Butte Fine Particulate Matter (PM2.5) Planning

Presentation to:
Mat-Su Borough Assembly
Meeting

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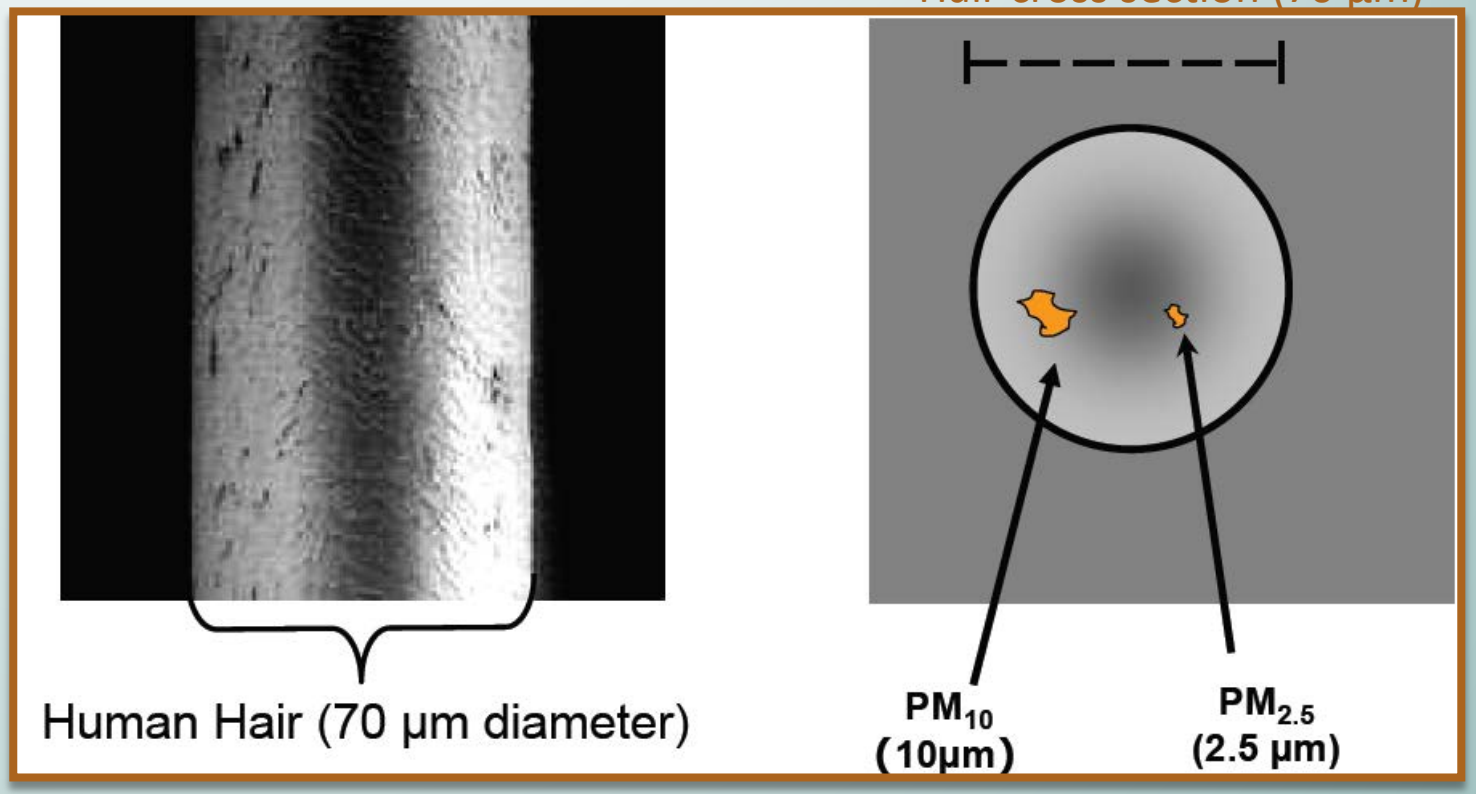
Purpose of the Presentation

- Goal is to protect Human Health
- Air Monitoring is continuing to show unhealthy levels of fine particulate matter (PM2.5)
- Wood burning sources
- Need for immediate action
- Local solutions
- Collaboration with DEC's Air Quality Program

Particulate Matter (PM)

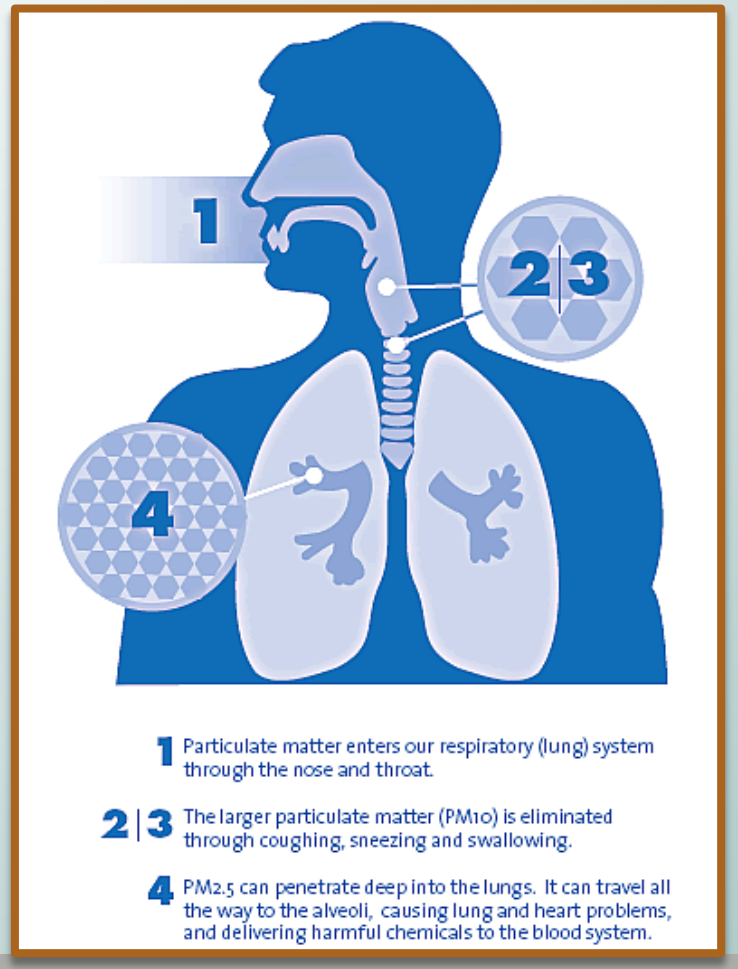
- A complex mixture of extremely small particles and liquid droplets.
- PM_{10} vs $PM_{2.5}$



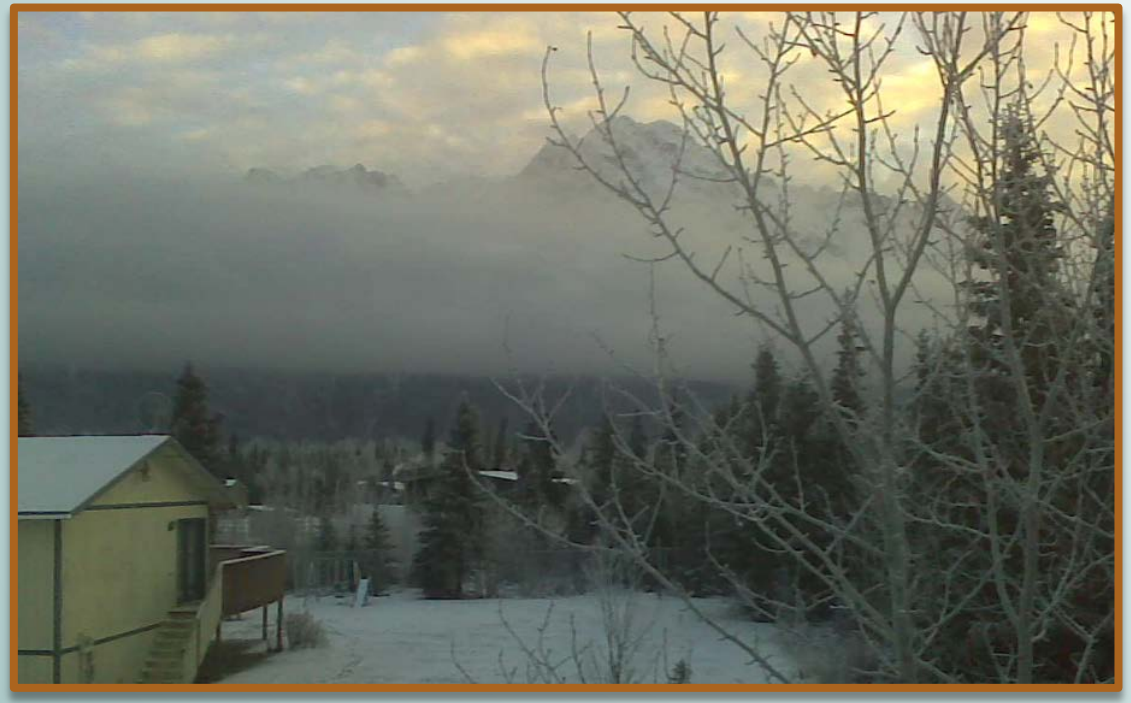
Source: M. Lipsett, California Office of Environmental Health Hazard Assessment

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 ($PM_{2.5}$)



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

$PM_{2.5}$ Monitoring

- Year-round mandatory monitoring for $PM_{2.5}$ 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/

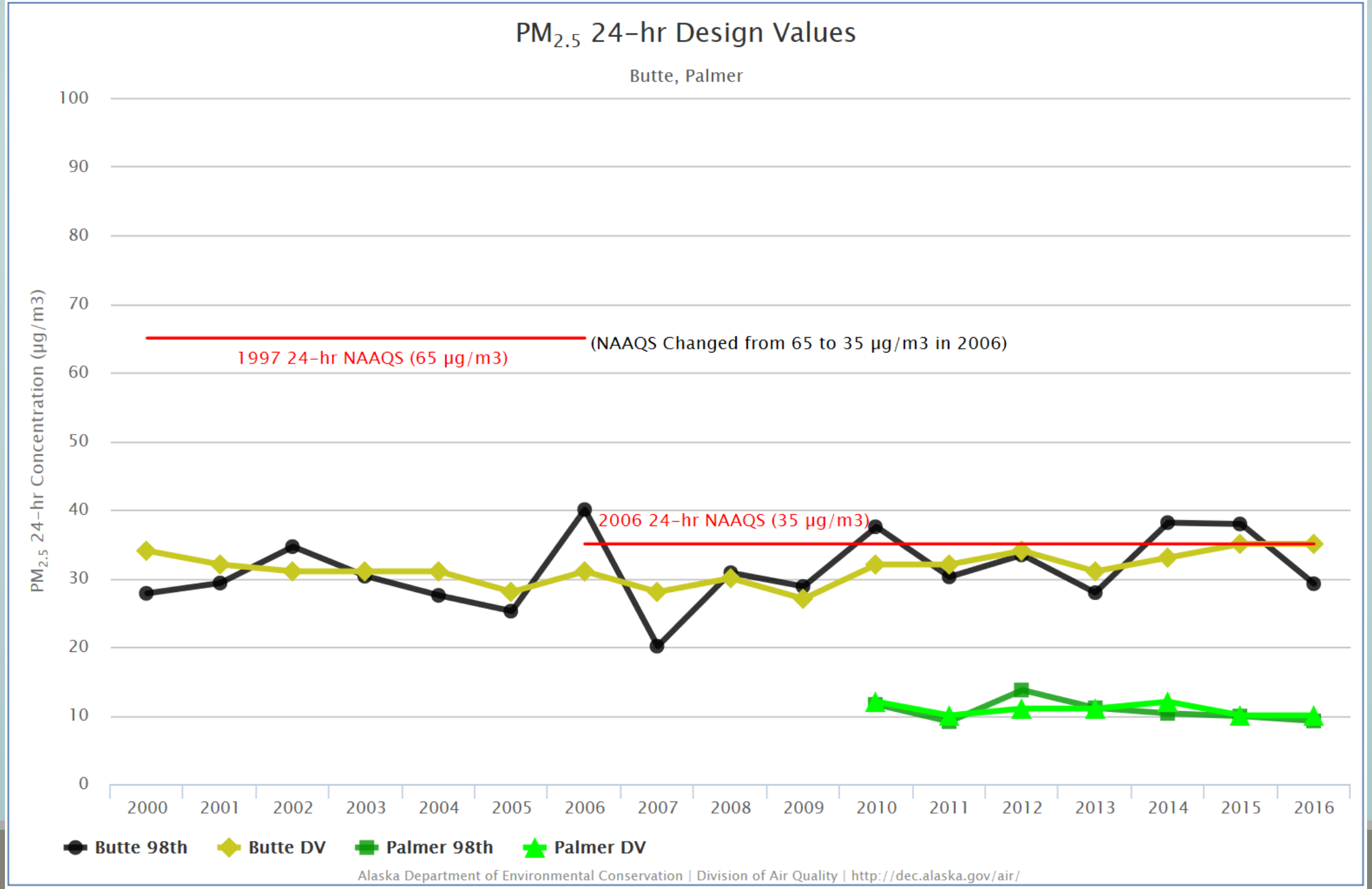
Monitoring

- Butte monitor getting close to violating the national $PM_{2.5}$ standard

➢ 98th Percentile $PM_{2.5}$ 24-hr Average Concentration, µg/m³	2014	2015	2016	2016 Design Value	Not in Attainment*
	38.1	37.9	29.2	35.1	35

**Compliance with the 24-hr $PM_{2.5}$ NAAQS is determined using three years of air monitoring data. The design value is an average of 98th percentile 24-hr average $PM_{2.5}$ concentrations over three years. Values < 35.5 round down to 35 and are considered in compliance.*

- Palmer monitor shows lower concentrations (2016 design value of 10 µg/m³)


PM2.5 24-hr Design Values
Butte, Palmer
100
90
80
70
60
50
40
30
20
10
0
PM2.5 24-hr Concentration (µg/m3)
1997 24-hr NAAQS (65 µg/m3)
(NAAQS Changed from 65 to 35 µg/m3 in 2006)
2006 24-hr NAAQS (35 µg/m3)
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Butte 98th
Butte DV
Palmer 98th
Palmer DV
Alaska Department of Environmental Conservation | Division of Air Quality | http://dec.alaska.gov/air/

Butte $PM_{2.5}$ Monitoring:

	98th Percentile (µg/m³)	Design Value (DV)* (µg/m³)	Standard (µg/m³)
2012	33.4	33.7	35
2013	27.9	30.5	35
2014	38.1	33.1	35
2015	37.9	34.6	35
2016	29.2	35.1	35

* DV < 35.5 round down to 35 and are in compliance

Butte $PM_{2.5}$ Monitoring:

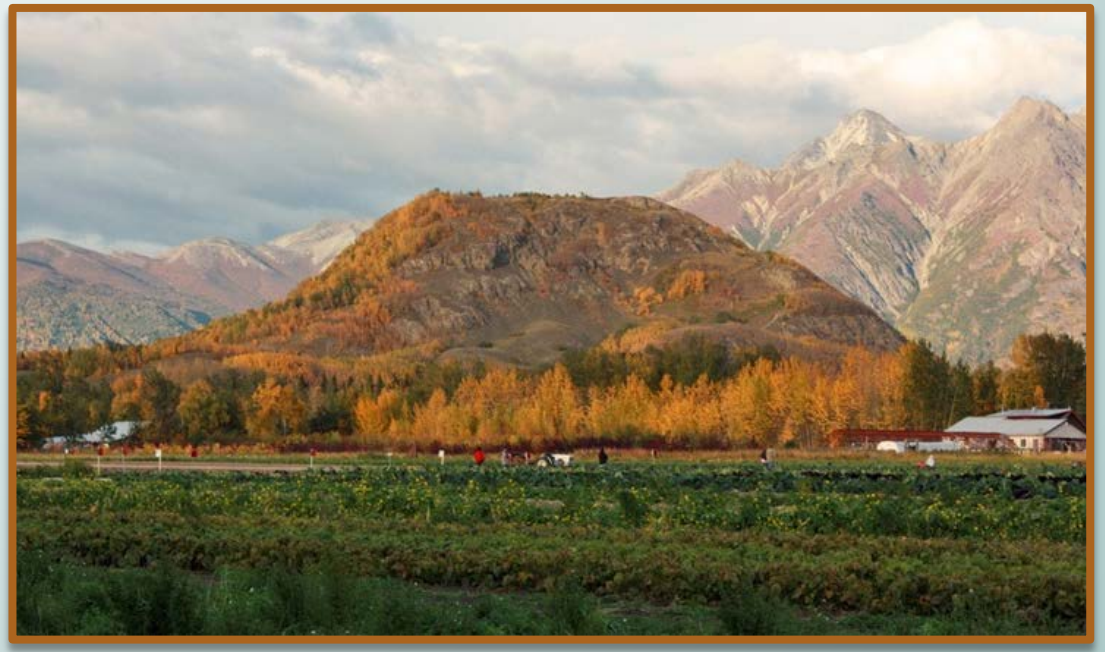
Long term trend of $PM_{2.5}$ concentrations close to the health standard:

- More pronounced over the past 3 years: increased number of exceedances
- Three year design value for 2015 and 2016 were barely below the standard
- 2016 had lower 98th percentile than previous years.

Butte $PM_{2.5}$ Monitoring

2017 Monitoring values (to date) show 4 dates that exceed the standard:

Date	PM2.5 concentration in µg/m³
1/1/2017	63.5
1/2/2017	42.2
1/11/2017	41.6
2/6/2017	44.1



Consequences of Nonattainment

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 withholding 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 selling and burning of 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
- Encourage hook up to natural gas
  - Device change out programs
- 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 will not be 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/

Action Is Necessary to Prevent Nonattainment

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?
  - Incentive programs – encourage hook up to natural gas, device change outs
  - Enhance dry firewood options – energy logs
  - Conditions on slash burning/land clearing

Suggested Next Steps

- 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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https://dec.alaska.gov/air/

http://dec.alaska.gov/air/anpms/comm/matsu_pm2-5.htm