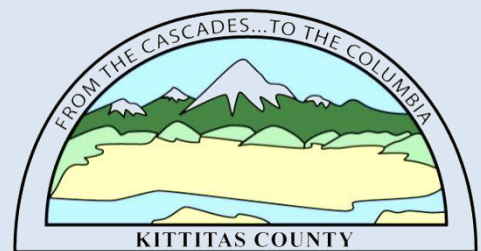


Kittitas County

PM Advance Program: Path Forward Plan



March, 2017



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Kittitas County, Washington

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Last Updated: March 29th, 2017

Acknowledgements

Months of planning went into this project and this would not have been possible without the help and support of the community of Kittitas County. Special thanks go to the Washington State Department of Ecology, particularly the Air Quality division in the Central Regional Office for providing funding and technical assistance for our air quality improvement projects. The Advisory Committee members also deserve recognition for the hours they've donated in service to their community. Lastly thanks to the United States Environmental Protection Agency for continuing to protect the nation's air quality and for sponsoring this program.



Kittitas County, Washington

Air Quality Advisory Committee

March 10, 2017

Advance Program
c/o Laura Bunte
U.S. Environmental Protection Agency



Dear Ms. Bunte,

We are writing in support of the Kittitas County PM Advance Program: Path Forward Plan.

As the Kittitas County Air Quality Advisory Committee, we are committed in improving air quality for all Kittitas County residents. The programs and measure outlined in the PM Advance plan are critical for improving Kittitas County's outdoor ambient air quality in regards to fine particulate matter. Continued sustainable fine particulate emission reduction efforts will assist Kittitas County in avoiding non-attainment and reduce the frequency of violations of the National Ambient Air Quality Standards established in the Clean Air Act.

The Kittitas County Path Forward Plan focuses on voluntary measures to expand knowledge of local air quality, clean and efficient wood stove use and local wood stove change-out programs. It is in the best interests of all our county residents to reduce the level of fine particulates to avoid significant health impacts.

In conclusion, we, the Kittitas County Air Quality Advisory Committee members strongly support this document and will assist with implementation programs and projects outline therein.

Thank you for allowing Kittitas County to join the PM Advance Program and for your continued efforts to improve air quality across the United States.

Sincerely,

Andrew Lyons
HopeSource

Kirstin Taggart
Washington Resource
Conservation and
Development

Anne Johansen, PhD
Central Washington University

Mark Larson, MD
Kittitas Valley Healthcare

Bill Hansen
Chamber of Commerce

Josh Hink
Kittitas County Fire
Marshals

Jordan Lowe
HopeSource

Rose Shriner
Kittitas County
Conservation
District

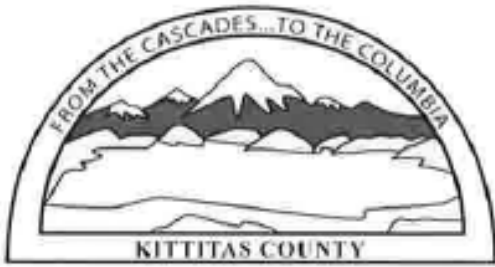
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Kittitas County, Washington

BOARD OF COUNTY COMMISSIONERS

District One
Paul Jewell

District Two
Laura Osiadacz

District Three
Obie O'Brien

March 27, 2017

Advance Program
c/o Laura Bunte
U.S. Environmental Protection Agency

Dear Ms. Bunte,

We are writing in support of the Kittitas County PM Advance Program: Path Forward Plan.

As the Kittitas County Board of County Commissioners, we are committed in improving air quality for all Kittitas County residents. The programs and measure outlined in the PM Advance plan are critical for improving Kittitas County's outdoor ambient air quality in regarding fine particulate matter. Continued sustainable fine particulate emission reduction efforts will assist Kittitas County in avoiding non-attainment and reduce the frequency of violations of the National Ambient Air Quality Standards established in the Clean Air Act.

The Kittitas County Path Forward Plan focuses on voluntary measures to expand knowledge of local air quality, clean and efficient wood stove use and local wood stove change-out programs. It is in the best interests of all our county residents to reduce the level of fine particulates to avoid health impacts.

In conclusion, we, the Kittitas County Board of County Commissioners members support this document and the plan for implementation of the programs and projects outlined therein.

Thank you for allowing Kittitas County to join the PM Advance Program and for your continued efforts to improve air quality across the United States.

Sincerely,

Paul Jewell, Chair

Laura Osiadacz, Vice Chair

Obie O'Brien, Commissioner



BOARD OF HEALTH

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Paul Jewell

District Two
Laura Osiadacz

District Three
Obie O'Brien Rich Elliott Dr. John Asriel

March 16, 2017

Advance Program
c/o Laura Bunte
U.S. Environmental Protection Agency

Dear Ms. Bunte,

We are writing in support of the Kittitas County PM Advance Program: Path Forward Plan.

As the Kittitas County Board of Health, we are committed in improving air quality for all Kittitas County residents. The programs and measure outlined in the PM Advance plan are critical for improving Kittitas County's outdoor ambient air quality in regarding fine particulate matter. Continued sustainable fine particulate emission reduction efforts will assist Kittitas County in avoiding non-attainment and reduce the frequency of violations of the National Ambient Air Quality Standards established in the Clean Air Act.

The Kittitas County Path Forward Plan focuses on voluntary measures to expand knowledge of local air quality, clean and efficient wood stove use and local wood stove change-out programs. It is in the best interests of all our county residents to reduce the level of fine particulates to avoid health impacts.

In conclusion, we, the Kittitas County Board of Health members support this document and the plan for implementation of the programs and projects outlined therein.

Thank you for allowing Kittitas County to join the PM Advance Program and for your continued efforts to improve air quality across the United States.

Sincerely,

Paul Jewell, Chair

Laura Osiadacz, member

Dr. John Asriel, member

Obie O'Brien, member

Rich Elliott, member

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Executive Summary

Kittitas County is a rural community in central Washington State that struggles with poor air quality. The geography of the county, along with a culture of indoor and outdoor burning, leads to unhealthy ambient air conditions during the winter months. Nestled along the eastern slopes of the Cascade Mountains, the air shed's stagnant weather conditions and air inversion events trap harmful pollutants in the lower atmosphere, often for multiple days at a time. During these times, the air monitors located in Kittitas County report some of the worst air quality in Washington State for fine particulate matter (PM_{2.5}). Unhealthy air quality can adversely impact the health of the community, especially among sensitive populations such as pregnant women, children and the elderly. PM_{2.5} is especially harmful due to its small size as it easily enters lung tissue. Prolonged exposure to high levels of PM_{2.5} can cause premature death and impaired lung development in infants and children and can increase the risk of heart attacks, stroke and respiratory illness in adults and the elderly.

In addition to detrimental health effects, declining air quality conditions have placed Kittitas County in danger of violating federal ambient air quality standards set by the United States Environmental Protection Agency (EPA). Continued violations could cause the EPA to issue a non-attainment designation to Kittitas County, imposing costly federal and state regulatory action which could negatively impact the economics of Kittitas County.

In an effort to avoid non-attainment and protect the health of Kittitas County's citizens, Kittitas County joined the EPA's PM Advance program. This program encourages communities at risk of non-attainment to take proactive efforts to improve air quality before a non-attainment designation is issued. This Path Forward Plan outlines the voluntary measures Kittitas County has adopted through the Kittitas County Public Health Department and the Kittitas County Air Quality Advisory Committee and how these efforts will educate and influence the public to limit harmful particulate emissions.

Sign Up Letter



To Protect and Promote the Health and the Environment of the People of Kittitas County

August 30th, 2016

Advance Program
c/o Laura Bunte
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards, C304-01
Research Triangle Park, NC 27711

Dear Ms. Bunte:

The Kittitas County Public Health Department (KCPHD) intends to participate in the PM Advance program with respect to Kittitas County, Washington. We have partnered with the Washington State Department of Ecology's (Ecology) Air Quality Program and the Kittitas County Air Quality Advisory Committee consisting of representatives from Kittitas County Solid Waste, HopeSource (local non-profit), Ecology, Central Washington University Chemistry and Sociology Departments, Kittitas Valley Fire and Rescue as well as local businesses and realtors. In addition, we now wish to partner with the Environmental Protection Agency to improve air quality in Kittitas County, Washington. We meet program eligibility based on the following criteria:

1. Kittitas County is not currently designated a nonattainment area for fine particulate matter (PM_{2.5}) according to 2012 National Ambient Air Quality Standards (NAAQS).
2. The entire county of Kittitas is proposed for enrollment. Kittitas County has 43,269 residents in an area of 2,333 square miles. It includes the cities of Ellensburg (county seat with ~20,000 residents), Cle Elum, South Cle Elum, Roslyn, and Kittitas, as well as the unincorporated communities of Thorp, Easton, Ronald, Snoqualmie Pass, and Vantage. Ellensburg is also home to Central Washington University, with approximately 10,000 students. Geographically, it is located east of the Cascade Mountain range, centered by a NW-SE oriented valley where atmospheric inversion layers are common during cold winter months. This region is a semi-arid shrub-steppe ecosystem.
3. Kittitas County currently hosts two co-located PM_{2.5} air monitors at the Hal Holmes Community Center in Ellensburg. A nephelometer, owned and maintained by Ecology, was supplemented in fall 2014 with a Federal Equivalent Monitor, also owned and maintained by Ecology, to start "official" data collection to establish attainment or non-attainment designation in the following three years. Two portable indoor air monitors, obtained through federal grant funding for the Public Health Emergency Preparedness and Response program, are available at the Kittitas County Public Health Department as needed for



To Protect and Promote the Health and the Environment of the People of Kittitas County

emergency situations. In addition, one nephelometer and two personal black carbon (BC) monitors have been acquired by Central Washington University with funds from Ecology, for mobile monitoring studies. Besides PM_{2.5} and sporadic BC measurements, no other air monitoring is underway.

4. Kittitas County has submitted all required reports for the National Emissions Inventory through Ecology. Documentation can be requested from the Air Quality Section Manager for Ecology's Central Regional Office, Susan Billings, (509) 575-2486, susan.billings@ecy.wa.gov or found at: <http://www.ecy.wa.gov/programs/air/EmissionInventory/AirEmissionInventory.htm>.

Efforts supported by the PM Advance program in Kittitas County would help to:

- Reduce the level of PM_{2.5}, including air pollutants
- Maintain air quality levels in accordance with NAAQS
- Avoid future violations of NAAQS that could lead to future nonattainment
- Increase public awareness about PM_{2.5} as an air pollutant
- Promote public participation in preserving healthy air quality

Our goal is to implement new measures and programs, reduce particulate matter levels in Kittitas County, Washington and to continue existing messaging and outreach to community residents. It is in our best interest to work with our stakeholders and the public to achieve this goal.

Please contact me via email at kimberly.sarver@co.kittitas.wa.us or by phone at (509) 962-7680 if you have any questions.

Sincerely,

Kimberly Sarver
Environmental Health
Specialist
Kittitas County Public Health
Department

Holly Myers
Environmental Health
Supervisor
Kittitas County Public Health
Department

Obie O'Brien,
Chairman
Kittitas County Board of
County Commissioners

CC: Christi Duboiski, EPA PM Advance Program



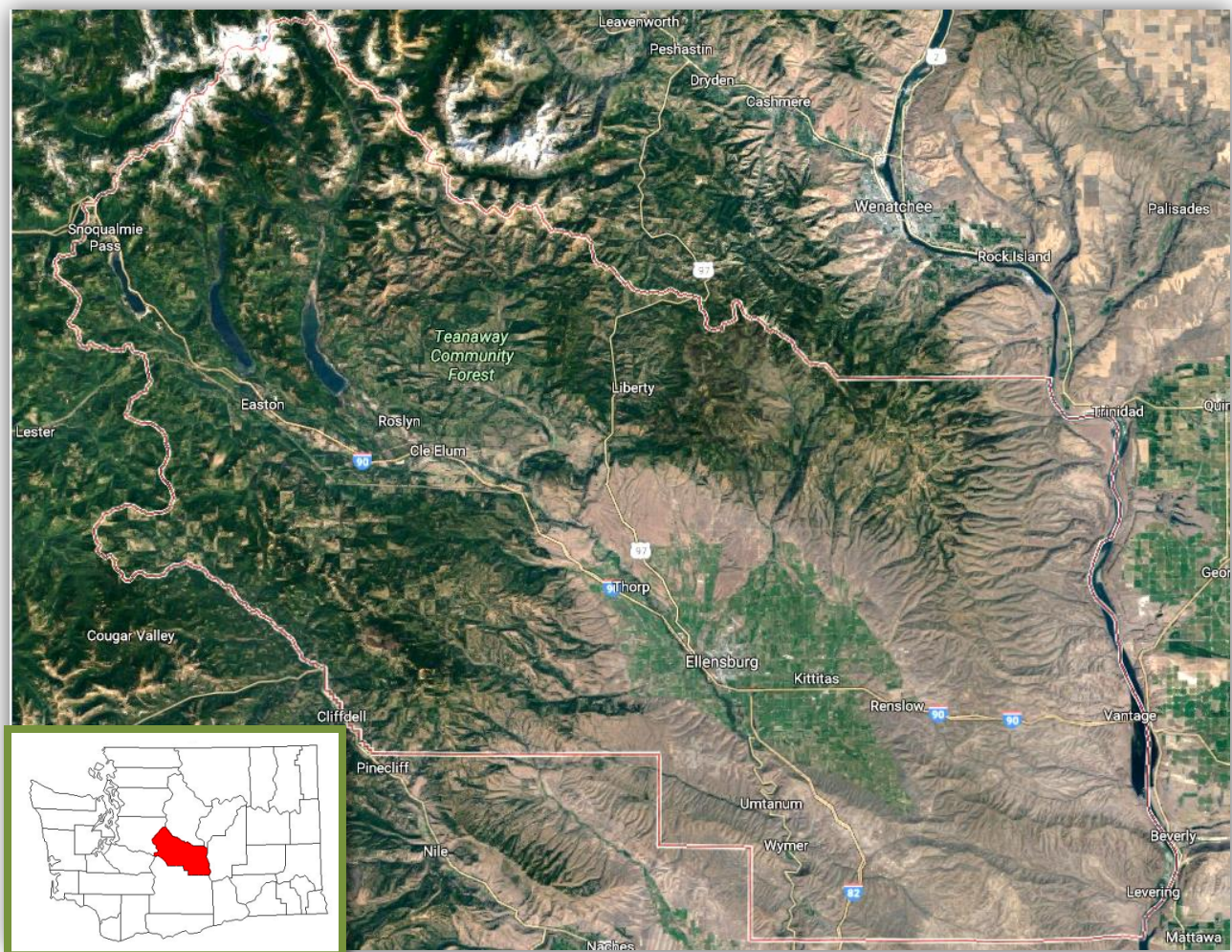
507 N. Nanum Street, St. 102 - Ellensburg, WA 98926
T: 509.962.7515 - F: 509.962.7581
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Background

Geography

Kittitas County is a rural area located in the center of Washington State along the eastern slopes of the Cascade Mountain Range. The county encompasses 2,333 square miles, stretching from the top of Snoqualmie Pass down to the Columbia River, and is home to approximately 41,000 people (US Census, 2010). Geographically, Kittitas County is one of the largest counties in Washington State. However, over two-thirds of the area is hilly and mountainous, leading to a sparse population of 17.8 persons per square mile in 2010, (Meseck, 2016). Convenient access to state and federal forest lands, with the purchase of a permit, provides residents with an inexpensive source of fuel for heating.

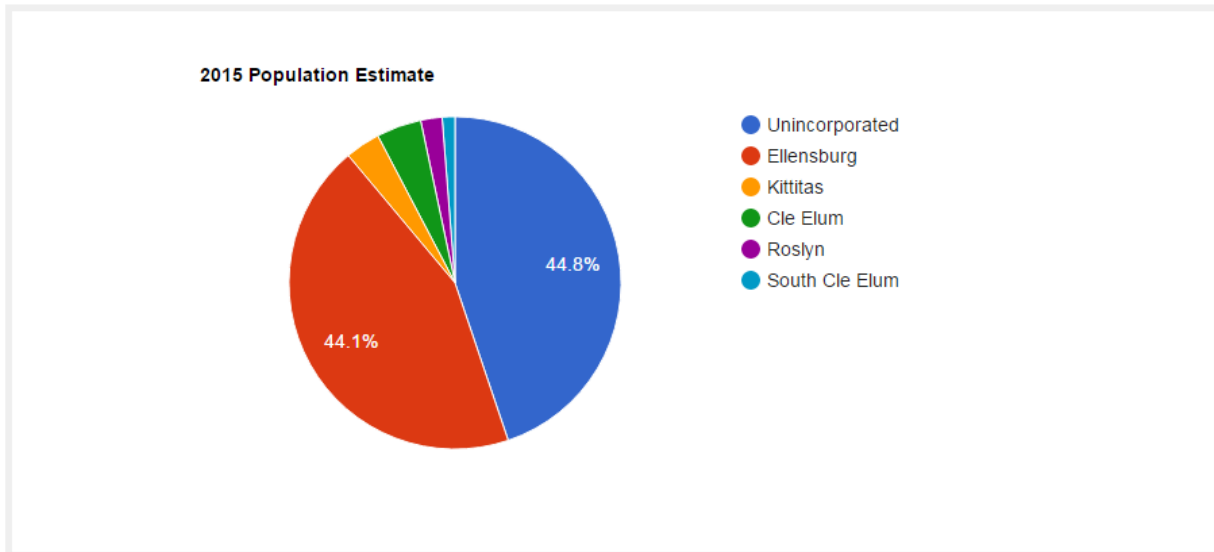
Figure 1: Kittitas County Topography



The county is commonly divided into two sectors for discussion purposes, upper and lower county. Upper county extends to the west from Thorp to Snoqualmie Pass. Lower county stretches east from Thorp to Vantage. Ellensburg is the County Seat and resides in lower county along with Kittitas, Vantage and Thorp. Upper county communities include Cle Elum, South Cle Elum, Roslyn, Easton, Ronald, Liberty and Snoqualmie Pass. The majority of the population lives in Ellensburg or unincorporated communities, (County 2015).

Figure 2: County Population Distribution

County Population



Source: US Census Bureau

Current Estimates

Municipality	Census Estimates					
	2010	2011	2012	2013	2014	2015
Kittitas County	40,915	41,300	41,500	41,900	42,100	42,670
Unincorporated	18,063	18,315	18,440	18,785	18,890	19,120
Incorporated	22,852	22,985	23,060	23,115	23,210	23,550
Cle Elum	1,872	1,875	1,865	1,870	1,870	1,865
Ellensburg	18,174	18,250	18,320	18,370	18,440	18,810
Kittitas	1,381	1,430	1,450	1,450	1,475	1,455
Roslyn	893	895	895	895	895	890
South Cle Elum	532	535	530	530	530	530

Source: Office of Financial Management, State of Washington

Population by Decennial Census: 1900-2010

	United States	Washington State	Kittitas County
2010	308,745,538	6,724,540	40,915
2000	281,421,906	5,894,121	33,362
1990	248,709,873	4,866,692	26,725
1980	226,545,805	4,132,156	24,877
1970	203,211,926	3,409,169	25,039
1960	179,323,175	2,853,214	20,467
1950	151,325,798	2,378,963	20,230
1930	123,202,624	1,563,396	18,154
1920	106,021,537	1,356,621	17,737
1910	92,228,496	1,141,990	18,561
1900	76,212,168	518,103	9,704

Source: US Census Bureau

History

The Kittitas valley was a traditional gathering place for Native American tribes, who grazed their horses on the lush grass and dug for camas and kouse roots. White cattle ranchers settled the area in the early 1800's and the Treaty of 1855 resulted in tribes moving to the Yakama and Colville Reservations, (Kittitas County History, 2017).

White settlers engaged in agricultural activities, particularly raising herds of cattle and horses, (Meseck, 2016). Upper Kittitas County expanded through booming mining districts. Railroads promoted transportation of hay and cattle, and led to expansion of irrigation projects which further expanded the farming community. The Homestead Act of 1862 prompted heavy migration into the county, turning tiny mining and farming communities into bustling towns (Kittitas County History, 2017). In 1883 the Washington Territorial Legislature split the area and recognized the northern portion as Kittitas County, (Meseck, 2016).

Declining beef prices, severe winters and overgrazing took its toll on the range, prompting the federal government to regulate grazing in 1897, which pushed the community to the hay-production industry of today. Hay was sold to Seattle, Tacoma and other Puget Sound communities needing thousands of tons of hay to feed work-horses for the state's lumber and mining companies (Kittitas County History, 2017).

Demographics

Modern day Kittitas County remains dedicated to agriculture with a large farming community and continues to be known for lush hay and roaming cattle. Today, hay production nets more than \$50 million annually for Kittitas County farmers. Almost 90% of the hay produced is exported overseas with Japan as the largest export customer, (Meseck, 2016).

Kittitas County is most famous for the Ellensburg Rodeo and Kittitas County Fair, which began in 1885. Competitors and rodeo enthusiasts travel from all corners of Washington State to watch the show (Kittitas County History, 2017).

Central Washington University (CWU) was founded in 1891 and is located in Ellensburg. The university is home to over 10,000 students and is rapidly expanding with a 15 to 20% increase in first year students each year. Kittitas County is a popular destination for outdoor enthusiasts needing a break from the hustle and bustle of the metropolitan Puget Sound area (History, 2006).

The residents of Kittitas County are primarily white with a small population of Hispanics and Latinos representing 7.6%. Almost a quarter of the population lives below the poverty line and the median household income is \$41,232 (US Census, 2010). The rural, low income population of Kittitas County greatly affects the types of air pollutants emitted.

Air Quality

Weather Conditions

The unique geography of the Kittitas Valley creates optimal conditions for long periods of high pressure during the winter months, resulting in lengthy air inversions. When air inversion events occur during the home heating season, pollutants emitted into the lower atmosphere are trapped, exposing residents to unhealthy air, often for weeks at a time (Fuller et al, 2015). Fine particle air pollution in the Ellensburg area reaches unhealthy levels multiple times each winter and air conditions are often unhealthy for sensitive groups.

Figure 3: A View of Ellensburg - Winter versus Summer

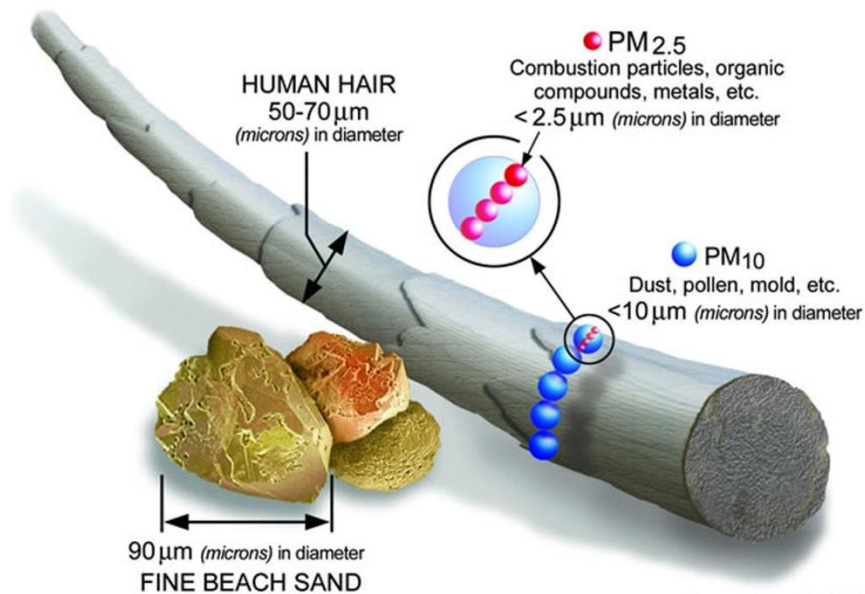


An Overview of PM_{2.5}

Fine particulate matter (PM_{2.5}), is a mixture of solids and liquid droplets floating in the air that are 2.5 micrometers or less in diameter. PM_{2.5} is smaller than the width of a human hair. Children, elderly adults and people with heart or lung diseases are most likely to be affected by particle pollution exposure, however even healthy adults may experience temporary negative symptoms when exposed to high levels. Health issues include irritation of the eyes, nose and throat, coughing, chest tightness, shortness of breath, reduced lung function, irregular heartbeat, asthma attacks, heart attacks and premature death in people with heart or lung disease (Fuller et al, 2015).

In the environment particle pollution can reduce visibility and create haze, stain and damage buildings and statues, increase acidity in water bodies or change the flow of nutrients and even deplete soil or damage forests and crops. PM_{2.5} is produced from all types of combustion including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning and some industrial processes (Particle Pollution, 2017).

Figure 4: Particle Pollution Diagram



National Ambient Air Quality Standards

The Clean Air Act, ratified in 1970, requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The act identifies two types of national ambient air quality standards. Primary standards provide public health protection while secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals,

crops, vegetation, and buildings. NAAQS are set for six principal pollutants, called "criteria" air pollutants. NAAQS are reviewed and revised periodically, (NAAQS, 2016). The current standards for particulate matter were revised in 2013 and are listed below.

Table 1: National Ambient Air Quality Standards for Particulate Matter

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Particle Pollution (PM)	PM _{2.5}	primary	1 year	12.0 µg/m ³	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m ³	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years

Air Quality in Kittitas County

Between 2007 and 2013, the number of days with unhealthy fine particle pollution levels dramatically increased in Kittitas County, indicating a dangerous trend. During the winter home heating season, air quality readings from the monitoring station in Ellensburg reports one of the highest levels of PM_{2.5} air pollution in the state. In addition, the number of large area wildfires increased between 2011 and 2015, adding to public health risks associated with ongoing PM_{2.5} pollution. Even without the contributions from wildfires, the numbers continue to rise, inviting a closer look at what is contributing to this steady increase in PM_{2.5}.

Monitoring data between 2014 and 2016 showed a decrease in the number of poor air quality days. However, due to mild winters and monitoring equipment failures the resulting data may not be reliable or statistically significant. A future analysis of data from the winter of 2016 to 2017 should provide a better indication of the true air quality trends in Kittitas County.

Figure 5: Days Over 20ug/m³ PM_{2.5}

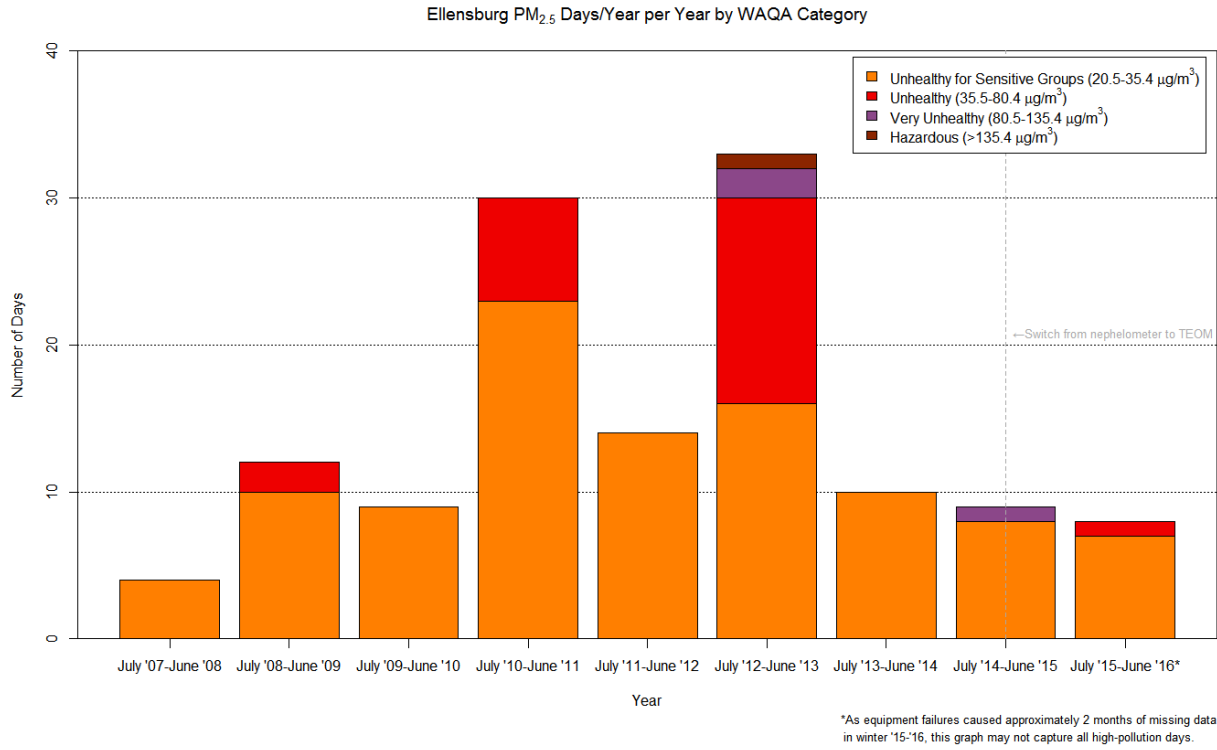
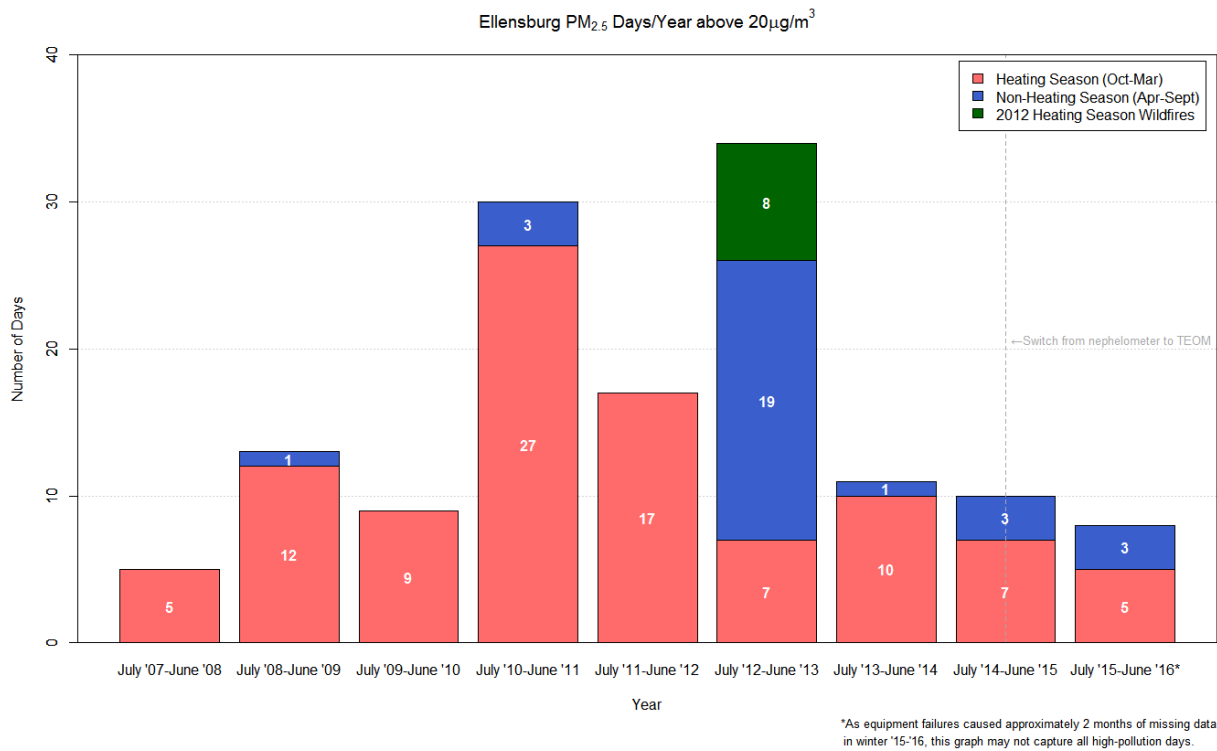


Figure 6: Days Over 20ug/m³ PM_{2.5} by Heating Season



If poor air quality conditions continue or decline further, Kittitas County could be designated as a non-attainment area by the EPA, requiring costly regulatory measures and potentially causing economic hardship within the community. As it currently stands, the combined impact on health and the environment is already costing the community. In a 2009 report, Washington State Department of Ecology (ECY) created a model for estimating health and economic impacts of fine particle pollution in Washington, (Health Effects, 2009). ECY’s model estimates that the direct and indirect costs associated with fine particle pollution in Kittitas County exceed \$1 million each year.

The increase in poor air quality days raises concerns regarding respiratory impacts and potential health risks. Kittitas County consistently has higher mortality rates for influenza and pneumonia compared to the rest of the state, although in recent years, this difference is not statistically significant, (Death Certificate Data, 2006-2015) While we have yet to determine the cause of this, the statistic draws concern regarding respiratory impacts related to poor air quality.

In 2012, the Kittitas County Public Health Department (KCPHD) assessed the community for health impacts and identified that the number of poor air quality days in Kittitas County was 1.5% higher than for the rest of Washington State (Read, 2012). However, at the time funding was not available to further assess or remedy the issue.

Table 2: 2012 Community Health Assessment

Category	Health Indicator	Kittitas County	Washington State	United States	Target	
Environmental Quality	Air	Percent of days with unhealthy air quality ^{23,24}	1.9%	0.4%	n/a	0.4%
	Water	Percent of stream sections with high levels of fecal coliforms and without a pollution control plan in place ²⁵	17.8%	52.7%	n/a	16.0%
	Food Safety	Percent of routine food establishment inspections with significant violations ^{26,27}	1.2%	5.0%	n/a	1.1%

ECY emissions inventory data from 2011, partially updated with 2014 data, estimate residential wood burning is the largest source of PM_{2.5} emissions during the winter months at 32% of winter emissions. Summer PM_{2.5} emissions are estimated to be primarily from road dust at 27%. Spring and Fall PM_{2.5} emissions are dominated by residential wood combustion at 20% and 21% respectively. Residential wood combustion is estimated to be the second largest contributor to annual PM_{2.5} emissions at 18% with road dust as the secondary contributor at 17%. An estimated 50.7 tons of PM_{2.5} are produced in the winter months from residential wood combustion with over 120 tons emitted annually. Including all emission sources, Kittitas County produces over 654 tons of PM_{2.5} annually (Summers, 2016). With emissions inventory data clearly implicating wood stoves as the primary PM_{2.5} pollution source, KCPHD and ECY opted to target indoor and outdoor residential burning in future outreach efforts.

Figure 7: Emissions Inventory Data 2011 to 2014

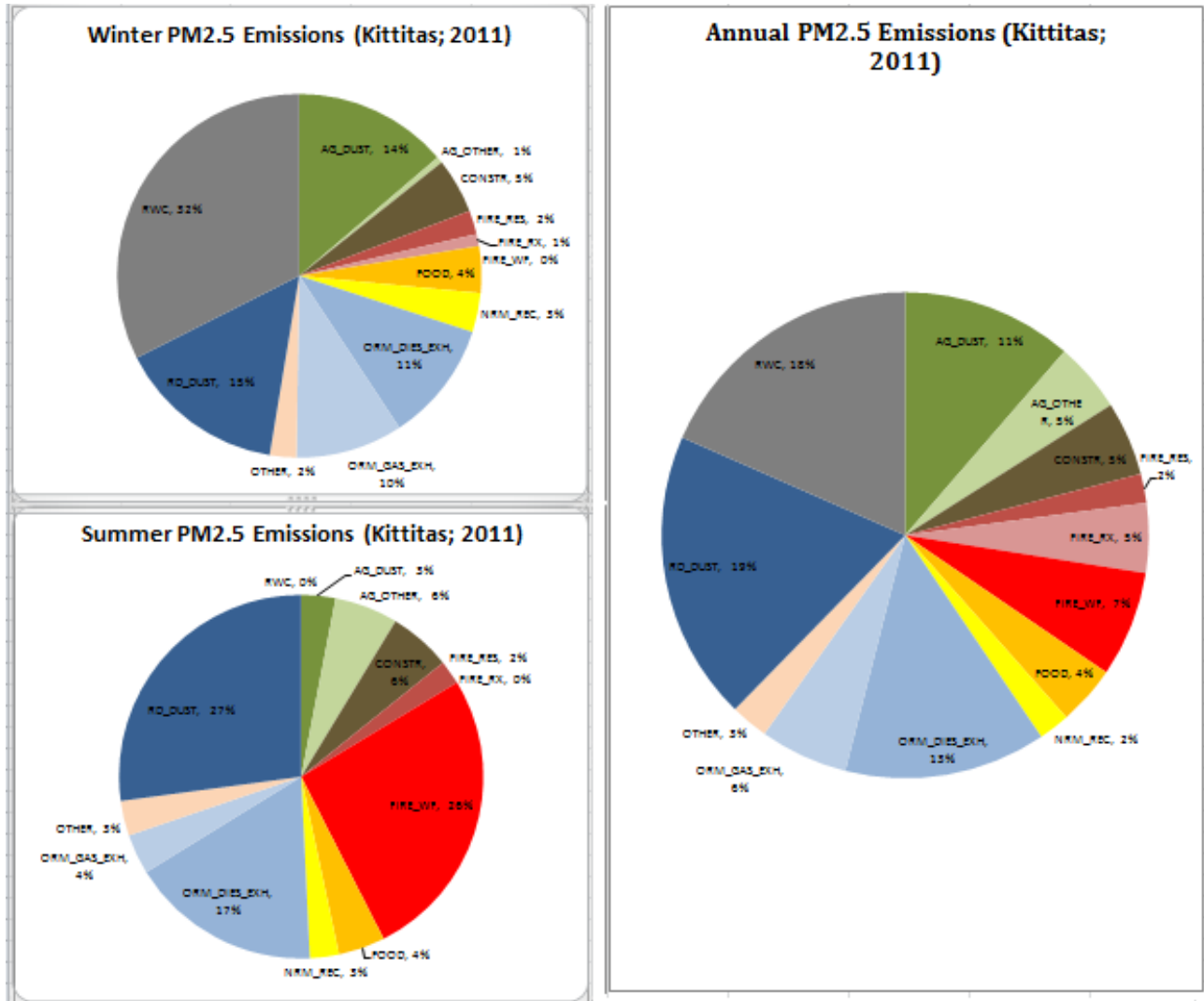


Figure 7 Legend

DUST_HARV	AG_DUST	Agricultural Harvesting	AIR	OTHER	Aircraft: military, commercial, general aviation
TILL	AG_DUST	Agricultural tilling	COMMC	OTHER	Commercial Combustion
OB_AGBURN	AG_OTHER	Agricultural Burning	FUEL	OTHER	Residential non-Wood Fuel
NRM_AG	AG_OTHER	Agricultural Equip	MISC	OTHER	Miscellaneous
CONST	CONSTR	Construction	NRM_AIR	OTHER	Airport Ground Support Equip
NRM_CONST	CONSTR	Construction and Mining Equip	NRM_BOAT	OTHER	Recreational Boats
OB_RES	FIRE_RES	Residential outdoor burning: yard waste, trash	NRM_COM	OTHER	Commercial Equip
OB_SILV	FIRE_RX	Silvicultural Burning	NRM_IND	OTHER	Industrial Equip
FIRE	FIRE_WF	Wildfires	NRM_LAWN	OTHER	Lawn and Garden Equip
FOOD	FOOD	Food and Kindred Products	NRM_LOG	OTHER	Logging Equip
NRM_REC	NRM_REC	Recreational Equip	NRM_RAIL	OTHER	Rail Maintenance Equip
ORM_DIES_EXH	ORM_DIES_EXH	Onroad Diesel Exhaust	RR	OTHER	Locomotives
ORM_GAS_EXH	ORM_GAS_EXH	Onroad Gas Exhaust	SHIP	OTHER	Commercial Marine Vessels
ORM_BRK_TIR	OTHER	Onroad Brake and Tire	DUST_PAV	RD_DUST	Paved Road Dust
ORM_CNG_EXH	OTHER	Onroad CNG Exhaust	DUST_UNPV	RD_DUST	Unpaved Road Dust
			RWC	RWC	Residential Wood Combustion

Community Partners

ECY partnered with KCPHD in early 2014 to investigate factors that could contribute to this steady increase in PM_{2.5} and to explore behaviors that may be modifiable through public health education and outreach. An air quality advisory committee (AQAC) was formed to assist with projects and included representatives from Central Washington University (CWU), KCPHD, ECY, local non-profit organizations, Kittitas County Fire Marshals, local fire departments, Kittitas County Realtor's association, Kittitas County Chamber of Commerce, local wood stove retailers and others. The committee is still active today and has broadened its membership to include representatives from wildfire prevention organizations and local conservation groups.

Community Assessment and Outreach

In 2014, KCPHD and the AQAC conducted a community wide survey, with grant funds from ECY, to examine behaviors, beliefs and attitudes around air quality and burning behavior in Kittitas County. The findings of this study revealed Kittitas County residents engage in many types of burning behaviors that contribute to PM_{2.5} air pollution. In addition, the lack of general knowledge regarding particulate matter pollution in Kittitas County pointed to a strong need for outreach and education in this area. While the survey was comprehensive, further research needed to be done to verify findings and to inform future clean air projects (Fuller, 2014).

The results of this survey were used to create an education and outreach campaign focused on increasing public knowledge of air quality issues and proper burning practices. In 2015, a second survey was conducted to validate initial findings and to analyze the impact of initial outreach and education attempts. Both of the surveys and the education and outreach campaign were funded through grants from ECY. The data from these surveys was later used to update ECY's emission inventory model for Kittitas County and provide more accurate analysis of PM_{2.5} emission sources.

The 2015 survey revealed there are still many Kittitas County residents who do not agree that air quality is an important environmental issue or that wood stoves are a significant contributor to PM_{2.5} pollution. However, even with the lack of agreement on the air quality issue, a significant amount of community support exists for engaging in activities that would attempt to reduce PM_{2.5} pollution. Most respondents would support measures to reduce PM_{2.5} pollution in Kittitas County through further education regarding efficient wood stove operation and programs to replace or upgrade current equipment. The amount of people who reported heating their homes solely with wood matched the most recent census report on households that heat with wood. The survey also distinguished primary and secondary heat source burners from sole sources, which decreased initial findings by almost half. The number of people who self-report having certified stoves aligns with the data on reported certified characteristics, meaning they are accurately identifying their equipment as certified. The 2015 survey findings validated the high numbers of certified stoves reported by Kittitas County in 2014. However, many people who use wood to heat their home report that they are not engaging in all of the behaviors that will result in the cleanest and most

efficient burn possible. Indoor burners are burning wood primarily in the fall and winter which corresponds with data from Ecology regarding PM_{2.5} emissions data from previous home heating seasons (Fuller et al, 2015).

A quarter of our population engages in frequent small pile burning outdoors, most of which is used for disposing of brush and yard debris clearing. There are also a large number of outdoor burners who are still misidentifying paper, cardboard and lumber as being legal to burn (Fuller et al, 2015).

Response data from the 2015 survey was analyzed to determine if there were statistically significant changes in the areas that were covered by the education and outreach campaign. Community knowledge increased in target areas of air quality related items, including PM_{2.5}. With the most effective outreach methods being news articles series in local papers and radio ads. While it is difficult to determine if the change in public knowledge and perception is a direct impact from outreach and education, the amount of people reached by materials is encouraging (Fuller et al, 2015).

Increasing public knowledge about air quality issues and wood burning practices is important, however, the next step is helping people understand how their behaviors impact PM_{2.5} pollution. People who do not see a direct and immediate impact of their behaviors may not be motivated to change burning habits or beliefs about air quality, which may have an effect on burning practices. Messaging to the public must show how certain practices can have a cumulative effect on PM_{2.5}. Certain avenues of the education and outreach campaign, such as newspaper articles and other media, appeared to be successful and may be a good avenue for future education and outreach campaigns. Conducting monitoring studies of PM_{2.5} speciation, as well as sources of other particulate matter sizes, would also be an effective way to show the community where the PM_{2.5} pollution is coming from and how it relates to overall particulate matter. It would be beneficial for KCPHD to continue educational programs in addition to gathering aggregate air quality data in order to monitor health impacts and risks (Fuller et al, 2015).

The PM Advance Program

As part of our commitment to continue PM_{2.5} emission reduction efforts, the AQAC, KCPHD and Kittitas County Board of Health (BOH) have joined the EPA's PM Advance Program. This Path Forward Plan is the first step in supporting sustainable efforts to improve air quality in Kittitas County.

The PM Advance Program is run by the EPA and encourages states, tribes and local governments to take proactive steps to reduce PM_{2.5}. The EPA provides support to communities who want to pursue air pollution reduction within the PM Advance framework. Improvements in air quality from participation in the program could help:

- Protect the health of the community
- Provide a cushion against future violations or revisions of the PM_{2.5} NAAQS
- Allow for flexibility to choose control measure and programs that fit the community and are cost effective
- Result in multi-pollutant benefits.

To be eligible for the program, the participating area must:

- Not be designated nonattainment for a PM_{2.5} NAAQS
- Identify the area that wants to participate
- Identify the air monitors reflecting air quality in the area
- Meet national and state emission inventory reporting requirements prior to signing up for the program

Each participating area drafts a 5-Year Path Forward Plan as part of the PM Advance program. Each plan details the history of the area, the air quality issues and outlines voluntary and regulatory control measures and programs the community will pursue to reduce PM_{2.5} emissions. Kittitas County joined the PM Advance program in August of 2016 and submitted the first Path Forward Plan in March of 2017.

Update Schedule

Kittitas County's Path Forward control measures and programs will be evaluated on an annual basis with a discussion of effectiveness presented to ECY and the EPA. The Path Forward Plan will be fully reassessed and updated if necessary every two years. The AQAC will be responsible for the update and program analyses if an air quality staff member is not available from KCPHD. The next update is scheduled to be completed by June 30th, 2019.

PM 2.5 Control Measures

Voluntary Measures

The following projects are voluntary measures and do not include new ordinances or regulations. Voluntary measures focus on education, outreach and programs to provide affordable options to reduce PM_{2.5} emissions. The projects are divided into three tiers according to funding and staff time.

Tier 1 includes basic education and outreach efforts that are implementable without additional funding and in the absence of a dedicated air quality staff member at KCPHD. Examples include forwarding clean burning information to a neighborhood after receipt of a smoke complaint, distributing brochures and flyers at local businesses, and issuing public information during times of poor air quality.

Tier 2 projects require a dedicated air quality staff member at KCPHD or greater involvement of the AQAC members. Projects may require small amounts of funding to purchase materials. This section includes partnerships with other organizations for projects not funded by KCPHD or the AQAC. Examples include booths at local community events and educational workshops to provide facts about clean burning best practices and the benefits of certified woodstoves.

Tier 3 lists projects that are implementable only under specific grants and require substantial amounts of funding. The purpose of this section is to outline project rationale and methods to prepare for future grant applications. This section also includes existing programs and projects that are looking to expand through acquisition of additional grant funding.

Some projects cannot be implemented until the necessary funding is awarded. Projects marked “pending” are awaiting approval or funding. An “ongoing” status indicates a pre-existing project that was implemented before Kittitas County joined the PM Advance program. An “in-progress” designation indicates a project that was implemented as part of the PM Advance program.

Tier 1 – Volunteer Staff

Project title: Smoke Complaint Response

Lead Agency: Kittitas County Public Health Department

Partner Agencies: Local Fire Departments

Goal: Reduce the number of households with high opacity smoke emissions and improve burning related behaviors in response to complaints.

Description: When KCPHD receives a complaint about wood smoke, letters are sent to the entire neighborhood. This provides an educational opportunity to advertise the benefits of certified woodstoves, establish clean burning practices and distribute relevant information to wood-burning hotspots.

Project Methods:

1. Complaints received by phone or email at KCPHD are logged into an internal complaint tracking system, CAMAS, by the complaint recipient.
2. Complainants are asked whether they wish to remain anonymous and contact information for the complainant is recorded if appropriate. The name of the staff member who first received the complaint is recorded as well as the name of the staff member assigned to the response. The address and parcel map number, date the complaint was received, initial complaint description and actions taken are recorded within the tracking system.
3. Based on the nature of the complaint, the complaints are routed through CAMAS to the appropriate specialist for investigation.
4. The specialist consults a county parcel map and establishes a target area for response that encompasses the most houses in the immediate vicinity of the complainant.
5. Letters are sent to all residences in the specified area with clean burning information and suggestions to limit smoke emissions along with information about available wood stove change out programs.
6. Local fire department staff may become involved in the cases of repeat offenders and are able to issue fines for egregious outdoor and indoor burning violations.
7. Once a complaint has been closed, the closing date is recorded. A complaint is closed when the appropriate level of compliance has been achieved or the complaint has been passed on to the appropriate county or city code enforcement personnel. Currently the air quality program at the Kittitas County Public Health Department does not have regulatory authority to impose fines without working through city or county code enforcement. If the issue escalates, Washington State Department of Ecology is made aware of the situation through their AQ section.

Assessment: The number of air quality related complaints is tracked electronically through the CAMAS system as described above. The annual amount of complaints as well as the number of complaints received each month are recorded and reviewed periodically. Repeat offenders are flagged for additional education. Complaint response efforts are considered successful if no additional complaints are received for that residence or neighborhood for the remainder of the season.

Status: Ongoing

Project title: Spanish Translation of Existing Educational Materials

Lead Agency: KCPHD

Partner Agencies: Washington State Department of Ecology, HopeSource, Environmental Protection Agency

Goal: Broaden awareness of air quality issues in underserved populations.

Description: Many educational materials exist regarding clean burning, certified wood stoves and PM_{2.5} health concerns. However, most of the materials possessed by KCPHD are only available in English. Since there is a significant Hispanic population in Kittitas County and neighboring counties, it benefits the community to translate existing materials into other languages.

Project Methods: Volunteer staff from KCPHD and HopeSource will translate existing educational materials into Spanish, along with other languages as needed.

Assessment: The number of Spanish brochures distributed at events and in the KCPHD office would be tracked. Requests would be logged internally for other language translation requests.

Status: Pending

Tier 2 – Dedicated Staff

Project title: Elementary/Middle School Education Program

Lead Agency: Kittitas County Public Health Department

Partner Agencies: Ellensburg School District, Thorp School District, Kittitas School District, Cle Elum Roslyn School District, Easton School District

Goal: Incorporate the importance of clean air and compliance with clean air laws into school science programs.

Funding Source: State and/or federal grants

Description: An air quality education program in schools would promote PM_{2.5} measurement, awareness and monitoring, enhance environmental science curriculums and spread accurate information about air quality in our communities. These messages would also reach parents and raise awareness of air quality in the community.

Project Methods:

1. Select pilot school or district for the first round of the education program.
2. Identify target grade level with advice from local teachers and school officials.
3. Identify key messages such as “clean wood burning” or “dangers of poor air quality”.
4. Design an education program focused on the key message from step 3.
5. Print and prepare education materials. An air quality tool box of education material would be provided to teachers along with technical assistance from KCPHD staff.
6. Schedule time to meet with the teacher prior to classroom visit to discuss the education program and messages.
7. Visit the classroom and implement the education program.
8. Interview parents in person or via a survey a week after program implementation to measure the spread of the message and its applicability. Other assessment methods are discussed below in “Assessment”.
9. If successful, expand the program to other schools and districts.
10. Publish findings and materials on KCPHD’s website for use in other regions.

Assessment: Personal interviews or survey materials would be conducted with the student’s parents approximately a week after the classroom visit to assess how far the education message spread and how applicable the material was to the household. Another method would involve students taking home a brochure with a parent signature page. Students who return the signed page to their teacher would receive a reward.

Status: Pending

Project title: Air Quality Education Booth

Lead Agency: Kittitas County Public Health Department

Partner Agencies: None

Goal: Enhance community awareness of current air quality issues and promote PM_{2.5} emission reduction tactics.

Description: Multiple events are hosted throughout the year that offer free or low cost registration for booths. KCPHD frequently attends these events to promote clean burning practices, emphasize the importance of using certified wood stoves and expand the community’s awareness about local air quality issues.

Project Methods: A schedule of potential events that KCPHD and AQAC partners could attend on an annual basis is included in Appendix A. Future air quality staff will use this schedule to ensure

timely registration for each event. Factors for event selection include registration fees, expected number of visitors, target population and community perception of the educational message.

Assessment: Educational materials such as flyers, posters, and handouts are counted before and after the event to determine the number of materials distributed. Air quality staff will also attempt to quantify the total number of event participants along with the number of individuals who made direct contact.

Status: In Progress

Project title: Air Quality Advertising Campaign

Lead Agency: Kittitas County Public Health Department

Partner Agencies: Local news and radio outlets

Goal: Enhance community awareness of current air quality issues and impacts.

Funding Source: If little to no funding is available, organizers can take advantage of free public service announcements through the radio as well as press releases to local newspapers to spread air quality information. Additional funding would allow for more complex radio and print advertisements as well as television and cinema advertisements.

Description: Key messages would be distributed through print, radio and television media sources during the appropriate seasons to address air quality impacts. These messages would include information on current or upcoming air quality concerns. For example, tips on cutting, stacking and covering wood when the United States Forest Service has open wood cutting.

Project Methods:

1. Identify a funding source and establish a budget.
2. Select local media outlets based on past survey data. Past surveys indicated which media sources were most viewed by the community.
3. Work within the budget to purchase advertising time and space with local media outlets.
4. Create and record advertisements.
5. Distribute to selected media outlets at the appropriate times.

Assessment: Past survey data indicated which media outlets the community uses most frequently and where air quality message distribution was effective. Future surveys could be distributed as a confirmation measure that key messages are reaching the community.

Status: Pending

Tier 3 – Grant Projects

Project title: Woodstove Change Out

Lead Agency: HopeSource - Ellensburg

Partner Agencies: Washington State Department of Ecology, Armstrong's Stove and Spa

Goal: Reduce PM_{2.5} emissions and improve local air quality by replacing uncertified wood stoves with certified devices, or more efficient heating devices, at reduced cost.

Description: Using funds supplied by Washington State Department of Ecology, HopeSource provides a rebate to qualifying applicants to reduce the cost of purchasing a new certified woodstove or other low emission home heating device.

Funding Source: A Wood Smoke Reduction grant was awarded to HopeSource by the Washington State Department of Ecology. Previous grant amounts totaled \$90,000 from 2011 to 2013 and \$175,000 from 2013 to 2015. The funds awarded to each client were based on a sliding scale,

described below in the Project Methods. The current grant, running from 2015 to 2017, totals \$85,000.

Project Methods:

1. The woodstove exchange program is advertised through referrals from local woodstove and heating device retailers along with radio and newspaper advertisements. These efforts are coordinated by HopeSource with technical assistance from Washington Department of Ecology.
2. Clients must reside within the designated area, shown on the map in APPENDIX B to qualify for a rebate. They must own an uncertified stove or a certified stove manufacturer prior to 1995 and must burn at least two cords of wood per winter to qualify.
3. Once an application has been approved, the customers take the rebate form to the device retailer, and purchase the device for the remainder of the cost not covered by the rebate.
4. Rebate incentives for the 2011-2013 and 2013-2015 grants were based on the total cost of the new device, the type of device installed and the income of the client.
 - a. For clients with income of less than 125% of the Federal Poverty Level (FPL), the incentive amount matched the total replacement cost.
 - b. For 125%-200% of the FPL, clients paid 10% of the cost of a wood stove or 5% of the cost of a ductless system, and the incentive matched the remaining cost.
 - c. For greater than 200% of the FPL, clients paid for 20% of the cost of a wood stove or 10% of the cost of a ductless system, and the incentive matched the remaining cost.
 - d. If costs exceeded \$3,576 for a wood stove or \$5,292 for a ductless system, clients with an income greater than 125% of the FPL paid the extra amount. This provided a simple and fair calculation to determine client contributions, which was especially important given the varying costs associated with chimney venting replacement.
 - e. Some clients wished to install different stove models or to have a second ductless head installed, which increased the client's contribution while decreasing the incentive amount.
5. Rebate incentives for the 2015-2017 grant are set at \$750 for wood stoves or inserts, \$1000 for pellet stoves or inserts, \$1,250 for gas stoves or inserts and \$1,750 for ductless heat pumps. These amounts are set and do not factor in the clients income. A limited number of low income families may qualify for larger rebates.
6. First, a certified installer verifies that the current woodstove is an uncertified model according to EPA standards.
7. A certified installer then must install the device in order for the rebate to be valid. Once the device is installed, the installer verifies proper installation with HopeSource with pictures.
8. The old device is removed by the installer and taken to a designated facility for destruction. Destruction is verified with pictures and a certificate of destruction signed by the disposal facility. This ensures that the device has been destroyed and will not be resold or used.
9. The installer then submits the required documents to HopeSource.
10. HopeSource reviews the submitted documents and issues the rebate funds directly to the installer.

Assessment: The success of the project is determined by whether the device installation goals were reached. The 2011 to 2013 grant funds were used to install 23 devices with a goal of 24 devices, including one ductless heat pump. The 2013 to 2015 grant funds were used to install a total of 42 devices which exceeded the goal of 34 devices. 34 new certified wood stoves, 1 pellet stove, 1 natural gas stove and 6 ductless heat pumps were installed between 2013 and 2015. So far, 6 devices have been installed for the 2015-2017 grant. The 2015-2017 grant program implementation was delayed until April 2016. Washington State Department of Ecology calculated

a net reduction of 2077.97 lbs of PM_{2.5} emissions between 2011 and 2013 and 3,653 lbs between 2013 and 2015.

Status: Ongoing

Project title: Woodstove Bounty

Lead Agency: Washington State Department of Ecology – Central Regional Office,

Partner Agencies: Kittitas County Solid Waste Department, Kittitas County Public Health Department, HopeSource, Kittitas Valley Fire and Rescue, WCC Ellensburg and Yakima Crews, Kittitas County Fire District #7, City of Cle Elum.

Goal: Reduce PM_{2.5} emissions from wood smoke by collecting and destroying uncertified woodstoves, effectively removing them from future use.

Description: A \$250 rebate was offered to Kittitas County residents who turned in their old woodstoves to be recycled. Kittitas County, Ecology and HopeSource staff are present for one day at the selected transfer station to inspect woodstoves and award rebates to qualifying participants. The stoves must be in working order and free from ash and debris to qualify.

Funding Source: Residential Wood Smoke Reduction funds from the Washington State legislature were awarded to Washington State Department of Ecology. Costs associated with the 2014 event are included in APPENDIX C.

Project Methods:

Event Advertising

1. Ecology drafts a budget for the event and secures the corresponding funding.
2. Ecology works with the appropriate partner agencies to select a date and location for the collection event to take place.
3. Once a date and location are selected, flyers are distributed to local businesses and bulletin boards approximately one month prior to the event. KCPHD, KCSW, HopeSource, Ecology and the local fire departments are responsible for distributing flyers. Previous flyers have been 8.5 by 11in in size and laminated to ensure durability.
4. Approximately three weeks prior to the event paid newspaper ads are run in the Ellensburg Daily Record and the Northern Kittitas News Tribune. Previous ads ran from one to two days in different weeks and were large with colored print.
5. A news release drafted by Ecology will be run concurrent to the ads in the newspapers.
6. Paid advertising through the KXLE radio station is run three times a day on Mondays, Wednesdays and Fridays for a full month prior to the event. Ecology CRO's smoke management team and KXLE contributed to the transcript in past years.

Event Procedure

1. Event staff arrive at the transfer station at least thirty minutes prior to the scheduled start time. All staff should check in at the main office or scale house prior to entering the facility. Typically staff arrive around 7:30am.
2. Staff and volunteers are briefed on event procedures and safety.
3. At 8:00am, inspectors begin evaluating stoves for rebate qualification as specified above.
4. Customers enter the transfer station via the scale house and are directed by the scale house attendants to the drop off zone. Customers are directed to remain in their vehicles at all time for safety.
5. Inspectors evaluate all woodstoves to determine if qualified for a rebate. If the wood stove does not qualify, a rebate is not issued and the customer is directed to leave the facility. If qualified the appropriate forms are completed and a 250 dollar rebate is issued to the customer.

6. While their woodstove is evaluated, customers are asked to complete a survey on wood smoke, wood burning and garbage burning. Completion of the survey enters participants in a raffle for a 50 dollar gift card. Two winners are chosen for the raffle.
7. Upon completion of the survey customers are provided a bag of outreach items including litter bags, pens, key chains, and flyers with education on efficient woodstove heating and the importance of drying wood before use.
8. Once customers complete the appropriate documents and received their rebates they are directed to leave the facility through the scale house.
9. Event staff begin packing up at 3:00pm, typically the bulk of participants have come and gone by noon.

Assessment: Bounty success is tracked through the number of uncertified woodstoves received and by the number of individuals reached. Since each vehicle may contain multiple people or stoves, these factors must be tracked individually. Three woodstove bounties have occurred in Kittitas County prior to 2016. The Ellensburg transfer station hosted two bounties, one in 2012 which collected 72 woodstoves and one in 2014 which collected 67 woodstoves. The Cle Elum transfer station hosted its first woodstove bounty in 2015 and collected 104 woodstoves. The 2014 and 2015 bounties reached over 137 individuals.

Status: Complete. Future events pending further funding

Project title: Electronic Air Quality Sign

Lead Agency: Kittitas County Public Health Department

Partner Agencies: To Be Determined

Goal: Increase community awareness of current burn bans and air quality conditions.

Description: An electronic sign would provide updates to the community on current ambient PM_{2.5} concentrations and burn bans. A prominent location such as the County courthouse, on CWU campus University Way or a local fire department would be ideal to reach as many community members as possible. Ideally, the sign would be automatically updated with data from the monitoring equipment at Central Washington University to cut down on staff time.

Project Methods:

1. Funding is secured to purchase and install the sign. A potential source of funding is the Environmental Protection Agency.
2. A location is selected and approved by the Kittitas County Commissioners after a set amount of time to allow for community input via comments at public hearings.
3. Students at Central Washington University create an automatic update system to connect data from monitoring equipment to the sign.
4. The sign is installed in the approved location.

Assessment: Feedback would be gathered from the community approximately a year after installation to determine effectiveness of broadcasted material and sign location. Prior to installation, a temporary billboard containing similar information as the electronic sign could be installed, with a follow up survey to determine the number of individuals reached.

Status: Pending

Project title: School Flag Program

Lead Agency: Kittitas County Public Health Department

Partner Agencies: Local schools

Goal: Promote environmental education for students and educate parents about current air quality conditions.

Description: As funding becomes available, Kittitas County will assist the local school districts with purchasing air quality flags through the Environmental Protection Agency's school flag program. These flags correspond to the Washington Air Quality Advisory (WAQA) categories and are flown based on current air quality conditions. The program will promote environmental education for students, assist the county in building relationships with schools and reach members of the community who may not otherwise participate in air quality outreach efforts.

Project Methods:

1. Funding is secured through the EPA's school flag program to purchase flags for local schools.
2. Each school will designate a staff member or student to be responsible for checking current air quality conditions and flying the appropriate flag.
3. Training and education will be provided by KCPHD to the designated flag personnel.
4. If funding allows, this program will align with an elementary or middle school education program.

Assessment: The program will be considered a success if school personnel are diligent about raising the appropriate flags with current air quality conditions. Parents will be asked for feedback pertaining to the program.

Status: Pending

Project title: Community Clean-Up Day

Lead Agency: Kittitas County Public Health Department

Possible Partner Agencies: Kittitas County Solid Waste Department, Waste Management of Ellensburg

Goal: Provide an alternative to outdoor burning for the community to reduce PM_{2.5} production from outdoor burning.

Description: With appropriate funding and coordination between KCPHD, KCSW and Waste Management of Ellensburg, the Kittitas County Compost Facility would accept yard waste from the community free of charge as an incentive to compost instead of burning outdoors. Ideally, this project would become an annual event that could be combined with other education and outreach efforts.

Project Methods:

1. Draft a project proposal and interagency agreements between KCPHD, KCSW and Waste Management of Ellensburg. City governments of Ellensburg and Cle Elum may also be included.
2. Locate and acquire funding to offset processing costs for KCSW.
3. Set an appropriate date for the clean-up event. The middle of fall or spring are ideal times to collect yard waste and are times that community members are likely to burn.
4. Advertise the event through local media sources such as radio and newspaper. Flyers and posters would be distributed to local businesses and neighborhoods. Advertising would ideally take place at least two months prior to the event, one month prior, and during the last three weeks before the event.
5. Host event at the Kittitas County Compost Facility.
6. Perform a follow-up assessment as necessary.

Assessment: Success of the project would be determined by the number of households in attendance as well as the volume of material acquired during the event.

Status: Pending

Implementation Schedule

Table 3: Implementation Schedule

Project Title	Tier	Status	Date
Woodstove Change Out	3	Ongoing	2007 - Present
Smoke Complaint Response	1	Ongoing	2010 - Present
Air Quality Education Booth	2	Ongoing	2010 - Present
Woodstove Bounty	3	Pending	2012 - Present
Spanish Education Materials	1	In-Progress	2017 - 2018
Advertising Campaign	2	Pending	Fall 2017
Elementary/Middle School Education Program	2	Pending	2018
Community Clean-Up Day	3	Pending	Spring/Fall 2018
Electronic Air Quality Sign	3	Pending	2019 - 2021
School Flag Program	3	Pending	2019 - 2021

Regulatory Measures

The following measures are regulatory in action and require enforcement efforts from designated agencies. At this time, regulatory measures consist of existing practices, and laws. No new ordinances or local laws are proposed at this time. This section also includes a selection from current state law outlined in the Washington Administrative Code (WAC). More information on WAC can be found at <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-433&full=true>. Current Washington State Law regulates agricultural burning activities, air quality burn bans and sets emission standards for solid fuel burning devices. Since Kittitas County does not have a designated clean air agency, the Washington State Department of Ecology is responsible for enforcement of air quality related WAC sections.

WAC 173-430 Washington Clean Air Act

WAC 173-430-010 –Purpose of the regulation.

Chapter 70.94 RCW, the Washington Clean Air Act, declares it is the intent of the state to protect public health and it is the policy of the state that the responsibilities and costs of protecting the air resource and operating state and local air pollution control programs be shared as equitably as possible among all sources whose emissions cause air pollution. Some of the sources whose emissions contribute to air pollution in the state include industrial sources (large and small), mobile sources such as vehicles, and area sources such as woodstoves, general outdoor burning, and agricultural burning. A variety of strategies to control and reduce the impact of emissions are described throughout chapter 70.94 RCW, including controls on emissions created from agricultural burning. The act intends that public health be protected and also allows for agricultural burning that is reasonably necessary. The act also requires that burning be restricted and regulated to address the potentially competing goals of both limiting air pollution and allowing agricultural burning. Chapter 70.94 RCW authorizes the Washington state department of ecology (ecology) and local air authorities to implement the provisions of that act related to agricultural burning. This rule establishes control strategies for agricultural burning in the state to minimize adverse health and the environmental effects from agricultural burning in accord with the most reasonable procedures to follow in safeguarding life and property under all circumstances or is reasonably necessary to carry out the enterprise or both. These strategies include:

- (1) Establishing a permit program with minimum statewide requirements and specific burn authorizations.
 - (2) Providing for implementation of a research program to explore and identify economical and practical alternatives to agricultural burning.
 - (3) Encouraging and developing economically feasible alternative methods to agricultural burning.
 - (4) Limiting the scope of the rule to agricultural burning and distinguishing between agricultural burning and other types of burning.
 - (5) Providing for local administration of the permitting program through delegation.
 - (6) Assessing air quality within a region and incorporating this data into an evaluation tailored to emissions from agricultural burning.
 - (7) Making use of metering as a component of the agricultural burning permit program.
- Metering is a technique of limiting emissions from agricultural burning at specific times and places

by taking into account potential emission rates, forecasted weather (dispersion), and current and projected air quality.

(8) Using improved and proven technology in evaluating the conditions under which burning is authorized, including those related to meteorology, emissions, and air pollution.

(9) Providing for education and communication.

[Statutory Authority: 2010 c 70, RCW **70.94.6528** and *Ted Rasmussen Farms, LLC v. State of Washington, Department of Ecology*, Docket # 22989-1-III. WSR 10-23-049 (Order 10-05), § 173-430-010, filed 11/10/10, effective 12/11/10. Statutory Authority: RCW **70.94.650**, **70.94.743**, and **70.94.745**. WSR 06-16-052 (Order 04-10), § 173-430-010, filed 7/26/06, effective 8/26/06. Statutory Authority: RCW **70.94.650**. WSR 95-03-083 (Order 94-17), § 173-430-010, filed 1/17/95, effective 2/17/95; WSR 93-14-022 (Order 92-58), § 173-430-010, filed 6/28/93, effective 7/29/93. Statutory Authority: RCW **70.94.331**. WSR 90-19-062 (Order 90-10), § 173-430-010, filed 9/17/90, effective 10/18/90; Order DE 77-20, § 173-430-010, filed 11/9/77. Formerly WAC 18-16-010.]

WAC 173-430-020 - Agricultural Burning Activities

(1) This regulation applies to burning related to agricultural activities. It does not apply to silvicultural burning or outdoor burning. For these requirements refer to:

- Chapter **173-425** WAC for outdoor burning.
- Chapter **332-24** WAC for silvicultural burning.

(2) Burning of organic debris related to agricultural activities is allowed when it is reasonably necessary to carry out the enterprise. Agricultural burning is reasonably necessary to carry out the enterprise when it meets the criteria of the best management practices and no practical alternative is reasonably available.

(3) Anyone conducting burning related to agricultural activities must comply with local fire safety laws and rules, and burn when wind takes the smoke away from roads, homes, population centers, or other public areas.

(4) Burning related to agricultural activities must not occur during an air pollution episode or any stage of impaired air quality. Definitions of air pollution episode and impaired air quality are found in WAC **173-430-030**.

(5) Burning of organic debris related to agricultural activities requires a permit and fee, except for agricultural burning that is incidental to commercial agricultural activities (RCW **70.94.6524**). An agricultural operation burning under the incidental agricultural burning exception must still notify the local fire department within the area and not burn during an air pollution episode or any stage of impaired air quality. The specific types of burning that qualify as exceptions to the permit requirement are:

(a) Orchard prunings. An orchard pruning is a routine and periodic operation to remove overly vigorous or nonfruiting tree limbs or branches to improve fruit quality, assist with tree canopy training and improve the management of plant and disease, and pest infestations;

(b) Organic debris along fencelines. A fenceline or fencerow is the area bordering a commercial agricultural field that is or would be unworkable by equipment used to cultivate the adjacent field;

(c) Organic debris along or in irrigation or drainage ditches. An irrigation or drainage ditch is a waterway which predictably carries water (not necessarily continuously) and is unworkable by equipment used to cultivate the adjacent field;

(d) Organic debris blown by wind. The primary example is tumbleweeds.

[Statutory Authority: 2010 c 70, RCW **70.94.6528** and *Ted Rasmussen Farms, LLC v. State of Washington, Department of Ecology*, Docket # 22989-1-III. WSR 10-23-049 (Order 10-05), § 173-

430-020, filed 11/10/10, effective 12/11/10. Statutory Authority: RCW [70.94.650](#), [70.94.743](#), and [70.94.745](#). WSR 06-16-052 (Order 04-10), § 173-430-020, filed 7/26/06, effective 8/26/06. Statutory Authority: RCW [70.94.650](#). WSR 95-03-083 (Order 94-17), § 173-430-020, filed 1/17/95, effective 2/17/95; WSR 93-14-022 (Order 92-58), § 173-430-020, filed 6/28/93, effective 7/29/93. Statutory Authority: RCW [70.94.331](#). WSR 90-19-062 (Order 90-10), § 173-430-020, filed 9/17/90, effective 10/18/90; Order DE 77-20, § 173-430-020, filed 11/9/77. Formerly WAC 18-16-020.]

WAC 173-430-040 - Agricultural burning requirements.

(1) Agricultural burning is allowed when it is reasonably necessary to carry out the enterprise. A farmer can show it is reasonably necessary when it meets the criteria of the best management practices and no practical alternative is reasonably available. In certain circumstances, ecology may certify an alternative to burning. Where the certified alternative is reasonably available, burning is not allowed. Certified alternatives are described in WAC [173-430-045](#).

(2) For allowed agricultural burning, ecology or local air authorities with jurisdiction will make daily or specific fire burn calls (during times of anticipated burning) and use metering when necessary to minimize the potential for adverse air quality impacts. Metering is a technique of limiting emission from burning at specific times and places by taking into account potential emission rates, forecasted weather (dispersion), and current and projected air quality. The burn decision process will consider: The potential number of burns and their expected size(s) and duration(s); recent and current ambient concentrations of pollutants; other potential emissions sources; and evaluations and judgments about how foreseeable meteorological conditions will affect concentrations of pollutants in the air sheds.

(a) For the purposes of this section: The smoke management index is a set of conditions that guide the production of certain reports as described in (c) of this subsection and evaluations as described in (d) of this subsection. The smoke management index is not an air quality standard as defined in RCW [70.94.030](#)(4) and further identified in RCW [70.94.331](#). The smoke management index is not an emission standard as defined in RCW [70.94.030](#)(9) and further identified in RCW [70.94.331](#). The smoke management index is not an air pollution episode as described in RCW [70.94.710](#).

(b) Ecology and local air authorities making daily or specific fire burn calls in areas where PM_{2.5} concentrations are regularly monitored will follow the procedures in (c) of this subsection when making the burn decision whenever either of the following smoke management index conditions exist:

(i) A most recent daily average (twenty-four-hour) PM_{2.5} concentration was equal to or greater than 16 micrograms per cubic meter. This is based on the division between the "good" and "moderate" classifications of the 2009 U.S. Environmental Protection Agency's Air Quality Index (AQI) for (twenty-four hours average PM_{2.5}) particulate matter.

(ii) A two-hour rolling average PM_{2.5} concentration, during the most recent twenty-four to thirty hours was equal to or greater than the regional seasonal average PM_{2.5} concentration plus 15 micrograms per cubic meter.

(c) In authorizing additional burning, a determination will be documented explaining that the decision to allow additional burning is not expected to result in a further significant deterioration of air quality. The determination will be entered on a standard form noting the date, time, the location of the additional burning, the size of the burn(s), and a brief explanation of the opinion as to why the additional burning is not expected to result in a further, significant reduction of air quality. The purpose of the determination and recordkeeping requirements of this section is to enhance agency

and public understanding of the effectiveness of the daily burn and metering decision-making process, and to improve its application over time. A notice of the determinations will be made by ecology or a local air authority with jurisdiction at the time the daily burn decision is communicated. Ecology or a local air authority with jurisdiction will also periodically make the determination forms conveniently available to the public.

(d) Following a determination described in (c) of this subsection and a deterioration of air quality to levels equal to or greater than a two-hour rolling average concentration of the regional seasonal average PM_{2.5} concentration plus 25 micrograms per cubic meter in the specific area during the twenty hours following such determination, ecology or the local air authority with jurisdiction will evaluate the deterioration and document any findings and opinions regarding why the deterioration occurred. Ecology or the local air authority with jurisdiction will make evaluations under this subsection conveniently available to the public.

(e) Ecology or a local air authority with jurisdiction may evaluate emission dispersion impacts in the regular course of business. In addition, ecology or the local air authority with jurisdiction will produce an annual report summarizing determinations and evaluations under the smoke management index.

(f) Under RCW 70.94.473 and 70.94.6512, no burning is authorized when an air quality alert, warning, emergency or impaired air quality condition has been issued.

(g) For purposes of protecting public health (not eliminating agricultural burning), if an area exceeds or threatens to exceed unhealthy air pollution levels, the permitting authority may limit the number of acres, on a pro rata basis as provided by RCW 70.94.6532 or by 70.94.6528.

(3) Except as described in WAC 173-430-020(5), all agricultural burning requires a permit.

(a) Ecology or local air authorities with jurisdiction will provide agricultural burning application forms for agricultural burning.

(b) To qualify for an agricultural burning permit the farmer must be an agricultural operation or government entity with specific agricultural burning needs, such as irrigation districts, drainage districts, and weed control boards.

(c) Application information. A farmer must fill out the information requested on a permit application, pay the permitting fee, and submit it to the permitting authority for review and approval before burning.

(i) The application must describe the reason for burning and include at least the following information: Name and address of the person or corporation responsible for the burn, the specific location (county; legal description: Section, township, range, block and unit number), the crop type, the type or size of the burn, driving directions to the burn, specific reason for the burn, the target date for burning, a map, signature of the responsible party, and any additional information required by the permitting authority. Each permitting authority may require additional information on the application.

(ii) All applications must comply with other state or local rules.

(d) The permitting authority must evaluate the application, and approve the permit before burning.

(e) Permit decisions including the issuance, denial, or conditioning must be based on consideration of air quality conditions in the area affected by the proposed burning, the time of year, meteorological conditions, the size and duration of the proposed burning activity, the type and amount of vegetative material to be burned, the applicant's need to carry out the burning, existence of extreme burning conditions, risk of escape onto property owned by another, and the public's interest in the environment.

(f) Ecology or its delegate, or a local air authority with jurisdiction, or its delegate must approve or deny the permit in part or in whole based on information in the application.

(g) Ecology and its delegate or a local air authority with jurisdiction or its delegate may issue permits for appropriate agricultural burning activities in nonattainment areas, maintenance areas, and urban growth areas as described in RCW [70.94.6514](#).

(4) All agricultural burning permits require a fee.

The applicant must include the fee when submitting the application. The permitting authority will charge fees as described under WAC [173-430-041](#).

(5) All agricultural burning permits must include conditions intended to minimize air pollution.

(a) A farmer must comply with the conditions on the agricultural burning permit.

(b) Permits must be conditioned to minimize emissions and impacts insofar as practical, including denial of permission to burn during periods of adverse meteorological conditions. When necessary as determined by ecology or the local air authorities to ensure compliance with the act, permit conditions will include at least one of the following:

- The use of a daily burn decision.
- Permit specific decisions.
- Metering.

(c) The permitting authority must:

(i) Act on a complete application (as determined by the permitting authority) within seven days of receipt.

(ii) Evaluate the application and approve or deny all or part of it.

(iii) Evaluate the application to determine if the requested burning is within the general or crop-specific best management practices.

(iv) If the permitting authority denies the application, they must state the reason for the denial.

(6) Other laws. A farmer must obtain any local permits, licenses, or other approvals required by any other laws, rules, or ordinances. The farmer must also honor other agreements entered into with any federal, state, or local agency.

[Statutory Authority: 2010 c 70, RCW [70.94.6528](#) and *Ted Rasmussen Farms, LLC v. State of Washington, Department of Ecology*, Docket # 22989-1-III. WSR 10-23-049 (Order 10-05), § 173-430-040, filed 11/10/10, effective 12/11/10. Statutory Authority: RCW [70.94.650](#), [70.94.743](#), and [70.94.745](#). WSR 06-16-052 (Order 04-10), § 173-430-040, filed 7/26/06, effective 8/26/06. Statutory Authority: RCW [70.94.656](#). WSR 98-12-016 (Order 97-45), § 173-430-040, filed 5/26/98, effective 6/26/98. Statutory Authority: RCW [70.94.656](#)(4). WSR 97-03-021 (Order 96-05), § 173-430-040, filed 1/7/97, effective 2/7/97. Statutory Authority: RCW [70.94.650](#). WSR 95-03-083 (Order 94-17), § 173-430-040, filed 1/17/95, effective 2/17/95; WSR 93-14-022 (Order 92-58), § 173-430-040, filed 6/28/93, effective 7/29/93. Statutory Authority: RCW [70.94.331](#). WSR 90-19-062 (Order 90-10), § 173-430-040, filed 9/17/90, effective 10/18/90; Order DE 77-20, § 173-430-040, filed 11/9/77. Formerly WAC 18-16-040.]

WAC 173-433 Solid Fuel Burning Device Standards, Procedures and Restrictions

WAC 173-433-010 - Purpose

This chapter, promulgated under chapters [43.21A](#) and [70.94](#) RCW, establishes the following for solid fuel burning devices:

- Emission standards;
- Certification standards and procedures;
- Fuel restrictions;

- Operation restrictions during impaired air quality burn bans; and
- Criteria for prohibiting the use of solid fuel burning devices that are not certified.

[Statutory Authority: Chapter **70.94** RCW. WSR 14-04-013 (Order 12-04), § 173-433-010, filed 1/23/14, effective 2/23/14. Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 88-01-056 (Order 87-44), § 173-433-010, filed 12/16/87.]

WAC 173-433-020 - Applicability

The provisions of this chapter apply to solid fuel burning devices in all areas of the state of Washington.

[Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 88-01-056 (Order 87-44), § 173-433-020, filed 12/16/87.]

WAC 173-433-100 - Emission performance standards

(1) **Woodstoves.** Woodstove sales must comply with the requirements of subsection (3) of this section, Solid fuel burning devices.

(2) **Fireplaces.** A person must not advertise to sell, offer to sell, sell, bargain, exchange, or give away a factory built fireplace unless it meets the 1990 EPA standards for woodstoves or equivalent standard that may be established by the state building code council by rule. Subsection (3) of this section does not apply to fireplaces, including factory built fireplaces, and masonry fireplaces.

(3) **Solid fuel burning devices.** A person must not advertise to sell, offer to sell, sell, bargain, exchange, or give away a solid fuel burning device in Washington unless it has been certified and labeled in accordance with procedures and criteria specified in "40 C.F.R. 60 Subpart AAA - Standards of Performance for Residential Wood Heaters" as amended through July 1, 1990, and meets the following particulate air contaminant emission standards and the test methodology of the EPA in effect on January 1, 1991, or an equivalent standard under any test methodology adopted by the EPA subsequent to such date:

- (a) Two and one-half grams per hour for catalytic woodstoves; and
- (b) Four and one-half grams per hour for all other solid fuel burning devices.

(c) For purposes of this subsection, "equivalent" means the emissions limits specified in this subsection multiplied by a statistically reliable conversion factor determined by ecology that relates the emission test results from the methodology established by the EPA prior to May 15, 1991, to the test results from the methodology subsequently adopted by that agency.

[Statutory Authority: Chapter **70.94** RCW. WSR 14-04-013 (Order 12-04), § 173-433-100, filed 1/23/14, effective 2/23/14. Statutory Authority: Chapter **70.94** RCW and 501-506 ESHB 1028, 1991. WSR 93-04-105 (Order 91-55), § 173-433-100, filed 2/3/93, effective 3/6/93. Statutory Authority: Chapter **70.94** RCW. WSR 91-07-066 (Order 90-58), § 173-433-100, filed 3/20/91, effective 4/20/91. Statutory Authority: RCW **70.94.331**. WSR 90-19-062 (Order 90-10), § 173-433-100, filed 9/17/90, effective 10/18/90. Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 89-02-054 (Order 88-38), § 173-433-100, filed 1/3/89; WSR 88-01-056 (Order 87-44), § 173-433-100, filed 12/16/87.]

WAC 173-433-110 - Opacity standards

- (1) **Statewide opacity standard.**

(a) A person must not cause or allow emission of a smoke plume from any solid fuel burning device to exceed an average of twenty percent opacity for six consecutive minutes in any one-hour period.

(b) A local air authority must not adopt or enforce an opacity level for solid fuel burning devices that is more stringent than the statewide standard.

(2) **Test method and procedures.** Methods and procedures specified by the EPA in "40 C.F.R. 60 Appendix A reference method 9 - VISUAL DETERMINATION OF THE OPACITY OF EMISSIONS FROM STATIONARY SOURCES" as amended through July 1, 1990, must be used to determine compliance with subsection (1) of this section.

(3) **Enforcement.** Smoke visible from a chimney, flue or exhaust duct in excess of the opacity standard constitutes prima facie evidence of unlawful operation of an applicable solid fuel burning device. This presumption may be refuted by demonstration that the smoke was not caused by an applicable solid fuel burning device. The provisions of this requirement shall:

(a) Be enforceable on a complaint basis.

(b) Not apply during the starting of a new fire for a period not to exceed twenty minutes in any four-hour period.

(4) **Education.** Any person or retailer providing information on the operation of solid fuel burning devices, such as brochures, demonstrations, and public education programs, should include information that opacity levels of ten percent or less are attainable through proper operation. [Statutory Authority: Chapter **70.94** RCW. WSR 14-04-013 (Order 12-04), § 173-433-110, filed 1/23/14, effective 2/23/14. Statutory Authority: Chapter **70.94** RCW and 501-506 ESHB 1028, 1991. WSR 93-04-105 (Order 91-55), § 173-433-110, filed 2/3/93, effective 3/6/93. Statutory Authority: Chapter **70.94** RCW. WSR 91-07-066 (Order 90-58), § 173-433-110, filed 3/20/91, effective 4/20/91. Statutory Authority: RCW **70.94.331**. WSR 90-19-062 (Order 90-10), § 173-433-110, filed 9/17/90, effective 10/18/90. Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 88-01-056 (Order 87-44), § 173-433-110, filed 12/16/87.]

WAC 173-433-120 - Prohibited fuel types

A person must not cause or allow any of the following materials to be burned in a solid fuel burning device:

- (1) Garbage;
- (2) Treated wood;
- (3) Plastic and plastic products;
- (4) Rubber products;
- (5) Animal carcasses;
- (6) Asphaltic products;
- (7) Waste petroleum products;
- (8) Paints and chemicals; or

(9) Any substance which normally emits dense smoke or obnoxious odors other than paper to start the fire, properly seasoned fuel wood, or coal with sulfur content less than 1.0% by weight burned in a coal-only heater.

[Statutory Authority: Chapter **70.94** RCW. WSR 14-04-013 (Order 12-04), § 173-433-120, filed 1/23/14, effective 2/23/14; WSR 91-07-066 (Order 90-58), § 173-433-120, filed 3/20/91, effective 4/20/91. Statutory Authority: RCW **70.94.331**. WSR 90-19-062 (Order 90-10), § 173-433-120, filed 9/17/90, effective 10/18/90. Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 89-

02-054 (Order 88-38), § 173-433-120, filed 1/3/89; WSR 88-01-056 (Order 87-44), § 173-433-120, filed 12/16/87.]

WAC 173-433-130 - General emission standards

In addition to the general applicability of chapter **173-400** WAC to all emission sources;

(1) Emissions detrimental to persons or property. No person shall cause or permit the emission of any air contaminant from an identifiable solid fuel burning device, including any air contaminant whose emission is not otherwise prohibited by this chapter, if the air contaminant emission causes detriment to the health, safety, or welfare of a person, plant or animal, or causes damage to property or business.

(2) Odors. Any person who shall cause or allow the generation of any odor from any solid fuel burning device which may interfere with any other property owner's use or enjoyment of his property must use recognized good practice and procedures to reduce these odors to a reasonable minimum.

[Statutory Authority: Chapter **70.94** RCW. WSR 91-07-066 (Order 90-58), § 173-433-130, filed 3/20/91, effective 4/20/91. Statutory Authority: RCW**70.94.331**. WSR 90-19-062 (Order 90-10), § 173-433-130, filed 9/17/90, effective 10/18/90. Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 89-02-054 (Order 88-38), § 173-433-130, filed 1/3/89.]

WAC 173-433-140 - Criteria for impaired air quality burn bans

Ecology or a local air authority may call an impaired air quality burn ban as follows:

(1) Stage 1 impaired air quality burn ban:

(a) Ecology or the local air authority may call a stage 1 impaired air quality burn ban when they predict that the twenty-four hour average of PM-2.5 levels will reach or exceed thirty-five micrograms per cubic meter within forty-eight hours.

(b) Pierce, Snohomish, and Yakima counties each contain at least one area at risk for nonattainment. In these counties, the local air authority may call a stage 1 impaired air quality burn ban when they predict that the twenty-four hour average of PM-2.5 levels will reach or exceed thirty micrograms per cubic meter within seventy-two hours.

(2) Stage 2 impaired air quality burn ban:

(a) Ecology or the local air authority may call a stage 2 impaired air quality burn ban when all of the following conditions exist:

(i) A stage 1 impaired air quality burn ban is already in effect and has not reduced the trend of rising PM-2.5 levels adequately.

(ii) The twenty-four hour average of PM-2.5 levels have already reached or exceeded twenty-five micrograms per cubic meter.

(iii) Ecology or the local air authority expects that PM-2.5 levels will remain above twenty-five micrograms per cubic meter for twenty-four hours or more from the time PM-2.5 levels reached the trigger in (a)(ii) of this subsection.

(b) Ecology or the local air authority may call a stage 2 impaired air quality burn ban without calling a stage 1 impaired air quality burn ban when all of the following conditions exist:

(i) The twenty-four hour average of PM-2.5 levels have reached or exceeded twenty-five micrograms per cubic meter.

(ii) PM-2.5 levels have risen rapidly.

(iii) Ecology or the local air authority predicts that the twenty-four hour average of PM-2.5 levels will exceed thirty-five micrograms per cubic meter within twenty-four hours.

(iv) Weather conditions alone are highly unlikely to help decrease PM-2.5 levels sufficiently.

(c) Pierce, Snohomish, and Yakima counties each contain at least one area at risk for nonattainment. In these counties, the local air authority may call a stage 2 impaired air quality burn ban without calling a stage 1 impaired air quality burn ban when all of the following conditions exist:

(i) The twenty-four hour average of PM-2.5 levels have reached or exceeded twenty-five micrograms per cubic meter.

(ii) PM-2.5 levels have risen rapidly.

(iii) The local air authority predicts that the twenty-four hour average of PM-2.5 levels will reach or exceed thirty micrograms per cubic meter within twenty-four hours.

(iv) Weather conditions alone are highly unlikely to help decrease PM-2.5 levels sufficiently.

(3) Ecology or the local air authority may call an impaired air quality burn ban for areas smaller than a county, when and where feasible.

[Statutory Authority: Chapter 70.94 RCW. WSR 14-04-013 (Order 12-04), § 173-433-140, filed 1/23/14, effective 2/23/14; WSR 91-07-066 (Order 90-58), § 173-433-140, filed 3/20/91, effective 4/20/91.]

WAC 173-433-150 - Restrictions on operation of solid fuel burning devices

(1) Stage 1 impaired air quality burn ban:

(a) Except as described in (b) of this subsection, a person must not operate any solid fuel burning device during a stage 1 impaired air quality burn ban when all of the following apply:

- The solid fuel burning device is located in a residence or commercial establishment within the geographical area covered by the stage 1 impaired air quality burn ban.
- The residence or commercial establishment has an adequate source of heat other than a solid fuel burning device.

(b) A person meeting all of the conditions in (a) of this subsection must not operate any solid fuel burning device during a stage 1 impaired air quality burn ban unless the solid fuel burning device is one of the following:

(i) A nonaffected pellet stove; or

(ii) A woodstove certified and labeled by the EPA under "40 C.F.R. 60 Subpart AAA - Standards of Performance for Residential Wood Heaters" as amended through July 1, 1990; or

(iii) A woodstove meeting the "Oregon Department of Environmental Quality Phase 2" emissions standards contained in Subsections (2) and (3) of Section 340-21-115, and certified in accordance with "Oregon Administrative Rules, Chapter 340, Division 21 - Woodstove Certification" dated November 1984.

(c) Except as allowed by (b) of this subsection, a person already operating a solid fuel burning device when a stage 1 impaired air quality burn ban begins must withhold new solid fuel for the duration of the impaired air quality burn ban.

(2) Stage 2 impaired air quality burn ban:

(a) A person must not operate any solid fuel burning device during a stage 2 impaired air quality burn ban when all of the following apply:

- The solid fuel burning device is located in a residence or commercial establishment within the geographical area covered by the stage 2 impaired air quality burn ban.

- The residence or commercial establishment has an adequate source of heat other than a solid fuel burning device.

(b) A person already operating a solid fuel burning device when a stage 2 impaired air quality burn ban begins must withhold any new solid fuel for the duration of the stage 2 impaired air quality burn ban.

(3) **Air pollution episodes.** Ecology may declare air pollution episodes as defined in chapter 173-435 WAC.

(a) A person must not operate any solid fuel burning device during alert, warning, or emergency air pollution episodes when all of the following apply:

- The solid fuel burning device is located in a residence or commercial establishment within the geographical area covered by the air pollution episode.

- The residence or commercial establishment has an adequate source of heat other than a solid fuel burning device.

(b) A person already operating a solid fuel burning device when an alert, warning, or emergency air pollution episode begins must withhold new solid fuel for the duration of the alert, warning, or emergency air pollution episode.

(4) The following matrix graphically illustrates the applicability of different types of solid fuel burning devices to the provisions of subsections (1) through (3) of this section:

Type of Device	Impaired Air Quality Burn Ban		Episode			
	First Stage	Second Stage	Forecast	Alert	Warning	Emergency
Pellet Stove (nonaffected)	OK	NO	OK	NO	NO	NO
EPA Certified Woodstove	OK	NO	OK	NO	NO	NO
DEQ Phase 2 Woodstove	OK	NO	OK	NO	NO	NO
EPA Exempted Device	NO	NO	OK	NO	NO	NO
All Other Devices	NO	NO	OK	NO	NO	NO

NOTES: "OK" indicates that a person may operate the device

"NO" indicates that a person must withhold new fuel from the device

(5) Smoke visible from a chimney, flue or exhaust duct after three hours has elapsed from the declaration of the episode or impaired air quality burn ban constitutes prima facie evidence of unlawful operation of an applicable solid fuel burning device. A person may refute this presumption with a demonstration that the smoke was not caused by a solid fuel burning device.

(6) Ecology, local air authorities, health departments, fire departments, or local police forces having jurisdiction in the area may enforce compliance with the air pollution episode or impaired air quality burn ban after three hours has elapsed from the declaration of the air pollution episode or impaired air quality burn ban.

[Statutory Authority: Chapter 70.94 RCW. WSR 14-04-013 (Order 12-04), § 173-433-150, filed 1/23/14, effective 2/23/14; WSR 91-07-066 (Order 90-58), § 173-433-150, filed 3/20/91, effective 4/20/91. Statutory Authority: RCW 70.94.331. WSR 90-19-062 (Order 90-10), § 173-433-150,

filed 9/17/90, effective 10/18/90. Statutory Authority: Chapters **70.94** and **43.21A** RCW. WSR 88-01-056 (Order 87-44), § 173-433-150, filed 12/16/87.]

WAC 173-433-155 - Criteria for prohibiting solid fuel burning devices that are not certified

(1) After January 1, 2015, and after meeting the requirements in subsection (3) of this section, ecology or the local air authority may prohibit the use of solid fuel burning devices in a nonattainment area or an area with an approved PM-2.5 maintenance plan.

(2) Except as provided in subsection (3) of this section, the prohibition will prohibit the use of solid fuel burning devices that are not certified, even in the absence of an air quality episode or impaired air quality burn ban.

(3) Before prohibiting the use of solid fuel burning devices as allowed in subsections (1) and (2) of this section, ecology or a local air authority must:

(a) Allow exemptions from this subsection as described in RCW **70.94.477(2)** and **70.94.477(6)**.

(b) Seek input from any city, county, or jurisdictional health department affected by the proposal to prohibit the use of solid fuel burning devices.

(c) Make the following written findings:

(i) The EPA has designated the area nonattainment for PM-2.5 or has approved a PM-2.5 maintenance plan for the area.

(ii) Emissions from solid fuel burning devices in the area are a major contributing factor for violating the national ambient air quality standard for PM-2.5.

(iii) The area has an adequately funded program to assist low-income households to secure an adequate source of heat.

(4) When both of the following are true:

- The area is in ecology's jurisdiction.

- The legislative authority of a city or county for the area formally expresses concerns with the written findings required in subsection (3)(c) of this section.

Ecology will publish all of the following on the agency web site:

(a) The reasons for prohibiting the use of solid fuel burning devices.

(b) The agency's responses to the concerns expressed by the city or county legislative authority.

(5) The responsibility for enforcement of the prohibition of the use of solid fuel burning devices resides solely with ecology or the local air authority.

(6) A city, county, or jurisdictional health department serving the area may agree to assist with enforcement activities.

(7) On or after June 7, 2012, and before January 1, 2015, ecology or the local air authority must provide assistance to households using solid fuel burning devices to reduce the emissions from those devices or change out to a lower emission device.

(8) Before the effective date of any prohibition, ecology or the local air authority must provide public education in the area regarding all of the following:

(a) How households can reduce their emissions through cleaner burning practices.

(b) The importance of respecting impaired air quality burn bans.

(c) Opportunities for assistance in obtaining a cleaner device.

(9) In an area where the EPA has approved a PM-10 maintenance plan, ecology or the local air authority may prohibit the use of solid fuel burning devices when all of the following are true:

(a) The PM-10 maintenance plan contained a prohibition on the use of solid fuel burning devices as a contingency measure.

(b) The area has violated the PM-10 national ambient air quality standard.

(c) The emissions from solid fuel burning devices are a major contributing factor to the violation of the PM-10 national ambient air quality standard.
[Statutory Authority: Chapter 70.94 RCW. WSR 14-04-013 (Order 12-04), § 173-433-155, filed 1/23/14, effective 2/23/14.]

Appendices

Appendix A

Annual schedule of events for Air Quality Education booth

Event Name	Date(s)	Location	Description	Registration Fee
KEEN Winter Fair	January 28 th , 2017	Hal Holmes Center 4 th and Ruby Street, Ellensburg WA	Environmental and Community educational showcase	\$35
Spirit of the West	February 17 th -19 th 2017	Kittitas County Fairgrounds and Downtown Ellensburg	A celebration of music, poetry and art. Attracts over 4,000 visitors.	Free
KXLE Home and Garden Show	March 3 rd -5 th , 2017	Kittitas County Fairgrounds 901 E. 7 th Ave, Ellensburg, WA 98926	Home and Garden Show \$2 admission Features vendors specializing in home improvement, décor, lawn and garden.	\$599 (indoor booth) \$1200 + (outdoor booth)
Ellensburg Farmer's Market	May-October Saturdays 9am-1pm	4 th avenue between Pearl and Ruby	Farmer's Market	Unknown
Roslyn Farmer's Market	June-September Sundays 10am-2pm	Pennsylvania Ave, Roslyn WA	Farmer's Market	Unknown
Kittitas Valley Early Iron Club - Annual Threshing Bee and Antique Equipment Show	September	Olmstead Place State Park 921 Ferguson Road Ellensburg, WA 98926		Unknown

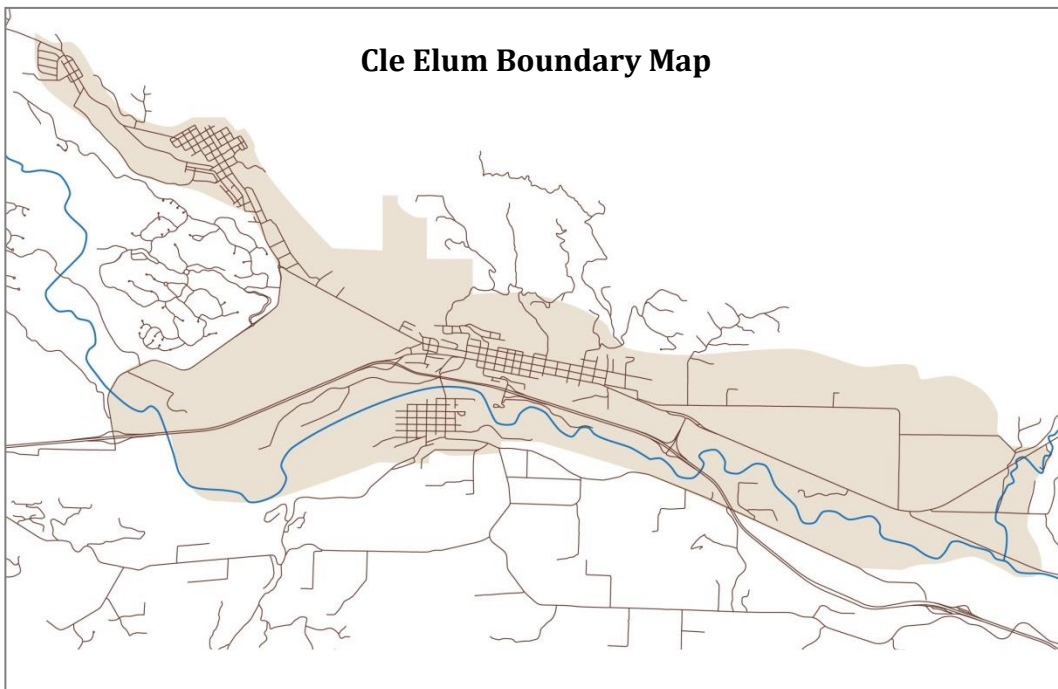
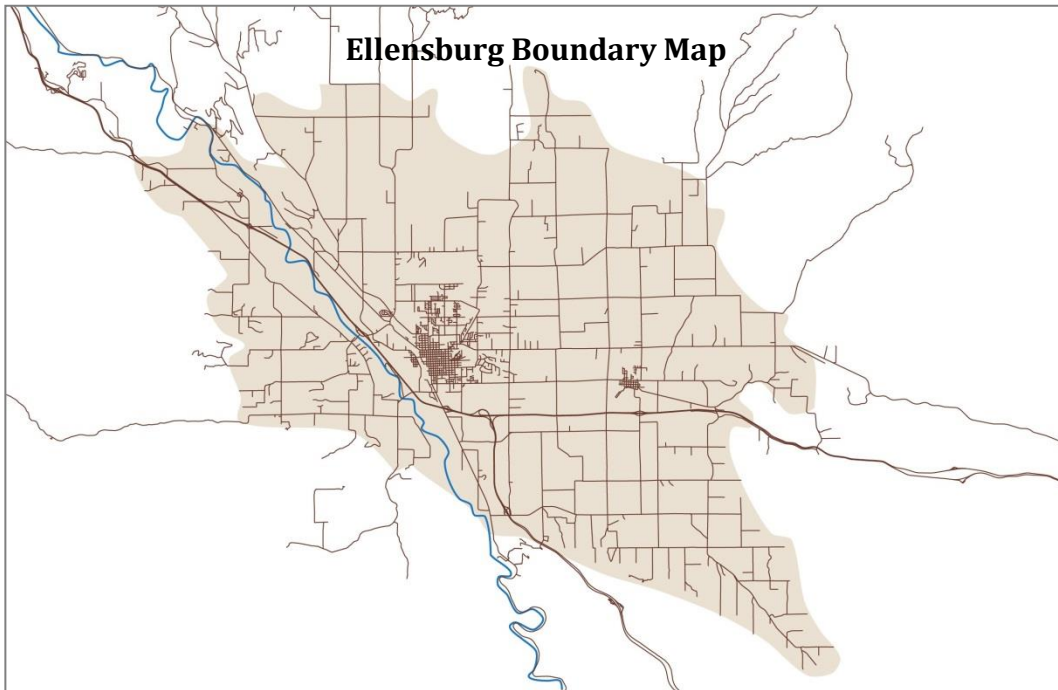
Annual schedule of events for Air Quality Education booth - Continued

Thorp Community Days	Sept. 30 th – October 1 st	Thorp Fire Station 10700 N Thorp Hwy	Community Festival in Thorp Free Admission	Unknown
Junk-Tiquen in the Burg	Oct-17 Apr-17	Kittitas County Fairgrounds 901 E. 7 th Ave, Ellensburg, WA 98926	Antiques show \$5 admission Free Parking	Unknown
Ellensburg Fall Festival/ Festival/	October	6181 Wilson Creek Road,	U-pick pumpkin patch, corn maze,	Unknown
Huffman Farms	Every Sat/Sun	Ellensburg, WA 98926	Free Admission	
Hunter's Breakfast	October	Swauk Teanaway Grange 1361 Ballard Hill Rd. Cle Elum, WA 98922	Paid breakfast, raffle items, live music to celebrate the opening of hunting season	Unknown
District 7 Fire Department Firewise Event	Unknown	Kittitas County Fire and Rescue 123 E 1 st St, Cle Elum, WA 98922		Unknown
Local Fire Department "Open Houses"	Unknown			Unknown

Appendix B

HopeSource woodstove exchange program residential boundaries, 2015-2017 grant cycle

Source: HopeSource-Ellensburg, Accessed 01/05/2017



Appendix C

Wood Stove Bounty Event Costs 2014, Ellensburg Transfer Station

Source: 2014 Bounty Report Ellensburg, Provided by Washington State Department of Ecology, Central Regional Office, Smoke Management Team

Location	Partner with Kittitas County for this event	Free
CRO Personnel*	Day of event: 2 x 10 staff hours, + 1 x 6.5 staff hours =	\$3580.00
WCC	Crew time - Approx. =	\$577.50
Volunteers	2 - KCPH, 2 KCFR	Free
Lodging	None	None
Meals	Lunch - per diem for ECY staff plus WCC =	\$76.52
Transportation	Motor pool - 72 miles RT x 2 vehicles (rough estimate)	\$30.00
Advertising	Flyers/Posters - Minuteman Press Radio Announcements - KXLE Newspaper Ad - Ellensburg Daily Record	\$53.07 \$336.00 \$779.44
Bounty Total	67 wood stoves at \$200 each	\$13,400.00
Survey Incentive	\$50 to two participants determined by random number	\$100.00
Approx. Cost		\$18,933.00

* Personnel costs included in the table are only those worked the day of the event.

Sources

- "County Population." Kittitas County Washington. Kittitas County, 2015. Web. 23 Feb. 2017.
- Fuller, Amy. *Kittitas County Air Quality Survey*. Rep. Ellensburg: KCPHD, 2014. Print.
- Fuller, Amy, and Daniel Hinz. *2015 Air Quality Survey Results Report*. Rep. Ellensburg: KCPHD, 2015. Print.
- Hinz, Daniel. "Final Report: Kittitas County Public Health Department (KCPHD) Interagency Agreement Report for Air Quality Project # C1400161 Washington State Department of Ecology." May 2015, Print.
- "History." Ellensburg, WA - History. City of Ellensburg, Washington, 2006-2017. Web. 11 Jan. 2017.
- "Kittitas County History" Kittitas County Historical Museum, Ellensburg, WA. N.p., 2017. Web. 11 Jan. 2017. <<http://www.kchm.org/kittitas-county-history.php>>.
- Meseck, Don. "Kittitas County Profile." Kittitas County Profile. Employment Security Department, Washington State, Sept. 2016. Web. 23 Feb. 2017.
- "NAAQS Table." EPA. Environmental Protection Agency, 20 Dec. 2016. Web. 14 Feb. 2017.
- "Particle Pollution (PM)." Particle Pollution (PM). Air Now, 31 Jan. 2017. Web. 14 Feb. 2017.
- Summers, Stephanie. Emissions Inventory Kittitas County Updated 2014. Rep. Lacey, WA: Washington State Department of Ecology, 2016. Print.
- Read, Robin. *The Health of Kittitas County: A Profile of Health, Well-being, and Quality of Life in Our Community*. Rep. Ellensburg: KCPHD, 2012. Print.
- US Census. United States Census Bureau, 2010. Web. 07 Dec. 2016.
- Washington State Department of Ecology: Air Quality Program. Health Effects and Economic Impacts of Fine Particle Pollution in Washington. Publication number:09-02-021. December 15,2009.
- Washington State Department of Health, Center for Health Statistics, Death Certificate Data, 1990–2015, August 2016.

Figure Sources

Cover Page Images

Carmony, Jay. Washington State Department of Ecology, Central Regional Office. View of Ellensburg, Manastash Ridge Viewpoint. 2011. Ellensburg, WA. N.p.: n.p., n.d. N. pag. Print.

Air Monitoring Station, Grand Isle State Park Louisiana. 2016. EPA Web Archive, Grand Isle, Louisiana. Air Data from the Gulf Coastline. Web. 23 Feb. 2017.

Himmel, John. Taylor Bridge Fire. 2012. Ellensburg, WA.

Weather Striped Air Bag Wind Sock Sky. N.d. Max Pixel. Web. 23 Feb. 2017.

Figure 1

"Kittitas County, Washington." Google Maps. N.p., n.d. Web. 23 Feb. 2017.

Figure 2

"County Population." Kittitas County Washington. Kittitas County, 2015. Web. 23 Feb. 2017.

Figure 3

Carmony, Jay. Washington State Department of Ecology, Central Regional Office. View of Ellensburg, Manastash Ridge Viewpoint. 2011. Ellensburg, WA. N.p.: n.p., n.d. N. pag. Print.

Figure 4

"Particle Pollution (PM)." Particle Pollution (PM). Air Now, 31 Jan. 2017. Web. 14 Feb. 2017.

Figure 5

Washington State Department of Ecology. Air Monitoring Data, Kittitas County Updated 2014. Rep. Lacey, WA: Washington State Department of Ecology, 2016. Print.

Figure 6

Washington State Department of Ecology. Air Monitoring Data, Kittitas County Updated 2014. Rep. Lacey, WA: Washington State Department of Ecology, 2016. Print.

Figure 7

Summers, Stephanie. Emissions Inventory Kittitas County Updated 2014. Rep. Lacey, WA: Washington State Department of Ecology, 2016. Print.

Table Sources

Table 1

"NAAQS Table." EPA. Environmental Protection Agency, 20 Dec. 2016. Web. 14 Feb. 2017.

Table 2

Read, Robin. The Health of Kittitas County: A Profile of Health, Well-being, and Quality of Life in Our Community. Rep. Ellensburg: KCPHD, 2012. Print.