasing wood, what is the cost per cord?    \$ \_\_\_\_\_
8. How many cords do you use annually? \_\_\_\_\_
9. Is your main wood burning device EPA certified (tag on back of device)?    YES    NO    NOT SURE
10. What is the primary fuel you use for heating your home?  
WOOD            PROPANE            FUEL OIL            ELECTRICITY            SOLAR            KEROSENE  
LPG GENERATOR            DIESEL GENERATOR            OTHER \_\_\_\_\_
11. What is the secondary fuel you use for heating your home (if any)?  
WOOD            PROPANE            FUEL OIL            ELECTRICITY            SOLAR            KEROSENE  
LPG GENERATOR            DIESEL GENERATOR            OTHER \_\_\_\_\_
12. If your residence has a heated outbuilding, what is the fuel used? (If no heated outbuilding, skip question)  
WOOD            PROPANE            FUEL OIL            ELECTRICITY            SOLAR            KEROSENE  
LPG GENERATOR            DIESEL GENERATOR            OTHER \_\_\_\_\_

Please fill out the contact information below so you may be entered in the drawing and contacted regarding upcoming educational workshops and community programs (all information will be kept confidential):

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ ZIP \_\_\_\_\_  
PHONE \_\_\_\_\_ EMAIL \_\_\_\_\_

Would you be willing to participate in a more in-depth survey by phone?    YES    NO

Additional optional survey questions:

- |  |     |    |
|--|-----|----|
| Do you receive any assistance from an energy assistance program (i.e. LIHEAP)?     | YES | NO |
| Is your annual household income above \$46,000?                                    | YES | NO |
| Are there school-age children in the home (K-12)?                                  | YES | NO |
| Are there any individuals over the age of 55 in the home?                          | YES | NO |
| Is anyone in the home diagnosed with asthma or any respiratory/breathing disorder? | YES | NO |

## Appendix D

### Portola Area Residential Heating Survey

# Portola Area Residential Heating Survey (One Survey per Household)

**BRING THIS SURVEY TO THE WOOD STOVE WORKSHOP ON MARCH 19 (see reverse) OR**

**Return this survey to the Northern Sierra Air Quality Management District (NSAQMD) using any of the following: Portola drop boxes at Plumas Rural Services (171 Nevada St.), Portola Family Resource Center (165 Ridge St.) or the Portola Library OR Fax to 530-832-0101 OR complete the survey online at [www.myairdistrict.com](http://www.myairdistrict.com).**

**Completed surveys received by April 15, 2015 will be entered in a drawing for a \$100 gift card to Ace Hardware.**

Please circle or fill in answers below.

1. Status of home ownership:      OWNER                  RENTER
2. What year was this home built (approximately)? \_\_\_\_\_
3. Is this home your primary or secondary residence? PRIMARY      SECONDARY
4. Does your residence have a wood burning device? YES      NO (skip to #10)
5. If yes, circle the type of device it is (if more than one, the one you use most):

Winters can be very cold... Your answers will help the NSAQMD develop voluntary programs to improve home heating in Portola, saving residents time and money.

WOOD STOVE      FIREPLACE      PELLET STOVE      FIREPLACE INSERT      OUTDOOR WOOD BOILER

If your home has a second wood burning device, please indicate the type from the list above:

6. If burning wood, where is it obtained?                  CUT                  BUY
7. If purchasing wood, what is the cost per cord? \$ \_\_\_\_\_
8. How many cords do you use annually? \_\_\_\_\_
9. Is your main wood burning device EPA certified (tag on back of device)? YES      NO      NOT SURE
10. What is the primary fuel you use for heating your home?

WOOD                  PROPANE                  FUEL OIL                  ELECTRICITY                  SOLAR                  KEROSENE  
LPG GENERATOR                  DIESEL GENERATOR                  OTHER \_\_\_\_\_

11. What is the secondary fuel you use for heating your home (if any)?

WOOD                  PROPANE                  FUEL OIL                  ELECTRICITY                  SOLAR                  KEROSENE  
LPG GENERATOR                  DIESEL GENERATOR                  OTHER \_\_\_\_\_

12. If your residence has a heated outbuilding, what is the fuel used? (If no heated outbuilding, skip question)

WOOD                  PROPANE                  FUEL OIL                  ELECTRICITY                  SOLAR                  KEROSENE  
LPG GENERATOR                  DIESEL GENERATOR                  OTHER \_\_\_\_\_

Please fill out the contact information below so you may be entered in the drawing and contacted regarding upcoming educational workshops and community programs (all information will be kept confidential):

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE \_\_\_\_\_ EMAIL \_\_\_\_\_

Would you be willing to participate in a more in-depth survey by phone?      YES      NO

Additional optional survey questions:

Do you receive any assistance from an energy assistance program (i.e. LIHEAP)?      YES      NO  
Is your annual household income above \$46,000?      YES      NO  
Are there school-age children in the home (K-12)?      YES      NO  
Are there any individuals over the age of 55 in the home?      YES      NO  
Is anyone in the home diagnosed with asthma or any respiratory/breathing disorder?      YES      NO

## Summary of 2015 Home Heating Survey Results

The Air District developed a residential heating survey to be distributed throughout the nonattainment area. The surveys were distributed in various areas; on the District website, local newspaper, public library, local grocery store, hardware store, Portola Family Resource Center, and the Senior Center. Residents were encouraged to complete it by April 15, 2015 in order to be eligible for a gift certificate in a local hardware store.

Additionally, the District requested all participating residents to complete a survey at the March 19, 2015 Wood Stove workshop. Residents completing the survey at the workshop became eligible for a \$1,000 gift certificate which could be used towards the replacement of a non-certified stove with an EPA-certified appliance. The District collected 39 surveys at the workshop. The District picked up an additional 30 surveys at various drop offs throughout town. The District also worked with the public health program which collected 11 surveys from home-bound residents. Another 9 were collected by the Air District from their online survey. A total of 89 surveys were collected by April 15, 2015.

Results of the survey showed that 71% of those surveyed owned their homes. 28% of the homes were built after 1990 (so they likely contained EPA certified appliances). 97% of the residents labeled their home as their primary residence, so there were very few surveyed residents that used their home as a vacation home. 70% of those surveyed stated they owned a wood burning appliance. However, it should be noted that 39 of the total 89 surveys were collected during the wood stove workshop, so those results would be biased towards wood stove owners.

Of special interest was the breakdown of the type of wood burning appliances; 82% owned wood stoves, 9 % owned fireplaces, 6% owned wood stove inserts and only 3% owned pellet stoves. Approximately an equal amount of those who use wood burning appliances cut and/or buy their wood. 87% of those who burn wood use more than 3 cords of wood/year. 47% of those with wood burning appliances stated the appliance was an EPA certified appliance. 58% of those surveyed stated that wood was the primary fuel they used to heat their homes.

## Appendix E

### Incentive Measure and Enforceable Commitment

## RESIDENTIAL WOOD STOVE CHANGE-OUT INCENTIVE MEASURE

### OVERVIEW

The Northern Sierra Air Quality Management District (District) will be implementing the Greater Portola Wood Stove Change-out Program 2016 (Wood Stove Program) in Plumas County funded by the U.S. EPA's 2015 Targeted Air Shed Grant Program, the District and other agencies. The objective of the Wood Stove Program is to reduce pollution levels so the Portola area can attain the PM2.5 standard by 2021. Over the next five years, grant funds will be used to replace older, uncertified wood stoves in the community with newer U.S. EPA-certified devices and to educate residents on proper ways to store and burn wood.

U.S. EPA allocated \$2,483,607.00 towards the Wood Stove Program to the District to implement a financial incentive program to encourage owners of older uncertified wood stoves within the nonattainment area to switch earlier to newer cleaner-burning devices. To qualify, the uncertified wood stove must be operable and currently in use in the residence. Over the next five years, 2016 through 2020, the District will offer incentives ranging from \$1,500 to \$4,500. Table 1 summarizes the incentive measure and the estimated reductions in emissions.

Table 1. Incentive Measure Summary

<b>Source Category:</b>	Residential Fuel Combustion – Wood Stoves		
<b>Implementing Agency:</b>	Northern Sierra Air Quality Management District and ARB		
<b>Type of Action:</b>	Northern Sierra Air Quality Management District Incentive Program		
<b>Portola Nonattainment Area Estimated Emission Reductions (tons of pollutant)</b>			
Pollutant	2019 (RFP) Annually	2021 (Attainment) Annually	2022 (Quantitative Milestone) Annually
CO	114.1	195.6	195.6
SO2	0.1	0.1	0.1
NOx	0.9	1.6	1.6
VOC	32.2	55.1	55.1
PM2.5-Primary	16.5	28.3	28.3
Total HAPs	2.4	4.1	4.1

## **DEMONSTRATION THAT WOOD STOVE PROGRAM MEETS U.S. EPA REQUIREMENTS**

According to U.S. EPA guidelines, there are four necessary elements to demonstration the integrity of incentive programs that are to be credited as achieving emission reductions towards a SIP – the reductions from these programs must be enforceable, quantifiable, surplus, and permanent<sup>1</sup>.

The District has developed a series of documents to provide guidance to all parties, to verify each step in the process and to collect information to provide in a database that will be publicly available online. Together the documents are considered to be the District's program guidelines. This section includes the integrity demonstration for the Wood Stove Program projects using the Guidance Document for the Greater Portola Wood Stove Change-out Program (Guidance Document) dated 8/11/2016 as the incentive-based emission reduction measure. The Guidance Document is included in Appendix P and contains the following documents:

- Program Application for Zone 1 (dated 4/1/16)
  - Application Form (dated 4/1/16)
  - Applicant Certification (dated 4/1/16)
  - Home Heating Survey (dated 4/1/16)
- Program Application for Zone 2 (dated 4/7/16)
  - Application Form (dated 4/7/16)
  - Applicant Certification (dated 4/7/16)
  - Home Heating Survey (dated 4/7/16)
- Owner/Tenant Agreement (dated 3/1/16)
- Program Tracking Form (dated 5/1/16)
- Acknowledgement of Training Form (dated 4/7/16)
- Verification of Destruction Form (dated 5/18/16)
- Cover Sheet (dated 3/1/16)

In addition, these two documents will also be referenced:

- Work plan for the 2016 Residential Wood Stove Change-out Project in the Plumas County PM2.5 Nonattainment Area (dated 1/21/16 and included in Appendix Q)
- Northern Sierra Air Quality Management District: Request for Qualification for List of Qualified Retailers/Contractors for Greater Portola Wood Stove Change-out Program (RFQ) (Appendix E)
  - Retailer/Contractor Contract Agreement (dated 3/1/16 and included in Appendix F)

---

<sup>1</sup> See "Guidance on Incorporating Voluntary Mobile Source Emission Reduction Programs in State Implementation Plans (SIPs)," October 24, 1997, at page 6-7; "Improving Air Quality with Economic Incentive Programs," January 2001 at Section 4.1; "Incorporating Emerging and Voluntary Measures in a State Implementation Plan (SIP)," September 2004 at pages 3-4' and "Diesel Retrofits: Quantifying and Using Their Emission Benefits in SIPs and Conformity," February 2014 at pages 27-29.



All wood stove change-out projects will satisfy the U.S. EPA integrity element demonstration, therefore emission reductions achieved through these projects are SIP creditable.

### Enforceable

Emission reductions and/or required actions are enforceable if they are independently verifiable and practically enforceable consistent with U.S. EPA guidance; program violations are defined; those liable can be fined; the state or U.S. EPA may apply penalties and secure corrective action where applicable; citizens have access to all emissions-related information obtained from participating sources. The following procedures will be followed to document all steps and ensure the old stoves are replaced with new, EPA-certified stoves, homeowners are trained on proper usage, the old stove was rendered inoperable and the project was completed.

In order for projects to be considered for funding, a complete application must be submitted and certified by the applicant to the District. The requirements and certification for the applicants are in:

- Program Application for Zone 1, page 1 and 2, Sections 1-14, dated 4/1/16
- Program Applications for Zone 2, page 1 and 2, Sections 1-15, dated 4/7/16
- Program Application for Zone 1, page 3, "Applicant Certification," Section a – m, dated 4/1/16
- Program Application for Zone 2, page 3, "Applicant Certification," Section a – m, dated 4/7/16

These sections require each applicant to qualify by having a currently installed and operating non-EPA certified wood stove (non-EPA certified devices were typically purchased and installed prior to 1992). In addition, according to the Program Application for Zone 1 and 2, Sections 3 and 4, the applicant will be disqualified if the old device is removed from the home prior to applicant approval and the new device is purchased before applicant approval. Before and after photos will provide evidence of installation. Finally, all installations must be completed by a District-approved Retailer and self-installation of the new device is not eligible. The applicant must also certify to these statements on pages 3 of the Program Application, the Applicant Certification Form Sections a through m.

Additional District efforts such as inspections include applicants allowing the District, as agreed upon in the Applicant Certification Form for Zone 1 and 2, to verify proper wood burning practices are being exercised as discussed by the Retailer and in accordance with U.S. EPA Burnwise education materials because proper wood stove burning practices are critical to the effectiveness of the new devices.

The applicant can be a homeowner or tenant, but tenants or owners who have tenants who wish to be applicants must fill out the Owner/Tenant Agreement in addition to the

Program Application for Zone 1 and 2. The Agreement requires the homeowner and tenant to “allow the Northern Sierra Act Quality Management District (District) and District-approved Retailers into the property noted above for inspection, estimate, installation and permitting. This includes allowing photos to be taken of the old, non-EPA certified device before removal and photos of the new EPA certified device (Device) after installation.” Owner and tenant must also agree to review and agree to the applicant and Application Certification as noted above. Finally, tenants agree not remove the device and as it must stay with the property.

Once the District has selected an applicant for funding through the Wood Stove Program, the applicant must contact a District-approved Retailer. Prior to applicant selection, the District submitted a request for qualifications for retailers and contractors. Based on the requirements, the District selected qualified retailer/contractor with agreements creating the District-approved retailer/contractor list. The agreement between the District and the retailer/contractor and the requirements are in the RFQ.

Per these provisions, only qualified retailers/contractors as identified on the District’s Wood Stove Program website and with signed District agreements will be eligible to participate in the Wood Stove Program based on the following:

1. The retailer/contractor must certify possession of a Chimney Safety Institute of America (CSIA) and/or National Fireplace Institute (NFI) certification.<sup>2</sup>
2. The retailer/contractor must certify possession of a C-61 (D34 Prefabricated Equipment Contractor) license.<sup>3</sup>
3. The retailer/contractor will agree to promote switching to non-wood appliances by highlighting their benefits to project participants.<sup>4</sup>
4. Upon participating, retailers/contractors will agree to train and educate the new owner on the proper operation of the new wood stove and acceptable fuels to maximize the emission reductions. Verification of training will be required before payment will be issued to the retailer/contractor.<sup>5</sup>
5. The retailer/contractor must be an authorized dealer of U.S. EPA certified devices and must be able to provide a list of all the U.S. EPA certified device brands for which each respondent is representing.<sup>6</sup>
6. The retailer/contractor must have all U.S. EPA certified devices sold to be under warranty, and retailer/contractor must have agreement with all manufacturers to honor the warranties.<sup>7</sup>
7. The retailer/contractor agrees to follow best practices on the new device installation procedures.<sup>8</sup>
8. The retailer/contractor attests that they will remove and properly dispose of, or otherwise permanently render inoperable, the older stoves.<sup>9</sup>

---

<sup>2</sup> Pg. 3, Retailer/Contractor Agreement  
<sup>3</sup> Pg. 3, Retailer/Contractor Agreement  
<sup>4</sup> Pg. 5, RFQ  
<sup>5</sup> Pg. 2, Retailer/Contractor Agreement  
<sup>6</sup> Pg. 3, Retailer/Contractor Agreement  
<sup>7</sup> Pg. 3, Retailer/Contractor Agreement  
<sup>8</sup> Pg. 7, Retailer/Contractor Agreement

These requirements ensure that projects are carried out as anticipated, provide the District, ARB, and the public with data needed to verify the project emission reductions and help ensure that violations can be identified. Inspection requirements including verification of usage and requirements for photographic confirmation of the device ensure information provided by the applicant is consistent with actual operating device and the existing device is in working condition.

Record keeping and tracking will be retained by the District/ARB, held for 5 years past the attainment date, and each replacement project must include all of the parameters necessary for quantifying the reductions.

These requirements ensure that projects are carried out as anticipated, provide the District, ARB, and the public with data needed to verify the project emission reductions and help ensure that violations can be identified. The District and the ARB will track, quantify, and report on the achieved reductions according to the schedule described in the 'Enforceable Commitment' Section. The 'Enforceable Commitment' Section also outlines steps that the District will take if the achieved emission reductions are short of projected milestone.

### Quantifiable

To show that emission reductions from these incentive programs are quantifiable, the emission reductions must be measured in a reliable manner that can be replicated. In general, emission reductions are calculated by taking the difference between the emissions of a baseline technology and a reduced technology. The baseline technology is an uncertified wood stove. The reduced technologies are U.S. EPA-certified wood stove, pellet stove, propane stove, and kerosene stove.

The estimated emission reductions from the wood stove change-out program were calculated using the EPA Burn Wise Wood Stove and Fireplace Emissions Calculator<sup>10</sup>. The calculator was used to estimate the difference between the PM<sub>2.5</sub> emissions of an uncertified (pre-1992) stove and a standard U.S. EPA-certified stove. Figure 1 illustrates what the EPA Burn Wise Wood Stove and Fireplace Emissions Calculator looks like. The highlighted fields represent the inputs and outputs. The inputs include the cumulative number of stoves credited towards attainment, the amount of wood burned per year (4.3 cords), and the wood density (1.04). The output includes tons of PM<sub>2.5</sub> emissions saved annually (28.27 tons). This value was divided by 365 days to estimate the tons of PM<sub>2.5</sub> emissions saved each day.

Each annual demonstration will be calculated by averaging emission rates for all devices changed-out during the year and factoring this value into the calculator. Table 2 lists the number of change-outs planned for each year and the estimated emission reductions. Additionally, in each annual demonstration report, the District and

---

<sup>9</sup> Pg. 7, Retailer/Contractor Agreement

<sup>10</sup> Currently available at [https://www.epa.gov/sites/production/files/2015-11/emissioncalculator\\_2.xlsx](https://www.epa.gov/sites/production/files/2015-11/emissioncalculator_2.xlsx)

ARB will identify the relevant version of the Burn Wise Emission Calculator or any other specified methodology used to calculate emission reductions for the previous calendar year.

Figure 1. Screen Shot of EPA Burn Wise Wood Stove and Fireplace Emissions Calculator

Parameters for Calculation of WS Changeout Benefit		Inputs	Input Description																																									
Cords of Wood Burned per Woodstove =		4.3	See separate worksheet in this spreadsheet for EPA default values for burnrates																																									
Wood density to convert cords to tons (tons oven dried wood/cord) =		1.04	use state average of wood density, based on oven dried wood. Densities available in this file in a separate worksheet.																																									
Number of conventional stoves changed out =		600																																										
Woodstove % efficiency for conventional WS =		54	Compilation of Emission Factors, AP42, 5th edition																																									
Woodstove % efficiency for certified WS =		68	Compilation of Emission Factors, AP42, 5th edition																																									
Fraction assumed changed out to new Cert WS, remainder to non-wood burning heaters =		1																																										
		NEI Pollutant Code	Emission factors (lb/ton)	Conv WS	Certified WS	Reference																																						
Directions for use		CO		230.8	107	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
Input in cell B2 the number of cord burned per woodstove		SO2		0.4	0.4	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
input in cell B3 the wood density		NOX		2.8	2	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
Input in cell B4 the number of conventional woodstoves being changed out		VOC		53	15	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
Input in cell B7 the fraction of new stoves that are EPA certified		PM2.5-PRI		30.6	12	Conv Factor = AP-42; Certified EF = 060704 email from Jim Houck																																						
Emissions avoided displayed in box		PM10-PRI		30.6	12	Conv Factor = AP-42; Certified EF = 060704 email from Jim Houck																																						
		600 Dioxin teq		4.6E-09	7.94E-10	MARAMA report																																						
		106990 1,3-butadiene		0.4	0.18	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
		40 16-PAH		0.64	0.3	MARAMA report																																						
		75 7-PAH		0.04	0.02	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
		75070 Acetaldehyde		0.62	0.54	MARAMA report																																						
		107028 Acrolein		0.1	0.04	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
		71432 Benzene		2.16	0.96	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
		50000 Formaldehyde		1.46	0.98	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
		CH4 Methane		64	28.4	Section 1.10, Compilation of Emission Factors, AP42, 5th edition																																						
		91203 Napthalene		0.18	0.14	MARAMA report																																						
		<table border="1"> <thead> <tr> <th colspan="2">Emission Avoided (tons)</th> </tr> <tr> <th>Pollutant</th> <th>Total Emissions Avoided</th> </tr> </thead> <tbody> <tr> <td>CO</td> <td>195.64</td> </tr> <tr> <td>SO2</td> <td>0.11</td> </tr> <tr> <td>NOX</td> <td>1.63</td> </tr> <tr> <td>VOC</td> <td>55.12</td> </tr> <tr> <td>PM2.5-PRI</td> <td>28.27</td> </tr> <tr> <td>PM10-PRI</td> <td>28.27</td> </tr> <tr> <td>Dioxin teq</td> <td>0.00000005329</td> </tr> <tr> <td>1,3-butadiene</td> <td>0.3449</td> </tr> <tr> <td>16-PAH</td> <td>0.5390</td> </tr> <tr> <td>7-PAH</td> <td>0.0324</td> </tr> <tr> <td>Acetaldehyde</td> <td>0.2565</td> </tr> <tr> <td>Acrolein</td> <td>0.0915</td> </tr> <tr> <td>Benzene</td> <td>1.8751</td> </tr> <tr> <td>Formaldehyde</td> <td>0.9147</td> </tr> <tr> <td>Methane</td> <td>55.61</td> </tr> <tr> <td>Napthalene</td> <td>0.0923</td> </tr> <tr> <td>total HAPS =</td> <td>4.146</td> </tr> </tbody> </table>					Emission Avoided (tons)		Pollutant	Total Emissions Avoided	CO	195.64	SO2	0.11	NOX	1.63	VOC	55.12	PM2.5-PRI	28.27	PM10-PRI	28.27	Dioxin teq	0.00000005329	1,3-butadiene	0.3449	16-PAH	0.5390	7-PAH	0.0324	Acetaldehyde	0.2565	Acrolein	0.0915	Benzene	1.8751	Formaldehyde	0.9147	Methane	55.61	Napthalene	0.0923	total HAPS =	4.146
Emission Avoided (tons)																																												
Pollutant	Total Emissions Avoided																																											
CO	195.64																																											
SO2	0.11																																											
NOX	1.63																																											
VOC	55.12																																											
PM2.5-PRI	28.27																																											
PM10-PRI	28.27																																											
Dioxin teq	0.00000005329																																											
1,3-butadiene	0.3449																																											
16-PAH	0.5390																																											
7-PAH	0.0324																																											
Acetaldehyde	0.2565																																											
Acrolein	0.0915																																											
Benzene	1.8751																																											
Formaldehyde	0.9147																																											
Methane	55.61																																											
Napthalene	0.0923																																											
total HAPS =	4.146																																											

Table 2. The relationship between the number of stoves changed out and 2021 attainment year calculation.

Year	Stoves Changed-out		Stoves Credited Towards Attainment	PM2.5 Emission Avoided	
	Per Year	Cumulative		tpy	tpd
2016	100	100	0	0	0
2017	100	200	100	4.710	0.013
2018	150	350	200	9.423	0.026
2019	150	500	350	16.490	0.045
2020	100	600	500	23.557	0.065
2021	0	600	600	28.268	0.077
2022	0	600	600	28.268	0.077

Recordkeeping and tracking will be retained by the District/ARB, held for 5 years past the attainment date, and each replacement project must include:

1. Program Tracking Number for each stove project that refers to the voucher number and funding source to serve as SIP identifier
2. Specific Guideline Year as represented by the date on each District form
3. Location of Applicant (county or city or zip)
4. Model of Old Stove (if available)
5. Old Stove Serial Number (if available)
6. Old Stove Fuel Source/type (default wood)
7. Certification that old stove is currently installed and in-use
8. Model of New Stove
9. New Stove Serial Number
10. New Stove Fuel Source/Type
11. Date New Stove Installed (available for use)
12. Homeowner/renter signed commitment to use new stove as a primary source of heat
13. Affirmation by retailer/contractor that homeowner/renter was properly trained in use and fuel source
14. Date of City Verified Destruction
15. City Certification that Old Stove was Destroyed with Photo
16. Date of Payment/reimbursement to retainer/contractor
17. Emissions Rate of Old Wood Stove
18. Emissions Rate of New Stove
19. Useful Life of New Stove
20. Emission Reductions (emission benefit from replacing old stove with new stove)

This data will be acquired during the applicant and retailer/contractor submittal, agreement, and installation process documentation listed earlier in this section. The data will be stored in a database where the District and ARB can input the listed information above, calculate the emission reductions, District performed inspections, and will be made available to the public in annual report described below or upon request.

These requirements ensure that projects are carried out as anticipated, provide the District, ARB, and the public with data needed to verify the project emission reductions and measured in a reliable manner that can be replicated.

### Surplus

Emission reductions are surplus when they are not otherwise required by other regulations or legal mandates, any other state/local air quality program, a consent decree, or a federal rule designed to reduce criteria pollutant or precursor emissions. Also, emission reductions are considered surplus only for the project life of the device being replaced.

There are currently no other state or federal requirements to replace old wood stoves in the Portola nonattainment area. The current SIP emission inventory for wood stoves was developed through a 2015<sup>11</sup> survey and is included in the baseline SIP inventory.

Recordkeeping and reporting requirements described above in the “Enforceable” and “Quantifiable” sections ensure that current and future emission estimates correctly represent emissions occurring in the Portola nonattainment area. Inspection requirements described in the “Enforceable” section ensure that the unit being replaced is still in-use and useable form and thus would not have been replaced by normal turnover. These requirements ensure that emission reductions from normal fleet turnover are not treated as surplus.

These requirements ensure that projects are carried out as anticipated, provide the District, ARB, and the public with data needed to verify the project emission reductions meet the surplus integrity element.

### Permanent

Emission reductions from incentive programs are permanent if the State and U.S. EPA can ensure that emission reductions occur for as long as they are relied upon in the SIP, and no longer than the remaining project life of the wood stove being replaced. The Wood Stove Program requires that the old wood stove be rendered inoperable and recycled and that the destruction is verified to ensure old wood stoves is not reused and that the emission reductions are permanent. See “Verification of Destruction Form.”

- Program Application for Zone 1, page 3, “Applicant Certification,” dated 4/1/16
- Program Application for Zone 2, page 3, “Applicant Certification,” dated 4/7/16
- Owner/Tenant Agreement, dated 3/1/16
- Acknowledgement of Training Form, dated 4/7/16

The first two sections above specify that the agreements must include language stating that the applicant is required to agree to participate in follow up training and a survey ensuring that the emission reductions quantified are occurring and permanent. The third section certifies that the new stove will not be replaced, modified, or removed unless it is replaced by a cleaner burning appliance. These provisions enable U.S. EPA and the public to evaluate the validity for which ARB attributes emission reductions to a particular project and to determine whether the emission reductions are occurring over time.

These requirements ensure that projects are carried out as anticipated, provide the District, ARB, and the public with data needed to verify the project emission reductions meet the permanent integrity element.

---

<sup>11</sup> [https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-1\\_2011.pdf](https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-1_2011.pdf)

## Conclusion

Relevant portions of the documentation listed above relating to the Wood Stove Program establish clear criteria that enable the District to (1) verify compliance with the applicant and retailer/contractor certification statements to ensure that contracted emission reductions are enforced; (2) quantify the emission reductions attributed to specified projects with a reasonable level of accuracy; (3) verify that those emission reductions are “surplus” to federal/state requirements and other legal mandates; (4) follow-up on applicant and retailer/contractor certifications providing continued implementation of the program to ensure that emission reductions are “permanent” throughout the life of each project.

### **ENFORCEABLE COMMITMENT**

The Northern Sierra Air Quality Management District (the District) Governing Board hereby commits to:

- A. Implement at least 350 residential wood stove replacement projects for the purpose of meeting RFP by December 31, 2019 and at least 600 residential wood stove replacement projects for the purpose of attainment by December 31, 2021 in accordance with the following incentive program guidelines: Guidance Document for the Portola PM<sub>2.5</sub> Nonattainment Area Wood Stove Change-out Program dated August 25, 2016;
- B. By December 31, 2019, achieve 0.045 tons per day (tpd) of reductions in *PM*<sub>2.5</sub> emissions from the baseline inventory in the Greater Portola Area Fine Particulate Matter (PM<sub>2.5</sub>) Attainment Plan (Plan) through implementation of these projects or substitute measures in accordance with Section E;
- C. By December 31, 2021, achieve 0.077 tpd of reductions in *PM*<sub>2.5</sub> emissions from the baseline inventory in the Plan through implementation of these projects or substitute measures in accordance with Section F;
- D. In an annual report for each year from 2016-2022 submitted to EPA by March 31 of each following year:
  - i. Identify each project implemented during the previous calendar year by program tracking number, description of both baseline and new equipment, and quantified emission reductions;
  - ii. Provide an internet link to the EPA Burnwise Emission Calculator used to calculate emission reductions;
  - iii. Describe the actions taken and documentation collected by ARB to confirm each project’s compliance with program requirements;
  - iv. Determine whether the identified projects are projected to achieve the full amount of PM<sub>2.5</sub> emission reductions identified in paragraphs B and C; and
  - v. Describe any changes to relevant forms and related impacts on program integrity.

- E. If EPA determines by July 1, 2018 that information submitted by the District is insufficient to demonstrate that emission reductions required under paragraph B will occur on schedule, adopt and submit to EPA, no later than September 1, 2019, substitute rules and/or measures that will achieve emission reductions addressing the shortfall as expeditiously as practicable and no later than December 31, 2019.
- F. If EPA determines by July 1, 2020 that information submitted by the District is insufficient to demonstrate that emission reductions required under paragraph C will occur on schedule, adopt and submit to EPA, no later than September 1, 2021, substitute rules and/or measures that will achieve emission reductions addressing the shortfall as expeditiously as practicable and no later than December 31, 2021.

### **TECHNICAL ANALYSES/SUPPORT**

The District will rely on projections of SIP-creditable emission reductions under the Wood Stove Program Incentive Measure to satisfy PM<sub>2.5</sub> SIP requirements including attainment demonstration, reasonable further progress, contingency measures, and quantitative milestones. The Portola SIP relies on directly emitted PM<sub>2.5</sub> to provide 100 percent of reductions needed to demonstrate attainment. The wood stove change-out program will provide 93 percent of the needed reductions and the remaining seven percent will come from the ongoing reductions in the mobile sector. The plan does not take any credit for the ongoing reductions in NO<sub>x</sub> emissions.

The attainment demonstration relies on two independent rollback approaches with each demonstrating attainment of the standard by 2021. The traditional rollback relies on emission reductions in directly emitted PM<sub>2.5</sub> from the wood stove change-out estimated using the EPA calculator. The reductions are calculated for each year of the program factoring the estimated number of changed-out stoves. Once the program is fully implemented and 600 uncertified stoves are replaced with EPA-certified stoves, the nonattainment area's wood burning emissions will be reduced 19.3 percent. The alternative rollback does not rely on the calculator. Instead, it assumes that PM<sub>2.5</sub> generated by each uncertified stove reflects 60 percent reduction in emissions and greater heating efficiency (68 percent for the certified stove compared to 54 for the uncertified stove). Both methods independently demonstrate that the projected emission reductions will be sufficient to attain the annual standard. While the area was not designated nonattainment for the 24-hour standard, it has 24-hour design value over the 24-hour standard. The projected emission reductions will be sufficient to reduce PM<sub>2.5</sub> concentrations below the 24-hr standard. Listed below are SIP elements that rely on emission reductions from the wood stove change-out:

- Attainment demonstration for annual and 24-hour standard
- Reasonable Further Progress – The area makes progress towards attainment in a combined stepwise and linear approach.
- Quantitative milestones - The area is expected to reduce emissions of directly emitted PM<sub>2.5</sub> by 0.048 tpd by 2019 and 0.80 tpd by 2022. The reductions to be



achieved from the wood stove change-out program are 0.045 tpd and 0.077 tpd for 2019 and 2022, respectively.

- Contingency measure – The plan will need to provide for 0.0085 tpd in contingency measures. This is equivalent to one year of reductions necessary for RFP.

Because the plan relies on a voluntary measure to provide emission reductions necessary to attain the standard, the District and ARB took extra precautions to ensure that the program is successful and delivers the projected reductions needed to meet the milestones and attain the standard. The District took a number of steps to ensure sufficient participation in the program in order to meet the projected number of change-outs. One of the most important steps is offering significant financial incentives, up to full cost of purchase and installation of a cleaner burning device. Additionally, the District developed a simple and streamlined application process for those applying to participate in the program. To provide a personal service the District maintains a satellite office at Portola with a full time staff and offers assistance in filling applications in both, English and Spanish. All of these efforts are accompanied by a heavy advertising campaign which began a year before the program started and included town hall meetings complete with demonstration of cleaner burning appliances, website and newspaper advertising and posting fliers in frequently attended and visible locations. The District committed to holding annual kick-off meeting to promote participation in the program.

In addition to ensuring sufficient participation in the program, the estimated emission reductions were calculated very conservatively. The estimates are based on the assumption that each uncertified stove will be replaced with a standard EPA certified stove. The heating devices offered through this program are much cleaner than the standard EPA certified devices. The District partnered with two retailers to implement this program. The retailers are tasked with offering the cleanest burning appliance that will meet the resident's need. The District offers additional \$1,000 (up to full cost of purchase and installation) to residents willing to switch to alternative fuel. Since the majority of the change-outs will be completed during the summer months when homeowners are not heating their homes, concentrations during the second half of the year should be lower due to change-outs accomplished during summer. However, in order to come up with conservative reductions, only the change-outs accomplished during the prior year were factored into the projected emission reductions and the corresponding air quality benefits.

Finally, the District is implementing a suite of other measures as part of a long-term wood smoke reduction strategy. The District partnered with the City of Portola and other local organizations to educate the public on the importance of clean burning and proper device maintenance. These vital outreach and education efforts should bring significant emission reductions, for which the plan does not take any credit. Another potential source of reductions not factored into the plan is a voluntary wood burning program which will start during the 2016/2017 winter. This is a temporary measure to reduce wood smoke while the change-out program is being implemented.

## **DEMONSTRATION OF STATE FUNDING AND LEGAL AUTHORITY**

### Funding

The District currently has the following funds designated for implementing a financial incentive program to encourage owners of older uncertified stoves within the nonattainment area to switch to newer cleaner-burning devices:

- 1) \$2,483,607 from the 2015 Targeted Air Shed Grant.
- 2) \$400,000 from the EPA settlement with H&S Performance, LLC
- 3) \$40,000 of local District fees

Furthermore, the District is partnering with the local Portola Resource Center to identify eligible low income residents and assist them in applying for changeout incentives through the following programs:

- 1) United States Department of Agriculture (USDA) Rural Development Office Rural Repair and Rehabilitation program
- 2) United States Department of Health and Human Services the Low Income Home Energy Assistance Program (LIHEAP) program
- 3) United States Department of Energy Weatherization program

### Legal Authority

The Northern Sierra Air Quality Management District (District) was formed in 1986 by the merging of the Air Pollution Control Districts of Nevada, Plumas, and Sierra Counties. The District has the primary responsibility for control of air pollution from all sources other than vehicular sources. The control of vehicular sources is the responsibility of the ARB. The District is composed of District staff, a Governing Board of Directors, and a Hearing Board. Currently, District staff is limited to four full-time employees in the main office in Grass Valley and one full-time employee located in the District's only field office in the City of Portola.

One of the goals of the District is to conduct outreach and administer programs that will help bring the Portola nonattainment area into attainment of the PM<sub>2.5</sub> air quality standard. The District is working closely with Portola city officials, Plumas County agencies, local community organizations, and state and federal government organizations to outline a plan to reach attainment of the PM<sub>2.5</sub> air quality standard by 2021.

In the past 16 years, the District has successfully distributed \$142,000 to residents through different residential wood stove changeout programs throughout all three counties, changing out 142 wood stoves to cleaner burning appliances. The District has demonstrated the technical ability to successfully implement a wood stove changeout program by establishing a plan, tracking progress, and adjusting accordingly to

maximize short- and long-term program goals. In addition, the District has successfully administered \$2,224,000 of incentive funds from the ARB Lower Emission School Bus Program and \$2,281,808 from the Carl Moyer program. The success of these programs substantiates the District's experience in public outreach, marketing, administrative coordination, and fund management.

The District has assigned three of the five staff members who have extensive experience in implementing the past wood stove changeout programs in the District.

The ARB, under the California Health and Safety Code Section 39500, has the responsibility for coordinating, encouraging, and reviewing the efforts of all levels of government as they affect the air quality. Furthermore, under the section 39602, the ARB is designated as the state agency responsible for the preparation of the state implementation plan required by the Clean Air Act and, to this end, shall coordinate the activities of all districts necessary to comply with that act. ARB staff will assist with annual verification of progress including estimating reductions in emissions and PM2.5 concentrations.

With respect to grant management, ARB has accepted several U.S. EPA grants in the past three years, including: Section 105 Air Pollution Control Financial Assistance Grant (Grant Number A-00901315), PM 2.5 Monitoring Network Grant (Grant Number PM-98960901), and the State Clean Diesel Grant (Grant Number DS-00T87901). Each of these recent grants represents a continuation of a multi-year, multi-million dollar grant from U.S. EPA. For each grant, ARB has completed all grant agreement terms and completed (or expects to complete) the approved work plans to expeditiously apply funds to shared U.S. EPA and ARB air quality goals. ARB has documented progress on these grants through submittal of required reports and inputting collected data into state and national databases, as appropriate per the grant terms.

Additionally, ARB has extensive experience implementing multi-million dollar incentives programs, such as the Lower-Emission School Bus Program, the Carl Moyer Memorial Air Quality Standards Attainment (Moyer) Program, Goods Movement Emission Reduction (Goods Movement) Program, the Air Quality Improvement Program (AQIP), and the Providing Loan Assistance for California Equipment (PLACE) Program. ARB's experience in these programs has established solid working relationships with air districts as well as engine/equipment and retrofit manufacturers and vendors necessary for successfully implementing the proposed project.

## **PROCEDURES FOR PUBLIC DISCLOSURE OF INFORMATION**

Provisions to ensure that U.S. EPA and the public have access to emission data in accordance with the requirements of CAA section 114 and U.S. EPA's implementing regulations in 40 CFR 2.301.

There are three methods the public can access information relating to the Northern Sierra Air Quality Management District Wood Stove Program

1. All documents created and/or used in implementing the requirements of the Wood Stove Program shall be kept and maintained by the District for a period of 5 years past the attainment date. Consistent with the California Public Records Act and other related requirements, such records shall be made available for public review upon request to the District. Information regarding the process for the public review of such records shall be included on the Wood Stove Program website at <http://myairdistrict.com/index.php/grants-incentives/portola-woodstove-change-out-program/>.
2. In addition, a database developed and housed by ARB shall be utilized to store all essential information in implementing and accounting emission reductions from the Wood Stove Program. Excluding applicant personal information, the public may request information from the database by contacting ARB or District.
3. Derived from the database and per the enforceable commitment, an annual demonstration report produced by ARB and the District shall be submitted no later than March 31 of the following year and show the quantity of emission reductions achieved through the SIP-creditable incentive program, Wood Stove Program. Previously submitted annual demonstration reports will be made available on ARB's website ([Link TBD](#)) and the District's website (<http://myairdistrict.com/index.php/grants-incentives/portola-woodstove-change-out-program/>).

### **PROVISIONS TO MEASURE AND TRACK PROGRAMMATIC RESULTS**

In addition to the annual report described in the enforceable commitment on page 8, the District/ARB shall perform a retrospective assessment to evaluate the overall performance of its Wood Stove Program and develop recommendations for future enhancements to Wood Stove Program implementation. The assessment will be included in every third annual report, and will include the following:

- Comparison of projected rate of woodstove changeouts (units/year, as described in plan submission) with actual rate of changeouts;
- Comparison of projected numbers of changeouts by type (e.g., wood to pellet stove, or wood to gas stove, as described in plan submission) with actual changeouts by type;
- Description of the geographic distribution of changeouts;
- Adequacy of State resources to implement the program over the expected life of the program;
- Comparison of projected PM<sub>2.5</sub> air quality improvements from implementation of Wood Stove Program (as described in plan submission) to monitored PM<sub>2.5</sub> air quality data;
- Discussion of implementation difficulties and potential solutions – e.g., coordination with stove retailers, types of landlord/tenant complaints;
- Discussion of reasons for changing program forms, if any.

8/11/2016

## Appendix F

### Guidance Document for the Greater Portola

### Wood Stove Change-out Program

This page intentionally left blank

The forms listed below were developed to facilitate the Greater Portola Wood Stove Change-out Program.

<b>Form Title</b>	<b>Date</b>
Cover Sheet	3/1/16
Checklist for Final Packet Submissions	5/1/16
Wood Stove Change-out Process Flow Chart	4/9/16
District Approved Retailers	4/18/16
District Approved Retailers-Spanish	7/22/16
Eligibility Criteria Overview	4/1/16
Eligibility Criteria Zone 1	3/1/16
Eligibility Criteria Zone 2	3/1/16
How to Identify Certified Stoves	3/1/16
NSAQMD Application Zone 1	4/1/16
NSAQMD Application Zone 2	4/7/16
Owner Tenant Agreement	3/1/16
Boilerplate Letter to Resident – Pre-Qualified	3/1/16
Boilerplate Letter to Resident – Spanish Pre-Qualified	3/1/16
NSAQMD Letter to Resident – over \$3,500	8/1/16
Program Tracking Form	5/1/16
NSAQMD Training Form	4/7/16
NSAQMD Verification of Destruction	5/18/16

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

## COVER SHEET

**This form is to be completed by NSAQMD as the cover for the complete packet submitted to ARB:**

Program Tracking #: \_\_\_\_\_

Date of submission to ARB: \_\_\_\_\_

Date funds were disbursed from NSAQMD to Retailer/Installer: \_\_\_\_\_

<p>Mail Packet to: Kasia Turkiewicz Air Quality Planning and Science Division, ARB P.O.Box 2815 Sacramento, CA 95812</p> <p>District Contacts:</p> <p>Gretchen Bennitt, District Project Manager 200 Litton Drive, Suite 320 P.O. Box 2509 Grass Valley, CA 95945 530-274-9360 x102 <a href="mailto:gretchen@myairdistrict.com">gretchen@myairdistrict.com</a></p> <p>Julie Ruiz, Project Coordinator 257 E. Sierra, Unit E P.O. Box 2227 Portola, CA 96122 530-832-0102 <a href="mailto:julie@myairdistrict.com">julie@myairdistrict.com</a></p>
---



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM



**NSAQMD CHECK LIST**

**MUST BE COMPLETED BEFORE SUBMISSION TO NSAQMD FOR REIMBURSEMENT**  
**Attach this sheet to the front of each submission packet**

<b>Program Tracking Number:</b>	
<b>Date Submitted to NSAQMD:</b>	
<b>Retailer:</b>	
<b>Total Check Request:</b>	

Done	Item	Responsible Party
	Application (including Home Heating Survey)	Applicant
	Owner/Tenant Agreement, if needed	Applicant
	Estimate signed by NSAQMD staff	Retailer and NSAQMD staff
	Exceeds \$3,500 letter, if needed	Retailer and NSAQMD staff
	Photos of non-EPA certified device	Retailer or NSAQMD staff
	Program Tracking Form	Retailer
	Photos of new installed device	Retailer or NSAQMD staff
	Verification of Destruction Form	Retailer and City of Portola staff
	Photos of old device destroyed	City of Portola staff
	Acknowledgement of Training Form	Retailer
	Copy of Permit	Retailer
	Final Invoice	Retailer

**10 Items Required (2 additional, if necessary)**

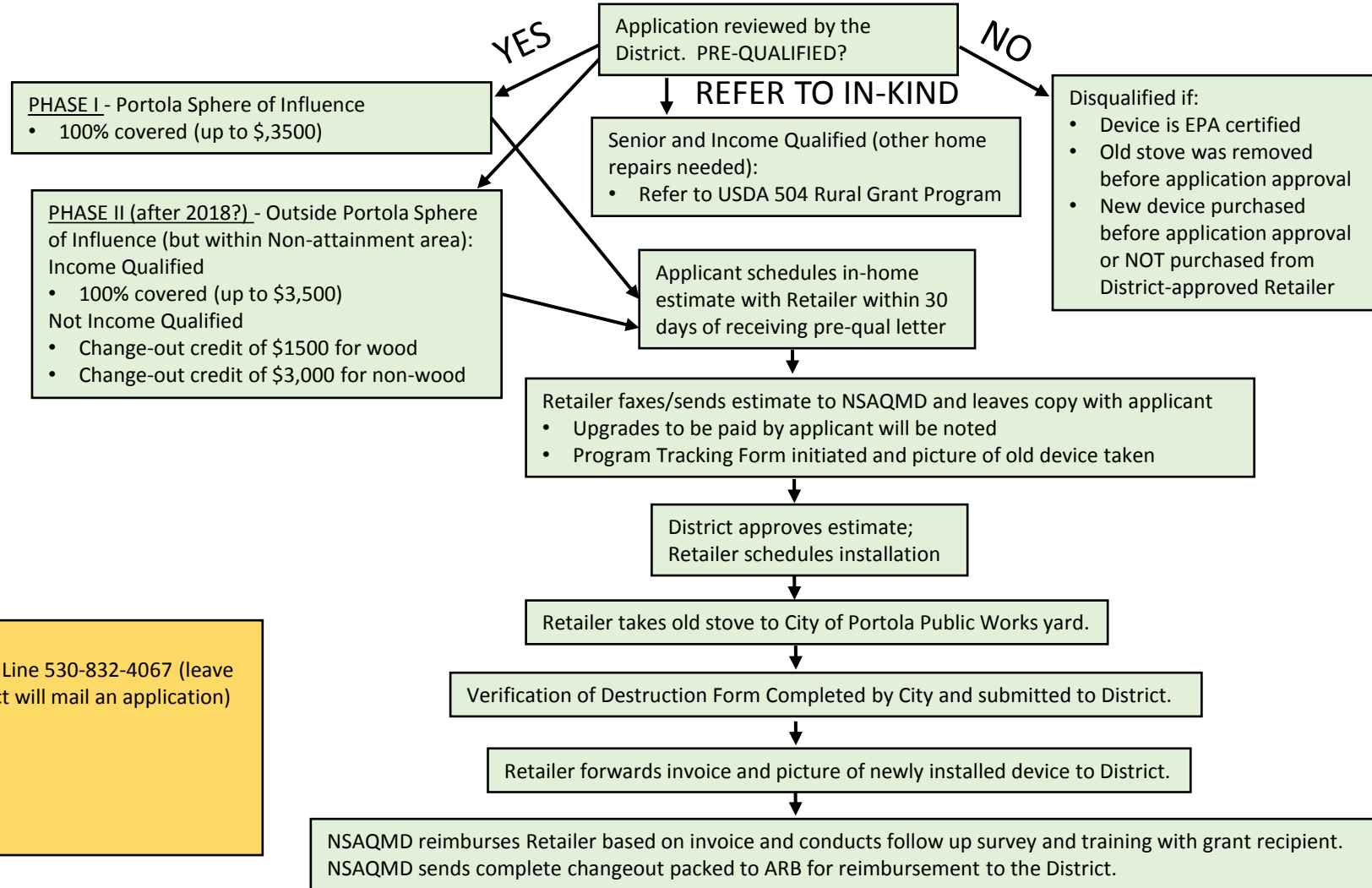
# Wood Stove Change-out Process Flowchart - DRAFT

Program start date: 04/09/16 for Phase I

- ACTIVITIES**
- EPA Grant Award Press Release – 11/10/15
  - Home Heating Financial Assistance Workshop – 12/2/15
  - Program Announcement – XX/XX/16??
  - Begin accepting applications – XX/XX/16??
  - Media Kick Off – XX/XX/16??
  - Stove Fair – XX/XX/16??

- FORMS (on website by Program Announcement date)**
- Informational flier (Eligibility Criteria)
  - Application
    - How the Program Works
    - Application
    - Applicant Certification (to be signed)
    - Portola Home Heating Survey

- APPLICATIONS AVAILABLE:**
- Woodstove Change-Out Information Line 530-832-4067 (leave message with address and the District will mail an application)
  - [www.myairdistrict.com](http://www.myairdistrict.com)
  - Wood Stove Retailers
    - Quincy Hot Spot
    - Wolf Creek Wood Stoves
    - Others??



DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM



## DISTRICT-APPROVED RETAILERS

**Quincy Hot Spot**  
**530-283-2929**

2019 East Main Street  
Quincy, CA 95971  
[www.quincyhotspot.com](http://www.quincyhotspot.com)

**Wolf Creek Wood Stoves**  
**530-832-9858**

**530-616-0135 (cell)**  
55 Delleker Drive  
Portola, CA 96122

**530-284-1399**

201 Main Street  
Greenville, CA 95947  
[www.wolfcreekwoodstoves.com](http://www.wolfcreekwoodstoves.com)

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320

Mailing Address: P.O. Box 2509

Grass Valley, CA 95945

(530) 274-9360 / FAX: (530) 274-7546

email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)NORTHERN FIELD OFFICE

257 E. Sierra, Unit E

Mailing Address: P.O. Box 2227

Portola, CA 96122

(530) 832-0102 / FAX: (530) 832-0101

email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

GRANDIOSO PROGRAMA DE CANVIO DE ESTUFAS DE MADERA

## RESIVIDA Y APROVADA POR EL DISTRITO

Estos son las dos oficinas a donde pueden llamar para su estimacion de el servicio de Estufa de Madera.

**Quincy Hot Spot****530-283-2929**

2019 East Main Street

Quincy, CA 95971

[www.quincyhotspot.com](http://www.quincyhotspot.com)**Wolf Creek Wood Stoves****530-832-9858****530-616-0135 (cell)**

55 Delleker Drive

Portola, CA 96122

**530-284-1399**

201 Main Street

Greenville, CA 95947

[www.wolfcreekwoodstoves.com](http://www.wolfcreekwoodstoves.com)

# NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT

[www.myairdistrict.com](http://www.myairdistrict.com)

Wood Stove Change-Out Information Line: 530-832-4067



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

## CRITERIA FOR PARTICIPATION IN THE GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM (see map on the next page)

### ELIGIBILITY CRITERIA FOR ALL PARTICIPANTS:

- Must currently have an installed, operating non-EPA certified wood stove.
- Must submit a completed application to be considered for the program. Applications will be disqualified:
  - IF the old device is removed from the home prior to application approval.
  - IF the new certified, device is purchased before application approval.
  - IF any information on the application is false or incomplete.
- Installation must be completed by a District-Approved Retailer.

### ZONE 1 CRITERIA:

- Must reside within the City of Portola Sphere of Influence.

### MAXIMUM FUNDING:

- Up to \$3,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.

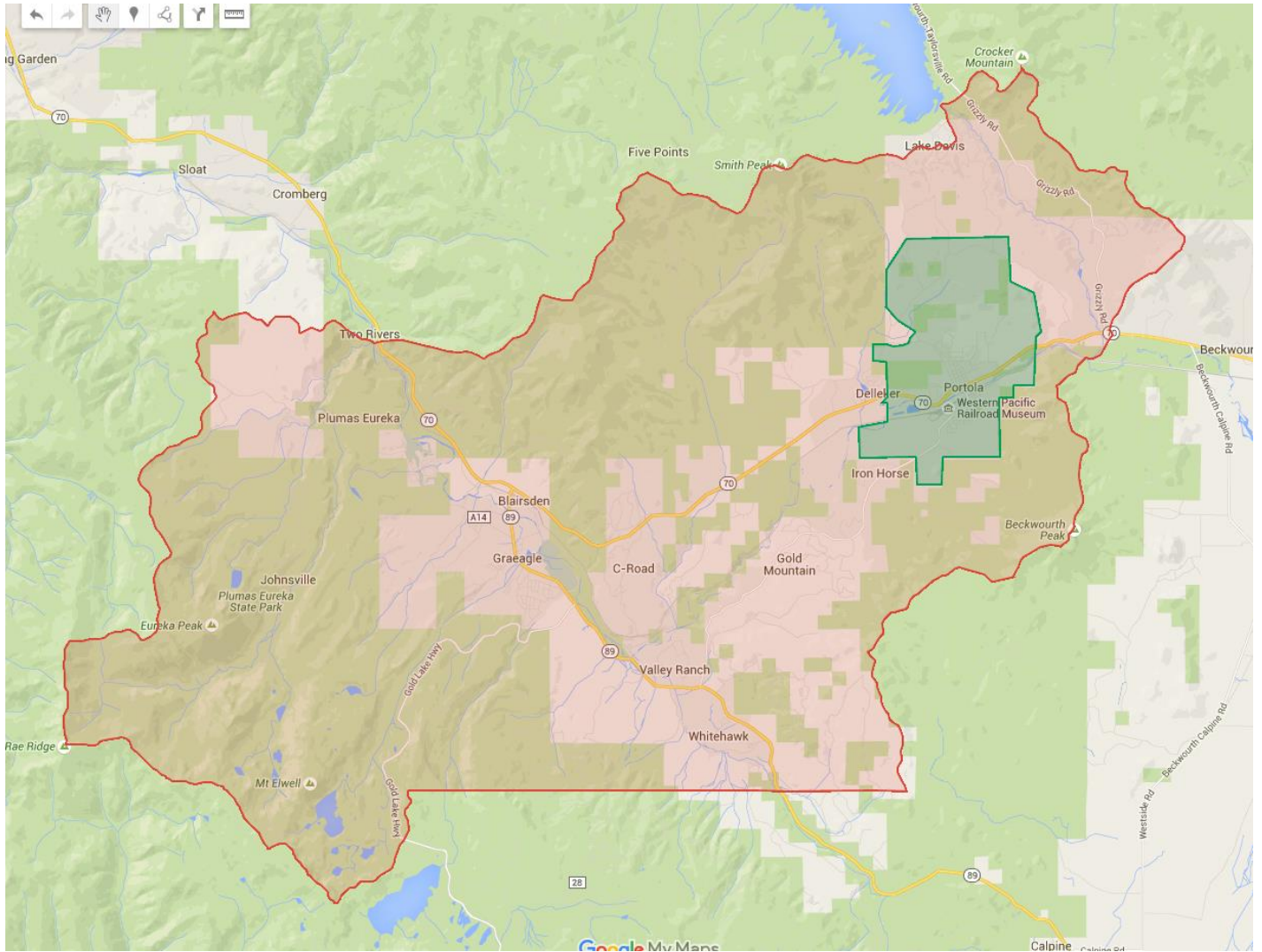
### ZONE 2 CRITERIA:

- Must reside within the Greater Portola PM2.5 Non-Attainment Area (and outside the City of Portola Sphere of Influence).
- Low-Income residents will qualify for greater funding.

### MAXIMUM FUNDING:

- Up to \$1,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$3,000 to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.
- Up to \$3,500 for low income residents to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 for low income residents to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.

# MAP of the Greater Portola PM2.5 Non-Attainment Area (with the City of Portola Sphere of Influence in green)



**NON-ATTAINMENT AREA INCLUDES COMMUNITIES OF IRON HORSE, DELLEKER, C ROAD, MOHAWK VISTA, PLUMAS-EUREKA, BLAIRSDEN-GRAEAGLE, GOLD MOUNTAIN, WHITEHAWK, CLIO, JOHNSTVILLE, AND PORTIONS OF LAKE DAVIS.**

**(Go to [www.myairdistrict.com](http://www.myairdistrict.com) to explore the map in greater detail)**

# NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT

[www.myairdistrict.com](http://www.myairdistrict.com)

**Wood Stove Change-Out Information Line: 530-832-4067**



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

## ELIGIBILITY CRITERIA – ZONE 1

*(ZONE 1 IS DEFINED AS HOMES WITHIN THE CITY OF PORTOLA SPHERE OF INFLUENCE – SEE ATTACHED MAP)*

The Northern Sierra Air Quality Management District (District) is offering a wood stove change-out program to qualified homeowners within the Greater Portola PM2.5 Non-attainment Area in Plumas County, California for replacement of non-EPA certified wood stoves with new, efficient, cleaner burning EPA certified devices. This program is funded by the U.S. EPA's 2015 Targeted Air Shed Grant Program with additional funds provided by the District's AB2766 program and other agencies. This is a 5-year voluntary program that will end August 31, 2020 or when funds run out, whichever comes first. Under this Grant Program, the District will be working with the participating woodstove retailers to provide a replacement device worth up to \$3,500 per stove change-out (including device, necessary stove pipe, permit, labor, etc.). As an added incentive, the District will provide up to \$1,000 in additional funds (total installation not to exceed \$4,500) to replace a non-EPA certified wood stove with a pellet stove or non-solid fuel heating device (propane/kerosene).

- Must be a Resident of the City of Portola (Sphere of Influence), Plumas County, CA (see attached map or, for better accuracy, go to the Google Earth File at [www.myairdistrict.com](http://www.myairdistrict.com))
- Must currently have an installed, operating non-EPA certified wood stove (non-EPA certified stoves were typically purchased and installed prior to 1992)
- Available to homeowners and renters - an Owner/Tenant Agreement must be signed for a rental property.
- Includes mobile and manufactured homes.
- Must submit a completed application to be considered for the program. Your application will be disqualified:
  - IF the old device is removed from the home prior to application approval
  - IF the new certified, device is purchased before application approval
  - IF any information on the application is false or incomplete
- Installation must be completed by a District-approved Retailer
- No retroactive rebates are available.

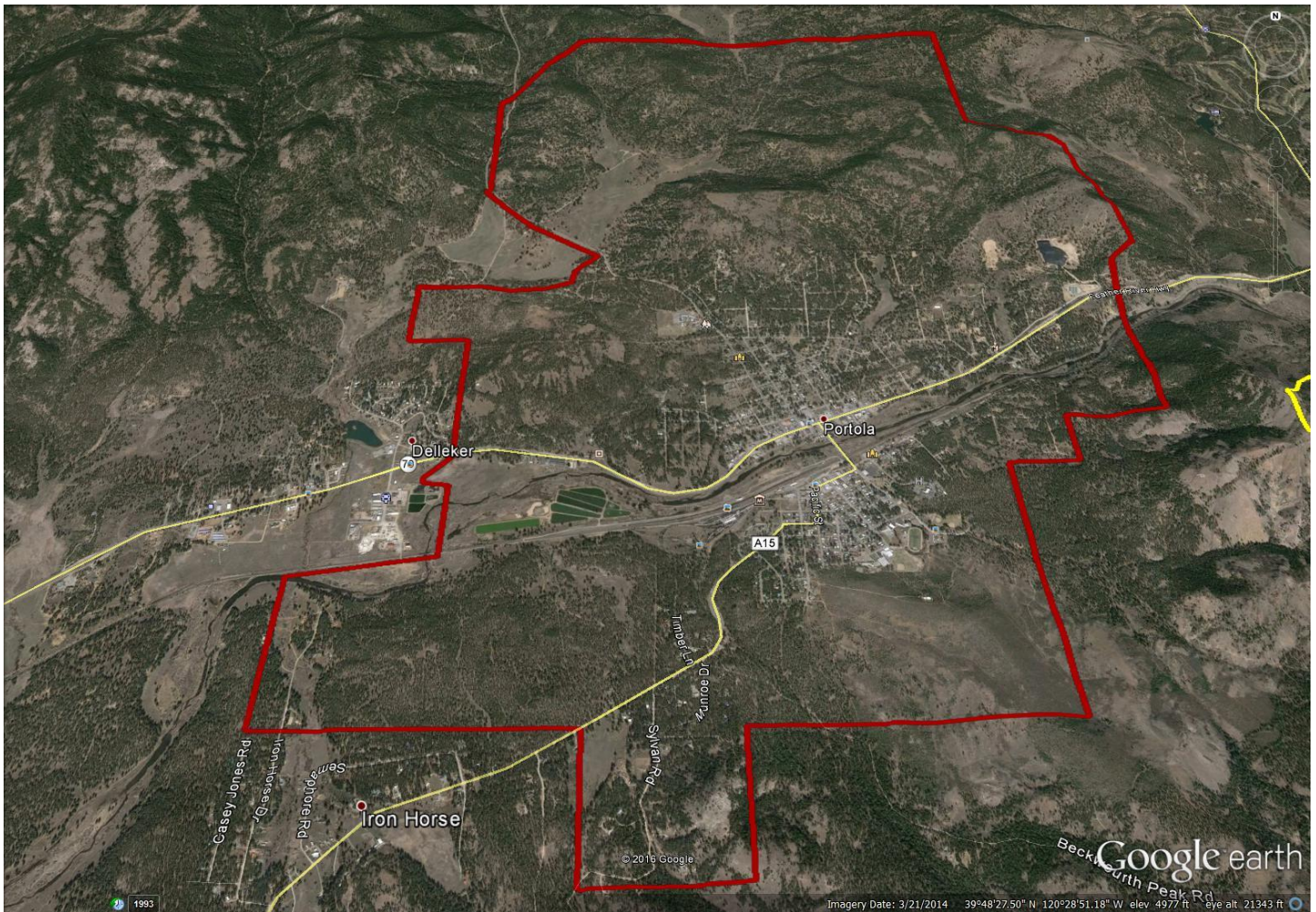
To complete an application, go to [www.myairdistrict.com](http://www.myairdistrict.com). Print out the application, fill it out and return it to the District via email, fax, or mail. Alternately, you may leave your name, phone number and complete address on the information line at 530-832-4067 and an application will be mailed to you. Application hardcopies are also available at Portola City Hall, Portola Library and the Portola Family Resource Center.

The mission of this program is to reduce health impacts by reducing fine particulate (PM2.5) in the air from wood smoke. These microscopic particles go deep into the lungs where they may become trapped. PM2.5 is linked with premature death, work and school absences, and significant health problems including aggravated asthma, acute respiratory symptoms (such as chest pain and coughing), chronic bronchitis and decreased lung function. Sensitive individuals (those most at risk from exposure to smoke) are the elderly, children, asthmatics, adults with pre-existing heart and lung disease, pregnant women, and people engaging in strenuous outdoor activity.

*Submission of an application does not guarantee funding.*

## MAP of Zone 1: CITY OF PORTOLA SPHERE OF INFLUENCE

Please contact the air district for further assistance.







GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

## **ELIGIBILITY CRITERIA – ZONE 2**

*(ZONE 2 IS DEFINED AS HOMES OUTSIDE THE CITY OF PORTOLA SPHERE OF INFLUENCE – SEE ATTACHED MAP)*

The Northern Sierra Air Quality Management District (District) is offering a wood stove change-out program to qualified homeowners within the Greater Portola PM2.5 Non-attainment Area in Plumas County, California for replacement of non-EPA certified wood stoves with new, efficient, cleaner burning EPA certified devices. This program is funded by the U.S. EPA's 2015 Targeted Air Shed Grant Program with additional funds provided by the District's AB2766 program and other agencies. This is a 5-year voluntary program that will end August 31, 2020 or when funds run out, whichever comes first.

If your residence is OUTSIDE the Portola City Sphere of Influence, then you may be eligible for

- Up to \$1,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
  - Up to \$3,000 to replace a non-certified wood burning device with a Pellet, Propane or Kerosene heating device.
  - Up to \$3,500 for low income residents to replace a non-certified wood burning device with an EPA certified wood burning device.
  - Up to \$4,500 for low income residents to replace a non-certified wood burning device with a Pellet, Propane or Kerosene heating device.
- 
- Must reside within the Greater Portola Non-Attainment Area, Plumas County, CA (see attached map or, for better accuracy, go to the Google Earth File at [www.myairdistrict.com](http://www.myairdistrict.com))
  - Must currently have an installed, operating non-EPA certified wood stove (non-EPA certified stoves were typically purchased and installed prior to 1992)
  - Available to homeowners and renters - Owner/Tenant Agreement must be signed for a rental property.
  - Includes mobile and manufactured homes
  - Must submit a completed application to be considered for the program. Your application will be disqualified:
    - IF the old device is removed from the home prior to application approval
    - IF the new certified, device is purchased before application approval
    - IF any information on the application is false or incomplete
  - Installation must be completed by a District-approved Retailer
  - No retroactive rebates are available.

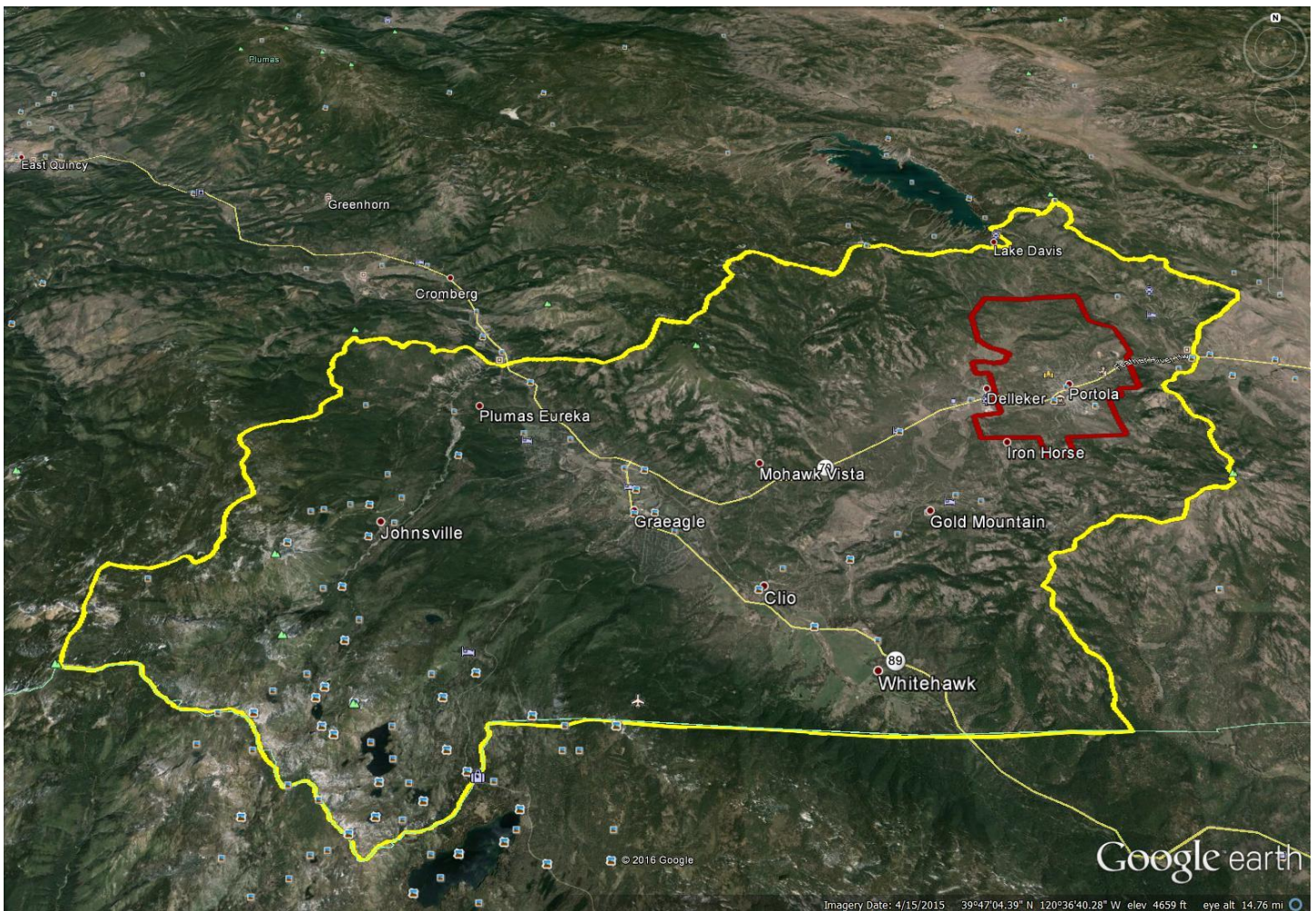
To complete an application, go to [www.myairdistrict.com](http://www.myairdistrict.com). Print out the application, fill it out and return it to the District. Alternately, you may leave your name, phone number and complete address on the information line at 530-832-4067 and an application will be mailed to you. Application hardcopies are also available at Portola City Hall, Portola Library, the Portola Family Resource Center and the Mohawk Community Resource Center.

The mission of this program is to reduce health impacts by reducing fine particulate (PM2.5) in the air from wood smoke. These microscopic particles go deep into the lungs where they may become trapped. PM2.5 is linked with premature death, work and school absences, and significant health problems including aggravated asthma, acute respiratory symptoms (such as chest pain and coughing), chronic bronchitis and decreased lung function. Sensitive individuals (those most at risk from exposure to smoke) are the elderly, children, asthmatics, adults with pre-existing heart and lung disease, pregnant women, and people engaging in strenuous outdoor activity.

*Submission of an application does not guarantee funding.*

## **MAP of Zone 2: OUTSIDE THE CITY OF PORTOLA SPHERE OF INFLUENCE and WITHIN THE NON-ATTAINMENT AREA**

Please contact the air district for further assistance.



**INCLUDES COMMUNITIES OF IRON HORSE, DELLEKER, C ROAD, MOHAWK VISTA, PLUMAS-EUREKA, BLAIRSDEN-GRAEAGLE, GOLD MOUNTAIN, WHITEHAWK, CLIO, JOHNSTVILLE, AND PORTIONS OF LAKE DAVIS**



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

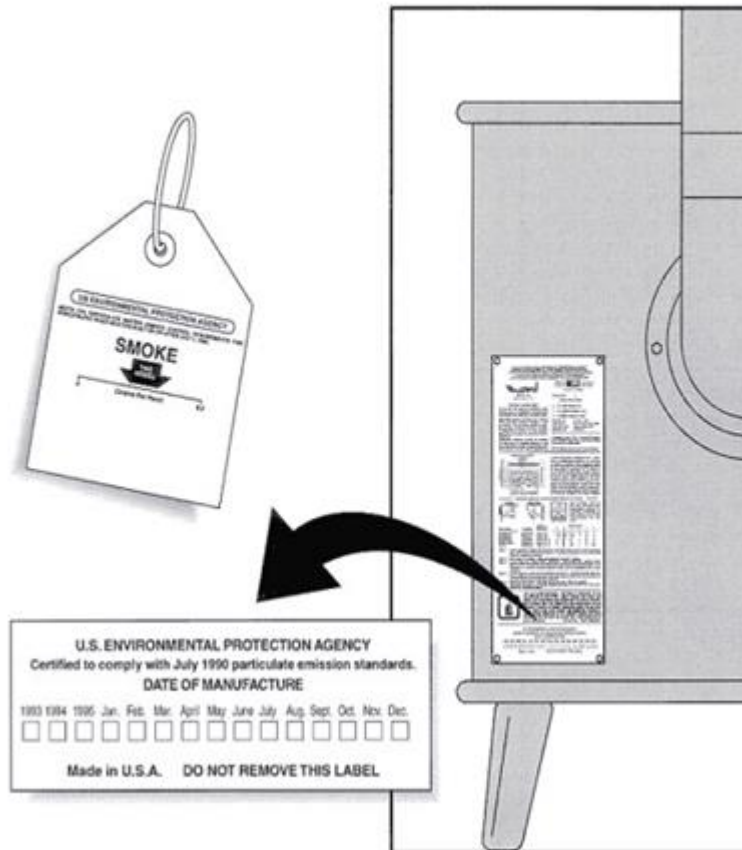
## HOW TO IDENTIFY AN EPA CERTIFIED WOOD STOVE

EPA Phase II Certified stoves will have a label permanently affixed to them which states that the stove is “certified to comply with the July 1, 1990, particulate matter emission standards” by the United States Environmental Protection Agency (USEPA).

If a stove was installed prior to 1990, it does not meet the current USEPA emission requirement. Certification for emissions performance is determined at the point of manufacturer. The EPA’s list of certified wood stoves is a primary resource used to determine if a stove is certified. A web link to this list can be found at: <https://www.epa.gov/compliance/list-epa-certified-wood-stoves>

A permanent wood stove label similar to the picture below is affixed to the back of an EPA Phase II Certified stove:

**EPA certification label circa 1988 to present**



**NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT**[www.myairdistrict.com](http://www.myairdistrict.com)**Wood Stove Change-Out Information Line: 530-832-4067**

GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**APPLICATION FOR ZONE 1 – Homes Within The City of  
Portola Sphere of Influence**

The Northern Sierra Air Quality Management District (District) is offering a change-out program to qualified homeowners within the Greater Portola PM2.5 Non-attainment Area in Plumas County, California for replacement of non-EPA certified wood stoves with new, efficient, cleaner burning EPA certified devices. This program is funded by the U.S. EPA's 2015 Targeted Air Shed Grant Program, the District's AB2766 program and other agencies. This program is a 5-year voluntary wood stove change-out program (applications must be received by August 31, 2020).

1. Zone 1 will be available only to applicants within the City of Portola Sphere of Influence (see attached map).
2. To qualify, the applicant must have a currently installed and operating non-EPA certified wood stove (non-EPA certified devices are typically purchased and installed prior to 1992).
3. If the old device is removed from the home prior to application approval, the applicant will be disqualified from this program.
4. If the new device is purchased before application approval, the applicant will be disqualified from this program.
5. Installation must be completed by a District-approved Retailer. Self-installation of the new device is NOT eligible.
6. This program covers the replacement of no more than one non-EPA certified device per home. This replacement should be considered the primary heating device for the home.
7. This program covers the replacement of non-EPA certified wood stoves in manufactured/mobile homes.
8. This program includes renters if an Owner/Tenant agreement is filled out and signed by both parties.
9. Woodstove brands and models will be determined by a District-approved Retailer/Contractor (Retailer) and approved by the District.
10. If your residence is INSIDE the Portola City Sphere of Influence, then you may be eligible for:
  - Up to \$3,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
  - Up to \$4,500 to replace a non-certified wood burning device with a Pellet, Propane or Kerosene heating device.
11. Upgrades over and above the approved amount will be paid by the applicant.
12. The old, uncertified wood stove must be surrendered to the Retailer for destruction and scrap recycling. The resale or transfer of the old stove in usable condition, for the purpose of its reuse as a stove, is a violation of the terms of this program and will result in forfeiture of the grant award.



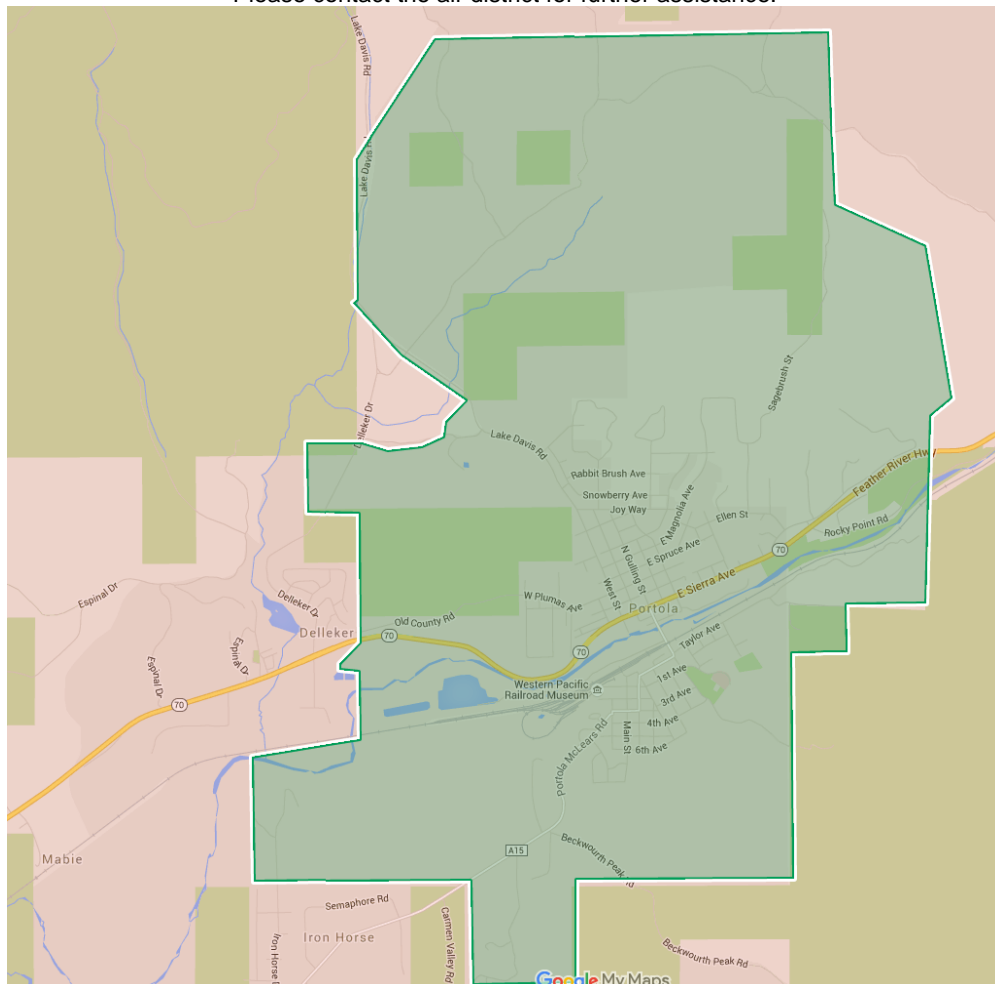
- 13. A photo will be taken by the Retailer before the old device is removed, a photo will be taken to document destruction and a photo will be taken of the new, certified device after installation.
- 14. To qualify, each applicant must first complete the attached application. Completed applications must be mailed to the Change-out Project Coordinator at the address on the application form. The application will be reviewed to determine if the preliminary qualification requirements have been met. Once pre-qualified, the applicant will have 30 days to schedule an in-home estimate with a Retailer. The District will approve the estimate before installation commences.

**NEXT STEP: Applicants will hear from the District within 21 days of receiving a submitted application. Submission of an application does not guarantee funding.**

The mission of this program is to reduce health impacts by reducing fine particulate (PM2.5) in the air from wood smoke. These microscopic particles go deep into the lungs where they may become trapped. PM2.5 is linked with premature death, work and school absences, and significant health problems including aggravated asthma, acute respiratory symptoms (such as chest pain and coughing), chronic bronchitis and decreased lung function. Sensitive individuals (those most at risk from exposure to smoke) are the elderly, children, asthmatics, adults with pre-existing heart and lung disease, pregnant women, and people engaging in strenuous outdoor activity.

## MAP of Zone 1: CITY OF PORTOLA SPHERE OF INFLUENCE

Please contact the air district for further assistance.



**APPLICANT CERTIFICATION**

By submitting this application, I certify the following:

- a. I understand that only currently installed and operating non-EPA certified wood stoves are eligible to be replaced under this program.
- b. No retroactive rebates are available. All applications must be received by August 31, 2020.
- c. I understand I will schedule an estimate with a District-approved Retailer within 30 days of receiving a letter of pre-qualification from the Northern Sierra Air Quality Management District (District). This deadline may be extended at the discretion of the District.
- d. I understand that only one non-EPA certified wood stove will be replaced with a certified device with funding from this program for primary heating of this residence.
- e. I understand I may be required to provide proof of my monthly income.
- f. I understand that if I qualify, I will use only a District-approved Retailer (Retailer). Devices purchased with funds from this program will be professionally installed. Self-installation of the device is prohibited.
- g. I will be replacing an operable non-EPA certified wood stove that is currently in use in my residence. The Retailer who installs the new device is responsible for removing the old device. The old device will be rendered permanently and irreversibly inoperable.
- h. I understand that I will be disqualified from this program if I provide the District with false information or if the old, uncertified device is removed from the residence prior to application approval or if a new device is purchased prior to application approval.
- i. The District does not warranty any devices purchased under this voucher program, including, but not limited to, the quality, functionality or satisfaction of the device.
- j. I agree to hold harmless the District and its directors, employees and agents from any and all loss, damage, or liability that arises out of or is in any way connected with installation or use of the device purchased in connection with this program.
- k. I will follow proper burning practices as discussed by the Retailer and in accordance with EPA BurnWise educational materials. I will operate this device according to the manufacturer's instructions and I will not burn pressure treated wood, garbage/trash, plastic or any other prohibited materials.
- l. I understand that proper wood burning practices (e.g., burning only dry, natural wood that has been seasoned at least 6 months) and proper stove installation and operation (e.g., maintaining a hot fire) are critical to the effectiveness of my new device.
- m. I understand that I will participate in follow up training and a survey conducted by the District.



**THIS PAGE INTENTIONALLY LEFT BLANK**



**APPLICATION FORM For Zone 1 – Homes within the City of Portola (Sphere of Influence)**

All sections of this application must be completed. A copy should be retained by the applicant for his or her records. The District is not responsible for materials lost by mail. Please review the Applicant Certification (page 3) before signing at the bottom. Submit the completed application by email, mail, or hand delivery to:

Julie Ruiz, Change-out Project Coordinator, NSAQMD  
[julie@myairdistrict.com](mailto:julie@myairdistrict.com)  
 P.O. Box 2227, Portola, CA 96122  
 257 E. Sierra, Unit E, Portola, CA 96122  
[www.myairdistrict.com](http://www.myairdistrict.com)

**Applicant Information:**

Name: \_\_\_\_\_

Physical Home Address: \_\_\_\_\_

Is this a mobile or manufactured home?  Yes  No

Mailing Address (if different): \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email (if available): \_\_\_\_\_

**Existing Wood Burning Stove:**

Make/Model: \_\_\_\_\_ Year Stove Manufactured: \_\_\_\_\_

My monthly income is: \_\_\_\_\_

The number of people living in the home (including adults and children under 18): \_\_\_\_\_

The EPA certified device I am interested in:  Wood stove  Pellet stove  
 Propane stove  Kerosene monitor

*The District strongly encourages upgrading to a non-wood heating device to further decrease emissions.*

**Additional Information:**

How did you hear about the Change-out Program? \_\_\_\_\_

Why are you applying? (Please check all that apply.)

- Not satisfied with current device;
- To reduce pollution;
- To save money
- Other: \_\_\_\_\_

Was the grant funding a significant factor in replacing your stove?  Yes  No

How many wood burning stoves are on your property?  1  2  3

In a typical heating season, how many cords of wood do you typically burn? \_\_\_\_\_

Is your wood stove used as a primary source of heat?  Yes  No

What % of wood is used in your primary stove?  100%  75%  50%

Do you know how old your stove is? If yes, how old: \_\_\_\_\_ years

In which room of your house is your wood stove located? \_\_\_\_\_

Do you own this home?  Yes, Owner  No, Renter

**I understand and agree to all conditions of this program (pages 1-3):** \_\_\_\_\_

*(applicant signature required)*





**Home Heating Survey** *Please circle or fill in answers below:*

1. Status of home ownership: OWNER RENTER
2. Is your home a mobile/modular/manufactured home? YES NO
3. What year was this home built (approximately)? \_\_\_\_\_
4. What year did you purchase home or move into home? \_\_\_\_\_
5. Is this home your primary or secondary residence? PRIMARY SECONDARY
6. What is your monthly income? \_\_\_\_\_
7. How many people live in your household? \_\_\_\_\_
8. Does your residence have a wood burning device? YES NO (skip to #10)
9. If yes, circle the type of device it is (if more than one, the one you use most):

WOOD STOVE FIREPLACE PELLET STOVE FIREPLACE INSERT OUTDOOR WOOD BOILER

If your home has a second wood burning device, please indicate the type from the list above:

\_\_\_\_\_

10. If burning wood, where is it obtained? CUT BUY
11. If purchasing wood, what is the cost per cord? \$ \_\_\_\_\_
12. How many cords do you use annually? \_\_\_\_\_
13. Is your main wood burning device EPA certified (tag on back of device)? YES NO NOT SURE
14. What is the primary fuel you use for heating your home?

WOOD PROPANE FUEL OIL ELECTRICITY SOLAR KEROSENE  
 LPG GENERATOR DIESEL GENERATOR OTHER \_\_\_\_\_

15. What is the secondary fuel you use for heating your home (if any)?

WOOD PROPANE FUEL OIL ELECTRICITY SOLAR KEROSENE  
 LPG GENERATOR DIESEL GENERATOR OTHER \_\_\_\_\_

16. If your residence has a heated outbuilding, what is the fuel used? (If no heated outbuilding, skip question)

WOOD PROPANE FUEL OIL ELECTRICITY SOLAR KEROSENE  
 LPG GENERATOR DIESEL GENERATOR OTHER \_\_\_\_\_

- Do you receive any assistance from an energy assistance program (i.e. LIHEAP)? YES NO
- Are there school-age children in the home (K-12)? YES NO
- Are there any individuals over the age of 62 in the home? YES NO
- Is anyone in the home diagnosed with asthma or any respiratory/breathing disorder? YES NO
- Have you upgraded windows or insulation since moving into the home? YES NO
- Would you be willing to participate in a more in-depth survey by phone? YES NO

Date Survey Completed: \_\_\_\_\_



**NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT**[www.myairdistrict.com](http://www.myairdistrict.com)**Wood Stove Change-Out Information Line: 530-832-4067**

GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**APPLICATION FOR ZONE 2 – Homes Located Outside the City of Portola Sphere of Influence and Within the Greater Portola PM2.5 Nonattainment Area**

The Northern Sierra Air Quality Management District (District) is offering a change-out program to qualified homeowners within the Greater Portola PM2.5 Federal Nonattainment Area in Plumas County, California for replacement of non-EPA certified wood stoves with new, efficient, cleaner burning EPA certified devices. This program is funded by the U.S. EPA's 2015 Targeted Air Shed Grant Program, the District's AB2766 program and other agencies. This program is a 5-year voluntary wood stove change-out program (applications must be received by August 31, 2020).

1. Zone 2 will be available to applicants outside the City of Portola Sphere of Influence BUT within the Greater Portola PM2.5 Nonattainment Area (see attached map).
2. To qualify, the applicant must have a currently installed and operating non-EPA certified wood stove (non-EPA certified devices are typically purchased and installed prior to 1992).
3. If the old device is removed from the home prior to application approval, the applicant will be disqualified from this program.
4. If the new device is purchased before application approval, the applicant will not qualify for this program.
5. Installation must be completed by a District-approved Retailer. Self-installation of the new device is NOT eligible.
6. This program covers the replacement of no more than one non-EPA certified device per home. This replacement should be considered the primary heating device for the home.
7. This program covers the replacement of non-EPA certified wood stoves in manufactured/mobile homes.
8. This program includes renters if an Owner/Tenant agreement is filled out and signed by both parties.
9. Woodstove brands and models will be determined by a District-approved Retailer/Contractor (Retailer) and approved by the District.
10. Upgrades over and above the approved amount will be paid by the applicant.
11. In Zone 2 qualified applicants may be eligible for:
  - Up to \$1,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
  - Up to \$3,000 to replace a non-certified wood burning device with a Pellet, Propane or Kerosene heater.
  - Up to \$3,500 for low income residents to replace a non-certified wood burning device with an EPA certified wood burning device.
  - Up to \$4,500 for low income residents to replace a non-certified wood burning device with a Pellet, Propane or Kerosene heater.



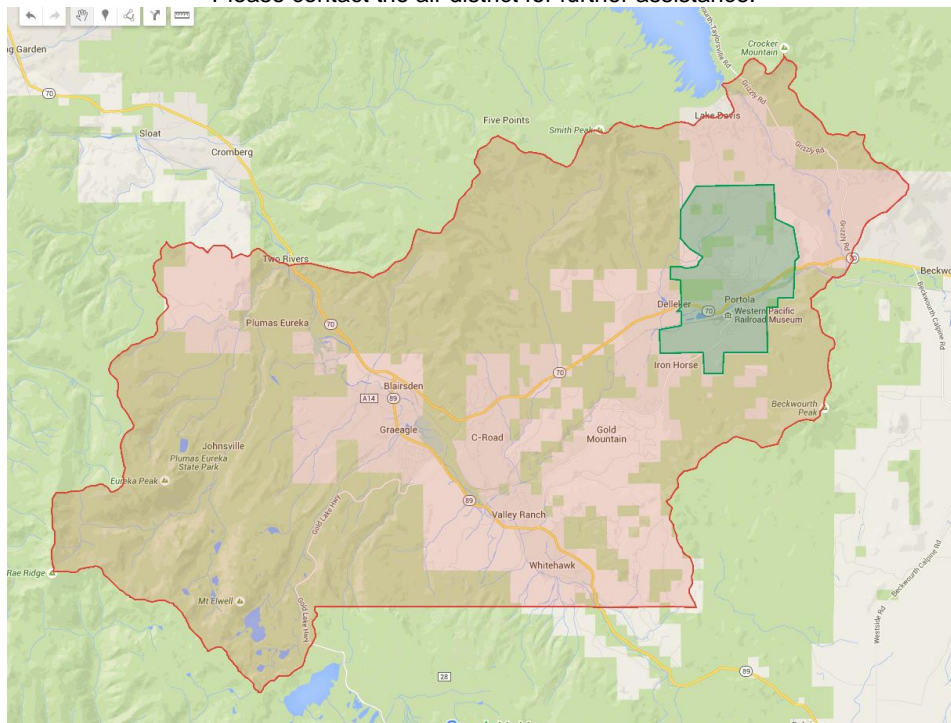
12. Must complete and submit attached Low Income Verification Form to apply for Low Income Qualification.
13. The old, uncertified wood stove must be surrendered to the Retailer for destruction and scrap recycling. The resale or transfer of the old stove in usable condition, for the purpose of its reuse as a stove, is a violation of the terms of this program and will result in forfeiture of the grant award.
14. A photo will be taken by the Retailer before the old device is removed, a photo will be taken to document destruction and a photo will be taken of the new, certified device after installation.
15. To qualify, each applicant must first complete the attached application. Completed applications must be mailed to the Change-out Project Coordinator at the address on the application form. The application will be reviewed to determine if the preliminary qualification requirements have been met. Once pre-qualified, the applicant will have 30 days to schedule an in-home estimate with a Retailer. The District will approve the estimate before installation commences.

**NEXT STEP: Applicants will hear from the District within 21 days of receiving a submitted application. Submission of an application does not guarantee funding.**

The mission of this program is to reduce health impacts by reducing fine particulate (PM2.5) in the air from wood smoke. These microscopic particles go deep into the lungs where they may become trapped. PM2.5 is linked with premature death, work and school absences, and significant health problems including aggravated asthma, acute respiratory symptoms (such as chest pain and coughing), chronic bronchitis and decreased lung function. Sensitive individuals (those most at risk from exposure to smoke) are the elderly, children, asthmatics, adults with pre-existing heart and lung disease, pregnant women, and people engaging in strenuous outdoor activity.

**MAP of Zone 2: HOMES OUTSIDE THE CITY OF PORTOLA SPHERE OF INFLUENCE AND WITHIN THE NONATTAINMENT AREA**

Please contact the air district for further assistance.



**INCLUDES COMMUNITIES OF IRON HORSE, DELLEKER, C ROAD, MOHAWK VISTA, PLUMAS-EUREKA, BLAIRSDEN-GRAEAGLE, GOLD MOUNTAIN, WHITEHAWK, CLIO, JOHNSTVILLE, AND PORTIONS OF LAKE DAVIS**



**APPLICANT CERTIFICATION**

By submitting this application I understand the following:

- a. I understand that only currently installed and operating non-EPA certified wood stoves are eligible to be replaced under this program.
- b. I understand that applications are processed in the order they are received and according to the District's final recommendations. No retroactive rebates are available. All applications must be received by August 31, 2020.
- c. I understand I will schedule an estimate with a District-approved Retailer within 30 days of receiving a letter of pre-qualification from the Northern Sierra Air Quality Management District (District). This deadline may be extended at the discretion of the District.
- d. I understand that only one non-EPA certified wood stove will be replaced with a certified device with funding from this program for primary heating of this residence.
- e. I understand I may be required to provide proof of my monthly income.
- f. I understand that if I qualify, I will use only a District-approved Retailer (Retailer). Devices purchased with funds from this program will be professionally installed. Self-installation of the device is prohibited.
- g. I will be replacing an operable non-EPA certified wood stove that is currently in use in my residence. The Retailer who installs the new device is responsible for removing the old device. The old device will be rendered permanently and irreversibly inoperable.
- h. I understand that I will be disqualified from this program if I provide the District with false information or if the old, uncertified device is removed from the residence prior to application approval or if a new device is purchased prior to application approval.
- i. The District does not warranty any devices purchased under this voucher program, including, but not limited to, the quality, functionality or satisfaction of the device.
- j. I agree to hold harmless the District and its directors, employees and agents from any and all loss, damage, or liability that arises out of or is in any way connected with installation or use of the device purchased in connection with this program.
- k. I will follow proper burning practices as discussed by the Retailer and in accordance with EPA BurnWise educational materials. I will operate this device according to the manufacturer's instructions and I will not burn pressure treated wood, garbage/trash, plastic or any other prohibited materials.
- l. I understand that proper wood burning practices (e.g., burning only dry, natural wood that has been seasoned at least 6 months) and proper stove installation and operation (e.g., maintaining a hot fire) are critical to the effectiveness of my new device.
- m. I understand that I will participate in follow up training and a survey conducted by the District.



**THIS PAGE INTENTIONALLY LEFT BLANK**



**APPLICATION FORM For Zone 2 – Homes outside the City of Portola (Sphere of Influence)**

All sections of this application must be completed. A copy should be retained by the applicant for his or her records. The District is not responsible for materials lost by mail. Please review the Applicant Certification (page 3) before signing at the bottom. Submit the completed application by email, mail, or hand delivery to:

Julie Ruiz, Change-out Project Coordinator, NSAQMD  
[julie@myairdistrict.com](mailto:julie@myairdistrict.com)  
 P.O. Box 2227, Portola, CA 96122  
 257 E. Sierra, Unit E, Portola, CA 96122  
[www.myairdistrict.com](http://www.myairdistrict.com)

**Applicant Information:**

Name: \_\_\_\_\_

Physical Home Address: \_\_\_\_\_  
 \_\_\_\_\_

Is this a mobile or manufactured home?  Yes  No

Mailing Address (if different): \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email (if available): \_\_\_\_\_

**Existing Wood Burning Stove:**

Make/Model: \_\_\_\_\_ Year Stove Manufactured: \_\_\_\_\_

My monthly income is<sup>1</sup>: \_\_\_\_\_

The number of people living in this home (including adults and children under 18): \_\_\_\_\_

The EPA certified device I am interested in:  Wood stove  Pellet stove  
 Propane stove  Kerosene monitor

*The District strongly encourages upgrading to a non-wood heating device to further decrease emissions.*

**Additional Information:**

How did you hear about the Change-out Program? \_\_\_\_\_

Why are you applying? (Please check all that apply.)

- Not satisfied with current device;
- To reduce pollution;
- To save money
- Other: \_\_\_\_\_

Was the grant funding a significant factor in replacing your stove?  Yes  No

How many wood burning stoves are on your property?  1  2  3

In a typical heating season, how many cords of wood do you typically burn? \_\_\_\_\_

Is your wood stove used as a primary source of heat?  Yes  No

What % of wood is used in your primary stove?  100%  75%  50%

Do you know how old your stove is? If yes, how old: \_\_\_\_\_ years

In which room of your house is your wood stove located? \_\_\_\_\_

Do you own this home?  Yes, Owner  No, Renter

**I understand and agree to all conditions of this program (pages 1-3):** \_\_\_\_\_

*(applicant signature required)*

<sup>1</sup> Must complete a Low Income Verification Form to qualify for low income funding.



**Home Heating Survey** *Please circle or fill in answers below:*

1. Status of home ownership: OWNER RENTER
2. Is your home a mobile/modular/manufactured home? YES NO
3. What year was this home built (approximately)? \_\_\_\_\_
4. What year did you purchase home or move into home? \_\_\_\_\_
5. Is this home your primary or secondary residence? PRIMARY SECONDARY
6. What is your monthly income? \_\_\_\_\_
7. How many people live in your household? \_\_\_\_\_
8. Does your residence have a wood burning device? YES NO (skip to #10)
9. If yes, circle the type of device it is (if more than one, the one you use most):

WOOD STOVE FIREPLACE PELLET STOVE FIREPLACE INSERT OUTDOOR WOOD BOILER

If your home has a second wood burning device, please indicate the type from the list above:

\_\_\_\_\_

10. If burning wood, where is it obtained? CUT BUY
11. If purchasing wood, what is the cost per cord? \$ \_\_\_\_\_
12. How many cords do you use annually? \_\_\_\_\_
13. Is your main wood burning device EPA certified (tag on back of device)? YES NO NOT SURE
14. What is the primary fuel you use for heating your home?

WOOD PROPANE FUEL OIL ELECTRICITY SOLAR KEROSENE  
 LPG GENERATOR DIESEL GENERATOR OTHER \_\_\_\_\_

15. What is the secondary fuel you use for heating your home (if any)?

WOOD PROPANE FUEL OIL ELECTRICITY SOLAR KEROSENE  
 LPG GENERATOR DIESEL GENERATOR OTHER \_\_\_\_\_

16. If your residence has a heated outbuilding, what is the fuel used? (If no heated outbuilding, skip question)

WOOD PROPANE FUEL OIL ELECTRICITY SOLAR KEROSENE  
 LPG GENERATOR DIESEL GENERATOR OTHER \_\_\_\_\_

- Do you receive any assistance from an energy assistance program (i.e. LIHEAP)? YES NO
- Are there school-age children in the home (K-12)? YES NO
- Are there any individuals over the age of 62 in the home? YES NO
- Is anyone in the home diagnosed with asthma or any respiratory/breathing disorder? YES NO
- Have you upgraded windows or insulation since moving into the home? YES NO
- Would you be willing to participate in a more in-depth survey by phone? YES NO

Date Survey Completed: \_\_\_\_\_



**LOW INCOME VERIFICATION FORM**

Residents located outside of the City of Portola Sphere of Influence, but within the Nonattainment area who wish to receive the maximum amount of funding based on income, must complete this form and submit it with an application.

2016 Gross Income Guidelines (source: CA Dept. of Community Services & Development):

Family Size	1	2	3	4	5	6	7	8
Monthly Gross Income	\$2,005	\$2,622	\$3,238	\$3,855	\$4,472	\$5,089	\$5,205	\$5,320

Have you previously applied for HEAP/LIHEAP assistance?  Yes  No

What is the monthly income of your entire household? \_\_\_\_\_

Be sure to count all of the following incomes:

- Wages
- TANF (AFDC)
- Workers Compensation
- Interest Income
- Social Security, SSI, SSP
- Disability Payments
- Pensions
- Unemployment Benefits
- Child Support
- Spousal Support
- Settlements

How many people live in your household? \_\_\_\_\_

**ATTACH INCOME DOCUMENTATION:**

(please include one of the following for each person living at this residence)

- Pay stub or
- Benefit letter or
- Income statement

**Please note that these documents will not be returned.**

Upon verification of income, applicant will be eligible for:

- Up to \$3,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 to replace a non-certified wood burning device with a Pellet, Propane or Kerosene heater.

I declare, under penalty of perjury, that the information on this application is true and correct:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date





DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**OWNER/TENANT AGREEMENT**

**Parties:** This Owner/Tenant Agreement (Agreement) is for services between the current Tenant \_\_\_\_\_ and the Owner (or Owner’s Agent) \_\_\_\_\_ concerning the real property located at \_\_\_\_\_

\_\_\_\_\_

<i>Address</i>	<i>City</i>	<i>State</i>	<i>Zip Code</i>
----------------	-------------	--------------	-----------------

**Grant Award:** The subject matter of this Agreement is the Greater Portola Area Wood Stove Change-out Program funded by the U.S. EPA’s 2015 Targeted Air Shed Grant Program. This grant award is available to Owner/Tenants for the replacement of a Non-EPA certified wood stove that is currently in operation with an EPA certified wood stove or certified pellet, propane or kerosene stove.

Whereas owner and tenant recognize the need for replacing a non-EPA certified wood stove with an EPA certified device to provide more efficient heating and less emissions into the home and the community.

Whereas owner and tenant desire to cooperate in participating in the Greater Portola Wood Stove Change-Out Program using funds from the U.S. EPA’s 2015 Targeted Air Shed Grant Program.

Now, therefore, owner and tenant agree as follows:

1. To allow the Northern Sierra Air Quality Management District (District) and District-approved Retailers into the property noted above for inspection, estimate, installation and permitting. This includes allowing photos to be taken of the old, non-EPA certified device before removal and photos of the new EPA certified device (Device) after installation.
2. The owner shall not raise the rent of the unit for a period of two years or evict the unit’s resident because of increased value of the unit due solely to the newly installed Device.
3. Either owner or tenant may complete an application for the Greater Portola Area Wood Stove Change-out Program. Both parties must review the application and agree to the items on page 3 “Applicant Certification”. Submission of an application does not guarantee funding.
4. The tenant shall not take possession of the Device upon vacating the real property noted above. The new EPA certified Device must stay with the property and belongs to the owner.
5. The tenant authorizes the District and the District-approved Retailers access to the property for a year after the new Device is installed for the purpose of education and training.
6. The tenant agrees to participate in a follow up survey by the District after installation of the new Device.

I hereby certify that I understand the conditions and requirements for participation in the District's Greater Portola Area Woodstove Change-out Program and agree to fulfill the requirements and comply with the conditions in this agreement. I understand that if any documents are incomplete or falsified, I will be disqualified from the program.

The undersigned represent that they have the authority of their respective parties to execute this Agreement.

Signature Tenant: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
*Printed Name/Title*

Signature Owner: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
*Printed Name/Title*

Owner's Mailing Address:

\_\_\_\_\_  
*Address* *City* *State* *Zip Code*

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320

Mailing Address: P.O. Box 2509

Grass Valley, CA 95945

(530) 274-9360 / FAX: (530) 274-7546

email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)NORTHERN FIELD OFFICE

257 E. Sierra, Unit E

Mailing Address: P.O. Box 2227

Portola, CA 96122

(530) 832-0102 / FAX: (530) 832-0101

email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**PROGRAM TRACKING #: 2016-000****KEEP THIS LETTER – IT IS PROOF OF YOUR PRE-QUALIFICATION**

March X, 2016

NAME  
ADDRESS.  
Portola, CA 96122

Dear NAME,

Thank you for your interest in the Greater Portola Woodstove Change-Out Program. Your application has been received and reviewed by the District. You are pre-qualified for a new, EPA certified heating device to replace your non-EPA certified wood burning device.

Please follow these simple steps to finalize your qualification:

1. Contact a "District-Approved Retailer" to set up an appointment for an in-home estimate to determine the best heating device for your home and needs. See the enclosed list of approved Retailers.
2. Your in-home estimate must be completed by XX (within 30 days of issue of this letter). If a Retailer has not completed an estimate by XX, your application may be withdrawn.

If you have any questions please contact the Project Coordinator, Julie Ruiz, at (530) 832-4067 or Allison King, Staff Secretary/Clerk of the Board, at (530) 274-9360 extension 105.

Thank you for your commitment to improving air quality and public health in your community.

Sincerely,

Gretchen Bennett, Executive Director  
Northern Sierra Air Quality Management Districtcc: Julie Ruiz, Project Coordinator  
Enclosures: District-approved Retailers and EPA Brochures

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320

Mailing Address: P.O. Box 2509

Grass Valley, CA 95945

(530) 274-9360 / FAX: (530) 274-7546

email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)NORTHERN FIELD OFFICE

257 E. Sierra, Unit E

Mailing Address: P.O. Box 2227

Portola, CA 96122

(530) 832-0102 / FAX: (530) 832-0101

email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

GRANDIOSO PROGRAMA DE CANVIO DE ESTUFAS DE MADERA

**PROGRAMA CLAVE #: 2016-0XX****CONSERVE ESTA CARTA ES PRUEVA DE SU PRECALIFICACION**

Julio 27, 2016

Juan Hernandez  
111 Portola Ave.  
Portola, CA 96122

Felisidades Mr.Hernandez,

Gracias por su interes en el programa Portola Stufas de Madera. Su aplicacion ha sido resivida y aprovada por el Distrito. Usted esta precalificado-a por una Nuevo EPA unidad sertificada para renplasar su no (EPA) sertificada Estufa de Madera.

Por favor siga estos simples pasos para finalizar su calificacion:

1. Contactar al proveedor de servicios para hacer una cita para la estimacion apropiada de cuerdo a las nesesidades de su hogar.
2. Este estimado tiene que ser completado antes del 27 de Agosto de 2016 (en los 30 dias de esta carta si esto no es completo durante los 30 dias cuando usted resivio esta carta su aplicacion sera desestimada).

Si usted tiene una pregunta por favor comuniquese con la coordinadora de el programa, Julie Ruiz, al 530-832-0102 los Viernes de 10:00AM a 12:00PM para ser atendidos en Espanol.

Gracias pr su interes en mejorar la calidad de el aire y la salud publica de su comunidad..

Sinceramente,

Julie Ruiz, Coordinador del proyecto  
Northern Sierra Air Quality Management Distritcc: Gretchen Bennett, Executive Director  
Enclosures: Distribuidora y aprobadora de el proyecto e informacion del programa (EPA)  
Agencia de Profeccion al Ambiente

DISTRICT HEADQUARTERS  
200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE  
257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**PROGRAM TRACKING #:** \_\_\_\_\_

**ESTIMATE EXCEEDS \$3,500\* – to be signed by Owner only (not Tenant)**

According to the in-home estimate provided by the District-approved Retailer, the cost to replace your non-EPA certified wood stove with a newer, certified wood stove exceeds \$3,500\*. Under the U.S. EPA’s 2015 Targeted Air Shed Grant Program, the District is prohibited from releasing more than \$3,500\* per stove change-out. The District is working to secure other funds that may be applied to costs over and above the grant maximum. If additional funds are secured at a later date, you will be notified by the District. There is no guarantee additional funds will be obtained. The retailer has provided you a ‘base estimate’, which includes the basic equipment and labor for a new device that meets all permitting and health and safety criteria for \$3,500\* or less.

Please initial the option that you are choosing today:

1. Continue with the installation of a new EPA certified heating device. Applicant agrees to pay the Retailer any cost over and above the base estimate (not over \$3,500\*).  
\_\_\_\_\_ (initials)
  
2. Applicant chooses NOT to continue with the program at this time. The District will notify applicant if additional funds are secured and a new estimate will need to be scheduled.  
\_\_\_\_\_ (initials)

If you have any questions please contact the Project Coordinator, Julie Ruiz, at (530) 832-0102.

Thank you for your commitment to improving air quality and public health in your community.

\_\_\_\_\_  
Print name of Applicant (Owner)

\_\_\_\_\_  
Signature of Applicant (Owner)

\_\_\_\_\_  
Date

\*In the case of replacing a non-EPA certified wood stove with a pellet or propane stove, the District will pay the Retailer up to \$4500. By signing this form, the applicant agrees to pay anything over \$4500 for a pellet or propane stove.



## PROGRAM TRACKING FORM

**This form is to be completed by participating Retailer/Contractor\***

Date: \_\_\_\_\_ Program Tracking #: \_\_\_\_\_ Building Permit #: \_\_\_\_\_  
Consumer's Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_  
County: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Email: \_\_\_\_\_

### **New Cleaner Burning EPA Certified Device**

Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_  
Device Serial #: \_\_\_\_\_  
New Stove Type: Wood  Pellet  Propane Gas  Kerosene   
Other:  \_\_\_\_\_  
Is wood stove: Catalytic  Non-Catalytic   
Emissions (grams per hour): \_\_\_\_\_  
Retailer Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
Retailer Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

### **Installation**

Name of Certified Installer\*\* : \_\_\_\_\_  
Date of Installation: \_\_\_\_\_

### **Old Non-EPA Certified Wood Stove**

Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_  
Device Serial #: \_\_\_\_\_

I certify that the old stove was not EPA-certified (NOTE: You will **ONLY** be reimbursed for replacing stoves that are **NOT** EPA certified): Yes

I certify that the old stove was in use prior to replacement: Yes

I certify that the installed device was new: Yes

**Recycling (for Replacement Projects):**

I certify that the old wood stove has been removed from the residence: Yes

I certify that the old wood stove has been delivered to the secured City of Portola Public Works yard for destruction before the stove's release to a Recycler: Yes

Name of City of Portola Employee: \_\_\_\_\_

**Signature:** \_\_\_\_\_

I certify that the information contained on this tracking form is accurate and the form is completely filled out. I also agree that I must meet the program requirements and be a participating Retailer in order to receive reimbursement from the Northern Sierra Air Quality Management District. This form must be submitted with **ALL** sections completed along with a copy of the estimate (signed by the District as approval), a copy of the invoice, photograph of stove **prior** to removing it **AND** of newly **installed** hearth appliance in order to receive reimbursement.

Name of Participating Retailer: \_\_\_\_\_

**Signature:** \_\_\_\_\_

- \* Participating Retailers must be registered with the District.
- \*\* The installer must be professionally certified (Chimney Safety Institute of America and/or National Fireplace Institute) and be in possession of a current C-61 (D-34 prefabricated equipment) contractor's license.

To assure quick processing, please make sure you send all items listed.

**Checklist of attachments:**

- Copy of estimate with District approval signature
- Estimate exceeds \$3,500 letter, if necessary
- Pre and post installation photos
- Acknowledgement of Training form
- Final invoice
- Copy of Permit (City, County or State)

**Make sure the following is complete:**

- Signatures above
- Program Tracking Number
- Building Permit Number

Mail all to:  
Julie Ruiz, Project Coordinator  
Northern Sierra Air Quality Management District  
P.O. Box 2227  
Portola, CA 96122

DISTRICT HEADQUARTERS  
200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE  
257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**ACKNOWLEDGEMENT OF TRAINING FORM**

**This form is to be completed by participating Retailer/Contractor AND signed by Owner/Tenant**

Date: \_\_\_\_\_ Program Tracking #: \_\_\_\_\_ Building Permit #: \_\_\_\_\_

Consumer's Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**New Cleaner Burning EPA Certified Device**

Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_

Device Serial #: \_\_\_\_\_

New Stove Type: Wood  Pellet  Propane Gas  Kerosene

Other:  \_\_\_\_\_

Retailer Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Retailer Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

I certify that I received the owner's manual for my new device:

Yes  No

I certify that I received training from the Retailer/Contractor on the operation of my new device per manufacturer instructions:

Yes  No

I certify that I received training from the Retailer/Contractor on proper fuel for my new device:

Yes  No

I certify I will NOT replace, modify OR remove the new certified appliance unless it will be replaced with a cleaner burning appliance:

Yes  No

**Signature (Homeowner/Tenant):** \_\_\_\_\_





## VERIFICATION OF DESTRUCTION FORM

**This form is to be completed by City of Portola**

Program Tracking #: \_\_\_\_\_ Device Serial #: \_\_\_\_\_

The method used to render the uncertified device permanently and irreversibly inoperable: \_\_\_\_\_

Date received from Retailer: \_\_\_\_\_

Name of Retailer: \_\_\_\_\_

Date device was destroyed: \_\_\_\_\_

Picture attached of destroyed device with Program Tracking # Yes

Date transferred to Recycler (placed in bin): \_\_\_\_\_

Name of Recycler: \_\_\_\_\_

I certify that the information contained on this certification form is accurate and the form is completely filled out. I certify that the uncertified device has been rendered permanently and irreversibly inoperable by the method noted above (and a photo taken). I certify that the device has been released to an approved scrap metal recycler.

City of Portola Employee Name: \_\_\_\_\_

**Signature:** \_\_\_\_\_

Mail, scan or fax form to:  
Julie Ruiz, Project Coordinator  
Northern Sierra Air Quality Management District  
P.O. Box 2227  
Portola, CA 96122  
530-832-0101 (fax)  
julie@myairdistrict.com

## Appendix G

Work Plan for the

Residential Wood Stove Change-out Project

in the Plumas County PM<sub>2.5</sub> Nonattainment Area

**Residential Wood Stove Changeout Project  
in the Plumas County PM2.5 Nonattainment Area**

January 21, 2016

California Air Resources Board  
1001 I Street, P.O. Box 2815  
Sacramento, CA 95812

Work plan prepared in coordination with:  
Northern Sierra Air Quality Management District  
200 Litton Drive, Suite 320  
Grass Valley, CA 95945

This page intentionally left blank

## Contents

1. PROJECT SUMMARY .....	1
2. PROGRAM COMPONENTS .....	2
a. Environmental Results .....	2
b. Environmental Justice .....	6
c. Education and Outreach .....	6
3. PROJECT OPERATION .....	7
a. Installation and Disposal .....	8
b. Timeline .....	8
c. Work Products and Benefits to the Public .....	10
d. Role of the District .....	10
e. Experience and Qualifications .....	11
f. Programmatic Capability and Past Performance .....	12
g. Partnerships .....	13
4. BUDGET .....	13
a. 2015 Targeted Air Shed Grant .....	13
b. Voluntary Cost Share/Match and Leveraged Funds .....	15

## Attachments

Attachment a. Source Apportionment Technical Report

Attachment b. PM2.5 Benefit Calculator

Attachment c. Biographical Sketches

Attachment c. Quality Assurance Narrative Statement

Key Project Contacts:

ARB Project Manager: Kasia Turkiewicz, Air Resources Engineer  
Phone: (916) 445-6497  
Fax: (916) 327-8524  
Email: kturkiew@arb.ca.gov

ARB Federal Grant Coordinator: Atif Saeed, Senior Accounting Officer  
Phone: (916) 322-3730  
Fax: (916) 322-9612  
Email: msaeed@arb.ca.gov

District Project Manager: Gretchen Bennitt, Executive Director  
Phone: (530) 274-9360 X 102  
Fax: (530) 274-7546  
Email: gretchen@myairdistrict.com

District Project Coordinator: Julie Ruiz, Air Pollution Specialist  
Phone: (530) 832-0102  
Fax: (530) 832-0101  
Email: nsaqmd.julie@gmail.com

## 1. PROJECT SUMMARY

The Northern Sierra Air Quality Management District (District) is proposing a residential wood stove changeout program to improve air quality in the Portola area and help the area attain PM2.5 standards. In January 2015, the U.S. Environmental Protection Agency (U.S. EPA or EPA) designated the City of Portola (City) and surrounding parts of Plumas County, California, as a nonattainment area for the annual PM2.5 standard. The objective of this project is to reduce pollution levels so the Portola area can attain the PM2.5 standard by the end of 2021. U.S. EPA grant funds will be used to replace older wood stoves in the community with newer EPA-certified devices and to educate residents on proper ways to store and burn wood.

The District will use the grant money to implement a financial incentive program to encourage owners of older uncertified stoves within the nonattainment area to switch to newer cleaner-burning devices. To qualify for this program, the uncertified stove must be operable and currently in use in the residence. The District estimates that 623 households within the City of Portola and 616 households outside of the city limits, but within the nonattainment boundary, use an uncertified wood stove as either a primary or secondary heating source. Table 1 shows the data used to estimate the number of households using uncertified stoves.

Table 1. Estimating the number of stoves subject to changeout

Item	Data Source	Percent (%)	Nonattainment Area	City of Portola
Households	Census <sup>1</sup>	--	2723	1369
Households using wood stoves	District Survey	70	1906	958
Households using uncertified wood stoves	EPA Burn Wise <sup>2</sup>	65	1239	623

Over the next five years, 2016 through 2020, the District will offer incentives ranging from \$1,500 to \$3,500. The City of Portola homeowners, where the air pollution is the worst due to higher housing density, will be eligible to receive a voucher to cover the cost of purchase and installation of a new stove as well as disposal of the old stove, up to \$3,500. The voucher amount offered to homeowners outside of the city limits, but within the boundaries of the nonattainment area, will depend on their income and the type of appliance requested. Those who meet low income qualifications<sup>3</sup> will receive the same voucher as homeowners residing within the city limit, up to \$3,500. The homeowners who exceed the low income threshold will receive a voucher for either \$1,500 to upgrade to an EPA-certified wood stove or \$3,000 to upgrade to a pellet, propane, or kerosene stove.

<sup>1</sup> US Census Bureau's 2009-2013 5-Year American Community Survey (2015)

<sup>2</sup> <http://www2.epa.gov/burnwise>

<sup>3</sup> Income qualifications will be determined at a later date by the District in coordination with the Portola Family Resource Center

The District estimates that between 2016 and 2020, 850 stoves will be changed out in the nonattainment area using a variety of funding methods. The majority of the stoves, 687, will be changed out using the 2015 Targeted Air Shed Grant and the remaining 163 stoves will be changed out using other sources of funding outlined in Section 3b. The District estimates that 442 residents will receive \$3,500 vouchers from the 2015 Targeted Air Shed Grant. This includes residents of the City of Portola regardless of income and residents of the nonattainment area who are income-qualified. Of the residents who exceed the low income threshold and live outside of the city limits, but within the boundaries of the nonattainment area, the District estimates 220 will take advantage of the \$1,500 voucher and 25 will take advantage of a \$3,000 voucher. In no case will the vouchers exceed the installed price of a new appliance (which includes disposal of the old appliance). Table 2 lists the cost of equipment estimated to be funded using the 2015 Targeted Air Shed Grant. The money will be distributed on a first come first serve basis. Once the grant money runs out, the District will stop issuing vouchers. The District reserves the right to modify allocation of resources in order to achieve maximum emission reduction.

Table 2. Type of equipment and associated cost financed using the 2015 Targeted Air Shed Grant

Area/Type of Appliance	Unit Cost <sup>4</sup>	Number of Units	Total Cost
City of Portola or Income-Qualified			
Any type of home-heating appliance	Up to \$3,500	442	\$1,547,000
Nonattainment Area (Outside the City Limit) No Income Restrictions			
Wood Stove	Up to \$1,500	220	\$330,000
Non-wood Appliance	Up to \$3,000	25	\$75,000
Total		687	\$1,952,000

## 2. PROGRAM COMPONENTS

There is strong evidence that changeout programs are a cost effective way to significantly improve air quality in communities where the use of woodstoves is widespread. This project will help the area attain both the annual and the 24-hour PM2.5 National Ambient Air Quality Standards (NAAQS or standards).

### a. Environmental Results

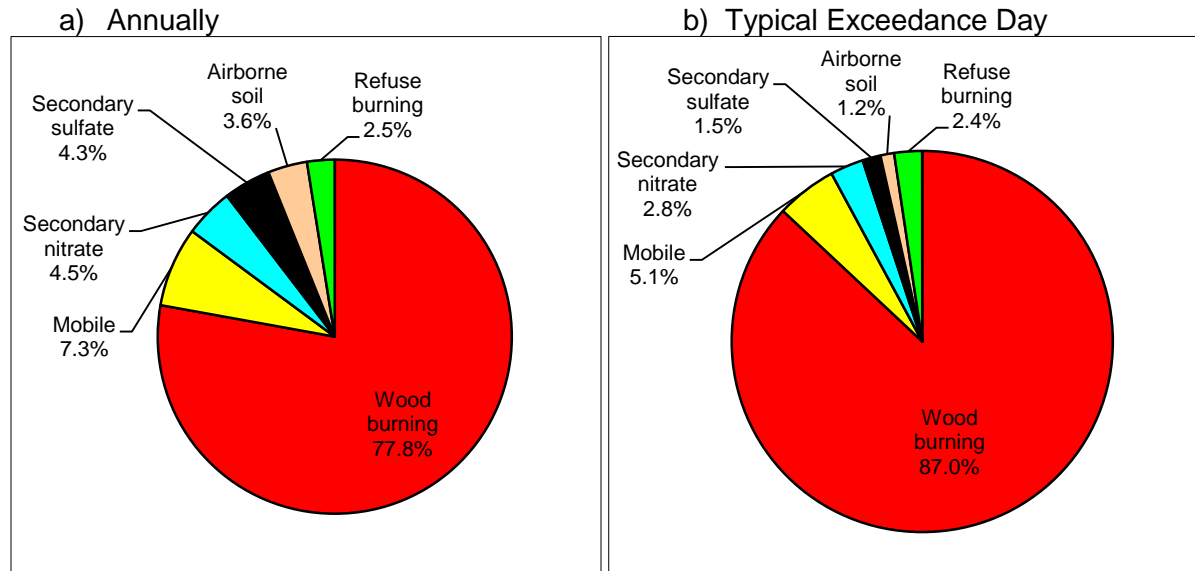
The impact of a wood stove changeout on PM2.5 concentrations was estimated by Air Resources Board (ARB) staff using a Positive Matrix Factorization (PMF) model and a “PM2.5 Benefit Calculator” (Calculator), a spreadsheet-based calculator developed by ARB staff (see Attachment C). PMF was used to identify PM2.5 sources in the Portola nonattainment area and determine their contribution to both the annual and 24-hr design values. The PMF model identified wood burning as a major contributor to PM2.5, responsible for 78 percent of the PM2.5 mass annually and 87 percent on exceedance days (Figure 1). Since all other sources combined contribute only a very

<sup>4</sup> Unit cost includes purchase and installation of a new unit as well as disposal of the old unit.



small portion of the total PM2.5, changes in emissions contributing to these lesser sources would have a negligible impact on the total PM2.5 mass.

Figure 1. Average Source Contribution in Portola Based on 2011-2014 Data



The PMF results were built into the Calculator spreadsheet to estimate the impact on PM2.5 concentrations of replacing the older wood stoves with newer, EPA-certified appliances. The Calculator was used to estimate PM2.5 mass from wood burning by applying a percent contribution derived from the PMF model to quarterly average PM2.5 concentrations. The total PM2.5 contribution from wood burning was parsed out between EPA-certified and uncertified stoves. The PM2.5 contribution from uncertified stoves was further parsed out into uncertified stoves that will remain in operation, and those that will be upgraded to newer EPA-certified stoves. The PM2.5 mass generated by the upgraded stoves was estimated by applying a 60 percent reduction in emissions and factoring in the improvement in stove efficiency, consistent with the EPA-developed emissions calculator. Estimated Portola PM2.5 concentrations were then calculated as the sum of wood burning contributions from EPA-certified stoves currently in operation, upgraded stoves, remaining uncertified stoves, and other minor source contributions resolved by PMF analyses.

The resulting analysis indicated that replacing 687 of the old wood stoves in the community with the new EPA-certified wood stoves would reduce annual PM2.5 design values from 14.1 ug/m3 in 2014 to 11.0 ug/m3 in 2021. The 24-hour design value would decrease from 45 ug/m3 to 33 ug/m3. The 687 wood stoves will be changed out over a five year period, from 2016 through 2020, as shown in Table 3.

Table 3. Number of stoves changed out per year

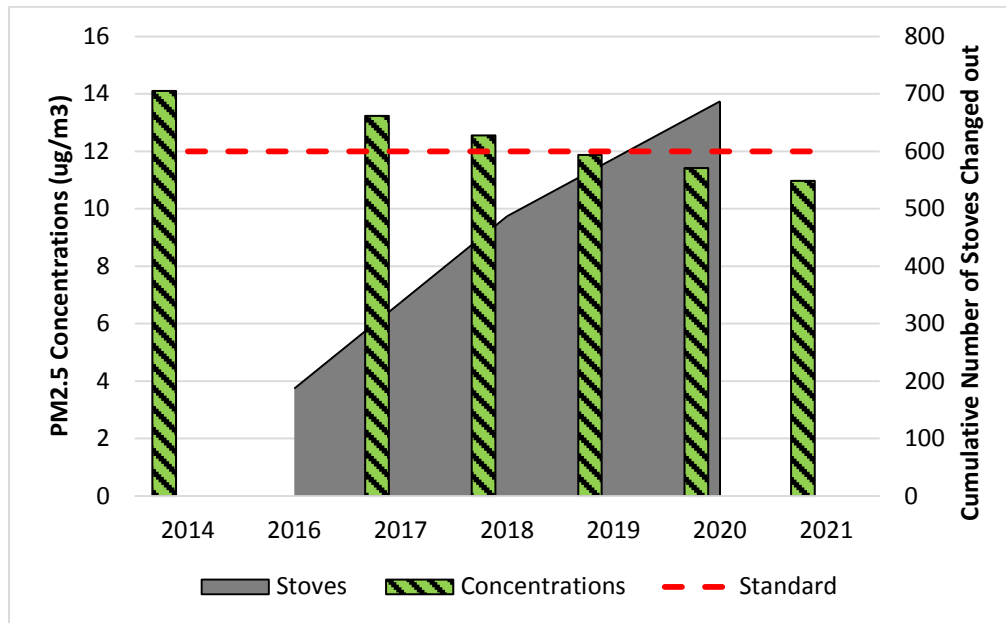
Year	Number of Stoves Changed Out
2016	187
2017	150
2018	150
2019	100
2020	100

Since the wood stoves will be changed out over the five year period, from 2016 through 2020, the full impact on PM<sub>2.5</sub> air quality will be realized starting in 2021. In order to provide a conservative estimate for demonstrating attainment of both standards by 2021, the estimated 2020 design value reflects 587 stoves projected to be changed out through the end of 2019. By 2021, once all 687 stoves are changed out, the design value is estimated to decrease to 11.0 ug/m<sup>3</sup>. Table 4 and Figure 2 illustrate the relationship between the number of stoves changed out and PM<sub>2.5</sub> concentrations.

Table 4. Relationship between stoves changed out and estimated design values

Standard	2020 Design Value 587 stoves changed out	2021 Design Value 687 stoves changed out
Annual	11.4 ug/m <sup>3</sup>	11.0 ug/m <sup>3</sup>
24-hour	35 ug/m <sup>3</sup>	33 ug/m <sup>3</sup>

Figure 2. Relationship between the number of woodstoves replaced and estimated annual PM<sub>2.5</sub> design values



Additionally, cleaner burning stoves will significantly reduce emission of other pollutants including carbon monoxide, formaldehyde, sulfur dioxide, and various gases such as

nitrogen oxides that can irritate the lungs. Equally important will be the reduction in emissions of Hazardous Air Pollutants (HAPs) which include carcinogens and other toxic pollutants that are associated with respiratory, cardiovascular, neurological, and numerous other non-cancer causing health effects. The PMF model identified “Refuse Burning” as one of the sources contributing to PM2.5 mass. Even though the source contributes very little PM2.5 mass, it may include toxic pollutants. The most likely sources of refuse burning are non-wood items burned in wood stoves or open burning piles. Plastic, foam, and the colored ink on magazines and boxes produce harmful chemicals when burned and also damage the wood-burning appliance. The education campaign will emphasize the danger of burning non-wood items to the health of the individual and the community as a whole.

Table 5 shows annual emission reductions, as well as reductions over the 20 year lifespan of a stove based on the 687 stove changeout. The following assumptions were made in developing these estimates:

1. The average household burns 4.3 cords of wood annually
2. The average wood density to convert cords to tons is 1.04
3. The wood stove efficiency will increase from 54 percent for the old stoves to 68 percent for the new stoves
4. The emission benefits of a wood stove changeout were estimated using the EPA Wood Stove and Fireplace Emission Calculator available from <http://www.epa.gov/burnwise/resources.html>.

Table 5. Estimated emission reduction (tons of pollutant) assuming 687 of older wood stoves will be replaced with EPA-certified woodstoves

<b>Pollutant</b>	<b>Annually</b>	<b>20 Years</b>
CO	224.0	4480.3
SO2	0.1	2.5
NOX	1.9	37.2
VOC	63.1	1262.3
PM2.5-PRI	32.4	647.3
PM10-PRI	32.4	647.3
total HAPs	4.7	95.0

Data from PM2.5 monitors located in the highest population concentration area of the City of Portola will be used to track progress towards meeting these goals. The monitoring site includes a PM2.5 Federal Reference Method (FRM) sampler, a PM2.5 Beta Attenuation Monitor (BAM), and a PM2.5 speciation sampler. PM2.5 FRM data will be used to track progress towards attainment of the standard, while the PM2.5 BAM data will be used to verify the impact of PM2.5 reductions on diurnal patterns. Once the project is implemented, PM2.5 concentrations during early morning and at night should decrease significantly. PM2.5 speciated data will be used to verify reductions in carbonaceous aerosols, a main component of wood burning, as well as wood burning markers including potassium and levoglucosan.

PM2.5 design values and emission reductions will be calculated annually to verify that the area is on track to meet air quality and emission reduction goals. The PM2.5 benefit calculator will be used to verify the relationship between the number of stoves changed out and PM2.5 concentrations and the U.S. EPA Burn Wise Calculator will be used to track reductions in emissions of PM2.5 as well as other pollutants associated with wood burning.

## **b. Environmental Justice**

This project will improve the air quality for residents of the Portola PM2.5 nonattainment area. The majority of Portola residents would not be able to afford new EPA-certified stoves without some financial assistance and most would need funding adequate to cover 100 percent of a changeout cost. About 16 percent of the nonattainment area residents have household incomes less than \$15,000 and close to 50 percent below \$35,000. Portola's unemployment rate of 22.3 percent is well above the national and state averages. According to the U.S. census, about 20 percent of residents are over the age of 62 and more susceptible to adverse reactions from air pollution. The Plumas County Public Health Agency estimates that at least 200 of the City's residents are homebound and the majority of these are seniors.

Replacing old stoves in Portola PM2.5 nonattainment area will not only improve the overall air quality in the area, increasing health benefits for the entire community, but will also ensure that residents have safer and more efficient stoves. The District will partner with the United States Department of Agriculture (USDA), the United States Department of Energy (DOE), the Low Income Home Energy Assistance Program (LIHEAP), the Energy Conservation Investment Program (ECIP), and the local Portola Resource Center to identify eligible low income residents and assist them in applying for changeout incentives. The District will encourage all residents to consider switching to a non-wood appliance, but especially residents who are homebound or have limited mobility. The retailers and partner agencies will be asked to highlight the benefits of operating a non-wood appliance to all potential customers. The District will discuss non-wood fuel subsidies with agencies providing services to low income residents in the area.

## **c. Education and Outreach**

The key to launching a successful wood stove changeout program will be the education and outreach to all residents of the nonattainment area. The District has already begun a public outreach campaign by hosting a wood stove workshop for Portola residents to educate them on proper burning techniques and the benefits of cleaner, more efficient wood stoves. The District also intensified the distribution of educational materials throughout the community. The District will continue promoting the project in the Portola PM2.5 nonattainment area using existing community contacts, libraries, schools, grocery and hardware stores, community resource groups, the faith community, and City of Portola and Plumas County officials and staff. Co-marketing the project with these organizations will be a key strategy for public education and participant

recruitment. The District is actively recruiting peer-to-peer champions to help educate others within the community. The District will also prepare a simple presentation about the project that can be used for public talks. The District will rely heavily on the area's only local newspaper, the Portola Reporter, as a way of publicizing the project and educating the public about the advantages of cleaner burning hearth appliances. The District will use letters to the editor, news articles, ads, and advertising inserts. The District will also promote the project on the District's website and contact the local radio station to appear on a night-time talk show. The District will repeat this media campaign throughout the five years of the program as needed.

The District plans to conduct a "Wood Stove Changeout Kick-Off" press conference to publicize the project in each year of the five year project. The District will invite an EPA spokesperson to these events to highlight the project's national, regional, and local significance. Participating wood stove retailers will also be invited.

The District will supply its participating retailers with the EPA Burn Wise materials to be distributed with each new EPA-certified wood stove to emphasize the need to burn wood properly. Whenever possible, the District will also take advantage of opportunities from any of its participating retailers to obtain sponsored advertising.

The District will work with local wood stove retailers in the Portola area and Plumas County to discuss outreach and financial assistance strategies to encourage wood stove changeouts to ultimately reduce wood smoke in the area and lead to attainment of the air quality standards. The District will formally enlist retailers through a written agreement that will identify the EPA-certified wood stove retailer as a participant. The agreement will stipulate that they will accept the project vouchers, follow best practices in hearth appliance installation procedures, and attest that they will remove and properly dispose of, or otherwise permanently render inoperable, the older stoves. The retailer will agree to promote switching to non-wood appliances by highlighting their benefits to project participants. To further promote installation of non-wood appliances, the District will provide additional incentive, using District's funding, of up to \$1,000 for a total of \$4,500 towards the purchase and installation of a non-wood heating appliance. The retailer will agree to train homeowners on proper appliance operation and acceptable fuels to maximize the emission reductions. Homeowners will be required to sign a form stating that they were trained to properly operate their new heating device. Verification of training will be required before payment will be issued to the retailer. Only qualified retailers with signed agreements will be eligible to participate in the project. Upon verification and approval, the District will submit final payment to the retailer. The participating retailers will also provide education to the new owner on the proper use of the new wood stove. The District will follow up with each owner with a customer satisfaction survey to assure that the wood stove is being used properly.

### **3. PROJECT OPERATION**

The objective of this project is to achieve maximum air quality benefits through the use of the 2015 Targeted Air Shed Grant for the replacement of uncertified stoves with new,

cleaner burning devices. The geographic area of the project is limited to the Portola PM2.5 nonattainment area.

### **a. Installation and Disposal**

The District will issue vouchers to qualified homeowners. To qualify for a voucher, the homeowner will have to complete an application to replace an uncertified (pre-1992) stove with a new wood stove, pellet, kerosene, or propane gas stove. Applications will be available at participating retailers, at the District office and web site, as well as other locations including City Hall, library, Portola Family Resource Center, Plumas Rural Services, and Veteran's Hall/Senior Center. Homeowners will have to agree to a number of requirements for participation. Applications for vouchers will be accepted on a first come, first served basis. The District will review the application to determine if the requirements have been met. Qualified applicants will receive a voucher worth up to \$3,500 toward a new EPA certified wood stove, pellet, kerosene, or propane gas stove. The installation must be coordinated and certified by the participating retailer. No do-it-yourself installations will be allowed under this program

Older stoves that are replaced through the program must be permanently removed from service and surrendered to the participating retailer. Participating retailers will be required to submit the Voucher Tracking Form to redeem each voucher. Each retailer will be responsible for submitting the form to the District along with before- and-after photos and validation that the old stove was removed from the residence.

The retailer will deliver the old stove to the City of Portola Public Works yard where a secured space for temporary storage will be designated. The City of Portola will be responsible for receiving the old stove from the retailer and rendering it inoperable within 90 days of the replacement by torching and/or drilling at least a two inch hole in the unit. The hole will be made in the corner or the side of the unit to ensure that the unit could not be replaced or repaired at a later date. The City will arrange with the recycling facility to have the old units transferred to the recycling facility. The City will be responsible for maintaining the records. Each unit delivered to the Public Works yard by the installer will be issued two tags bearing a serial number. One tag will be given to the installer upon delivery of the unit and the other one will be attached to the device. Once the device is destroyed the tag will be returned to the District along with the Verification of Destruction Form. The City employee will take a photograph of the old stove after it had been rendered inoperable and include it as part of the record. Upon verification and approval, the District will submit final payment to the retailer.

The participating retailers will also provide education to the new owner on the proper use of the new wood stove. The District will follow up with each owner with a customer satisfaction survey to assure that the wood stove is being used properly.

### **b. Timeline**

The District fully expects to complete the expenditure of all EPA Grant funds awarded within five years of receipt. Specifically, the District expects to spread out the number of

replaced stoves over five years as illustrated in Table 6.

Table 6. Number of stoves changed out per year

Year	Number of Stoves Changed Out
2016	187
2017	150
2018	150
2019	100
2020	100

Since attainment of the standard must be met by 2021, by the end of 2020 enough stoves need to be changed out to result in 2020 annual and 24-hour design values below the standards. Table 7 shows the approximate project timeline.

Table 7. Approximate project timeline, 2016 to 2020

Task	2016	2017	2018	2019	2020
<b>Establish and maintain partnership with retailers</b>					
Recruit participating retailers	X				
Establish voucher rebate application process; tracking protocols and retailer rebate procedures, modify as necessary	X	X	X	X	X
Educate and work with retailers throughout the project	X	X	X	X	X
<b>Education and outreach</b>					
Promote and advertise the project in the community	X	X	X	X	X
Maintain website with program information	X	X	X	X	X
Maintain a network of key stake holders to promote project	X	X	X	X	X
Host annual media “kick-off” event	X	X	X	X	X
<b>Facilitate wood stove changeout project</b>					
Identify and target low income residents most affected by particulate matter pollution, including children and seniors	X	X	X	X	X
Develop applications and procedures to collect and review applications	X				
Assist residents with applications	X	X	X	X	X
Verify completed applications, issue vouchers	X	X	X	X	X
Inspect and verify non-certified wood stoves are destroyed	X	X	X	X	X
Verify tracking forms and vouchers, issue checks, record in database	X	X	X	X	X
Follow-up with each resident on proper wood stove use	X	X	X	X	X
Number of stoves changed out	187	150	150	100	100
<b>Grant reporting and oversight</b>					
Compile reports on number of stoves changed out and associated cost	X	X	X	X	X
Verify projected reductions in ambient PM2.5 concentrations and emissions		X	X	X	X

### **c. Work Products and Benefits to the Public**

The main benefit of this project will be upgrading 687 uncertified stoves to cleaner burning EPA-certified appliances and educating residents about the proper way to store and burn wood to minimize health and environmental impacts. In order to accomplish this goal, the District will develop the following:

- Educational materials, including advertising flyers, press releases, media conferences, presentations, and brochures;
- Written agreements with wood stove retailers outlining rules and responsibilities;
- Application process including eligibility criteria, participant evaluation, and notification forms;
- Voucher program and tracking log; and
- Quarterly and final reports to ARB and the U.S. EPA

The District will utilize spreadsheets developed by the U.S. EPA to keep track of the number of stoves changed out and associated emission reductions. These include U.S. EPA Burn Wise Calculator and another spreadsheet currently under development.

The target population to receive the U.S. EPA grant funds would be 1,239 households with uncertified wood stoves within the Portola PM2.5 nonattainment area. The District will make a concentrated effort to enlist participation from low income residents in the nonattainment area. Not only will the owners of the older stoves benefit by upgrading to the newer stoves, all of the residents of the PM2.5 nonattainment area will benefit from significant improvements in air quality. Based on the U.S. Census Block Group data, the District estimates that there are 5,825 people living in the nonattainment area. Replacing 687 old wood stoves in the community with the new EPA-certified wood stoves would reduce annual PM2.5 design values from 14.1 ug/m<sup>3</sup> in 2014 to 11.0 ug/m<sup>3</sup> in 2021 and the 24-hour design value from 45 ug/m<sup>3</sup> to 33 ug/m<sup>3</sup>. Furthermore, replacing 687 older uncertified wood stoves with cleaner burning EPA-certified stoves would significantly reduce public exposure to hazardous air pollutants (HAPs).

### **d. Role of the District**

The District will assume sole responsibility for the operation and management of the project. This includes the following:

- Promote wood stove changeout project in the community and educate public about proper way to store and burn wood
  - Prepare and conduct wood stove kick-off media conference
  - Develop and deliver presentations to partners
  - Prepare and distribute media outreach and educational materials
- Prepare, distribute, and process applications
  - Assist in filling out application



- Respond to applicant's questions and concerns
- Review applications
- Administer the financial incentive program
  - Enter into a partnership with local retailers
  - Issue vouchers to qualified applicants
  - Process and track vouchers submitted by retailer
  - Issue payments to retailers
- Track vouchers, funds, and receipts for recycled stoves
- Develop quarterly and final reports to ARB and U.S. EPA

### **e. Experience and Qualifications**

The District was formed in 1986 by the merging of the Air Pollution Control Districts of Nevada, Plumas, and Sierra Counties. The District is required by state law to achieve and maintain the federal and state Ambient Air Quality Standards, which are air quality standards set at levels that will protect the public health. The District is composed of three primary entities, each with a specific purpose: District staff, Governing Board of Directors, and Hearing Board. Currently, the District staff is limited to four full-time employees in the main office in Grass Valley and one full-time employee located in the District's only field office in the City of Portola.

The District has a mission to conduct outreach and administer programs that will help bring the Portola nonattainment area back into attainment. The District is working closely with Portola city officials, Plumas County agencies, local community organizations, and state and federal government organizations to outline a plan to reach attainment by 2021.

In the past 16 years, the District has successfully distributed \$142,000 to residents through different residential wood stove changeout programs throughout all three counties, changing out 142 wood stoves to cleaner burning appliances.

The District's project for the purposes of this application will use many of the procedures, documents, and tracking techniques used in prior wood stove changeout programs, with an increased level of record-keeping and tracking.

The principal and responsible parties of the District currently assigned to the project are:

- Executive Director, Gretchen Bennitt
- Deputy Executive Director, Joe Fish
- Air Pollution Specialist I, Julie Ruiz
- Air Pollution Specialist III, Sam Longmire
- Business Manager, Allison King

Three of the five staff members have extensive experience in implementing the past wood stove changeout programs in the District. Joe Fish authored and implemented a

low-income senior changeout program. Gretchen Bennett has developed the criteria, vouchers, and outreach materials for wood stove changeouts throughout the District. Allison King worked directly with wood stove retailers and individual residents to process payments for changeouts in past programs. Allison King also has an extensive background in issuing and tracking payments, and conducting financial audits for many grant programs that the District has administered. A detailed biography of each staff member is included in the attachments.

ARB staff will assist with annual verification of progress including estimating reductions in emissions and PM2.5 concentrations. Kasia Turkiewicz, Air Resources Engineer, will oversee the project on behalf of ARB to ensure that funds are passed to the District in a timely manner. Eugene Kim, Air Resources Engineer, will provide technical support to track emission reductions and evaluate progress towards attainment of the PM2.5 standard.

#### **f. Programmatic Capability and Past Performance**

In the past 16 years, the District has successfully distributed \$142,000 to residents through different residential wood stove changeout programs throughout all three counties within the District boundaries, changing out 142 wood stoves to cleaner burning appliances. The District has demonstrated the technical ability to successfully implement a wood stove changeout program by establishing a plan, tracking progress, and adjusting accordingly to maximize short- and long-term program goals. In addition, the District has successfully administered \$2,224,000 of incentive funds from the ARB Lower Emission School Bus Program and \$2,281,808 from the Carl Moyer program. The success of these programs substantiates the District's experience in public outreach, marketing, administrative coordination, and fund management.

With respect to grant management, ARB has accepted several U.S. EPA grants in the past three years, including: Section 105 Air Pollution Control Financial Assistance Grant (Grant Number A-00901315), PM 2.5 Monitoring Network Grant (Grant Number PM-98960901), and the State Clean Diesel Grant (Grant Number DS-00T87901). Each of these recent grants represents a continuation of a multi-year, multi-million dollar grant from U.S. EPA. For each grant, ARB has completed all grant agreement terms and completed (or expects to complete) the approved work plans to expeditiously apply funds to shared U.S. EPA and ARB air quality goals. ARB has documented progress on these grants through submittal of required reports and inputting collected data into state and national databases, as appropriate per the grant terms.

Additionally, ARB has extensive experience implementing multi-million dollar incentives programs, such as the Lower-Emission School Bus Program, the Carl Moyer Memorial Air Quality Standards Attainment (Moyer) Program, Goods Movement Emission Reduction (Goods Movement) Program, the Air Quality Improvement Program (AQIP), and the Providing Loan Assistance for California Equipment (PLACE) Program. ARB's experience in these programs has established solid working relationships with air districts as well as engine/equipment and retrofit manufacturers and vendors necessary

for successfully implementing the proposed project.

### **g. Partnerships**

The District has established partnerships with the USDA, DOE, and LIHEAP to assist very low income residents with residential wood stove replacements. The District will encourage agencies assisting low income residents to promote non-wood heating appliances and consider subsidizing clean fuels.

The most essential partnership is with the local wood stove retailers. The retailers will assist in the outreach and marketing of the project, as well as the installation of certified appliances and the proper removal and demolition of uncertified appliances.

The City of Portola will be an active partner throughout the project. The City will continue to enforce a City ordinance as a change-of-ownership requirement that when a home is sold, all wood burning appliances must be EPA Phase II Certified, as well as any newly installed wood burning appliance. The City or Plumas County will inspect new installations of wood stoves as required. They will actively promote the changeout project during City Council Meetings and participate in community events.

Finally, the District will partner with additional groups to enhance the outreach of the project. These groups include chimney sweeps, local businesses, social services groups, health and medical care organizations, fire departments, home builders and remodelers, local opinion leaders, media representatives, social service groups, and others who can reach large numbers of people and may share its goal of improved air quality and public health.

The ARB will provide oversight of the project; provide assistance and review reports and documents. The ARB will forward project related documents to the U.S. EPA and ensure prompt transfer of funding to the District.

## **4. BUDGET**

### **a. 2015 Targeted Air Shed Grant**

The U.S. EPA allocated \$2,483,607.00 towards the Residential Wood Stove Changeout Project in the Plumas County PM2.5 Nonattainment Area. The overwhelming portion of the grant, \$1,952,000, will go directly towards the purchase and installation of the new EPA-certified stoves and disposal of the old stoves. A detailed description of the number and the types of devices to be funded under this project is included in Table 2. The District reserves the right to modify the allocation of resources in order to achieve maximum emission reductions.

The remaining \$531,607.00 will go towards the cost of administering the grant by the ARB and the District. All five staff members of the District will be assigned to the project. The District Project Manager is Gretchen Bennitt, the Executive Director of the

agency. The Project Coordinator is Julie Ruiz. She is an Air Pollution Specialist I located in Portola. The Project Business Manager is Allison King, Business Manager. Joe Fish is the Deputy Executive Director and Sam Longmire is an Air Pollution Specialist III.

Because the District has very limited resources, all five employees of the air District will assist residents with applications. In order to determine the amount of weeks worked each year, the District subtracted earned vacation, sick leave and holidays from the 52 weeks in each year. All employees will keep track of hours spent on the project on the District’s payroll database.

In order to change out the large number of woodstoves, the District has projected that the project will take place over five years: 2016, 2017, 2018, 2019, and 2020.

The five employees of the District receive 27 percent of salary and wages for fringe benefits. Fringe benefits consist of retirement benefits, health, vision, and dental benefits.

The District Project Manager will travel from Grass Valley to Portola to attend the annual “Kick-Off” event. The round-trip distance from Grass Valley to Portola is 208 miles. She will attend the event in each of the five years.

The ARB estimates \$175,000 in administrative expenses associated with overseeing the grant implementation and processing paperwork and funding.

Table 8 provides a detailed breakdown of the approximate funding associated with administering the grant and Table 9 summarizes how the grant money will be spent. Table 10 provides a detailed description of District staffs’ role in administering the grant.

Table 8. Estimated cost of administering the grant

Line Item and Itemized Cost	Rate (\$)	Hours per Week	Number of Weeks per Year	Number of Years	Cost
<b>District Personnel</b>					
(1) District Project Manager	48.74	8	43	5	\$83,832.80
(2) Project Coordinator	21.74	18	45	5	\$88,047.00
(3) Business Manager	24.44	8	43	5	\$42,036.80
(4) Project Staff #1	36.96	3	43	5	\$23,839.20
(5) Project Staff #2	42.52	3	43	5	\$27,425.40
Fringe Benefits (27%)					\$71,598.92
Travel					\$2,000.00
Other <sup>1</sup>					\$17,826.88
ARB Grant Administration Cost					\$175,000.00
<b>Total Grant Administration</b>					<b>\$531,607.00</b>

<sup>1</sup> “Other” cost includes advertisement in local papers, mailing, printing, and other miscellaneous expenses.

Table 9. Total 2015 Targeted Air Shed Grant expenditures

Type of Expenditure	Cost
Equipment	\$1,952,000.00
Grant Administration	\$531,607.00
Total	\$2,483,607.00

Table 10. Grant administration by staff and by task

Line Item and Itemized Cost	Percent
<b>Personnel</b>	
(1).Project Manager @ \$48.74 x 8 hours/week x 43 weeks	
Task 1 – Assist with “kick off” press conference	5
Task 2 – Attend “kick off” each year	5
Task 3 – Assist Project Coordinator	40
Task 4 – Assist residents with applications	35
Task 5 – Review forms and authorize payments	10
Task 6 – Sign thank you letters and participation	5
(2) Project Coordinator @ \$21.74 x 18 hours/week x 45 weeks	
Task 1 – Network with key stakeholders to promote project	5
Task 2 – Recruit and work with woodstove retailers	5
Task 3 – Develop procedures and forms, modify as	5
Task 4 – Maintain website with program information	5
Task 5 – Host annual media “kick off” event	5
Task 6 – Promote and advertise the project in the community	10
Task 7 – Discuss project status with project manager	10
Task 8 – Assist resident with applications	20
Task 9 – Identify and target income-qualified residents	5
Task 10 – Verify applications, vouchers and tracking forms	15
Task 11 – Inspect and verify stoves destroyed	5
Task 12 – Forward reviewed documentation to Manager	5
Task 13 – Follow up with each resident on woodstove use	5
(3) Business Manager @ \$24.44 X 8 hours/week X 43 weeks	
Task 1 – Assist residents with applications	40
Task 2 – Mail information, letters, vouchers	20
Task 3 – Record in database and track all transactions	10
Task 4 – Process checks for payment	20
Task 5 – Prepare thank you letters and record	10
(4) Project Staff #1 @36.96 X 3hours/week X 43 weeks	
Task 1 – Assist residents with applications	100
(4) Project Staff #2 @ 42.52 X 3 hours/week X 43 weeks	
Task 1 – Assist residents with applications	100

**b. Voluntary Cost Share/Match and Leveraged Funds**

With the assistance of the Environmental Finance Center (EFC), the District has concluded that approximately 163 households in the nonattainment area will participate

in programs for wood stove changeouts from the following agencies; USDA, DOE, LIHEAP, and ECIP. The District is planning a financial assistance workshop in the summer of 2015 with these agencies. The income-qualified programs are contingent upon availability of funds and the community's ability to target eligible households that meet both the income and age requirements of the funding programs. As education and outreach continues, these programs should be considered first for wood stove changeout assistance. The estimated amount for cost/share for income-qualifying programs is \$570,500 (Table 11).

Table 11. Participation in income-qualifying wood stove changeout programs

Program Name	Estimated Households Eligible*	Participation Rate	Number of Changeouts	Total Cost
Very Low Income Repair and Rehabilitation Grants (USDA)	204	75%	153	\$535,500
Low Income Energy Crisis Intervention Program (LIHEAP ECIP)	7	100%	7	\$24,500
Low Income Weatherization Program (DOE)	3	100%	3	\$10,500
<b>TOTALS</b>	<b>214</b>	<b>76%</b>	<b>163</b>	<b>\$570,500</b>

\*Eligibility for program based on income and age restrictions (USDA) and funding amounts (LIHEAP and DOE).

Additionally, the District has allocated \$40,000 of local fees specifically to be used for the wood stove changeout program, which brings the total amount of leveraged funding to \$610,500. Part of the \$40,000 provided by the District will be used for providing additional incentive of up to \$1,000 to encourage residents to change out to a pellet or a propane stove.

## Appendix H

### Wood Stove Change-out Request for Qualifications

# Northern Sierra Air Quality Management District

Request for Qualification

For

## **List of Qualified Retailers/Contractors for Greater Portola Woodstove Changeout Program**

### **Proposal Submission Deadline**

Friday, March 18, 2016 3:00 p.m. Pacific Time

### **MAIL:**

Northern Sierra Air Quality Management District  
P.O. Box 2509  
Grass Valley, California 959545

Must be RECEIVED in office by 3:00 p.m. on March 18

### **HAND DELIVERIES**

200 Litton Drive, Suite 320  
Grass Valley, CA 95945  
OR

257 East Sierra Street, Unit E  
Portola, CA 96122

will be accepted at either of the above address until 3:00 p.m. of the Deadline Date



**TABLE OF CONTENTS**

1. SUMMARY.....2  
 2. CONTRACT AWARD SCHEDULE.....3  
 3. GENERAL CONDITIONS.....3  
 4. BACKGROUND.....4  
 5. DESCRIPTION OF SERVICES REQUIRED.....4  
 6. CONTENT AND FORMAT REQUIREMENTS.....5  
 7. SELECTION PROCEDURES.....6  
 8. INQUIRIES.....7  
 ATTACHMENT A: COVER SHEET.....8  
 ATTACHMENT B: SAMPLE RETAILER CONTRACT AGREEMENT.....9

**1 SUMMARY**

The Northern Sierra Air Quality Management District, hereinafter collectively referred to as “the District”, is accepting Qualifications from all interested and qualified providers of woodstove/and other home heating devices for homes in the Greater Portola Area in Plumas County, California. The term “offeror” as used herein shall refer to providers submitting qualifications in response to this Request for Qualification (RFQ). The term “Retailer/Contractor” is also used to describe the successful offeror(s) in the context of providing services under a contract resulting from this RFQ.

All respondents must be in possession of a current CSIA and/or NFI certification at the proposal submission deadline listed in the CONTRACT AWARD SCHEDULE. All respondents must also be in possession of a current C-61(D-34 Prefabricated Equipment) Contractors License as well. Certifications and licenses must remain in effect during the entire term of the contract period.

An electronic copy may be downloaded from [www.myairdistrict.com](http://www.myairdistrict.com). Potential offerors must register with the District in order to be notified of addenda and other notices. To register, please send an email to [allison@myairdistrict.com](mailto:allison@myairdistrict.com) indicating “Qualification List for Retailers/Contractors” in the subject field. If you do not receive a reply to this email indicating that you have been registered, please call 530-274-9360 X 104. If potential offerors are unable to access internet, please call 530 274-9360 X 104 for a paper copy of the RFQ.

All proposals received in response to this RFQ will be evaluated on the criteria described herein.

Sealed responses must be clearly marked “Request for Qualification – List of Qualified Retailers/Contractors for Greater Portola Woodstove Changeout Program” and must include all elements described in the **CONTENT AND FORMAT REQUIREMENTS** section of this RFQ. One (1) original and one (1) copy of the proposal must be delivered to the address below before the date and time listed in the **CONTRACT AWARD SCHEDULE** section of this RFQ. The District will not be responsible for Qualifications delivered to a person or location other than that specified herein, and reliance on the postal service will not excuse late Qualifications.

Questions or requests for clarification of this RFQ may be submitted in writing and must be submitted no later than the date and time listed in the **CONTRACT AWARD SCHEDULE** section of this RFQ. Responses to questions will be published in an addendum after the question submittal deadline has passed.

Any amendment or addendum to this RFQ is valid only if in writing and issued by the Northern Sierra Air Quality Management District.

**2 CONTRACT AWARD SCHEDULE**

Publish RFQ	February 25, 2016
Deadline for Questions	March 3, 2016 at 3:00 p.m.
Proposal Submission Deadline	March 18, 2016 at 3:00 p.m.
Contract Award (tentative)	March 31, 2016
Services to Begin (tentative)	April 9, 2016

**3 GENERAL CONDITIONS**

- 3.1 **Prime Responsibility:** The selected Retailer(s)/Contractor(s) will be required to assume full responsibility for all services and activities offered in its/their qualification(s), whether or not provided directly. Further, the District will consider the selected Retailer(s)/Contractor(s) to be the sole point of contact with regard to contractual matters, including payment of any and all charges resulting from the contract.
- 3.2 **Assurance:** Any contract awarded under this RFQ must be carried out in full compliance with Title VI and VII of the Civil Rights Act of 1964 as amended, and Section 504 of the Rehabilitation Act of 1973 as amended. The Provider must guarantee that services provided will be performed in compliance with all applicable county, state and federal laws and regulations pertinent to this project.
- 3.3 If this contract involves protected health information and the Health Insurance Portability and Accountability Act of 1996 (Public Law 104-199 (HIPAA) applies: Any contract awarded under this RFP must comply with the requirement of 42 U.S.C. §§ 1171 et seq., Health Insurance Portability and Accountability Act of 1996 (HIPAA) and its subsequent amendments, related to Protected Health Information (PHI), in performing any task or activity related to this Agreement.
- 3.4 **Independent Retailer/Contractor:** In performance of the work, duties and obligations assumed by the offeror, it is mutually understood and agreed that the offeror, including any and all of the offeror's officers, agents and employees, will at all times be acting and performing in an independent capacity and not as an officer, agent, servant, employee, joint venture, partner or associate of the District.
- 3.5 Northern Sierra Air Quality Management District prohibits discrimination in employment or in the provision of services because of race, color, religion, religious creed, sex, age, marital status, ancestry, national origin, political affiliation, physical disability or medical condition. This clause does not require the hiring of unqualified persons.
- 3.6 The District reserves the right to reject any and all qualifications, to negotiate specific terms, conditions, compensation, and provisions on any contracts that may arise from this solicitation; to waive any informalities or irregularities in the response; and to accept the qualifications that appear to be in the best interest of the Northern Sierra Air Quality Management District. In determining and evaluating the qualifications, the experience of those who will be providing services under the contract, quality, equality, efficiency, utility, suitability of the services offered, and the reputation of applicants will be considered, along with other relevant factors. The District will not be liable for any costs incurred by any person in preparation of a response to this RFQ, in conduct of a presentation, or any other activities related to this RFQ. No claim for reimbursement of time, material or travel expenses shall be made by a response against the District, regardless of the results of the selection process.
- 3.7 The District reserves the right to:
- Request clarification of any submitted information;
  - Not enter into any agreement;
  - Not to select any applicant;
  - Amend or cancel this process at any time;

- Interview applicants prior to award and request additional information during the interview;
  - Negotiate a multi-year contract or a contract with an option to extend the duration; and/or
  - Issue similar RFQs in the future.
- 3.8 Qualified Retailers/Contractors must be prepared to enter into the District's "Retailer/Contractor Agreement" which a sample is attached as Attachment B to this RFQ. Please review the details of Attachment B carefully. By reference, it incorporates many standards, terms and conditions required as part of this RFQ. The District intends to award contracts substantially in the form of the sample "Retailer/Contractor Agreement" to the selected vendor(s). Portions of this RFQ and the sample Retailer/Contractor's proposal may be made part of any resultant contract and incorporated in the Contract.
- 3.9 Prior to commencement of services, the Retailer/Contractor must provide evidence of the following insurance coverages: Worker's Compensation and Commercial General Liability (naming the Northern Sierra Air Quality Management District as additional insured). The Retailer/Contractor will be required to maintain the required coverages, at its sole cost and expense, throughout the entire term and any subsequent renewal terms of the contract.

## 4 BACKGROUND

### 4.1 Background

The District is implementing a woodstove changeout program in the Greater Portola Area in Plumas County funded by the U.S. EPA's 2015 Targeted Air Shed Grant Program, the District and other agencies. The required services include working with prospective homeowners/renters in the Greater Portola Area to determine whether the homeowner/renter qualifies for the program, replace existing uncertified woodstove with an appropriate heating device and destroy the uncertified device according to the District requirements.

Funding is expected to be approximately \$2,000,000 over the next five years. The District will enter qualified applicants onto a list which will be utilized by homeowners/renters to work with approved Retailers/Contractors to replace uncertified woodstoves. The District will retain the List of Qualified Retailers/Contractors for five (5) years following the initial list development.

## 5 DESCRIPTION OF SERVICES REQUIRED

### 5.1 Required Qualifications

- a. Retailer(s)/Contractor(s) must be in possession of a CSIA and/or NFI certification. The certification must remain in effect during the entire term of the contract period.
- b. Retailer(s)/Contractor(s) must be in possession of a C-61 (D34 Prefabricated Equipment Contractor) license. This license must remain in effect during the entire term of the contract period.
- c. Retailer(s)/Contractor(s) must be an authorized dealer of EPA certified devices and must be able to provide a list of all the EPA certified device brands for which each respondent is representing.
- d. Retailer(s)/Contractor(s) must have all EPA certified devices sold to be under warranty, and Retailer(s)/Contractor(s) must have agreement with all manufacturers to honor the warranties.
- e. Retailer(s)/Contractor(s) must have a minimum of 3 years of experience of selling and installing stoves to manufacturer specifications.
- f. Retailer(s)/Contractor(s) must sell only EPA certified home heating devices and these devices must be installed according to Manufacturer specifications. Devices can not be modified from manufacturer specifications.
- g. Retailer(s)/Contractor(s) must offer woodstoves that are specifically designed to be installed within mobile homes/manufactured homes. Retailer(s)/Contractor(s) must be trained to install woodstoves in mobile homes/manufactured homes.

### 5.2 Conditions

Paperwork will consist of:

1. Program Tracking Form
2. Copy of estimate with District approval signature
3. Photo of non-certified woodstove installed and operational in home ("before")
4. Photo of certified device installed ("after")
5. Copy of Building Permit (City/County/State)
6. Acknowledgement of Training Form
7. Final Invoice

If the above documents are not received or are incomplete, funds will not be dispersed to the Retailer/Contractor.

- a. Retailer's/Contractor's accounting records, as they relate to work carried out through the proposed contract, shall be subject to inspection and review, for reporting purposes, by Federal, State and District agencies.

### 5.3 Description of Services

- a. Retailer/Contractor shall be required to adhere to the District's paperwork requirements as laid out in the attached agreement in order to receive any reimbursement for funds spent.
- b. Retailer/Contractor shall be required to provide education to the new device owner as required by the District.
- c. Retailer/Contractor must respond to inquiries from customers within a reasonable time period (no more than 30 days) and within the five year program time frame.
- d. The Retailer/Contractor will be required to assume full responsibility for purchase of appliances and materials, required tools, services and activities offered in its/their proposal(s), whether or not provided directly.
- e. The Retailer/Contractor shall be responsible for the proper disposal of removed appliances as required by the District.
- f. The Retailer/Contractor shall be responsible for obtaining all required building permits.
- g. The Retailer/Contractor shall be required to assist the Air District in educational and marketing events such as the annual woodstove changeout "kick-off" as requested by the District.

## 6 CONTENT AND FORMAT REQUIREMENTS

Interested offerors shall submit one (1) original plus one (1) copy of their proposal to Northern Sierra Air Quality Management District, Attention: Gretchen Bennitt, P.O. Box 2509, Grass Valley, CA 95945. Submissions that are hand-delivered may be brought to the Northern Sierra Air Quality Management District office at 200 Litton Drive, Suite 320, Grass Valley, CA 94954 OR Northern Sierra Air Quality Management District office at 257 E. Sierra Street, Unit E, Portola, CA, 96122.

Proposals shall be delivered no later than the date and time listed in the CONTRACT AWARD SCHEDULE and shall contain at a minimum the following items:

### 6.1 Cover Sheet (Attachment A)

- a. Provide the full legal name of the Retailer/Contractor who will execute the contract. Provide specific information concerning the agency, including: the agency's legal name, type of entity, and Federal Tax ID #.
- b. The cover sheet must be signed by an owner, corporate officer, or agent authorized by the Retailer/Contractor.

### 6.2 Documentation of Required Qualifications

- a. Provide documentation of your CSIA and/or NFI Certification.
- b. Provide documentation of C-61 (D-34 Prefabricated Equipment Contractor) contractors license
- c. Provide documentation of Workman's Compensation
- d. Provide documentation of Commercial General Liability (naming the Northern Sierra Air Quality Management District as Additional Insured).

### 6.3 Description of Services and Background

#### a. Overview

- i. Provide a narrative description of how you plan to provide these services. Include any specialized equipment, scheduling tools, communication plans and systems for record keeping that you will employ to ensure quality of service, compliance and accurate reporting.
- ii. Provide information about any unique equipment, experience or qualifications that uniquely qualify you to provide these services.

#### b. Background and Experience

- i. Provide an overview of the types of work you have performed. Include a summary of your qualifications as they relate to this RFQ.
- ii. Provide examples and references with contact information that substantiate your (or your organization's) experience in providing the types of services requested in this RFQ.
- iii. State the number of years of experience your key staff have performing this type of work.
- iv. Please describe any current, pending or past litigation (within the last 5 years) that the organization has been, is, or is expected to be a party to.

### 6.4 List of Brands Contractor is Currently Authorized to Represent

- a. Please submit a list of the EPA Certified device brands Contractor is currently authorized to represent.

### 6.5 Retailer/Contractor Agreement (Attachment B)

- a. Qualified Retailers/Contractors must be prepared to enter into the District's "Retailer/Contractor Agreement" which a sample is attached as Attachment B to this RFQ. Please review the details of Attachment B carefully. By reference, it incorporates many standards, terms and conditions required as part of this RFQ. The District intends to award contracts substantially in the form of the attached sample "Retailer/Contractor Agreement" to the selected vendor(s). Portions of this RFQ and the sample Retailer/Contractor's proposal may be made part of any resultant contract and incorporated in the Contract.

## 7 SELECTION PROCEDURES

Proposals will be screened to confirm that each proposal contains all required attachments and content and that the offerer has demonstrated compliance with all the required licensing and certification. Proposals that do not meet this minimum qualification will be set aside and will not be included in further consideration.

Qualifying proposals will be further evaluated on the criteria outlined in the CONTENT AND FORMAT REQUIREMENTS section.

Offerors submitting the most highly rated proposals may be contacted for interviews prior to final selection. The District reserves the right to award one or more contracts without holding interviews, in the event the written proposals provide a clear preference on the basis of the criteria described. Should interviews be conducted, the same criteria will be used to select the final provider(s).

The Retailer(s)/Contractor(s) selected for this project will be required to accept the Air District's Retailer Agreement and to comply with insurance standards as deemed acceptable to the District's Risk Manager. No agreement with the Air District is in effect until both parties have signed a contract.

## 8 INQUIRIES

Direct all inquiries regarding the RFQ process or proposal submissions to:

Gretchen Bennitt, Executive Director  
Northern Sierra Air Quality Management District  
P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 X 102  
[gretchen@myairdistrict.com](mailto:gretchen@myairdistrict.com)

**Attachment A: COVER SHEET**

Applicant: \_\_\_\_\_

Contact Person

Name and Title:

\_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Mobile Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Type of entity: \_\_\_\_\_

(e.g., corporation, sole-proprietorship, non-profit organization, public agency, etc.)

Federal Tax ID: \_\_\_\_\_

The undersigned certifies that, by submitting this proposal, the applicant agrees to perform the work described in this Request for Qualification.

\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Date

**Attachment B: SAMPLE Retailer/Contractor Agreement**  
**(subject to change)**



DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM 2016

**SAMPLE RETAILER/CONTRACTOR AGREEMENT  
(SUBJECT TO CHANGE)**

**Parties:** This Retailer/Contractor Agreement (Agreement) is for services between the Northern Sierra Air Quality Management District (District) and \_\_\_\_\_, of \_\_\_\_\_ (Retailer/Contractor), effective until funds run out or December 31, 2021 (whichever comes first).

**Grant Award:** The subject matter of this Agreement is the Greater Portola Area Wood Stove Change-out Program funded by various grants and funds. Every effort will be made for funds to be dispersed from the District to the Retailer/Contractor within 30 days from the time all paperwork is received by the District. Paperwork from the Retailer/Contractor will consist of:

1. Program Tracking Form
2. Copy of estimate with District approval signature
3. Photo of non-certified woodstove installed and operational in home ("before")
4. Photo of certified device installed ("after")
5. Copy of Building Permit (City/County/State)
6. Acknowledgement of Training Form
7. Final Invoice

If the above documents are not received or are incomplete, funds will not be dispersed to the Retailer/Contractor.

**Maximum Amount:**

**Phase I (Zone One):** Phase I begins early 2016 within Zone One. Zone One is defined as the boundary of the Portola City Sphere of Influence (PCSOI) Map attached to this agreement. In consideration of the services to be performed, the District agrees to pay Retailer/Contractor, in accordance with the payment provisions specified in Attachment A, a sum not to exceed the following: \$3,500 per new EPA certified woodstove replacement in, \$4,500 per a new pellet or gas stove in Zone One. The cost must include all aspect of the installation, including device, labor, permit, stove pipe, hearth and anything else necessary to ensure safe, effective installation and use of the new device. The Retailer/Contractor must submit an estimate of total cost to the District for approval. Under no circumstances will \$3,500 for a new certified EPA woodstove or \$4,500 for a new pellet of gas stove in Zone One be exceeded without prior authorization by the District.

**Phase II (Zone Two):** Phase II will begin in early 2018 within Zone Two. Zone Two is defined as the area outside the Portola City Sphere of Influence (PCSOI) but still within the Greater Portola PM2.5 Federal Nonattainment Area Boundaries. Both a map of Zone One (Portola City Sphere of

Influence) and a map of the Greater Portola PM2.5 Federal Nonattainment Area are included as attachments to this agreement.

In consideration of the services to be performed, the District agrees to pay Retailer/Contractor, in accordance with the payment provisions specified in Attachment A, a sum not to exceed the following:

For those residents within Zone Two who meet low income qualifications a sum not to exceed the following: \$3,500 per new EPA certified woodstove replacement in, \$4,500 per a new pellet or gas stove. The cost must include all aspect of the installation, including device, labor, permit, stove pipe, hearth and anything else necessary to ensure safe, effective installation and use of the new device. The Retailer/Contractor must submit an estimate of total cost to the District for approval. Under no circumstances will \$3,500 for a new certified EPA woodstove or \$4,500 for a new pellet of gas stove for a low-income qualified resident in Zone Two be exceeded without prior authorization by the District.

Residents in Zone Two who **exceed** the low income threshold will receive a voucher for either \$1,500 to upgrade to an EPA-certified wood stove or \$3,000 to upgrade to a pellet, propane, or kerosene stove.

**Scope of Services:**

Retailer/Contractor shall provide all of the services, materials and products (herein "Services") generally described in Attachment "A", according to a performance schedule, if applicable, as set forth in said attachment (herein "Program Provisions"). If requested, Retailer/Contractor agrees to serve as an expert witness for the District in any third party action or proceeding arising out of this Contract.

Retailer's/Contractor's accounting records, as they relate to work carried out through the proposed contract, shall be subject to inspection and review, for reporting purposes, by Federal, State and District agencies.

During initial visit to homes, the Retailer/Contractor shall discuss and strongly encourage homeowners to consider replacing wood appliances with alternative fuel devices, such as propane, pellet or kerosene.

The Retailer/Contractor will agree to train homeowners on proper appliance operation and acceptable fuels to maximize the emission reductions. Homeowners will be required to sign a form stating that they were trained to properly operate their new heating device. A form signed by the resident verifying that training has occurred will be required before payment will be issued to the retailer.

**Commercial General Liability Insurance:**

A Commercial General Liability insurance policy is required. Retailer/Contractor shall promptly provide proof of such insurance evidenced by a certificate of insurance with properly executed endorsements attached, which insurance shall include the following:

- (i) Broad form coverage for liability for death or bodily injury to a person or persons, and for property damage, combined single limit coverage, in the minimum of \$1,000,000.
- (ii) An endorsement naming District as an additional insured under said policy, with respect to claims or suits arising from the Services provided or the relationships

created under this Contract;

(iii) A provision that said insurance shall be primary and other insurance maintained by the District shall be excess only and not contributing with Retailer's/Contractor's insurance;

(iv) A provision that said insurance shall provide for thirty (30) days written notice to District of any termination or change in coverage protection, or reduction in coverage limits (except ten (10) days notice for non-payment of premium).

**Indemnity:**

Nothing herein shall be construed as a limitation of Retailer's/Contractor's liability, and Retailer/Contractor shall indemnify, defend and hold harmless the District and its officers, officials, employees, agents and volunteers from any and all liabilities, claims, demands, damages, losses and expenses (including, without limitation, defense costs and attorney fees of litigation) which result from the negligent act, willful misconduct, or error or omission of Retailer/Contractor, except such loss or damage which was caused by the sole negligence or willful misconduct of District or its officers, officials, employees, agents and volunteers.

**Agreement Term:** The period of the Retailer/Contractor performance shall begin upon date of execution, signified by the date on which all project dollars are spent.

**Amendment:** No changes, modifications, or amendment in the terms and conditions of this Agreement shall be effective unless reduced to writing, numbered, and signed by the duly authorized representative of the District and Retailer/Contractor. Any request for an amendment to this Agreement must be made in writing at least 30 days prior to the end date of this Agreement or the request may be denied.

**Retailer/Contractor as Independent:**

In providing services herein, Retailer/Contractor, and the agents and employees thereof, shall act in an independent capacity and as an independent contractor and not as agents or employees of District.

**Licensing, Permits, Certification and Requirements:**

Retailer warrants (i) Retailer/Contractor is qualified and competent to provide all Services under this contract; (ii) Retailer/Contractor and all employees of Retailer/Contractor hold all necessary and appropriate licenses therefore, including CSIA and/or NFI certification; and, (iii) Retailer/Contractor shall obtain, and remain in compliance with, all permits necessary and appropriate to provide said Services. Retailer/Contractor shall cause said licenses and permits to be maintained throughout the life of this Contract. Failure to do so shall constitute a Material Breach of this agreement, and, in addition to any other remedy available at law or otherwise, shall serve as a basis upon which District may elect to suspend payments hereunder, or terminate this Contract, or both.

- a. Retailers/Contractors must be in possession of a CSIA and/or NFI certification. The certification must remain in effect during the entire term of the contract period. This documentation must be provided.
- b. Retailers/Contractors must be in possession of a C-61 (D34 Prefabricated Equipment Contractor) license. This license must remain in effect during the entire term of the contract period. This documentation must be provided.

- c. Retailers/Contractors must be an authorized dealer of EPA certified devices and must be able to provide a list of all the EPA certified device brands for which each respondent is representing.
- d. Retailer(s)/Contractor(s) must have all EPA certified devices sold to be under warranty, and Contractor(s) must have agreement with all manufacturers to honor the warranties.
- e. Retailer(s)/Contractor(s) must have a minimum of 3 years of experience of selling and installing stoves to manufacturer specifications.
- f. Retailer(s)/Contractor(s) must sell only EPA certified home heating devices and these devices must be installed according to Manufacturer specifications. Devices can not be modified from manufacturer specifications.
- g. Retailer(s)/Contractor(s) must offer woodstoves that are specifically designed to be installed within mobile homes/manufactured homes. Retailer(s)/Contractor(s) must be trained to install woodstoves in mobile homes/manufactured homes.
- h. If applicable, public works law requires private construction contractors to pay prevailing wages to their workers and requires the construction contractor to follow public works law when working on a project funded by a public entity. A public entity can be the State of California, or any public agency such as a county, city, school or a special district. Prevailing wages are due, in most instances, if the project costs more than \$1,000, and involves the following construction work: new construction, alteration, demolition, installation, repair and maintenance. Contractors must make an attempt to hire apprentices when the total project costs exceed \$30,000.
- i. Retailer(s)/Contractor(s) must provide documentation of Workman's Compensation
- j. Retailer(s)/Contractor(s) must provide documentation of Commercial General Liability (naming the Northern Sierra Air Quality Management District as Additional Insured).
- k. Retailer(s)/Contractor(s) must provide Comprehensive Business or Commercial Automobile Liability for Owned Automobiles and Non-Owned/Hired Automobiles.

**Cancellation:** This Agreement may be cancelled by either party by giving written notice to the other at least 30 days in advance; provided, however, that District may terminate this Agreement immediately for reasons stated in Attachment A, incorporated by reference, herein. In the event of termination not the fault of the Retailer/Contractor, the Retailer/Contractor shall be paid for services performed to the date of termination in accordance with the terms of this Contract.

### Miscellaneous

#### **1. Books of Record and Audit Provision:**

Retailer/Contractor shall maintain complete records relating to this Contract for a period of five (5) years from the completion of Services hereunder. Said records shall include but not be limited to proposals and all supporting documents, original entry books, canceled checks, receipts, invoices, payroll records including subsistence, travel and field expenses, together with a general ledger itemizing all debits and credits.

Retailer/Contractor shall permit District to audit said records as well as such related records of any business entity controlled by Retailer/Contractor. Said audit may be conducted on Retailer/Contractor's premises or at a location designated by District, upon fifteen (15) days notice.

**2. Intellectual Property:**

All original photographs, diagrams, plans, documents, information, reports, computer code and all recordable media together with all copyright interests thereto (herein "Intellectual Property"), which concern or relate to this Contract and which have been prepared by, for or submitted to Retailer/Contractor shall be the property of District, and upon fifteen (15) days demand therefore, shall be promptly delivered to District without exception. Provided however, for personal purposes only and not for commercial, economic or any other purpose, Retailer/Contractor may retain a copy of Retailer/Contractor's work product hereunder.

**3. Entire Agreement:**

This Contract represents the entire agreement of the parties, and no representations have been made or relied upon except as set forth herein. This Contract may be amended or modified only by written, fully executed agreement of the parties.

**4. Jurisdiction and Venue:**

This Contract shall be construed in accordance with the laws of the State of California and the parties hereto agree that venue shall be in Plumas County, California.

**5. Compliance with Applicable Laws:**

The Retailer/Contractor shall comply with any and all federal, state and local laws, codes, ordinances, rules and regulations which relate to, concern or affect the Services to be provided by this Contract.

**6. Authority:**

All individuals executing this Contract on behalf of Retailer/Contractor represent and warrant that they are authorized to execute and deliver this Contract on behalf of Retailer/Contractor.

**7. Contact Persons:**

**Retailer/Contractor Program Contact**

Name:

Phone:

Email:

**District Program Contact**

Name: Julie Ruiz, Air Pollution Specialist II

Phone: 530 832-0102

Email: Julie@myairdistrict.com

**Attachments:**

This Agreement also consists of the following attachment(s) that are incorporated herein:

Attachment A – Program Provisions

Attachment B – Program Tracking Form

Attachment C – Maps of Zone 1 and Zone 2

Attachment D – Acknowledgement of Training Form

I hereby certify that I understand the conditions and requirements for participation in the District's Greater Portola Area Woodstove Change-out Program and agree to fulfill the requirements and comply with the conditions in this agreement that I am entering into with the District. I understand that if any documents are incomplete or falsified, I will not be paid by the District. Only by signing this agreement will I be considered a District-approved Retailer/Contractor for this program.

\_\_\_\_\_  
Signature of Authorized Retailer/Contractor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Air District Executive Officer

\_\_\_\_\_  
Date

**IN WITNESS WHEREOF**, the parties have executed this Contract effective on the Beginning Date, above.

## **Attachment A**

### **Program Provisions for designation as a District-approved Retailer/Contractor**

1. I will inform the customer about the program requirements and timelines.
2. I understand the maximum reimbursement allowed as outlined on page 1 and page 2 of this Retailer/Contractor Agreement.
3. I agree to provide documentation of CSIA and/or NFI certification.
4. I will consider additional discounts at the time of the sale to the purchase price of the EPA certified device (store discount and/or manufacturer discount).
5. I will complete and sign the Greater Portola Area Wood Stove Change-Out Program Tracking Form (Attachment B). I will make sure to include the manufacturer, model and serial number for each wood stove removed or replaced and also for the new replacement device. I will make sure to include the Program Tracking # and Building Permit #.
6. I will remove the uncertified wood stove from the residence and properly dispose of it by delivering it to the City of Portola Public Works yard for destruction.
7. The device will be installed per manufacturer's instructions and will not be modified in any way to compromise EPA's requirements for Phase II certification under NSPS rules
8. I will submit to the District complete paperwork with an original invoice for reimbursement within 30 days of completing the installation. Invoices submitted to the District without the required paperwork are not payable (no exceptions). The following paperwork must be submitted with invoice:
  - a) Program Tracking Form
  - b) Copy of Estimate with District approval signature
  - c) Photo of non-certified woodstove installed and operational in home ("before")
  - d) Photo of certified device installed ("after")
  - e) Copy of Building Permit (City/County/State)
  - f) Acknowledgment of Training Form
  - g) Final Invoice
9. I will provide training on best practices as defined by the District for using the new device to the customer.
10. As a participating retailer, I understand that it is my responsibility to ensure that all installations are done in accordance with any applicable city, town or county codes and or ordinances and that the District assumes no responsibility or liability for the removal of appliances, the purchase and installation of replacement appliances or any other element of the replacement process.
11. As a participating retailer, I agree to address and resolve unanticipated issues expeditiously with the District and the customer.
12. As a participating retailer, I understand that all installations must be completed no later than 90 days from the date on the estimate. If work cannot be completed due to unforeseen circumstances such as construction delays or weather conditions, I must obtain a written authorization from the District (emails or faxes are acceptable) for an extension to complete the installation. Any invoices submitted without prior authorization from the District will not be accepted by the District.
13. As a participating retailer, I agree to provide District staff access to my facility and records to inspect for compliance with program requirements, if requested. I understand that the District will provide not less than fifteen (15) calendar days' notice prior to this inspection.
14. I agree to provide proof of General Liability Insurance evidenced by a certificate of insurance with properly executed endorsements attached, as outlined in agreement.
15. I agree to provide a copy of a C-61 (D34 Prefabricated Equipment Contractor) license.
16. I agree to provide a provide a list of all the EPA certified device brands for which I have authority to represent.
17. I agree to provide documentation of Workman's Compensation.
18. I agree to provide Comprehensive Business or Commercial Automobile Liability for Owned Automobiles and Non-Owned/Hired Automobiles.
19. As a participating retailer, I fully understand that I will be removed from the program for not complying with the conditions and requirements of this statement.

## Attachment B

### Program Tracking Form





**Recycling (for Replacement Projects):**

I certify that the old wood stove has been removed from the residence: Yes

I certify that the old wood stove has been delivered to the secured City of Portola Public Works yard for destruction before the stove's release to a Recycler: Yes

Name of City of Portola Employee: \_\_\_\_\_

**Signature:** \_\_\_\_\_

I certify that the information contained on this tracking form is accurate and the form is completely filled out. I also agree that I must meet the program requirements and be a participating Retailer in order to receive reimbursement from the Northern Sierra Air Quality Management District. This form must be submitted with **ALL** sections completed along with a copy of the estimate (signed by the District as approval), a copy of the invoice, photograph of stove **prior** to removing it **AND** of newly **installed** hearth appliance in order to receive reimbursement.

Name of Participating Retailer: \_\_\_\_\_

**Signature:** \_\_\_\_\_

- \* Participating Retailers must be registered with the District.
- \*\* The installer must be professionally certified (Chimney Safety Institute of America and/or National Fireplace Institute) and be in possession of a current C-61 (D-34 prefabricated equipment) contractor's license.

To assure quick processing, please make sure you send all items listed.

**Checklist of attachments:**

- Copy of estimate with District approval signature
- Pre and post installation photos
- Acknowledgement of Training form
- Final invoice
- Copy of Permit (City, County or State)

**Make sure the following is complete:**

- Signatures above
- Program Tracking Number
- Building Permit Number

Mail all to:  
Julie Ruiz, Project Coordinator  
Northern Sierra Air Quality Management District  
P.O. Box 2227  
Portola, CA 96122

## Attachment C

Maps of Zone 1 (Portola City Zone of Influence)

And Map of Greater Portola PM2.5  
Nonattainment Area

Range 13 East

Range 14 East

Township 23 North

Township 22 North

Lake Davis Rd

Duffaker Dr  
S Duffaker Rd

Portola McCleers Rd

City of Portola  
Resolution:  
Adopted:  
City of Portola (SOI)  
Resolution: 2003-003  
Adopted: 3/10/2003  
Source: Fumas LAFCo  
Map Created 5/5/2011

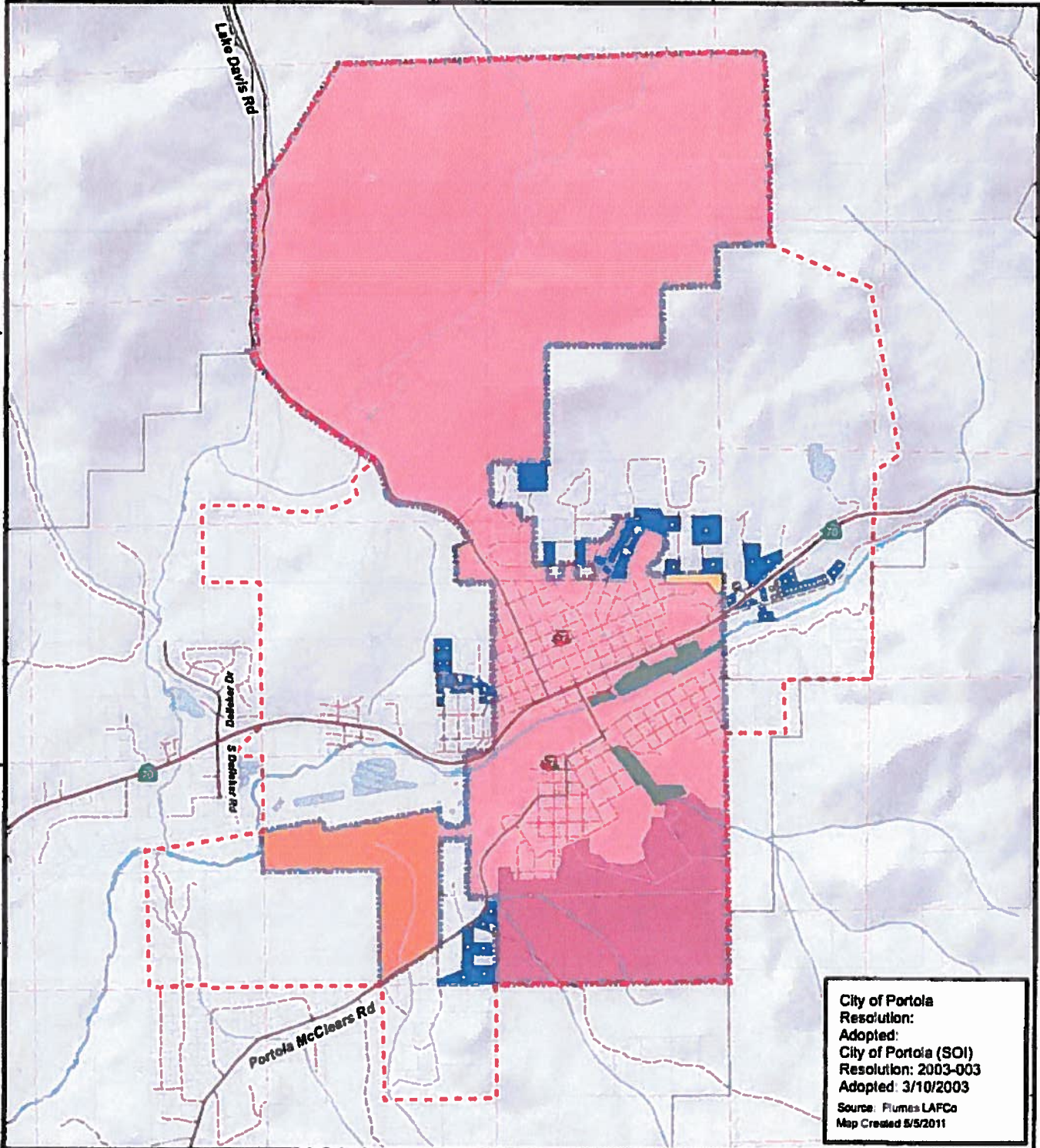
**Legend**

- Major Roads
- CA State Highway
- Stream / River
- Waterbodies
- Parcels
- City of Portola
- Water Service Outside of City Limits
- Sewer Served Outside City Limits

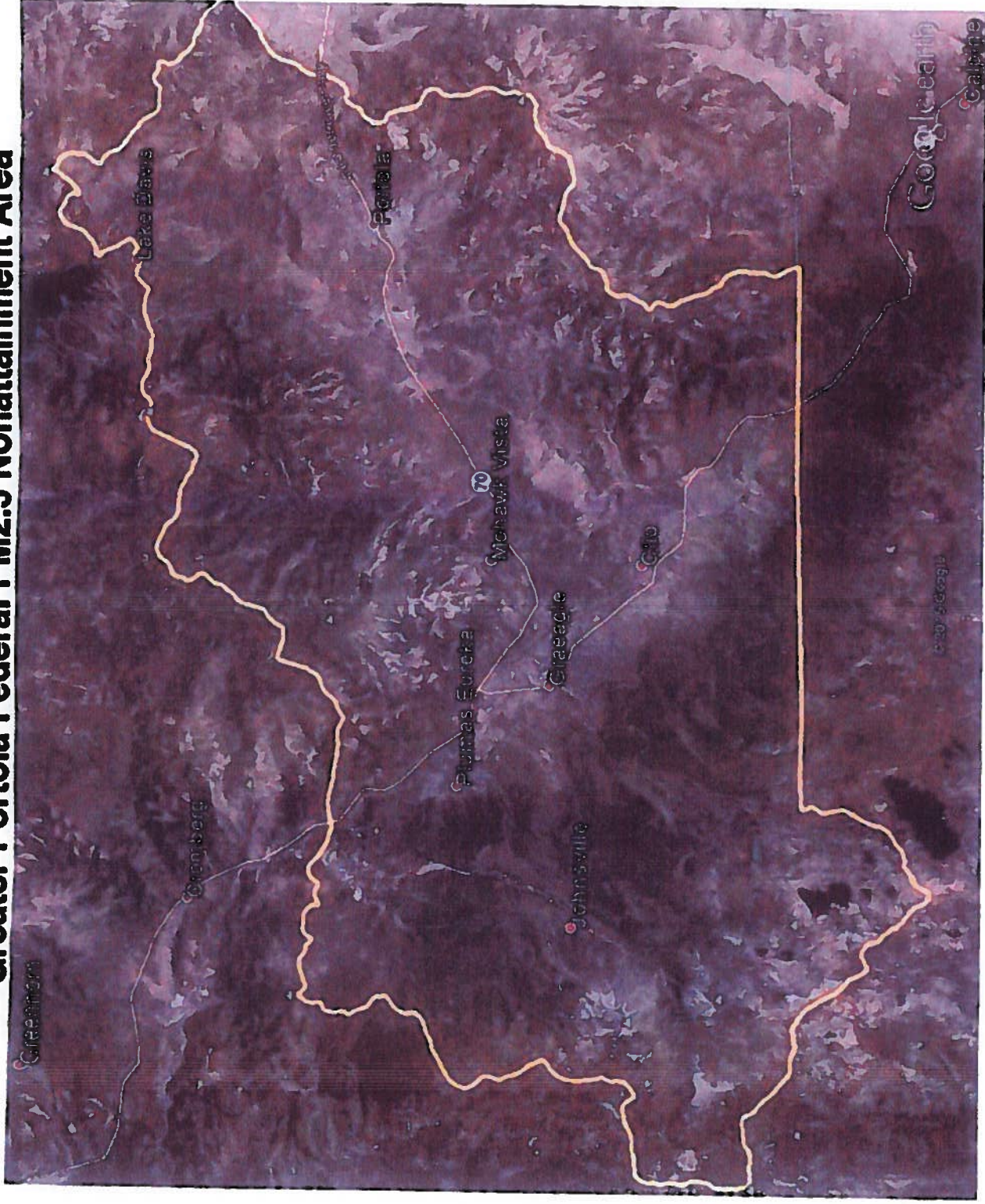
- City of Portola Parks
- City of Portola (SOI)
- Fire Stations
- Sectional Grid (MDB&M)

**Portola Planned Developments**

- Mountain View Estates
- Portola 192
- Woodbridge



# Greater Portola Federal PM2.5 Nonattainment Area



Google earth

miles  
km

10

20



## Attachment D

### Acknowledgment of Training Form

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM 2016

**ACKNOWLEDGEMENT OF TRAINING FORM**

**This form is to be completed by participating Retailer/Contractors AND signed by Homeowner/Renter**

Date: \_\_\_\_\_ Program Tracking #: \_\_\_\_\_ Building Permit #: \_\_\_\_\_  
Consumer's Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_  
County: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Email: \_\_\_\_\_

**New Cleaner Burning EPA Certified Device**

Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_  
Device Serial #: \_\_\_\_\_  
New Stove Type:    Wood     Pellet     Propane Gas     Kerosene   
Other:  \_\_\_\_\_  
Retailer Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
Retailer Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

I certify that I received the owner's manual for my new device:

Yes                   No

I certify that I received training from the Retailer/Contractor on the operation of my new device per manufacturer instructions:

Yes                   No

I certify that I received training from the Retailer/Contractor on proper fuel for my new device:

Yes                   No

**Signature (Homeowner/Renter):** \_\_\_\_\_

## Appendix I

### Retailer/Contractor Agreement



DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320

Mailing Address: P.O. Box 2509

Grass Valley, CA 95945

(530) 274-9360 / FAX: (530) 274-7546

email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)NORTHERN FIELD OFFICE

257 E. Sierra, Unit E

Mailing Address: P.O. Box 2227

Portola, CA 96122

(530) 832-0102 / FAX: (530) 832-0101

email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**RETAILER/CONTRACTOR AGREEMENT**

**Parties:** This Retailer/Contractor Agreement (Agreement) is for services between the Northern Sierra Air Quality Management District (District) and \_\_\_\_\_, of \_\_\_\_\_ (Retailer/Contractor), effective until funds run out or December 31, 2021 (whichever comes first).

**Grant Award:** The subject matter of this Agreement is the Greater Portola Area Wood Stove Change-out Program funded by various grants and funds. Every effort will be made for funds to be dispersed from the District to the Retailer/Contractor within 30 days from the time all paperwork is received by the District. Paperwork from the Retailer/Contractor will consist of:

1. Program Tracking Form
2. Copy of estimate with District approval signature
3. Photo of non-certified woodstove installed and operational in home ("before")
4. Photo of certified device installed ("after")
5. Copy of Building Permit (City/County/State)
6. Acknowledgement of Training Form
7. Final Invoice

If the above documents are not received or are incomplete, funds will not be dispersed to the Retailer/Contractor.

**Maximum Amount:**

**Zone 1:** Zone One is defined as the boundary of the Portola City Sphere of Influence (PCSOI) Map attached to this agreement. In consideration of the services to be performed, the District agrees to pay Retailer/Contractor, in accordance with the payment provisions specified in Attachment A, a sum not to exceed the following: \$3,500 per new EPA certified woodstove replacement in Zone 1, or \$4,500 per a new pellet or gas stove in Zone One. The cost must include all aspect of the installation, including device, labor, permit, stove pipe, hearth and anything else necessary to ensure safe, effective installation and use of the new device. The Retailer/Contractor must submit an estimate of total cost to the District for approval. Under no circumstances will \$3,500 for a new certified EPA woodstove or \$4,500 for a new pellet of gas stove in Zone One be exceeded without prior authorization by the District.

**Zone 2:** Zone Two is defined as the area outside the Portola City Sphere of Influence (PCSOI) but still within the Greater Portola PM2.5 Federal Nonattainment Area Boundaries. Both a map of Zone One (Portola City Sphere of Influence) and a map of the Greater Portola PM2.5 Federal Nonattainment Area are included as attachments to this agreement.

In consideration of the services to be performed, the District agrees to pay Retailer/Contractor, in

accordance with the payment provisions specified in Attachment A, a sum not to exceed the following:

For those residents within Zone Two who meet low income qualifications a sum not to exceed the following: \$3,500 per new EPA certified woodstove replacement in Zone Two, or \$4,500 per a new pellet or gas stove in Zone Two. The cost must include all aspect of the installation, including device, labor, permit, stove pipe, hearth and anything else necessary to ensure safe, effective installation and use of the new device. The Retailer/Contractor must submit an estimate of total cost to the District for approval. Under no circumstances will \$3,500 for a new certified EPA woodstove or \$4,500 for a new pellet of gas stove for a low-income qualified resident in Zone Two be exceeded without prior authorization by the District.

Residents in Zone Two who **exceed** the low income threshold will receive credit for either \$1,500 to upgrade to an EPA-certified wood stove or \$3,000 to upgrade to a pellet, propane, or kerosene stove.

**Scope of Services:**

Retailer/Contractor shall provide all of the services, materials and products (herein "Services") generally described in Attachment "A", according to a performance schedule, if applicable, as set forth in said attachment (herein "Program Provisions"). If requested, Retailer/Contractor agrees to serve as an expert witness for the District in any third party action or proceeding arising out of this Contract.

Retailer's/Contractor's accounting records, as they relate to work carried out through the proposed contract, shall be subject to inspection and review, for reporting purposes, by Federal, State and District agencies.

During initial visit to homes, the Retailer/Contractor shall discuss and strongly encourage homeowners to consider replacing wood appliances with alternative fuel devices, such as propane, pellet or kerosene.

The Retailer/Contractor will agree to train homeowners on proper appliance operation and acceptable fuels to maximize the emission reductions. Homeowners will be required to sign a form stating that they were trained to properly operate their new heating device. A form signed by the resident verifying that training has occurred will be required before payment will be issued to the retailer.

**Commercial General Liability Insurance:**

A Commercial General Liability insurance policy is required. Retailer/Contractor shall promptly provide proof of such insurance evidenced by a certificate of insurance with properly executed endorsements attached, which insurance shall include the following:

- (i) Broad form coverage for liability for death or bodily injury to a person or persons, and for property damage, combined single limit coverage, in the minimum of \$1,000,000.
- (ii) An endorsement naming District as an additional insured under said policy, with respect to claims or suits arising from the Services provided or the relationships created under this Contract;
- (iii) A provision that said insurance shall be primary and other insurance maintained by the District shall be excess only and not contributing with Retailer's/Contractor's insurance;
- (iv) A provision that said insurance shall provide for thirty (30) days written notice to District of any termination or change in coverage protection, or reduction in

coverage limits (except ten (10) days notice for non-payment of premium).

**Indemnity:**

Nothing herein shall be construed as a limitation of Retailer's/Contractor's liability, and Retailer/Contractor shall indemnify, defend and hold harmless the District and its officers, officials, employees, agents and volunteers from any and all liabilities, claims, demands, damages, losses and expenses (including, without limitation, defense costs and attorney fees of litigation) which result from the negligent act, willful misconduct, or error or omission of Retailer/Contractor, except such loss or damage which was caused by the sole negligence or willful misconduct of District or its officers, officials, employees, agents and volunteers.

**Agreement Term:** The period of the Retailer/Contractor performance shall begin upon date of execution, signified by the date on which all project dollars are spent.

**Amendment:** No changes, modifications, or amendment in the terms and conditions of this Agreement shall be effective unless reduced to writing, numbered, and signed by the duly authorized representative of the District and Retailer/Contractor. Any request for an amendment to this Agreement must be made in writing at least 30 days prior to the end date of this Agreement or the request may be denied.

**Retailer/Contractor as Independent:**

In providing services herein, Retailer/Contractor, and the agents and employees thereof, shall act in an independent capacity and as an independent contractor and not as agents or employees of District.

**Licensing, Permits, Certification and Requirements:**

Retailer warrants (i) Retailer/Contractor is qualified and competent to provide all Services under this contract; (ii) Retailer/Contractor and all employees of Retailer/Contractor hold all necessary and appropriate licenses therefore, including CSIA and/or NFI certification; and, (iii) Retailer/Contractor shall obtain, and remain in compliance with, all permits necessary and appropriate to provide said Services. Retailer/Contractor shall cause said licenses and permits to be maintained throughout the life of this Contract. Failure to do so shall constitute a Material Breach of this agreement, and, in addition to any other remedy available at law or otherwise, shall serve as a basis upon which District may elect to suspend payments hereunder, or terminate this Contract, or both.

- a. Retailers/Contractors must be in possession of a CSIA and/or NFI certification. The certification must remain in effect during the entire term of the contract period. This documentation must be provided.
- b. Retailers/Contractors must be in possession of a C-61 (D34 Prefabricated Equipment Contractor) license. This license must remain in effect during the entire term of the contract period. This documentation must be provided.
- c. Retailers/Contractors must be an authorized dealer of EPA certified devices and must be able to provide a list of all the EPA certified device brands for which each respondent is representing.
- d. Retailer(s)/Contractor(s) must have all EPA certified devices sold to be under warranty, and Contractor(s) must have agreement with all manufacturers to honor the warranties.
- e. Retailer(s)/Contractor(s) must have a minimum of 3 years of experience of selling and installing stoves to manufacturer specifications.

- f. Retailer(s)/Contractor(s) must sell only EPA certified home heating devices and these devices must be installed according to Manufacturer specifications. Devices cannot be modified from manufacturer specifications.
- g. Retailer(s)/Contractor(s) must offer woodstoves that are specifically designed to be installed within mobile homes/manufactured homes. Retailer(s)/Contractor(s) must be trained to install woodstoves in mobile homes/manufactured homes.
- h. If applicable, public works law requires private construction contractors to pay prevailing wages to their workers and requires the construction contractor to follow public works law when working on **a commercial** project funded by a public entity. A public entity can be the State of California, or any public agency such as a county, city, school or a special district. Prevailing wages are due, in most instances, if the project costs more than \$1,000, and involves the following construction work: new construction, alteration, demolition, installation, repair and maintenance. Contractors must make an attempt to hire apprentices when the total project costs exceed \$30,000.
- i. Retailer(s)/Contractor(s) must provide documentation of Workman's Compensation
- j. Retailer(s)/Contractor(s) must provide documentation of Commercial General Liability (naming the Northern Sierra Air Quality Management District as Additional Insured).
- k. Retailer(s)/Contractor(s) must provide Comprehensive Business or Commercial Automobile Liability for Owned Automobiles and Non-Owned/Hired Automobiles.

**Cancellation:** This Agreement may be cancelled by either party by giving written notice to the other at least 30 days in advance; provided, however, that District may terminate this Agreement immediately for reasons stated in Attachment A, incorporated by reference, herein. In the event of termination not the fault of the Retailer/Contractor, the Retailer/Contractor shall be paid for services performed to the date of termination in accordance with the terms of this Contract.

### Miscellaneous

#### 1. **Books of Record and Audit Provision:**

Retailer/Contractor shall maintain complete records relating to this Contract for a period of five (5) years from the completion of Services hereunder. Said records shall include but not be limited to proposals and all supporting documents, original entry books, canceled checks, receipts, invoices, payroll records including subsistence, travel and field expenses, together with a general ledger itemizing all debits and credits.

Retailer/Contractor shall permit District to audit said records as well as such related records of any business entity controlled by Retailer/Contractor. Said audit may be conducted on Retailer/Contractor's premises or at a location designated by District, upon fifteen (15) days notice.

#### 2. **Intellectual Property:**

All original photographs, diagrams, plans, documents, information, reports, computer code and all recordable media together with all copyright interests thereto (herein "Intellectual Property"), which concern or relate to this Contract and which have been prepared by, for or submitted to Retailer/Contractor shall be the property of District, and upon fifteen (15) days demand therefore, shall be promptly delivered to District without exception. Provided however, for personal purposes only and not for commercial, economic or any other purpose, Retailer/Contractor may retain a copy of Retailer/Contractor's work product hereunder.

**3. Entire Agreement:**

This Contract represents the entire agreement of the parties, and no representations have been made or relied upon except as set forth herein. This Contract may be amended or modified only by written, fully executed agreement of the parties.

**4. Jurisdiction and Venue:**

This Contract shall be construed in accordance with the laws of the State of California and the parties hereto agree that venue shall be in Plumas County, California.

**5. Compliance with Applicable Laws:**

The Retailer/Contractor shall comply with any and all federal, state and local laws, codes, ordinances, rules and regulations which relate to, concern or affect the Services to be provided by this Contract.

**6. Authority:**

All individuals executing this Contract on behalf of Retailer/Contractor represent and warrant that they are authorized to execute and deliver this Contract on behalf of Retailer/Contractor.

**7. Contact Persons:**

**Retailer/Contractor Program Contact**

Name:  
Phone:  
Email:

**District Program Contact**

Name: Julie Ruiz, Air Pollution Control Specialist II  
Phone: 530 832-0102  
Email: Julie@myairdistrict.com

**Attachments:**

This Agreement also consists of the following attachment(s) that are incorporated herein:

- Attachment A – Program Provisions
- Attachment B – Program Tracking Form
- Attachment C – Maps of Zone 1 and Zone 2
- Attachment D – Acknowledgement of Training Form

I hereby certify that I understand the conditions and requirements for participation in the District's Greater Portola Area Woodstove Change-out Program and agree to fulfill the requirements and comply with the conditions in this agreement that I am entering into with the District. I understand that if any documents are incomplete or falsified, I will not be paid by the District. Only by signing this agreement will I be considered a District-approved Retailer/Contractor for this program.

\_\_\_\_\_  
Signature of Authorized Retailer/Contractor

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Air District Executive Officer

\_\_\_\_\_  
Date

**IN WITNESS WHEREOF**, the parties have executed this Contract effective on the Beginning Date, above.

## **Attachment A**

### **Program Provisions for designation as a District-approved Retailer/Contractor**

1. I will inform the customer about the program requirements and timelines.
2. I understand the maximum reimbursement allowed as outlined on page 1 and page 2 of this Retailer/Contractor Agreement.
3. I agree to provide documentation of CSIA and/or NFI certification.
4. I will consider additional discounts at the time of the sale to the purchase price of the EPA certified device (store discount and/or manufacturer discount).
5. I will complete and sign the Greater Portola Area Wood Stove Change-Out Program Tracking Form (Attachment B). I will make sure to include the manufacturer, model and serial number for each wood stove removed or replaced and also for the new replacement device. I will make sure to include the Program Tracking # and Building Permit #.
6. I will remove the uncertified wood stove from the residence and properly dispose of it by delivering it to the City of Portola Public Works yard for destruction.
7. The device will be installed per manufacturer's instructions and will not be modified in any way to compromise EPA's requirements for Phase II certification under NSPS rules
8. I will submit to the District complete paperwork with an original invoice for reimbursement within 30 days of completing the installation. Invoices submitted to the District without the required paperwork are not payable (no exceptions). The following paperwork must be submitted with invoice:
  - a) Program Tracking Form
  - b) Copy of Estimate with District approval signature
  - c) Photo of non-certified woodstove installed and operational in home ("before")
  - d) Photo of certified device installed ("after")
  - e) Copy of Building Permit (City/County/State)
  - f) Acknowledgment of Training Form
  - g) Final Invoice
9. I will provide training on best practices as defined by the District for using the new device to the customer.
10. As a participating retailer, I understand that it is my responsibility to ensure that all installations are done in accordance with any applicable city, town or county codes and or ordinances and that the District assumes no responsibility or liability for the removal of appliances, the purchase and installation of replacement appliances or any other element of the replacement process.
11. As a participating retailer, I agree to address and resolve unanticipated issues expeditiously with the District and the customer.
12. As a participating retailer, I understand that all installations must be completed no later than 90 days from the date on the estimate. If work cannot be completed due to unforeseen circumstances such as construction delays or weather conditions, I must obtain a written authorization from the District (emails or faxes are acceptable) for an extension to complete the installation. Any invoices submitted without prior authorization from the District will not be accepted by the District.
13. As a participating retailer, I agree to provide District staff access to my facility and records to inspect for compliance with program requirements, if requested. I understand that the District will provide not less than fifteen (15) calendar days' notice prior to this inspection.
14. I agree to provide proof of General Liability Insurance evidenced by a certificate of insurance with properly executed endorsements attached, as outlined in agreement.
15. I agree to provide a copy of a C-61 (D34 Prefabricated Equipment Contractor) license.
16. I agree to provide a list of all the EPA certified device brands for which I have authority to represent.
17. I agree to provide documentation of Workman's Compensation.
18. I agree to provide Comprehensive Business or Commercial Automobile Liability for Owned Automobiles and Non-Owned/Hired Automobiles.
19. As a participating retailer, I fully understand that I will be removed from the program for not complying with the conditions and requirements of this statement.

## Attachment B

### Program Tracking Form





## PROGRAM TRACKING FORM

**This form is to be completed by participating Retailer/Contractor\***

Date: \_\_\_\_\_ Program Tracking #: \_\_\_\_\_ Building Permit #: \_\_\_\_\_  
 Consumer's Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Address: \_\_\_\_\_ City: \_\_\_\_\_  
 County: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Email: \_\_\_\_\_

### **New Cleaner Burning EPA Certified Device**

Manufacturer: \_\_\_\_\_  
 Model: \_\_\_\_\_  
 Device Serial #: \_\_\_\_\_  
 New Stove Type:    Wood     Pellet     Propane Gas     Kerosene   
 Other:  \_\_\_\_\_  
 If wood stove:                      Catalytic                       Non-Catalytic   
 Retailer Name: \_\_\_\_\_ Phone \_\_\_\_\_  
 Retailer Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

### **Installation**

Name of Certified Installer\*\*: \_\_\_\_\_  
 Date of Installation: \_\_\_\_\_

### **Old Non-EPA Certified Wood Stove**

Manufacturer: \_\_\_\_\_  
 Model: \_\_\_\_\_  
 Device Serial #: \_\_\_\_\_

I certify that the old stove was not EPA-certified (NOTE: You will **ONLY** be reimbursed for replacing stoves that are **NOT** EPA certified):                      Yes

I certify that the old stove was in use prior to replacement:                      Yes

I certify that the installed device was new:                      Yes

**Recycling (for Replacement Projects):**

I certify that the old wood stove has been removed from the residence: Yes

I certify that the old wood stove has been delivered to the secured City of Portola Public Works yard for destruction before the stove’s release to a Recycler: Yes

Name of City of Portola Employee: \_\_\_\_\_

**Signature:** \_\_\_\_\_

I certify that the information contained on this tracking form is accurate and the form is completely filled out. I also agree that I must meet the program requirements and be a participating Retailer in order to receive reimbursement from the Northern Sierra Air Quality Management District. This form must be submitted with **ALL** sections completed along with a copy of the estimate (signed by the District as approval), a copy of the invoice, photograph of stove **prior** to removing it **AND** of newly **installed** hearth appliance in order to receive reimbursement.

Name of Participating Retailer: \_\_\_\_\_

**Signature:** \_\_\_\_\_

- \* Participating Retailers must be registered with the District.
- \*\* The installer must be professionally certified (Chimney Safety Institute of America and/or National Fireplace Institute) and be in possession of a current C-61 (D-34 prefabricated equipment) contractor’s license.

To assure quick processing, please make sure you send all items listed.

**Checklist of attachments:**

- Copy of estimate with District approval signature
- Estimate exceeds \$3,500 letter, if necessary
- Pre and post installation photos
- Acknowledgement of Training form
- Final invoice
- Copy of Permit (City, County or State)

**Make sure the following is complete:**

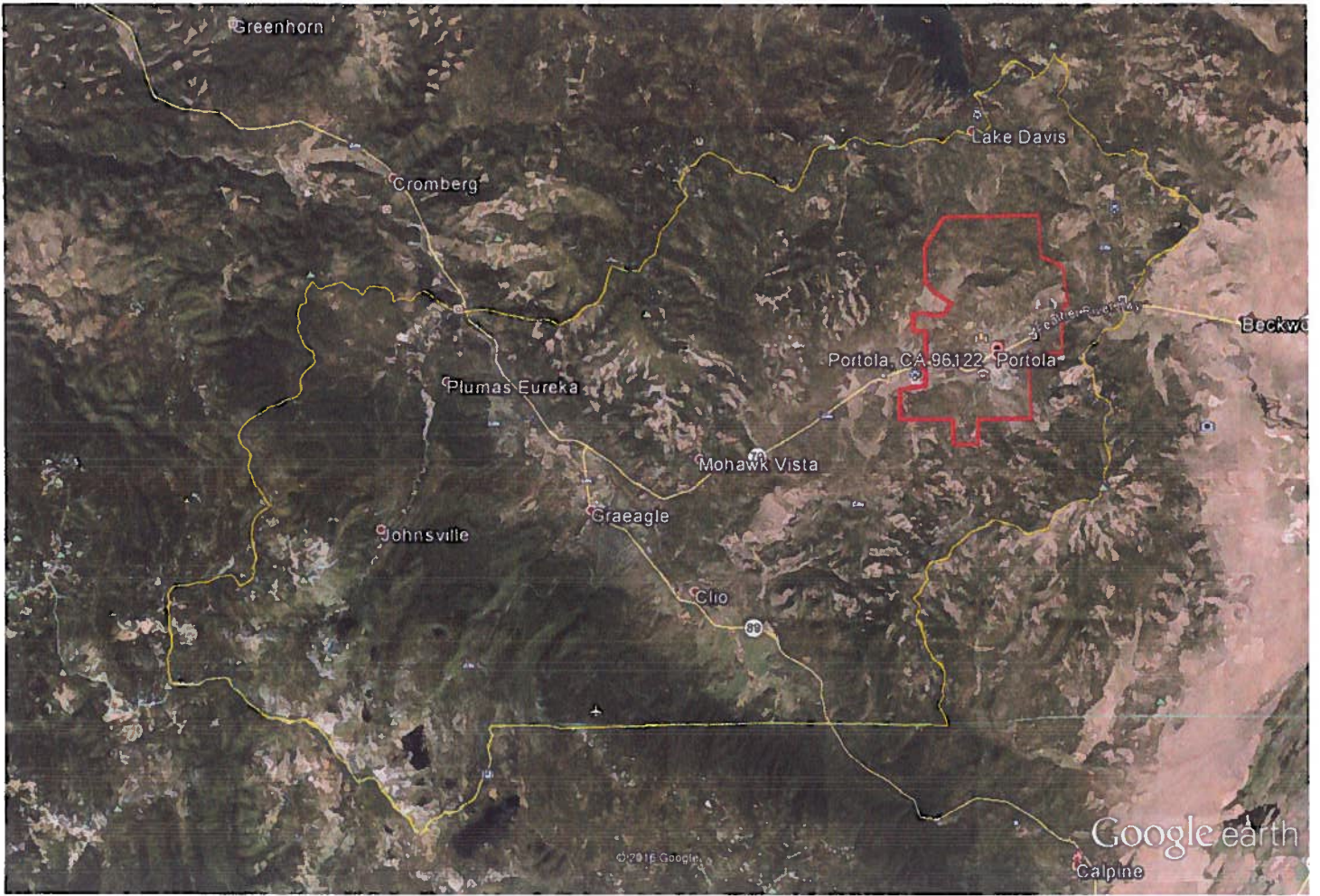
- Signatures above
- Program Tracking Number
- Building Permit Number

Mail all to:  
 Julie Ruiz, Project Coordinator  
 Northern Sierra Air Quality Management District  
 P.O. Box 2227  
 Portola, CA 96122

## Attachment C

Maps of Zone 1 (Portola City Zone of Influence)

And Map of Greater Portola PM2.5  
Nonattainment Area



Google earth



## Attachment D

### Acknowledgment of Training Form

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

**ACKNOWLEDGEMENT OF TRAINING FORM**

**This form is to be completed by participating Retailer/Contractors AND signed by Owner/Tenant**

Date: \_\_\_\_\_ Program Tracking #: \_\_\_\_\_ Building Permit #: \_\_\_\_\_  
Consumer's Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ City: \_\_\_\_\_  
County: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Email: \_\_\_\_\_

**New Cleaner Burning EPA Certified Device**

Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_  
Device Serial #: \_\_\_\_\_  
New Stove Type:    Wood     Pellet     Propane Gas     Kerosene   
Other:  \_\_\_\_\_  
Retailer Name: \_\_\_\_\_ Phone \_\_\_\_\_  
Retailer Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

I certify that I received the owner's manual for my new device:

Yes                       No

I certify that I received training from the Retailer/Contractor on the operation of my new device per manufacturer instructions:

Yes                       No

I certify that I received training from the Retailer/Contractor on proper fuel for my new device:

Yes                       No

**Signature (Homeowner/Renter):** \_\_\_\_\_

## Appendix J

### Wood Stove Change-out Eligibility Requirement

# NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT

[www.myairdistrict.com](http://www.myairdistrict.com)

Wood Stove Change-Out Information Line: 530-832-4067



GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM

## CRITERIA FOR PARTICIPATION IN THE GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM (see map on the next page)

### ELIGIBILITY CRITERIA FOR ALL PARTICIPANTS:

- Must currently have an installed, operating non-EPA certified wood stove.
- Must submit a completed application to be considered for the program. Applications will be disqualified:
  - IF the old device is removed from the home prior to application approval.
  - IF the new certified, device is purchased before application approval.
  - IF any information on the application is false or incomplete.
- Installation must be completed by a District-Approved Retailer.

### ZONE 1 CRITERIA:

- Must reside within the City of Portola Sphere of Influence.

### MAXIMUM FUNDING:

- Up to \$3,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.

### ZONE 2 CRITERIA:

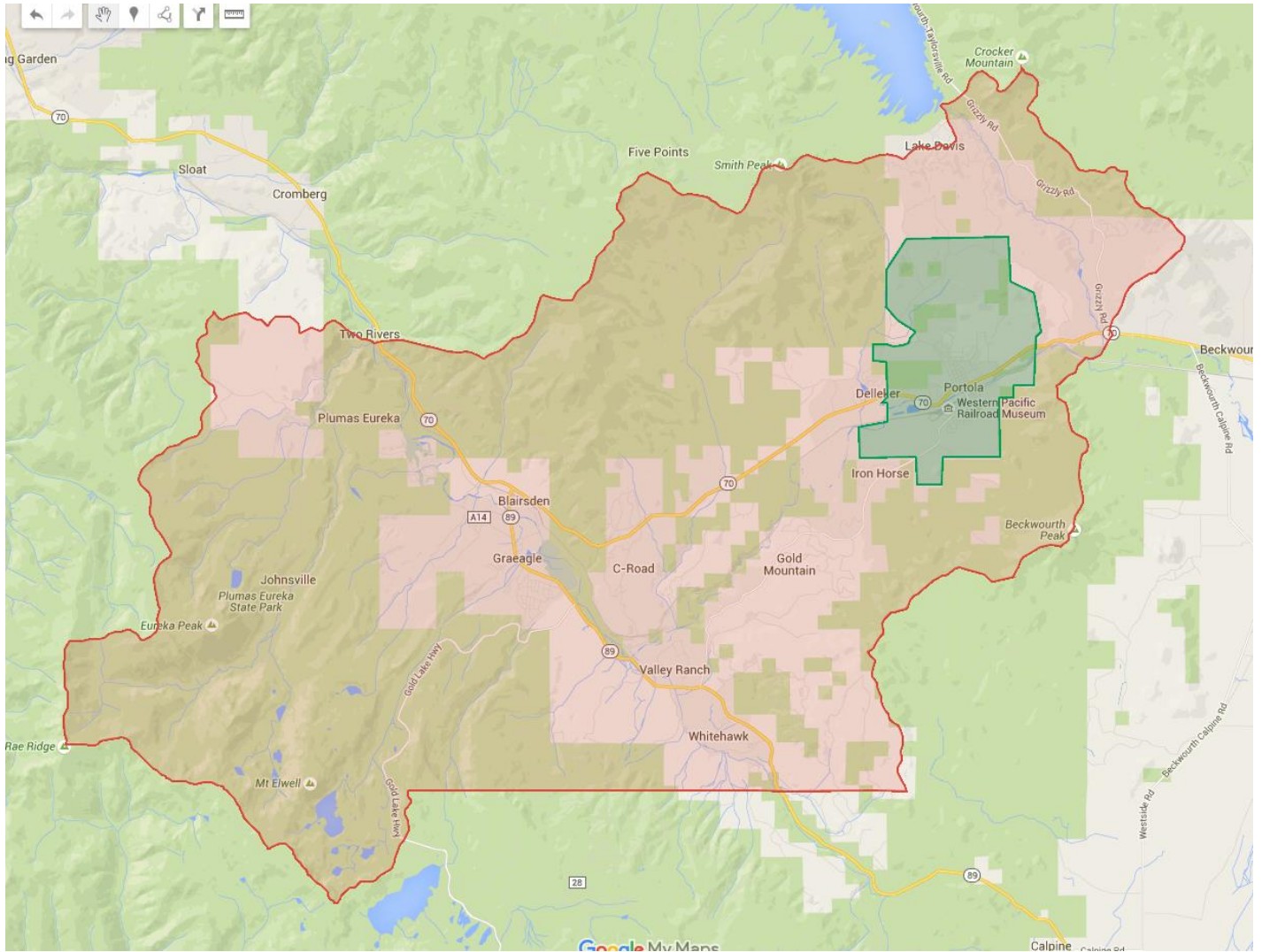
- Must reside within the Greater Portola PM2.5 Non-Attainment Area (and outside the City of Portola Sphere of Influence).
- Low-Income residents will qualify for greater funding.

### MAXIMUM FUNDING:

- Up to \$1,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$3,000 to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.
- Up to \$3,500 for low income residents to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 for low income residents to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.



# MAP of the Greater Portola PM2.5 Non-Attainment Area (with the City of Portola Sphere of Influence in green)



**NON-ATTAINMENT AREA INCLUDES COMMUNITIES OF IRON HORSE, DELLEKER, C ROAD, MOHAWK VISTA, PLUMAS-EUREKA, BLAIRSDEN-GRAEAGLE, GOLD MOUNTAIN, WHITEHAWK, CLIO, JOHNSTVILLE, AND PORTIONS OF LAKE DAVIS.**

**(Go to [www.myairdistrict.com](http://www.myairdistrict.com) to explore the map in greater detail)**

## Appendix K

# Memorandum of Understanding between the District and the City of Portola

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN THE CITY OF PORTOLA  
AND  
THE NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT**

THIS MEMORANDUM OF UNDERSTANDING ("MOU") is made and entered into this 9<sup>th</sup> day of March, 2016, by the CITY OF PORTOLA ("City") and the NORTHERN SIERRA AIR QUALITY MANAGEMENT DISTRICT ("NSAQMD") to allow the District to jointly implement a Wood Burner Stove Changeout Program ("Program") in the Greater Portola Federal Non-Attainment Area to help achieve air quality attainment status.

WHEREAS, the United States Environmental Protection Agency (USEPA) has found that the Greater Portola Federal Non-Attainment Area of the NSAQMD has remained an air quality non-attainment area for years; and

WHEREAS, NSAQMD applied to USEPA and received grant funding to implement a wood burner stove change-out program in the area; and

WHEREAS, CITY has the authority, capability and workforce to process applicable permits for the woodstove change-out and receive the non-compliant stove in accordance with state and federal law; and

WHEREAS, CITY further has the capacity to cause the non-compliant stove to be made useless and destroyed, and collected for final disposition; and

WHEREAS, NSAQMD has identified CITY as capable of the tasks presented; and

WHEREAS, NSAQMD Board of Directors and Portola City Council respectively and separately authorized the establishment of an MOU between the two entities, and for CITY to provide services to NSAQMD, and for NSAQMD to pay CITY for services provided.

NOW THEREFORE, in consideration of the promises and covenants set forth herein, the parties agree as follows:

1. Scope of Services

1.1 CITY agrees to provide services related to NSAQMD's project as requested by NSAQMD. Those services may include, but are not limited to, the following:

- a) Issuing woodstove permits for the installation of new, compliant heating devices within the City limits of the City of Portola.

- b) Accepting and storing removed, non-compliant heating device into the City's designated repository.
  - c) Destroying non-compliant heating device.
  - d) Maintaining an accurate record of the permitting and destruction of non-compliant heating device processes.
  - e) Providing copies of all permitting and destruction documentation to NSAQMD.
- 1.2 CITY will log the activities performed at the request of NSAQMD or as is required for the completion of work on the PROJECT in an administrative logbook. The administrative logbook will include a description of the activity, from request of permit to final disposition of the non-compliant heating device, and time spent in process. Copies of the log book pages will be submitted to NSAQMD as support documentation for the NSAQMD's billing statements.
  - 1.3 CITY will perform work with the thoroughness and competence that would be expected of an experienced and knowledgeable air pollution control district staff member. CITY staff shall conduct themselves in a professional manner and behave in a manner that is courteous and respectful of the public.

## 2. Geographic Area of Service for the Collection and Destruction of Woodstoves

CITY will provide for the collection and destruction of woodstoves throughout the Greater Portola Federal Non-Attainment Area. A map of the project area is attached as Exhibit A.

## 3. Payment

- 3.1 NSAQMD agrees to reimburse CITY for the services covered by this Agreement at the City's hourly reimbursement rate:

- Building Inspector \$25/hour
- Maintenance Worker \$24/hour
- Office Clerk (\$16/hour)

Any potential increases in the hourly rate must be authorized by NSAQMD in writing, thirty (30) days in advance of said increase. NSAQMD will also provide for equipment necessary, or provide reimbursement to CITY, to complete the project, as authorized by NSAQMD. The maximum sum payable under this MOU for each fiscal year of July 1 through June 30 of the following calendar year is Five Thousand Six Hundred Dollars (\$5,600.00). The amount paid to CITY shall constitute full payment for all services set forth herein. CITY shall not be reimbursed for any additional expenses incurred beyond this maximum amount without prior written agreement by the NSAQMD. The City will not be required to provide services when those services will not be reimbursed.

- 3.2 CITY shall bill NSAQMD not more often than quarterly based upon the time spent on services rendered for that quarterly billing period. CITY agrees to provide a detailed invoice, including copies of timecards, separating charges as assigned to various tasks of field work and administration to NSAQMD by the fifteenth day following the end of the quarter. NSAQMD agrees to pay CITY within thirty (30) days of receipt of invoice.
- 3.3 NSAQMD retains the right to require proof of services performed or costs incurred prior to any payment under this Agreement.

#### 4. Agreement Period

- 4.1 The conditions of this agreement shall remain in effect on a year round basis with an effective date upon the final signatures by both parties.
- 4.2 This agreement may be canceled by either party upon serving thirty (30) days notice in writing to the other party.
- 4.3 This agreement shall be in effect until cancelled and may be amended by the further agreement of both parties.

#### 5. CITY Employees

- 5.1 CITY employees shall perform the duties outlined in this MOU as City Employees, and not as employees of NSAQMD. CITY acknowledges that CITY is not entitled to any of NSAQMD's fringe benefits, including without limitation, paid holidays, life insurance, sick leave, or travel or any other expenses in connection with services performed hereunder.
- 5.2 Hiring and Supervision. The responsibility for hiring and supervision of all CITY employees, including establishing standards of performance, assignment of personnel, maintaining discipline, determining training required, maintaining personnel files, and other matters relating to the performance of services and control of personnel shall remain with the CITY.
- 5.3 The City and District agree that neither Party is an agent or employee of the other Party for any purpose and is not entitled to any of the benefits provided by any Party to its employees. This MOU shall not be construed as forming a partnership or any other association or agency among the City and Department.

#### 6. Ownership of Documents

CITY agrees to provide copies to NSAQMD, upon termination of this Agreement, all documents, drawings, photographs, and other written or graphic material, however produced, received from NSAQMD and used by CITY in the performance of its services hereunder. All work papers, drawings, internal memoranda, graphics, photographs, and any written or graphic

material, however produced, prepared by CITY in connection with its performance of services hereunder shall be, and shall remain after termination of this Agreement, the property of NSAQMD and may be used by the NSAQMD for any purpose whatsoever. NSAQMD agrees that any future use of documents produced by CITY under the terms of this Agreement shall be at the sole discretion of the NSAQMD and CITY shall bear no liability for the decisions on whether and how to use such documents.

## 7. Jurisdiction

This Agreement shall be governed by and construed in accordance with the laws of the State of California. Any suit, action, or proceeding brought under the scope of this Agreement shall be brought and maintained to the extent allowed by law in the County of Plumas, California.

## 8. Hold Harmless

- 8.1 NSAQMD agrees to defend, indemnify and hold harmless CITY, its directors, officers, servants and agents for any and all reasonable expenses, claims, liabilities, lawsuits and judgments which may occur as a result of any negligent willful acts or omissions on the part of CITY, or its directors, officers, employees, and agents, in any way connected with the performance of its duties and obligations pursuant to the Agreement. This provision shall survive any termination of the Agreement.
- 8.2 CITY agrees to defend, indemnify and hold harmless the NSAQMD, its directors, officers, servants and agents for any and all reasonable expenses, claims, liabilities, lawsuits and judgments which may occur as a result of any negligent willful acts or omissions on the part of NSAQMD, or its directors, officers, employees, and agents, in any way connected with the performance of its duties and obligations pursuant to this Agreement. This provision shall survive any termination of this Agreement.
- 8.3 Each party shall be financially responsible for all damages and losses caused by the negligent or willful misconduct of that Party, its officers, and employees.
- 8.4 Neither Party shall be liable to the other Party for any loss, damage, liability, claim or cause of action for damage to or destruction of property or for the injury to or death of persons arising solely from any act or omission of the other Party's officers, agents, or employees.
- 8.5 A Party against whom any claim arising from any subject matter of this MOU is filed shall give prompt written notice of the filing of the claim to the all other Party.

## 9. Notices


- 9.1 All notices relative to this MOU shall be given in writing and shall be personally served or sent by certified mail and become effective upon receipt. The Parties shall be addressed as follows, or at any other address designated by notice:

CITY: City Manager  
PO Box 1225  
Portola, CA 96122

NSAQMD: Air Pollution Control Officer  
P.O. Box 2509  
Grass Valley, CA 95945


**IN WITNESS WHEREOF**, the Parties hereto have caused this Memorandum of Understanding to be executed, the day and year first-above written.

Northern Sierra Air Quality Management District

  
Gretchen Bennitt  
Air Pollution Control Officer

3-28-16  
Date

City of Portola

  
Robert Meacher  
City Manager

4-5-2016  
Date

# EXHIBIT A





## Appendix L

### Wood Stove Change-out Process Flow Chart

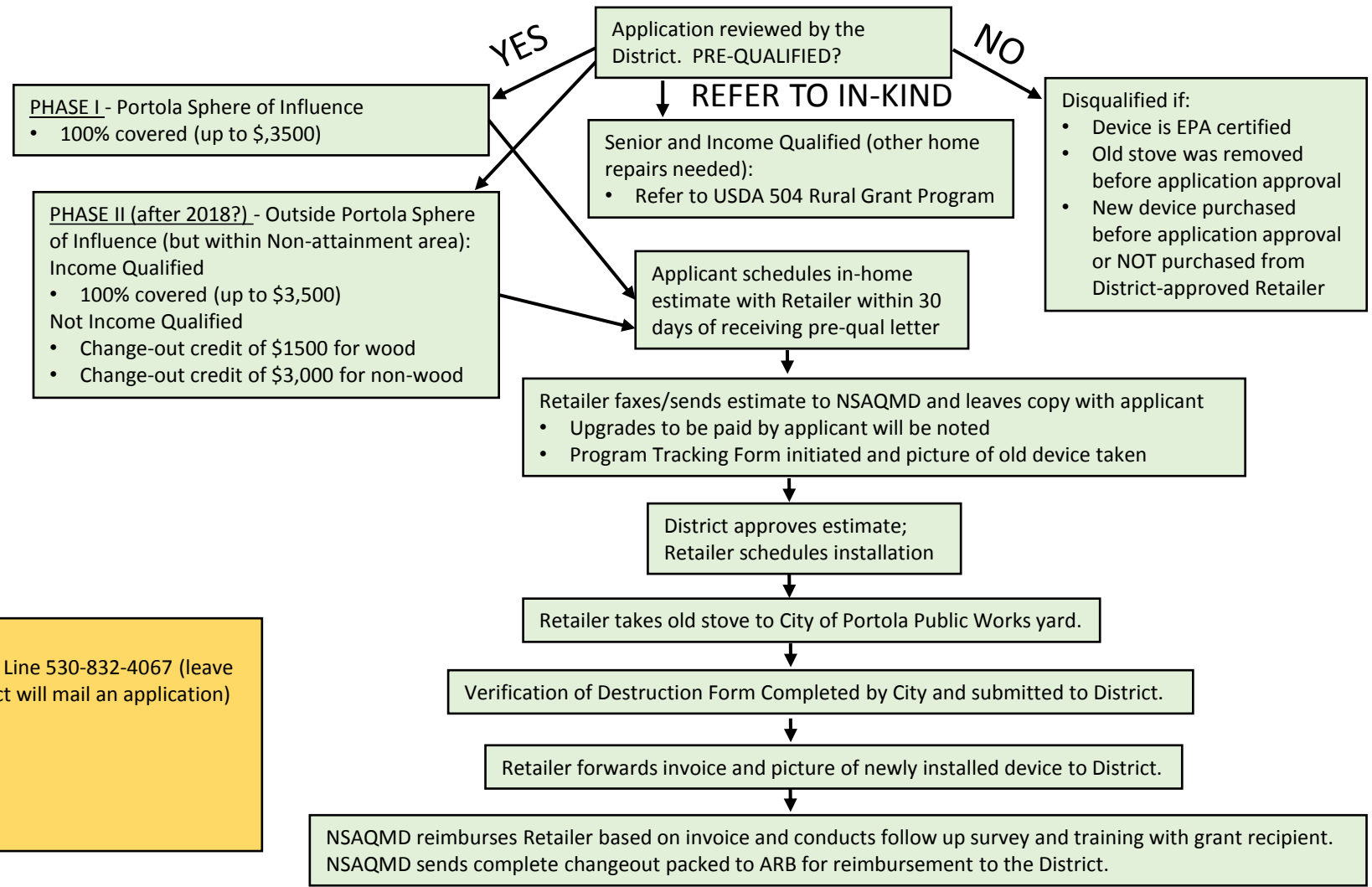
# Wood Stove Change-out Process Flowchart - DRAFT

Program start date: 04/09/16 for Phase I

- ACTIVITIES**
- EPA Grant Award Press Release – 11/10/15
  - Home Heating Financial Assistance Workshop – 12/2/15
  - Program Announcement – XX/XX/16??
  - Begin accepting applications – XX/XX/16??
  - Media Kick Off – XX/XX/16??
  - Stove Fair – XX/XX/16??

- FORMS (on website by Program Announcement date)**
- Informational flier (Eligibility Criteria)
  - Application
    - How the Program Works
    - Application
    - Applicant Certification (to be signed)
    - Portola Home Heating Survey

- APPLICATIONS AVAILABLE:**
- Woodstove Change-Out Information Line 530-832-4067 (leave message with address and the District will mail an application)
  - [www.myairdistrict.com](http://www.myairdistrict.com)
  - Wood Stove Retailers
    - Quincy Hot Spot
    - Wolf Creek Wood Stoves
    - Others??



## Appendix M

City of Portola Wood Stove and Fireplace Ordinance

Ordinance Number 344

ORDINANCE NO. 344

AN ORDINANCE OF THE CITY OF PORTOLA, COUNTY OF PLUMAS  
AMENDING CHAPTER 15.10 OF THE CITY OF PORTOLA MUNICIPAL CODE  
PROVIDING FOR REGULATION OF WOOD STOVES AND FIREPLACES

The Council of the City of Portola, California, does ordain as follows:

**Section 1.** Chapter 15.10 of the Portola Municipal Code is hereby amended to read as follows:

Title 15- BUILDINGS AND CONSTRUCTION

Chapter 15.10- WOOD STOVE AND FIREPLACE ORDINANCE

Sections:

- 15.10.010 Purpose.**
- 15.10.020 Definitions.**
- 15.10.030 Requirements for New Wood Burning Devices.**
- 15.10.040 Requirements for Existing Wood Burning Devices.**
- 15.10.050 Permitted Fuels in Wood Burning Devices, Wood Burning Fireplaces, Wood-Fired Cookstoves, Wood-Fired Fire Pits.**
- 15.10.060 Mandatory Curtailment of Wood Burning Heaters, Wood Burning Fireplaces, Wood-Fired Fire Pits and Wood-Fired Cookstoves During Stagnant Conditions.**
- 15.10.070 Outdoor Wood-Fired Boiler Installation Prohibited.**
- 15.10.080 Wood Stove Retailers/Contractors Required to Provide Educational Materials.**
- 15.10.090 Violations.**
- 15.10.100 Continuing Violations- Each day being a separate violation.**

**15.10.010 Purpose.**

- A. This chapter shall be cited as the “Wood Burning Device Ordinance”
- B. This chapter is enacted for the purpose of improving the air quality within the City limits and protecting the general welfare of the citizens and residents of Portola. The EPA officially designated the Greater Portola area as federal nonattainment for the federal annual standard for PM 2.5 (Particulate Matter with an aerodynamic diameter of 2.5 microns or less), on April 15, 2015. High PM2.5 levels are mostly due to impacts from residential wood burning. The City Council finds there is a need to regulate and reduce harmful emissions of exhaust gases from wood-burning heaters and fireplaces, and that an appropriate method of regulation is a wood burning device ordinance.

**15.10.020 Definitions.**

As used in this chapter:

- 1. “Air District” means the Northern Sierra Air Quality Management District.
- 2. “Building” means any residence, mobile home, commercial property or other structure.

3. "Certificate of Compliance" means a document issued by the Control Officer certifying that a building has no more than two wood burning heaters which are EPA-certified and no uncertified wood burning heaters.
4. "City" means the City of Portola.
5. "Control officer" means the official designated by the City Manager.
6. "EPA" shall mean the United States Environmental Protection Agency.
7. "EPA - Certified" means any wood burning heater with a Phase II certification or a more stringent certification as currently enforced in the NSPS.
8. "EPA-Qualified Fireplace" means any fireplace model or retrofit device that has been qualified by EPA under EPA's Voluntary Fireplace Program as emitting no more than 5.1 g/kg.
9. "Fireplace" means any permanently installed indoor or outdoor masonry or factory-built device used for aesthetic or space-heating purposes and designed to operate with an air to fuel ratio greater than or equal to 35 to 1.
10. "New Construction" means any single or multi-family housing unit, for which construction began on or after the effective date of this ordinance. Construction is deemed to occur when the foundation for the structure is installed.
11. "Notice of Exemption" means a document issued by the Control Officer certifying that a building has no wood burning heaters.
12. "NSPS" means New Source Performance Standard. For purposes of this rule the NSPS is the Code of Federal Regulations, Title 40, Part 60, Subpart AAA.
13. "Outdoor Wood-fired Boiler" or "Hydronic Heater" means a fuel burning device designed: (1) to burn primarily wood or wood pellet fuel; (2) not to be located inside structures ordinarily occupied by humans; and (3) to heat spaces or water by the distribution through pipes of a fluid, typically water or water and antifreeze mixture, heated in the device.
14. "Pellet Fueled Wood Heater" means a pellet-fueled heater, comprising a forced draft heater with an automatic feed which supplies appropriately sized feed material or compressed pellets of wood, corn, or other biomass material to the firebox.
15. "Permanently Inoperable" means modified in such a way that the wood burning heater can no longer function as a wood burning heater or easily be remodified to function as a wood burning heater. Conversion to other fuels, such as propane, is permitted.
16. "Wood Burning Device" means any wood burning heater or fireplace. Wood burning devices do not include wood-fired residential or commercial barbecue devices, wood-fired fire pits, or wood-fired cookstoves.
17. "Uncertified Wood Burning Device" means any wood burning device that does not meet the performance and emissions standards of a Phase II certification or a more stringent certification as currently enforced in the NSPS. Uncertified wood burning devices do not include wood-fired residential or commercial barbecue devices, wood-fired fire pits, or wood-fired cookstoves.
18. "Wood-Fired Cookstove" means a wood-fired appliance that is designed primarily for cooking food and that has the following characteristics:
  - a. An oven, with a volume of 0.028 cubic meters (1 cubic foot) or greater,
  - b. A device for measuring temperatures,
  - c. A flame path that is routed around the oven,
  - d. A shaker grate,
  - e. An ash pan,

- f. An ash clean-out door below the oven, and
  - g. The absence of a fan or heat channels to dissipate heat from the appliance.
19. "Wood Burning Heater" means an enclosed wood-burning device capable of and intended for space heating such as a wood stove, pellet-fueled wood heater, or wood-burning fireplace insert.

**15.10.030 Requirements for New Wood Burning Devices.**

**A. Installation of Wood Burning Devices.**

1. Wood Burning Heaters: No person shall advertise, sell, offer for sale, supply, transfer or install in any residence or other structure any wood burning heater within the City limits unless it is an EPA certified wood burning heater at the time of sale or transfer.
  - a. No local government authority within the City limits may issue a building permit to any person to install an uncertified wood burning heater; and
  - b. Certified devices shall have a label permanently affixed to them from the United States Environmental Protection Agency (USEPA) which states that the stove is certified to comply with the NSPS standards.
2. Wood Burning Fireplaces: No local government authority within the City limits may issue a building permit to any person to install a wood burning fireplace unless it is an EPA-qualified fireplace or EPA-certified fireplace.

**B. Limitation on Number of Wood Burning Devices in New Construction and Remodels.**

1. The number of EPA certified wood burning heaters installed on any residential or non-residential property for which a building permit is required shall not exceed one per individual dwelling unit; and
2. The number of EPA-qualified fireplaces installed on any residential or non-residential property for a which a building permit is required shall not exceed one per individual dwelling unit; and
3. No local government authority within the City limits may issue a building permit to any person to install a wood burning device in new construction or remodel, unless it is an EPA-qualified fireplace or EPA certified fireplace or wood heater certified to the level of the current NSPS; and
4. Wood burning devices shall not be considered the sole source of heat in any new construction within the City limits; and
5. The above limitations do not apply to devices that are defined as low emitting:
  - a. EPA-certified pellet fueled wood heater;
  - b. Devices that are exclusively gaseous- or liquid-fueled; and
  - c. EPA-certified wood burning devices that meet a certified emission rate of 1 gram/hour or less of particulate matter.

**15.10.040 Requirements for Existing Wood Burning Devices.**

**A. Existing Wood Burning Heaters and Change of Ownership.**

1. In order to complete any escrow transaction, on any residential or commercial property, the current property within the City limits owner must obtain either a 1) Certificate of Compliance or a 2) Notice of Exemption.
2. It is prohibited for any person to complete, or allow the completion of any Escrow transaction upon any residence or mobile home, or other parcel containing a building within the City limits unless each building on the parcel has been issued a Certificate of

Compliance by the Control Officer as having no more than two wood burning heaters which are EPA-Certified and no uncertified wood burning heaters.

3. A Certificates of Compliance or Notice of Exemption shall be issued by the Control Officer only upon physical inspection or documentary evidence that reliably establishes compliance with this section.
4. A Certificate of Compliance shall identify all of the following:
  - a. Owner's name.
  - b. Model number and manufacturer for each wood burning heater in the building.
  - c. The street address, Assessor's parcel number, or legal description of the parcel of real property where the building is located.
  - d. The location of the building and the specific location in the building where the wood burning heater is located.
5. A Notice of Exemption shall identify all of the following:
  - a. Owner's name.
  - b. The street address, Assessor's Parcel number, or legal description of the parcel of real property where the building is located.
  - c. The location of the building and whether a space heat source is exclusively utilized, and if so, what heat source is exclusively utilized.
6. The buyer and seller of any real property within the City limits shall observe this section and any disclosure statements supplied by the real estate agents relating to the requirement under this regulation for the inspection of any wood burning heater installed in a building on the property.
7. If the disclosure report indicates that a wood burning heater on the property within the City limits is uncertified, the wood burning heater must be removed from the property and destroyed/recycled at an approved facility or agency. Re-inspection and a copy of documentation from the destroying/recycling facility or agency is required by the Control Officer prior to issuance of a Certificate of Compliance.
8. The Control Officer may issue a Certificate of Compliance for a residence within the City limits without conducting a physical inspection if a person provides evidence that the EPA-certified wood burning heater has been installed in compliance with all applicable building, fire and other codes. This documentation shall include a receipt or invoice from the installation or purchase that includes the manufacturer and model name of the wood burning device.
9. A Certificate of Compliance issued pursuant to this section:
  - a. Remains valid until the residential or commercial property is transferred or conveyed to a new owner or for nine months, whichever comes sooner.
  - b. Does not constitute a warranty or guarantee by the Control Officer that the wood burning heater within the residence or commercial property meets any other standards of operation, efficiency or safety, except the certification standards contained in these regulations.
10. If a residential or commercial property within the City limits is to be sold and does not contain any wood burning heaters, a form approved by the Control Officer, containing the signatures of both the buyer and seller, attesting to that fact, may be accepted in lieu of an inspection, and the Control Officer may issue a Notice of Exemption. The completed form shall be submitted to the Control Officer within ten days of close of escrow. If the residential or commercial property contains an uncertified wood burning heater which

must be removed, the form must not be executed by either the buyer or seller until the removal has been completed. On any subsequent sale, a new Notice of Exemption is required.

11. Upon a change of ownership, no more than two EPA Certified wood burning heaters per building may remain in any property within the City limits, except for the low emitting devices outlined in 15.10.030(B)(5).
12. Upon a change of ownership, no uncertified wood-burning heater may remain in any property within the City limits.
13. The Control Officer may conduct audits after properties have closed escrow and have been recorded under the new owner's name in order to determine compliance with this ordinance. If the Control Officer finds that there is an uncertified wood burning heater in the building, the Control Officer shall require that the uncertified wood burning heater be destroyed/recycled at an approved scrappage/recycling facility or agency within 30 days of notifying the current property owner. A financial penalty may be assessed if noncompliance has been identified or if the current property owner fails to destroy/recycle the heater within the time prescribed in the notice.

**B. Existing individual dwelling units with two or more existing EPA Certified Wood Burning Heaters.**

Existing individual dwelling units with two or more existing EPA Certified Wood Burning Heaters may not install additional Wood Burning Heaters (certified or uncertified). The above limitation does not apply to heaters that are defined as low emitting, including without limitation the following:

1. EPA certified pellet fueled wood heaters;
2. Devices that are exclusively gaseous- or liquid fueled; and
3. EPA certified wood burning heaters that meet a certified emission rate of 1 gram/hour or less of particulate matter.

**15.10.050 Permitted Fuels in Wood Burning Devices, Wood Burning Fireplaces, Wood-Fired Cookstoves, Wood-Fired Fire Pits.**

Burning of any fuels or materials in a Wood Burning Device other than the following fuels within City limits shall be in violation of this ordinance:

- A. Seasoned wood (less than 20% moisture content).
- B. Uncolored paper.
- C. Manufactured logs, pellets, and similar manufactured products (i.e., processed fire starters).

**15.10.060 Mandatory Curtailment of Wood Burning Heaters, Wood Burning Fireplaces, Wood-Fired Fire Pits and Wood-Fired Cookstoves During Stagnant Conditions.**

**A. Episodic Wood Burning Curtailment Requirements.**

1. Effective January 1, 2021, the requirements of this section shall be in effect during the months of January, February, November, and December. The Air District shall determine when a mandatory curtailment of solid fuel combustion in the City is necessary, notify the community that mandatory curtailment is required, and make such other determinations as are necessary to carry out the objectives of this chapter.
2. No person shall operate a wood burning heater, wood burning fireplace, wood-fired fire pit or wood-fired cookstove within the City limits when a mandatory curtailment is in effect



unless the device is an approved and currently registered EPA-Certified Wood Burning Heater.

3. The approved and currently registered EPA-Certified Wood Burning Heater will be maintained and operated according to manufacturer instructions.
4. The Air District will declare a mandatory curtailment whenever it determines that the 24-hour average PM<sub>2.5</sub> concentration may exceed 30 ug/m<sup>3</sup> AND when adverse meteorological conditions are expected to persist.
5. The criteria for issuing a mandatory curtailment is as follows:
  - a. The Air District will analyze the available air monitoring data and determine whether a trend is continuing; and
  - b. The Air District will contact the National Weather Service located in either Reno or Sacramento to request a specific meteorological forecast specific for the Portola area; and
  - c. If the National Weather Service forecasts adverse meteorological conditions to persist and the Air District ascertains that there is a marked trend of continuing high concentrations of PM<sub>2.5</sub> possible, then the Air District will declare a mandatory curtailment.
6. Upon determination that mandatory curtailment is required, the Air District shall notify the public through one or more of the following methods:
  - a. A recorded telephone message.
  - b. Messages posted on the Air District website.
  - c. Electronic mail messages to persons or entities that have requested such notice.
  - d. Notifying broadcast, print or social media operating within the boundaries of the City of Portola.
  - e. Any additional method that the Air District determines is appropriate.

#### Registration of EPA-Certified Devices.

1. Eligibility Requirements – Any EPA-Certified Wood Burning Heater is eligible to be registered with the Air District.
  2. Registration Process – Effective July 1, 2020, persons applying to register a Wood Burning Heater shall submit a completed application and supplemental documentation demonstrating compliance with the eligibility requirements to the District. Supplemental documentation shall include the following:
    - a. Receipt or invoice from the installation or purchase that includes the manufacturer and model name of the Wood Burning Heater, or
    - b. A certification from the Air District verifying that the Wood Burning Heater meets the eligibility requirements.
  3. Administrative Requirements – The person who registers the Wood Burning Heater shall retain a copy of the Air District issued registration and make it available upon request.
- B. Penalties – Any person that violates the provisions of 15.10.060 is subject to the following
1. First time violators: a Notice to Comply or Warning will be issued. The Notice to Comply will require that any EPA-Certified Wood Burning Heater be registered within 30 days.
  2. Second time violators: Completion of a wood smoke awareness course that has been approved by the Air District, or payment of a penalty of \$50, or submission of proof of replacement of non-certified device with an EPA-Certified Wood Burning Heater or exclusively gaseous- or liquid-fueled heater.

3. Third time violators: payment of a penalty of \$150 or submission of proof of replacement of non-certified device with an EPA-Certified Wood Burning Heater or exclusively gaseous- or liquid-fueled heater.
4. Fourth time violators: payment of a penalty of \$500 or submission of proof of replacement of non-certified device with an EPA-Certified Wood Burning Heater or exclusively gaseous- or liquid-fueled heater.

**15.10.070 Outdoor Wood-Fired Boiler Installation Prohibited.**

All outdoor wood-fired boilers are prohibited from installation within the City of Portola.

**15.10.080 Wood Stove Retailers/Contractors Required to Provide Educational Materials.**

Retailers or Contractors selling or offering for sale new Wood Burning Devices within the City limits shall supply public awareness information with each sale of a Wood Burning Device in the form of pamphlets, brochures, or fact sheets on the following topics:

- A. Proper installation, operation, and maintenance of the Wood Burning Device.
- B. Proper fuel selection and use.
- C. Health effects from wood smoke
- D. Weatherization methods for the home,
- E. Proper sizing of Wood Burning Devices.
- F. Episodic Wood Burning Curtailment levels as defined in Section 15.10.060.

**15.10.090 Violations.**

Any person who violates any of the requirements of this chapter, or who falsely attests as to information as part of compliance with this chapter, is subject to penalties and punishments as set forth in Chapter 1.10 of this Municipal Code, may be subjected to the applicable penalties and punishments prescribed by law for perjury, and may have any license or permit issued by the City be revoked, including but not limited to a building permit or certificate of occupancy.

**15.10.100 - Continuing violations—Each day being a separate violation.**

After any person who is responsible for a violation of any provision in this chapter has been given notice of the violation, and such person does not comply or otherwise correct the violation within the time prescribed in the notice, then from that day forward, the continuing violation shall be deemed to be a separate offense on each and every day that the violation persists. A person who knowingly commits or suffers the continuing violation shall be guilty of a separate offense each and every day that the violation persists.

**Section 2. Approval.** The City of Portola Wood Stove and Fireplace Ordinance Amendment concerns revisions to wood stove regulations. The text changes reflecting the Amendment are incorporated by reference as if fully set forth herein into Title 15 of the Portola Municipal Code, and are hereby approved.

**Section 3. Enactment.** The City of Portola Wood Stove and Fireplace Ordinance Amendment shall be effective 30 days from the date of its approval by the City Council.

**Section 4. Summary Publication and Posting.** Within thirty (30) days after final adoption of this Ordinance, the City Clerk shall have a summary of this ordinance prepared by the City Attorney and published as required by the California Government Code. Within fifteen (15) days after final adoption of this ordinance, the City Clerk shall have it posted in three (3) public places.

This ordinance was introduced, read and the second reading was waived at a Regular Meeting of the City Council of the City of Portola duly held on June 8, 2016. The ordinance was finally passed and adopted at the Regular Meeting of the City Council of the City of Portola duly held on June 22, 2016, by the following vote:

AYES: Mayor Pro tem Larrieu  
Councilmember Gault  
Councilmember Oels

NOES:  
ABSTAIN:  
ABSENT: Vacant  
Mayor Powers

  
\_\_\_\_\_  
MAYOR PRO TEM LARRIEU

ATTEST:

  
\_\_\_\_\_  
CITY CLERK, Melissa Klundby

I, Melissa Klundby, City Clerk of the City of Portola, do hereby certify that the foregoing Ordinance was duly and regularly passed by the City Council of the City of Portola at a Regular Meeting held on June 22, 2016.

  
\_\_\_\_\_  
CITY CLERK, Melissa Klundby



## Appendix N

### Example of Press Release

DISTRICT HEADQUARTERS

200 Litton Drive, Suite 320  
Mailing Address: P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360 / FAX: (530) 274-7546  
email: [office@myairdistrict.com](mailto:office@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

NORTHERN FIELD OFFICE

257 E. Sierra, Unit E  
Mailing Address: P.O. Box 2227  
Portola, CA 96122  
(530) 832-0102 / FAX: (530) 832-0101  
email: [Julie@myairdistrict.com](mailto:Julie@myairdistrict.com) or [www.myairdistrict.com](http://www.myairdistrict.com)

\*\*\*\*\* PRESS RELEASE \*\*\*\*\*

## **Northern Sierra Air Quality Management District to begin accepting applications for the Greater Portola Wood Stove Change-Out Program on April 9!**

On Saturday, April 9 (11:00 a.m. – 2:00 p.m.) the Northern Sierra Air Quality Management District will be holding a Wood Stove Change-Out Fair at the Portola Veteran's Hall to inform residents about the Program. Participating wood stove retailers will be demonstrating various heating devices and the best ways to heat your home more efficiently while saving money!

The Air District is holding this Fair to officially 'kick-off' their five year voluntary residential wood stove change-out program for the Greater Portola Area – which includes the City of Portola and the outlying areas of Iron Horse, Delleker, C-Road, Mohawk Vista, Plumas-Eureka, Blairsden-Graeagle, Gold Mountain, Whitehawk, Clio, Johnsville, and portions of Lake Davis.

To be eligible for this program a resident must have a currently installed, operating non-EPA certified wood stove. Disqualifications will occur if the old device is removed from the home prior to application approval OR if the new woodstove is purchased before application approval.

For more information about the program, you can go to the Air District website at [www.myairdistrict.com](http://www.myairdistrict.com) or call the Wood Stove Change-Out Information Line: 530 832-4067.

The Air District received a \$2.48 million grant from the U.S. Environmental Protection Agency (U.S. EPA) to encourage owners to replace older wood stoves with cleaner burning devices and significantly improve air quality and public health in the Greater Portola federal PM2.5 nonattainment area. The grant is part of the U.S. EPA's 2015 Targeted Air Shed Grant Program intended to improve air quality in areas of the U.S. with the highest levels of pollution.

In January 2015, the U.S. EPA designated the City of Portola and surrounding parts of Plumas County as a federal nonattainment area for the annual PM2.5 health-based standard. PM2.5 is the fine particle pollution found in smoke. Studies indicate that the main source of smoke in Portola is from residential woodstoves and fireplaces.

Portola City Manager, Robert Meacher stated, "The air quality issue has been a priority for this and previous City Councils, and City staff understands the need to address this issue not only from a public health stand point, but also from a quality

of life issue, as more and more people look to our City and region as a great place to live where you want to play.”

Portola City Mayor, Bill Powers added, "The City has been working with the Air District for many years to develop a plan to reduce smoke levels from woodstoves. This important grant provides funding to help Portola residents with older wood stoves move to cleaner burning alternatives for keeping their families warm through the winter with less effort, lower fuel costs and less smoke. This is exactly what the City needed in order to reach the goal of cleaner, healthier air which will continue for generations.”

Mayor Powers continues, “A few years ago I replaced my old, clunky wood stove for a cleaner burning EPA wood stove. My house is warmer and I actually use less wood, which has saved me money and a lot of effort. But the real pay-off is how good it feels to know that this small change is improving my neighbors' health.”

The Air District will be partnering with the City of Portola, Plumas Family Resource Center, the USDA, Liberty Utilities, and the California Air Resources Board.

The District will also be relying on the local woodstove retailers of Wolf Creek Stoves and Quincy Hot Spot to assist with the program.

## Appendix O

### Wood Stove Workshop Announcement

# Wood Stove Change-Out Fair

hosted by the Northern Sierra Air Quality Management District (NSAQMD)

[www.myairdistrict.com](http://www.myairdistrict.com)

Wood Stove Change-Out Information Line: 530-832-4067

**WHEN: Saturday, April 9, 2016 11:00AM-2:00PM**

**WHERE: Portola Veterans Hall  
(children welcome; snacks provided)**

- **LEARN ABOUT THE GREATER PORTOLA WOOD STOVE CHANGE-OUT PROGRAM**
- **LEARN HOW TO HEAT YOUR HOME MORE EFFICIENTLY AND COST EFFECTIVELY**

## **PARTICIPATING PARTNERS INCLUDE:**

- WOOD STOVE RETAILERS/MANUFACTURERS – WOOD STOVE DEMONSTRATIONS
- HEARTH, PATIO & BARBEQUE ASSN. REPRESENTATIVES
- STATE AND FEDERAL AGENCY REPRESENTATIVES
- PUBLIC HEALTH OFFICIALS... AND MORE!

Admission is FREE and the first 20 people to sign in will receive a complimentary gift.

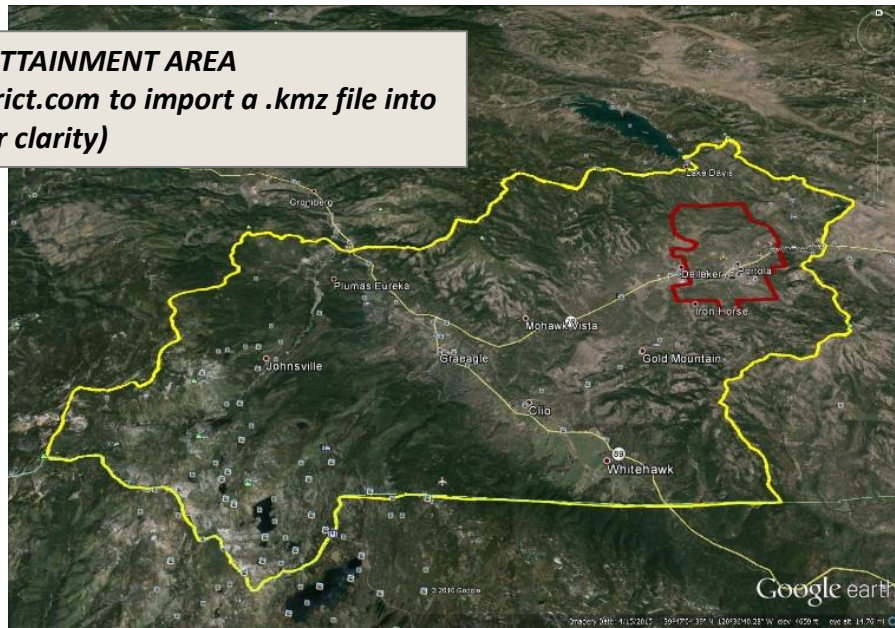


All attendees will be entered in a drawing to win a \$25 gift certificate for Leonard's Market



## MAP OF PM2.5 NON-ATTAINMENT AREA

(Go to [www.myairdistrict.com](http://www.myairdistrict.com) to import a .kmz file into Google Earth for better clarity)



### ELIGIBILITY CRITERIA FOR ALL PARTICIPANTS:

- Must currently have an installed, operating non-EPA certified wood stove.
- Must submit a completed application to be considered for the program. Applications will be disqualified:
  - IF the old device is removed from the home prior to application approval
  - IF the new certified, device is purchased before application approval
  - IF any information on the application is false or incomplete
- Installation must be completed by a District-Approved Retailer

### ZONE 1 CRITERIA:

- Must reside within the City of Portola Sphere of Influence.

### MAXIMUM FUNDING:

- Up to \$3,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.

### ZONE 2 CRITERIA:

- Must reside within the Greater Portola PM2.5 Non-Attainment Area (and outside the City of Portola Sphere of Influence).
- Low-Income residents will qualify for greater funding.

### MAXIMUM FUNDING:

- Up to \$1,500 to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$3,000 to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.
- Up to \$3,500 for low income residents to replace a non-certified wood burning device with an EPA certified wood burning device.
- Up to \$4,500 for low income residents to replace a non-certified wood burning device with a pellet, propane or kerosene heating device.

**ZONE 2 INCLUDES COMMUNITIES OF IRON HORSE, DELLEKER, C-ROAD, MOHAWK VISTA, PLUMAS-EUREKA, BLAIRSDEN-GRAEAGLE, GOLD MOUNTAIN, WHITEHAWK, CLIO, JOHNSTVILLE, AND PORTIONS OF LAKE DAVIS.**



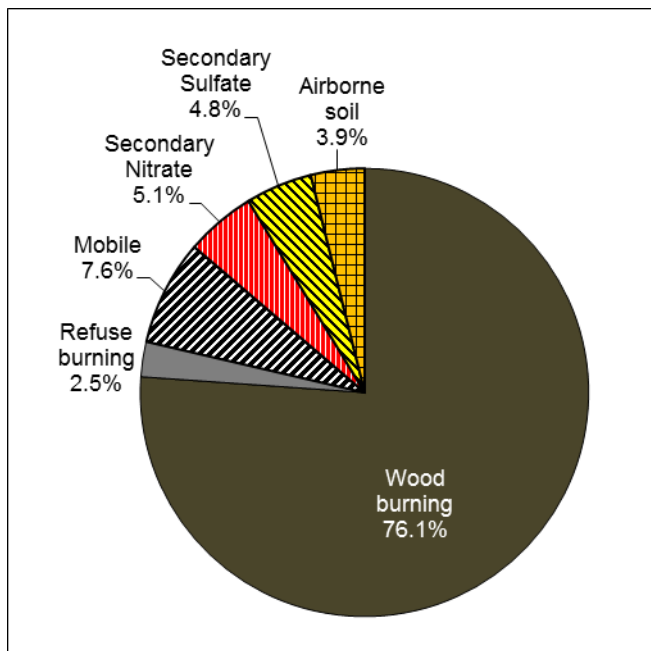
## Appendix P

### Assessment of Significance for Transportation Conformity

## Assessment of Significance for Transportation Conformity

PM<sub>2.5</sub> includes directly emitted particles as well as those formed in the atmosphere from gaseous precursors. The PM<sub>2.5</sub> problem in Portola is driven by wood smoke emissions as illustrated in Figure 1. In this chapter, we determine if on-road sources of direct PM<sub>2.5</sub> and precursor emissions are significant contributors to Portola air quality problems.

Figure 1. Annual Positive Matrix Factorization (PMF) Source Contribution



On-road sources contribute to directly emitted PM<sub>2.5</sub> as well as PM<sub>2.5</sub> precursors. In order to determine if their contribution to Portola's PM<sub>2.5</sub> design value is significant we evaluated the following factors:

1. Contribution from on-road emissions to the total emission inventory and future projections of growth in on-road emissions.
2. Contribution from on-road emissions to PM<sub>2.5</sub> design value.

Transportation emissions comprise less than one percent of total directly emitted PM<sub>2.5</sub> (Table 1). As for the precursors, contributions from transportation emissions vary from 1.9 percent for SO<sub>x</sub> to 36 percent for NO<sub>x</sub>. We also evaluated future year emissions to ensure that motor vehicle emissions are not projected to grow in the area. The on-road emissions for directly emitted PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors are projected to decrease through the attainment year, 2021 (Table 1).

Table 1. Contribution from On-Road Sector to Total PM2.5 and Precursor Emissions (tpd)

Category Name	Emissions in tons per day (tpd)		
	2013	2019	2021
PM2.5			
TOTAL PM2.5 FOR PORTOLA*	0.490	0.487	0.486
ON-ROAD	0.005	0.003	0.003
% PM2.5 FROM ON-ROAD	0.94	0.55	0.53
NOx			
TOTAL NOx FOR PORTOLA	0.504	0.317	0.295
ON-ROAD	0.181	0.115	0.096
% NOx FROM ON-ROAD	35.99	36.36	32.39
NH3			
TOTAL NH3 FOR PORTOLA	0.149	0.148	0.148
ON-ROAD	0.005	0.004	0.004
% NH3 FROM ON-ROAD	3.49	2.84	2.71
ROG			
TOTAL ROG FOR PORTOLA	0.940	0.873	0.857
ON-ROAD	0.101	0.063	0.055
% ROG FROM ON-ROAD	10.70	7.21	6.38
SOx			
TOTAL SOx FOR PORTOLA	0.016	0.016	0.016
ON-ROAD	0.000	0.000	0.000
% SOx FROM ON-ROAD	1.90	2.52	2.50

\*Base year inventory without reductions from woodstove change-out

The most important aspect of this analysis combines emission inventory and PM2.5 source contribution data to determine contribution from on-road sources to PM2.5 design value. For example, as illustrated in Table 1, on-road sources are responsible for about a third of total NOx emissions in the nonattainment area. Since nitrate contributes less than 4 percent to the PM2.5 design value, on road sources contribute about one third of that or 1.41 percent of the design value. Presented below is the analysis of on-road contribution to the PM2.5 design value for directly emitted PM2.5 and its precursors. PMF modeling results (Table 2) were used in conjunction with emission inventory to estimate contribution from on-road sources to the PM2.5 design value.

Table 2. Five-year average PMF source contribution

Source Category	%Contribution	Concentrations scaled to the DV (ug/m3)
Wood burning	76.12	10.58
Mobile	7.61	1.06
Secondary Nitrate	5.06	0.70
Secondary Sulfate	4.80	0.67
Airborne soil	3.88	0.54
Refuse burning	2.53	0.35
Total	100	13.9

The on-road sources include directly emitted PM<sub>2.5</sub> exhaust emissions, directly emitted PM<sub>2.5</sub> fugitive dust, as well as precursor emissions of ammonium nitrate, ammonium sulfate, and secondary organic aerosols (SOAs). The PMF model did not identify any contribution from SOA. Based on what we know about chemical composition and SOA formation, SOA contribution should be really small. The 'Attainment Demonstration' section evaluates potential SOA contribution in more detail. Since PMF identified secondary nitrate and secondary sulfate as PM<sub>2.5</sub> contributors, the following assumptions were used to separate them into nitrate, sulfate, and ammonium. The nitrate fraction of ammonium nitrate was calculated as molecular weight of nitrate (62) divided by the molecular weight of ammonium nitrate (80). The sulfate fraction of ammonium sulfate was calculated as molecular weight of sulfate (96) divided by the molecular weight of ammonium sulfate (132). The ammonium fraction of ammonium nitrate was calculated as molecular weight of ammonium (18) divided by the molecular weight of ammonium nitrate (80). The ammonium fraction of ammonium sulfate was calculated as molecular weight of ammonium (36) divided by the molecular weight of ammonium sulfate (132). The combined ammonium fraction is the sum of these two values.

Table 3 summarizes contributions from on-road emissions to the PM<sub>2.5</sub> design value. The on-road emissions are estimated to contribute 7.52 percent of the PM<sub>2.5</sub> design value or 1.05 ug/m<sup>3</sup>. This estimate is very conservative because we did not subtract background concentrations prior to estimating on-road contributions. For example, about 87 percent of fugitive dust contribution comes from background concentrations. If we were to factor this into the equation, the on-road contribution from fugitive dust would be reduced to 0.35 percent or 0.05 ug/m<sup>3</sup>.

Table 3. On-Road Contribution to PM2.5 Design Value

Component	5-Year Avg PMF Contribution		Emissions			On-Road Contribution to DV	
	%	ug/m3	Total (tpd)	On-road (tpd)	% from On-road	%	ug/m3
<b>PM2.5 components not influenced by on-road emissions</b>							
Wood burning	76.12	10.58					
Refuse burning	2.53	0.35					
<b>Sub-Total</b>	<b>78.65</b>	<b>10.93</b>					
<b>PM2.5 components influenced by on-road emissions</b>							
Mobile	7.61	1.06	0.015	0.005	30.07	2.29	0.32
Nitrate	3.92	0.55	0.504	0.181	35.93	1.41	0.20
Sulfate	3.49	0.49	0.016	0.000	1.90	0.07	0.01
Ammonium	2.45	0.34	0.149	0.005	3.48	0.43	0.06
Fugitive Dust	3.88	0.54	0.076	0.065	85.64	3.32	0.46
<b>Sub-Total</b>	<b>21.35</b>	<b>2.97</b>				<b>7.52</b>	<b>1.05</b>
<b>Grand Total</b>	<b>100.00</b>	<b>13.90</b>					

The section below presents basis for calculating on-road contribution to PM2.5 design value from PM2.5 precursors and directly emitted PM2.5.

NOx:

Annual NOx on-road emissions are 0.181 tons per day, which equates to 35.93 percent of the total NOx inventory. Based on PMF results, nitrate comprises 3.92 percent of the PM2.5 mass annually. Since the on-road portion is 35.93 percent of the total NOx inventory, it contributes 35.93 percent of the 3.92 percent or about 1.41 percent.

SOx:

On-road SOx emissions are negligible and are estimated at zero tons per day. As a result, motor vehicle SOx emissions are not considered significant and are not included in the motor vehicle emission budgets for conformity purposes.

Ammonia:

Annual ammonia on-road emissions are 0.005 tons per day, which equates to 3.48 percent of the total ammonia inventory. Based on PMF results, ammonium comprises 2.45 percent of the PM2.5 mass annually. Since the on-road portion is 3.48 percent of the total ammonia inventory, it contributes 3.48 percent of the 2.45 percent or about 0.06 percent.

VOC:

Annual VOC on-road emissions are 0.101 tons per day, which equates to 10.70 percent of the total VOC inventory. As indicated in the Assessment of Precursor Significance section, VOCs in general have a negligible impact on PM2.5 formation. It was estimated that they may contribute 0.40 percent of the PM2.5 mass. Since the on-road portion is only 10.70 percent of the total VOC inventory, it contributes 10.70 percent of the 0.40 percent or about 0.05 percent.

Directly emitted PM2.5 Mobile Contribution:

Annual PM2.5 on-road emissions are 0.005 tons per day, which comprises 30.07 percent of the total mobile emissions. Based on the PMF results, directly emitted PM2.5 from the entire mobile sector contributes 7.61 percent of the mass annually. Since the on-road portion is 30.07 percent of the 7.61 percent it contributes 2.29 percent of the PM2.5 mass.

Directly emitted PM2.5 Fugitive Dust:

On road sources contribute 0.065 tons per day of fugitive dust emissions, which equates to 85.64 percent of total fugitive dust emissions. Based on the PMF modeling, fugitive dust contributes 3.88 percent to the PM2.5 design value. Since the on-road portion is 85.64 percent of the mass, it contributes 85.64 percent of the 3.88 percent of the PM2.5 design value or about 3.32 percent. The on-road fugitive dust component could be further broken down into paved road dust, unpaved road dust, and construction and demolition using emission inventory as illustrated in Table 4. About 85 percent of fugitive dust attributed to transportation originates from unpaved roads.

Table 4. Breakdown of On-road Fugitive Dust Contribution by Category

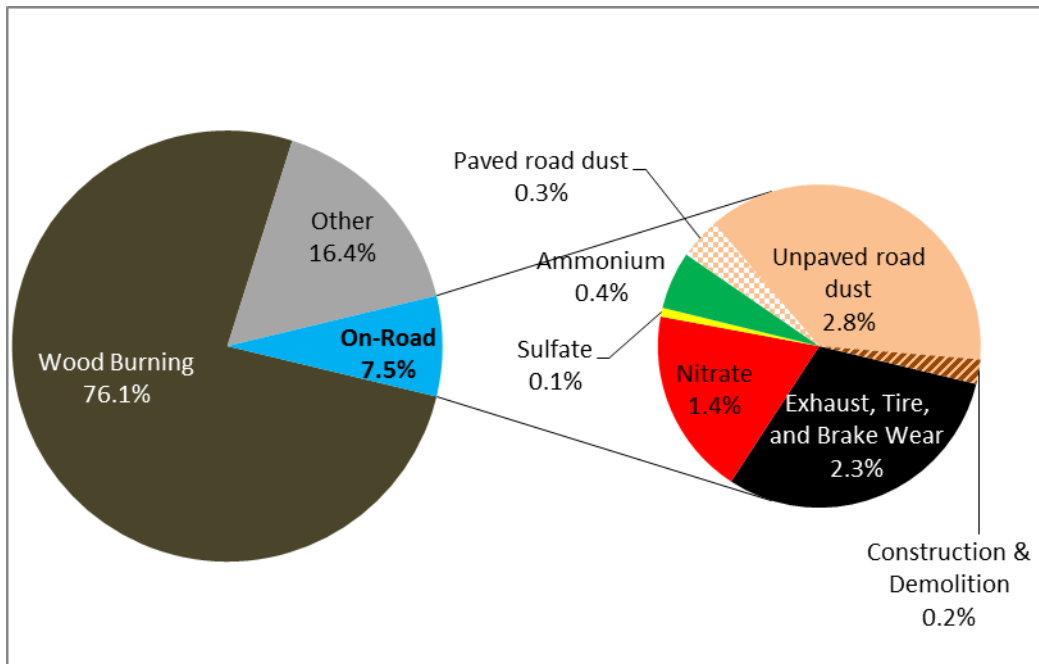
Category	Emissions		On-Road	
	Total (tpd)	% of On-Road	% of DV	ug/m3
Paved road dust	0.006	9.385	0.31	0.04
Unpaved road dust	0.055	85.077	2.82	0.39
Construction and Demolition	0.004	5.538	0.18	0.03
Total	0.065	100.000	3.32	0.46

Conclusions

Residential wood combustion is the largest source of PM2.5 in the Portola PM2.5 nonattainment area. This being the case, the attainment plan appropriately relies upon a strong wood stove change-out program to provide significant reductions in residential wood combustion emissions. On-road sources contribute about 7.52 percent or 1.05 ug/m3 of the design value (Figure 2).

The analysis presented in this chapter demonstrates that emissions from motor vehicles are insignificant contributors to the Portola nonattainment area's air quality problem and, therefore, should not be considered in regional emission analysis requirements. However, the reductions from PM2.5 on-road exhaust, tire, and brake wear emissions are factored into the attainment demonstration providing a benefit of 0.11 ug/m3. Therefore, transportation budgets for directly emitted PM2.5 on-road exhaust, tire, and brake wear are included in the plan.

Figure 2. On-road Contribution to PM2.5 Design Value





## Appendix Q

### Open Burning Educational Materials

# VEGETATION MANAGEMENT & AIR POLLUTION REGULATIONS

## SIERRA AND PLUMAS COUNTY

### BURN DAY STATUS

#### PLUMAS COUNTY

Quincy Area (530) 283-3602

Greenville (530) 284-6520

Chester (530) 258-2588

Portola (530) 832-4528

#### SIERRA COUNTY

Sierraville (530) 994-3561

Downieville (530) 289-3662

Before you consider burning, attempt a clean approach:

- |                          |                                    |
|--------------------------|------------------------------------|
| Leaves or Pine Needles   | - Compost or Greenwaste Dropoff!   |
| Paper or Cardboard       | - Recycle!                         |
| Branches smaller than 2" | - Chip or Greenwaste Dropoff!      |
| Branches larger than 2"  | - Use for Firewood!                |
| Stumps                   | - Commercial Disposal or Grinding! |

If you burn, you must follow **ALL** of the regulations listed below or you may be fined and/or prosecuted.

It is your responsibility to know and follow the local burning regulations. If you have any questions or wish to report illegal burning call the Northern Sierra Air Quality Management District at 530-283-4654 (Quincy local number), 530-832-0102 (Portola office) or 530-274-9360 (Grass Valley main office).

### Burn Only LEGAL Materials

The **ONLY** material that can legally be burned is dry vegetation, and the use of burn barrels is prohibited (except that non-glossy paper and cardboard may be burned and barrels may be used in some very remote areas – see reverse). The vegetation must originate from the property on which you are burning and be sufficiently dry (*down and drying for at least 3 – 6 weeks*) to minimize smoke. Never burn freshly cut green vegetation. Only material that will likely burn within 24 hours may be ignited.

It is against state law and a **MISDEMEANOR** to burn ANY thing else. **SOME** of the items which are illegal to burn are plywood, cans, glass, furniture, plastics, rubber, tires, motor oil, tar paper, asphalt shingles, construction debris, Styrofoam, painted or treated lumber, insulation, paints, coatings, metals and wire. These materials emit toxic chemicals that can cause illness when burned.

### Burn Only on a Permissive Burn Day

You can only legally burn on a **PERMISSIVE BURN DAY**. Call the numbers listed above for burn day information for your area. The recorded messages at these numbers contain burn day information and important additional open burning guidelines and restrictions. The Air District asks that you limit your burning to between 9AM and 3PM, when smoke dispersion is typically best. Ignoring these recommended hours tends to generate public complaints, which will lead to an enforcement action if you are causing a smoke nuisance.

### It is ILLEGAL to Allow Your Smoke to Cause a Nuisance to Your Neighbors:

District regulations require that material be burned with a minimum of smoke. All material must be **DRY** before burning. Whenever practical, leaves and pine needles should be left on the ground for erosion control or mulch. Stack vegetation in a way that allows good airflow and try to keep dirt out of the burn pile.

Leave  
the  
Leaves!

### PERMITS for Non-Residential Burns

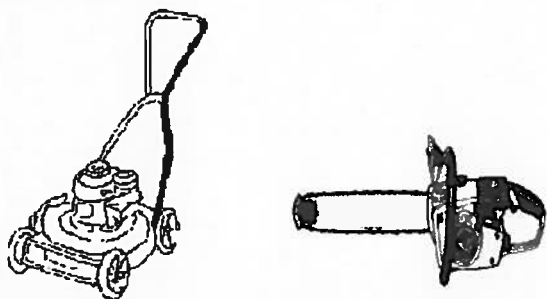
An Air Pollution Permit is required for any non-residential burn, such as for a timber harvest, a construction project, habitat management, right-of-way maintenance or an agricultural operation. If you have any doubts or questions about when you need a permit or what kind of permit you might need, please do not hesitate to call the Air District at one of the numbers listed above. Do not confuse an Air Pollution Permit with a Burn Permit issued by a local fire agency. When a Burn Permit is required by a fire agency, the Burn Day Status message (phone numbers at the top of the page) will let you know.

For additional information on composting and open burning please visit our website at [www.myairdistrict.com](http://www.myairdistrict.com).

**A Violation of Air Pollution Rules and Regulations is a Misdemeanor  
and Can Subject You to Monetary Penalties.**

## POWER EQUIPMENT

### CAN START WILDFIRES!



When grass dries out in the heat of summer, wildfires start easily. A simple spark caused by a lawnmower blade or weed-eater wire leader striking a rock, or high temperatures from mufflers or faulty spark arresters on yard equipment are enough to ignite dry grass. Restrict lawn mowing and equipment use to cooler hours when lower temperatures and higher humidity reduce the risk of starting a wildfire.

## Before You Burn, Try Alternatives First.

### 1. Composting

- A) Reduces smoke pollution
- B) Creates rich, fertile soils
- C) Reduces landfill waste
- D) Easy and effective way to dispose of leaves and pine needles

For more information on composting call your county Master Composter's program.

### 2. Chipping/Shredding

- A) An effective treatment of limbs, branches, leaves, pine needles and vegetation.
- B) Creates valuable landscaping material used for mulch and weed suppression.
- C) Chipping/shredding service may be free in some areas

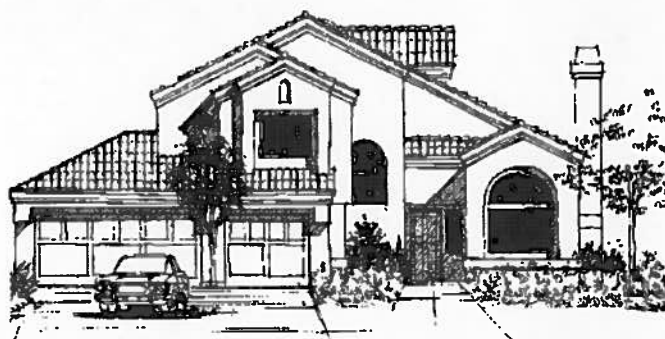
3. Greenwaste Pickup – If greenwaste pickup is not available where you live, then call your local garbage pickup company and request affordable greenwaste pickup now!

## **BURNING TIPS**

### **For your Safety and Protection**

1. **READ AND FOLLOW THE INSTRUCTIONS ON YOUR BURN PERMIT.**  
Burning may be prohibited in your local area. Please check with the local Air Pollution Control District and your Fire Chief before burning.
2. **BURN ONLY IN A FIRE SAFE LOCATION.**  
Make sure the ground is cleared of all flammable material for at least 10 feet around burn pile.
3. **ALWAYS HAVE WATER OR A GARDEN HOSE AVAILABLE WHILE BURNING.**

## Make Your Home Fire Safe



Millions of Californians live in residential developments that border fire-prone wildlands. Each year, hundreds of homes in these "suburban" and rural areas are lost to wildfire outbreaks. According to CalFire, homeowners can substantially increase the chance of their home surviving a wildfire by following these fire safe practices:

- A. Maintain a "defensible" space around your home by clearing all flammable vegetation a minimum of 100 feet around the structure. Clear dead leaves and branches to leave widely spaced ornamental shrubbery and trees.
- B. Clean all needles and leaves from the roof, eaves and rain gutters.
- C. Trim treelimits within 10 feet of your chimney and trim all dead limbs hanging over your house or garage.
- D. Cover your chimney outlet or flue with a spark arresting ½" mesh screen.
- E. Make sure your address is clearly visible for easy identification in an emergency.
- F. Make sure your home is located near a fire hydrant, or that you have a water storage supply of at least 2,500 gallons for use in emergency situations.
- G. Stack woodpiles at least 30 feet from buildings, fences and other combustible materials.
- H. Clear all vegetation and other flammable materials from beneath your deck. Enclose undersides of elevated decks with fire resistive materials.

For more information, contact your local CalFire office or local fire department.

## **BURN BARRELS AND PAPER-BURNING BANNED**

**The use of burn barrels and the burning of paper for disposal are PROHIBITED in Chester, Quincy, Greenville, Bucks Lake, Taylorsville, Beckwourth, Portola, Loyaltton, Downieville, Sierraville, Sierra City, Goodyears Bar, Sattley, Sierra Brooks, Calpine, and most of Sierra and Plumas Counties.**

In remote portions of the following zip code areas with fewer than 3 people per square mile, burn barrels may still be used and dry, non-glossy paper may be burned:  
Plumas County -- 95915, 95981, 96105 and 96129.  
Sierra County -- 95910, 95922, 95944, 96105, 96125 and 96126. Visit [www.myairdistrict.com](http://www.myairdistrict.com) or call 283-4654 (Quincy), 832-0102 (Portola office) or 274-9360 (Grass Valley office) to find out if you live in one of these exempt remote areas.

200 Litton Drive, Suite 320/P.O. Box 2509  
Grass Valley, CA 95945  
(530) 274-9360/FAX (530) 274-7546

**BEFORE YOU BURN...IS IT A BURN DAY?**

Don't forget that year-round, one must check to see if it is a Permissive Burn Day or a No-Burn Day before igniting that burn pile. A quick call to one of the Burn Day information numbers is all it takes to find out if and when it's OK to burn...and remain in compliance with state law.

Whether it's a Permissive Burn Day or a No-Burn Day is determined by the California Air Resources Board (ARB) in Sacramento. The ARB Meteorology Section considers factors related to the ability of smoke from open burning to rise and disperse adequately. These factors include surface and upper-air temperatures and wind velocities, relative humidity, and anticipated forecast changes. For example, the presence of a strong temperature inversion is likely to result in a No-Burn Day determination. The ability of smoke from open burning to rise and disperse adequately depends largely upon atmospheric stability at any given time and the influence of surrounding terrain.

However, the Burn Day determination doesn't necessarily end with ARB. If the fire danger is high, which sometimes is the case in late spring and early fall, the California Department of Forestry (CDF) may ask local Air Quality Districts to restrict open burning hours. And, during the summer, CDF calls for a total ban on open burning. Local Air Quality Districts may also restrict open burning on days ARB designates Permissive Burn Days if local conditions warrant (e.g., pre-existing poor air quality). Please call your nearby Burn Day information number before igniting your burn pile:

Higgins Corner.....268-1023  
City of Grass Valley...272-2465  
Grass Valley Area.....274-7928  
Downieville.....289-3662  
Truckee.....582-1027

Quincy.....283-3602  
Chester.....258-2588  
Greenville...284-6520  
Sierraville...994-3561

Even on a permissive burn day, please use good judgement before igniting a burn pile. Allow wet material to dry thoroughly; burning dry material creates less smoke. Consider terrain; if you are in a valley or box canyon and calm conditions prevent good smoke dispersion, postpone burning to a day with better breezes. If schools, hospitals, medical clinics, senior citizens, homes, etc., are nearby, do not burn unless smoke will be blown away from them.

**Remember. Permissive Burn Day status DOES NOT relieve your responsibility to burn in a manner consistent with preserving the public health.** Complying with Burn Day requirements, proper burning management, and not burning prohibited materials will minimize smoke impacts upon your neighbors, assure that toxic air pollutants are not emitted, and prevent violation of air quality regulations. The Northern Sierra Air Quality Management District encourages anyone needing assistance or having questions regarding proper open burning to call 274-9360 (Grass Valley office) or 283-4654 (Quincy office) or 550-7872 (Truckee office).

# RECIPE FOR STARTING YOUR OWN COMPOST

## EASY AS 1 - 2- 3

*Community Vegetation Management Program*

### 1. CHOP - CHIP - SHRED - MOW

Stockpile a supply (enough to form a 3' X 3' X 3' foot cube) of organic materials that are either chopped, chipped, shredded or mown into small particles (6" pieces or less).

### 2. LAYER - MIX - BROWNS - GREENS

Layer 4-6 inch equal amounts of "GREEN" (fresh or green) and "BROWN" (dead or dry) organic materials. Mix the two layers together with a pitchfork or shovel after every layer of brown and green. Continue layering and mixing until you've built a 3' X 3' X 3' pile (one cubic yard). This is the minimum size necessary to retain moisture and heat. Any kitchen waste should always be buried in the pile and not left on top.

### 3. TURN - WATER LAYERS - WAIT

Water your pile throughout your layering so that your compost is the consistency of a "wrung-out sponge". Turn your pile often if you want your compost to be available quicker. OR just let the bacteria and worms do all the work and gather your finished, organically rich compost in about 4-5 months!

DO COMPOST	DON'T COMPOST
manure (horse, cow, sheep, poultry)	meat, bones or fish
fruit and vegetable trimmings	dairy products or grease
coffee and tea grounds (including filters)	butter
paper napkins, towels	any other animal products
egg shells	chemically treated wood
leaves and pine needles	weeds that have gone to seed
grass clippings	invasive weeds
small wood chips or sawdust	diseased or poisonous plants
weeds that have not gone to seed	human, dog, or cat wastes
wood ash (in small quantities)	grains, beans or breads (in open piles/simple bins)

## Commonly Asked Questions

### When is My Compost Finished?

Your compost will be dark in color and have an earthy smell. It will also be difficult to recognize any of the ingredients. However, it is quite subjective...it is fine to use compost that still has a few recognizable items - it will finish rotting in the soil.

### How Can I Use My Finished Compost?

Compost can be used on gardens, lawns, landscapes and houseplants as a soil amendment (by digging some directly into the soil) or as mulch (adding a layer to the top of the soil) to protect the soil from erosion and help retain moisture.

### How Does Compost Benefit the Soil?

Compost does many things that synthetic fertilizers can't do. First, it adds organic matter. In clay soils compost helps to add porosity to the soil, making it drain more quickly so that it doesn't stay waterlogged and doesn't dry out into a bricklike substance. Compost also inoculates the soil with vast numbers of beneficial microbes (bacteria, fungi, etc.) and the habitat that the microbes need to live. These microbes extract the nutrients from the mineral part of the soil and eventually pass the nutrients on to plants.

### How Do I Keep Pests Out of My Compost Pile?

First, don't put any meat, bones or other animal products in your compost. Next, you may choose not to put any kitchen scraps in your pile, or bury your vegetable and fruit trimmings in the middle of the pile. Lastly, a tight-fitting lid will assist in keeping out rodents and other critters.

#### *Other ways to reduce organic waste:*

*In addition to composting, you can also help reduce organic waste by grasscycling, (leaving grass clippings on the lawn when you mow) vermiculture (worm composting), and/or chipping large wood pieces into mulch or compost materials.*

*For more information on these topics, please contact the Community Vegetation Management Program at Northern Sierra Air Quality Management District Office 274-9360.*

# Burning Garbage Makes Us



## Sick!



It is **ILLEGAL** for residents in Nevada County to burn the following materials:

### HOUSEHOLD TRASH

TIRES  
PLASTICS  
FURNITURE  
BOTTLES/GLASS  
COATED/GLOSSY PAPER  
DIAPERS

### CONSTRUCTION MATERIAL

METAL  
PVC PIPE  
PLYWOOD  
TREATED/PAINTED WOOD  
PETROLEUM WASTES  
TAR

### OR ANY OTHER GARBAGE

The burning of garbage can cause **TOXIC** emissions which can devastate not only your health, but also the health of anyone who is downwind from your prohibited burn pile. It is a violation of California State Law to burn any prohibited materials, and will result in penalties.

### What Can I Burn?

The **ONLY** material you can legally burn is dry vegetation such as brush, limbs and branches. However, you must burn these materials efficiently, with a minimum amount of smoke. It is **ILLEGAL** to create a smoke nuisance by burning wet material or by *not* practicing proper burn management techniques (smoldering piles).

### Alternatives to Burning

- 1) Chipping/Shredding
- 2) Composting
- 3) Landfill Disposal



If you must burn, you are required to:

- ◆ **BURN ONLY ON A PERMISSIVE BURN DAY:** call your local burn day recorder before you light a fire, **EVERY TIME!**

*Nevada City* 274-7928  
*Grass Valley* 268-1023

*Truckee* 582-1027  
*Downieville* 289-3662

If you have questions about District Rules and Regulations concerning outdoor burning, please call **The Northern Sierra Air Quality Management District at 274-9360**

## Why Is Burning Garbage Unhealthy and Dangerous?

The burning of garbage such as cans, glass, plastics, rubber, Styrofoam and other household materials can cause toxic emissions which can devastate not only your health, but also the health of your neighbors. It is illegal to burn any of these materials in an open burn pile and *extremely unhealthy* to burn them in a fireplace or wood stove.

Some of the hazardous substances that are emitted into the ambient air and neighborhood when you burn trash include: phenol, naphthalene, chlorobenzenes and polychlorobenzenes, dioxins and furans, polychlorinated biphenyls (PCB's), and assorted aldehydes, ketones and heavy metals. These substances are known to cause cancers, learning disabilities, breathing difficulty, kidney and liver damage, lack of coordination, immune system malfunctions and/or impaired brain development among children, in addition to other afflictions.

Some of the heavy metals, including mercury, and other toxic substances that are liberated during the burning of trash do not become transported in the smoke but remain in the ashes. When it rains, these substances are slowly washed into nearby waterways and into groundwater. Some of these contaminants persist for many years and can damage aquatic organisms and appear in drinking water wells, and even in garden vegetables.

Ozone (O<sub>3</sub>), another air pollutant, is a secondary product of combustion; burning releases volatile organic chemicals (VOC's) and oxides of nitrogen (NOX) which react in the presence of sunlight to create ozone. Ozone is a powerful oxidizing substance that can cause and contribute to a variety of health problems and has been shown to actually impair lung development in children. Western Nevada County has among the highest 24-hour ozone levels in the State, and will soon be officially designated as exceeding the national ambient air quality standards for ozone. This can result in a loss of federal highway dollars and a tightening of some of the laws that regulate businesses, among other costly sanctions.

The people most severely affected by air pollution include the elderly, people with existing health conditions such as damaged lungs and heart problems, individuals who work or exercise outdoors, and children.

**To report illegal burning or a smoke nuisance, or to ask questions concerning alternatives to burning, please call The Northern Sierra Air Quality Management District at (530) 274-9360**

**Please recycle your garbage today!**







## **BURNING GARBAGE IS A CRIME**



The Northern Sierra Air Quality Management District cautions residents that burning garbage is a violation of enforceable State, County, and District laws. Civil penalties can cost the violating party or property owner \$250 or more for the first offense, depending on the nature of the violation.

Prohibited materials include, but are not limited to: garbage, paper and cardboard, tires, construction materials, plastics, bedding or furniture, paint, rubber, petroleum products, Styrofoam and similar items.

The smoke and ash from burning illegal materials produces a number of toxic air pollutants. Among the most harmful are dioxins, which have been identified as dangerously carcinogenic air pollutants by the California Air Resources Board and the U.S. Environmental Protection Agency.

Toxic emissions can have an immediate effect not only on your health, but also on the health of your neighbors. Burning garbage in a fireplace or woodstove can also be hazardous to your health. Infants and children exposed to toxic air pollutants can experience increased lifetime cancer risk. Exposure to toxic fumes has been associated with respiratory problems and impaired development of lung and brain tissue.



Household garbage must be disposed of properly through curbside pickup or hauling to a transfer station or recycling center.



Additionally, as of January 1st, 2004, State law prohibited the use of burn barrels for residential open burning. That means any burning, of any material, in a burn barrel is a violation of the law.

**BURN ONLY ON A PERMISSIVE BURN DAY. Call your local burn day recorder before you light a fire, EVERY TIME!**

To report garbage burning or a smoke nuisance, call the Air District at: (530) 274-9360