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# Butte Fine Particulate Matter (PM<sub>2.5</sub>) Planning

Presentation to:  
Mat-Su Borough Assembly  
Meeting

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COMMISSIONER HARTIG

&

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JUNE 7, 2016



# Purpose of the Presentation

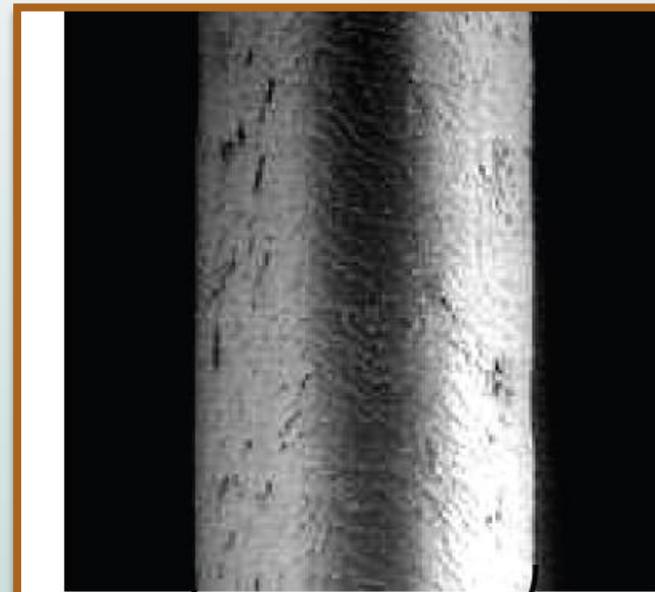
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- Goal is to protect Human Health
- Air Monitoring is showing unhealthy levels of fine particulate matter
- Wood burning sources
- Need for immediate action
- Local solutions
- Collaboration with DEC's Air Quality Program



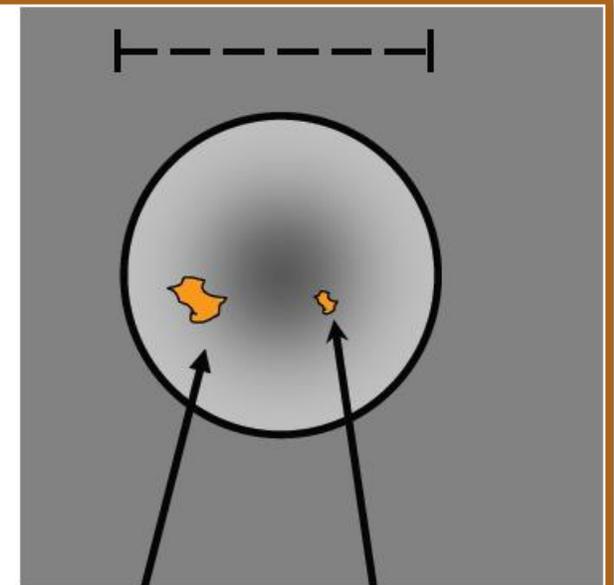
# Particulate Matter (PM)

- A complex mixture of extremely small particles and liquid droplets.
- $PM_{10}$  vs  $PM_{2.5}$



Human Hair (70  $\mu\text{m}$  diameter)

Hair cross section (70  $\mu\text{m}$ )



$PM_{10}$   
(10  $\mu\text{m}$ )

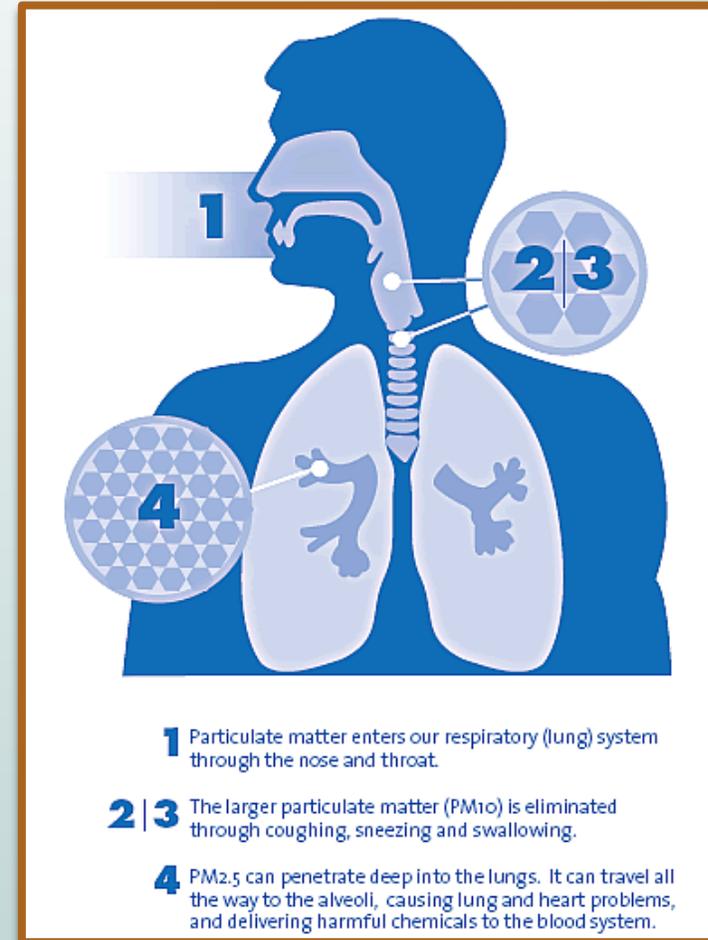
$PM_{2.5}$   
(2.5  $\mu\text{m}$ )

Source: M. Lipsett, California Office of Environmental Health Hazard Assessment



# Particle Pollution and Public Health

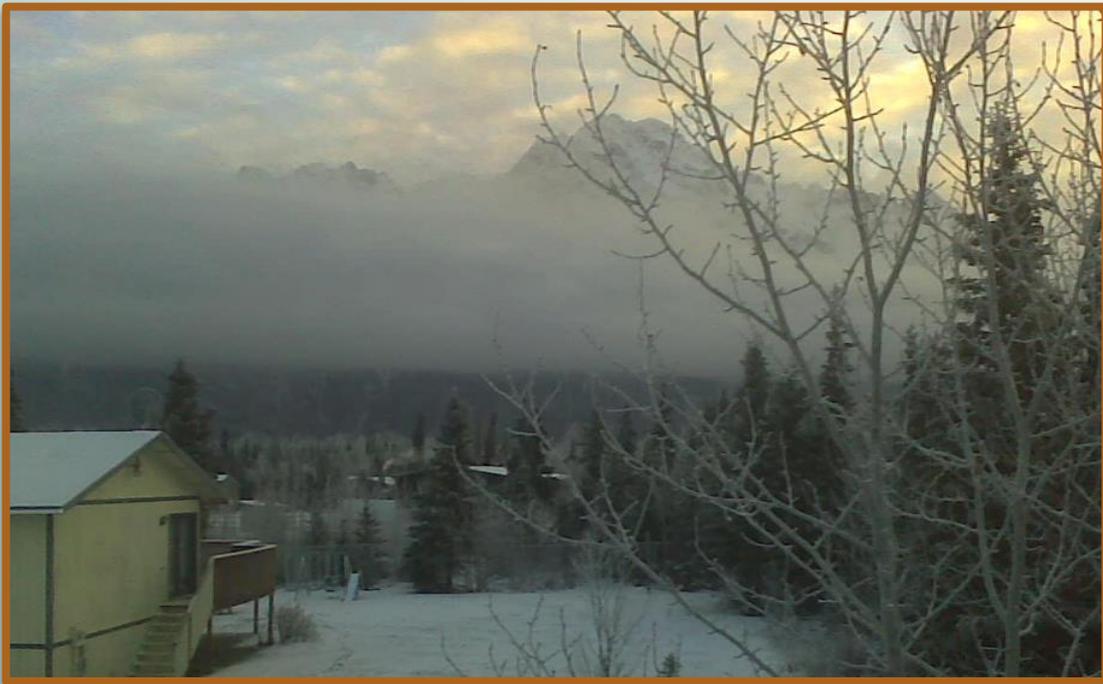
- Health effects associated with exposure to fine particles include:
  - Premature death in people with heart and lung disease
  - Changes in heart rate variability; Irregular heartbeat; Non-fatal heart attacks
  - Increased hospital admissions and emergency room visits
  - Increased respiratory symptoms (coughing, wheezing and shortness of breath)
  - Lung function changes in children and older adults





# Fine Particulate Matter Sources (PM<sub>2.5</sub>)

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- Fine particulates are typically formed as a result of fuel combustion
- Wood-fired heating devices
- Burning construction debris or trash (burn barrels)
- Land clearing



# Factors That Contribute to Air Pollution

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- ***Topography***

- Are you in a low spot?
- Where are your neighbors' homes in relation to your chimney?

- ***Stagnant air conditions***

- Little or no wind to disperse smoke
- Temperature inversions that trap smoke near the ground

- ***Combustion sources***

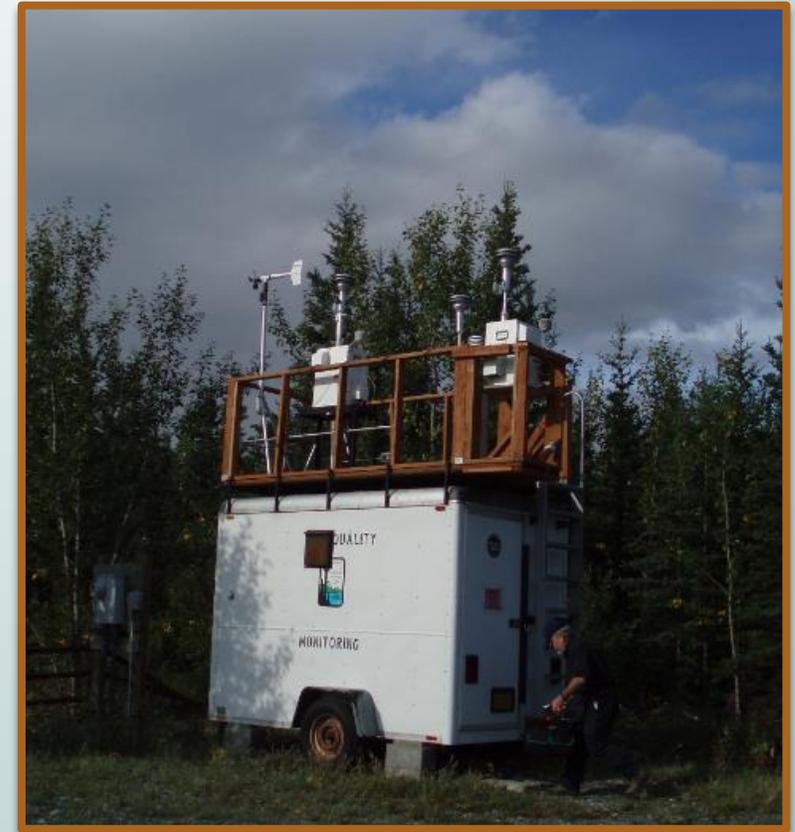
- Wood heaters
- Slash burning





# PM<sub>2.5</sub> Monitoring

- Year-round mandatory monitoring for PM<sub>2.5</sub> in Butte since Dec 1998
- Year-round monitoring in Palmer since 2011
- Public can access real time air monitoring data:
  - <http://dec.alaska.gov/Applications/Air/airtoolsweb/Aq/>





# Monitoring

- Butte monitor getting close to violating the national PM<sub>2.5</sub> standard
- If Butte has >6 days over 29.1 µg/m<sup>3</sup>, the 2016 DV will exceed federal standards

➤ 98 <sup>th</sup> Percentile PM <sub>2.5</sub> 24-hr Average Concentration, µg/m <sup>3</sup>	2013	2014	2015	Design Value	Not in Attainment*
	27.9	39.5	37.9	35.1	35.5

\*Compliance with the 24-hr PM<sub>2.5</sub> NAAQS is determined using three years of air monitoring data. The design value is an average of 98th percentile 24-hr average PM<sub>2.5</sub> concentrations over three years.

- Palmer monitor shows lower concentrations (2015 design value of 10 µg/m<sup>3</sup>)



# Butte PM<sub>2.5</sub> Monitoring: Consequences

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2016 Monitoring values stay below 29.1  $\mu\text{g}/\text{m}^3$ :

- Three year design value for 2016 will indicate Butte is in attainment
- Continue to work to stay below standard for 2017





# Butte PM<sub>2.5</sub> Monitoring: Consequences

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2016 Monitoring values are above 29.1  $\mu\text{g}/\text{m}^3$ :

- Three year design value for 2016 will indicate Butte is in nonattainment
- EPA could request State to submit recommendations for formal designations
- EPA currently reviewing the 24-hour PM<sub>2.5</sub> standard and could issue a finding within the year





# Consequences of Nonattainment

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Formal designation by EPA as a nonattainment area triggers a wide range of expensive requirements that result in an Air Quality Plan that must be submitted within 3 years.

- Failure to plan or submit required items results in federal sanction clocks. The sanctions include items such as 2:1 industrial offsets and a restriction in the use of federal highway money.
- All federally funded projects (road or other types) must meet conformity in order to get funded
- Once an area meets attainment, must maintain attainment for 20 years
- Requirements for ordinances and regulations that are enforceable (voluntary measures alone will not be enough)
- Plan must be able to demonstrate area can meet attainment
- Clean Air Act allows citizen lawsuits for failure to implement a plan



# Potential Control Measures

*Locally selected and implemented control measures have best chance of success.*

*Ideas from other communities:*

- Promote or require the installation of cleaner burning wood heaters
  - Device change out programs
- Promote or require the selling and burning seasoned, dry wood
  - Moisture Disclosure Program (current State voluntary program)
  - Registered wood seller
  - Community drying lots or kiln
  - Loan out moisture meters
  - Issue firewood gathering permit to recently burned areas
- Pair air advisories with messaging (use alternative source of heat, burn dry wood)
- Create a special purpose district with focused control measures
  - Local burn approvals
- If in nonattainment, voluntary measures not sufficient



# What Can Residents Do to Reduce Wood Smoke?

- Better insulate and weatherize homes to reduce heating demands
- Select a clean burning heating device sized appropriately to the space
- Follow the manufacturer's operating recommendations
- Maintain wood heater and chimney
- Only burn clean, dry wood in a wood stove
  - Check the moisture content of your wood – aim for 20%
- Don't let your fire smolder
  - <http://burnwise.alaska.gov/>

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Alaska DEC Alaska Department of Environmental Conservation Division of Air Quality search DEC State of Alaska

State of Alaska > DEC > Air Quality > ANPMS > Burn Wise

BURN WISE ALASKA FAIRBANKS PM2.5 OPEN BURN MOISTURE DISCLOSURE PROGRAM AIR QUALITY HOME

REGULATIONS

- ▶ Registered Wood Sellers
- ▶ Wood Heater Lists

HARMS OF WOOD SMOKE

WHAT YOU CAN DO

WOOD MOISTURE

KNOW YOUR WOOD

**BURN THE RIGHT WOOD, THE RIGHT WAY, IN THE RIGHT STOVE.**  
BURNWISE.ALASKA.GOV

**BURN WISE BREATHE EASY**

THE HARMS OF WOOD SMOKE

Wet Wood Dry Wood is Good Wood

Prev Play Next

The Harms of Wood Smoke

Scripts of Videos and Radio Ads can be found on each topic page.

KID'S ACTIVITY BOOK RADIO BROCHURES POSTERS

Previously Developed Media

For more information, contact:  
Alex Edwards  
alex.edwards@alaska.gov  
907-269-7695



# Action Is Necessary to Prevent Nonattainment

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*How do we work together to engage community and explore options?*

- Public Education
  - Road side signs when entering/exiting Butte
  - Distribute materials through woodstove dealers, wood sellers, mail outs, etc.
  - Education on local weather patterns
- Other ideas?
  - Local outdoor open burn ordinances
  - Incentive programs – device change outs, fuel switching
  - Enhance dry firewood options – energy logs
  - Conditions on slash burning/land clearing



# Suggested Next Steps

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- Finalize Memorandum of Understanding – Clearly identify roles and responsibilities between DEC and Mat-Su Borough
- Mat-Su Borough would have primary responsibility for preventing nonattainment – Local community best suited to tailor options and solutions
- DEC involvement would increase if area becomes nonattainment



# Your Input

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Division of Air Quality

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[denise.koch@alaska.gov](mailto:denise.koch@alaska.gov)

<https://dec.alaska.gov/air/>

[http://dec.alaska.gov/air/anpms/comm/matsu\\_pm2-5.htm](http://dec.alaska.gov/air/anpms/comm/matsu_pm2-5.htm)

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Alaska DEC Division of Air Quality Air Non-point Mobile Source

State of Alaska > DEC > Air Quality > ANPMS > Communities

### MAT-SU - BUTTE - PM<sub>2.5</sub>

98 <sup>th</sup> Percentile PM <sub>2.5</sub> 24-hr Average Concentration, µg/m <sup>3</sup>	2012	2013	2014	Design Value	Cannot Exceed*
	33.4	27.9	39.5	34	35

\*Compliance with the 24-hr PM<sub>2.5</sub> National Ambient Air Quality Standard (NAAQS) is determined using three years of air monitoring data. The design value is an average of 98th percentile 24-hr average PM<sub>2.5</sub> concentrations over three years. The 2012-2014 DV is 34 µg/m<sup>3</sup>. The NAAQS is currently 35 µg/m<sup>3</sup>.

Photo Taken December 14, 2014  
24-Hr PM<sub>2.5</sub> Average = 51.21 µg/m<sup>3</sup>

The Butte area of the Matanuska-Susitna Borough has experienced elevated levels of fine particulate matter (PM<sub>2.5</sub>). Air quality monitoring data indicates that the area may exceed the PM<sub>2.5</sub> National Ambient Air Quality Standard (NAAQS) of 35 micrograms/cubic meter. If the area continues to experience elevated levels of PM<sub>2.5</sub>, EPA may designate the area as a nonattainment area.

Information on this page can help residents understand the issue and learn what actions they can take to improve air quality.

**Current Air Quality**

- Real-Time Air Quality Data
- Air Quality Advisories

**Air Quality Monitoring Data**

- Design Values
- Butte PM<sub>2.5</sub> Data
- Palmer PM<sub>2.5</sub> Data
- Butte Monitoring Report

**Outreach & Education**

- Burnwise Alaska
- Split, Stack, Store & Save

**Complaint Form**

- Statewide Complaint Form

**Map**

- Butte Monitoring Site Map

**Monitoring Plan**

- Air Monitoring Plan

**Health and Safety**

- Harms of Woodsmoke
- PM<sub>2.5</sub> Health Effects

**Other Links**

- Mat-Su Borough Air Quality Webpage
- Exceptional Events
- Windblown Dust Events
- Glossary of Terms

**QUICK LINKS**

- ANPMS Contacts
- Air Pollution in Alaska
- Affected Communities
- Carbon Monoxide
- Indoor Air Quality
- Particulate Matter
- Regional Haze
- Air Toxics
- Projects & Reports

**Programs**

- Conformity
- Ultra Low Sulfur Diesel

**OF INTEREST**

- Division of Air Quality
- Monitoring and Quality Assurance
- Air Non-point Mobile Source
- Air Permit Program

Commissioner Public Notices Regulations Statutes Press Releases  
Divisions/Contacts Employee Email

Division of Air Quality  
410 Willoughby Ave, Ste. 303, Juneau, AK 99801  
Phone: 907-465-5105 | Fax: 907-465-5126 | TTY: 1-800-770-8973

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