



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

## Presentation to: Air Pollution Control Commission

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## Purpose of Presentation

- **Monitoring**
  - North Pole Saturation Study
  
- **Planning**
  - Moderate SIP
  - Serious SIP
    - Timeline
    - Control Measures



## DEC Regulatory Monitoring

- Operates SOB, Ncore, NPFS regulatory monitors (as of July 2016)
- Federal Reference Monitors (FRM) – Used to calculate compliance with national PM<sub>2.5</sub> standards
  - Locations remain fixed for decades after attainment achieved
  - Filter based instruments:
    - operating every 3<sup>rd</sup> day in North Pole
    - Operating daily at Ncore and planned for SOB (pending instrument purchase)
- Special Purpose Monitoring (SPM) –
  - Continuous analyzers (BAM), provide hourly data
  - Used to issue air quality advisories and alerts.
  - No additional short term SPM monitoring as of March 2016 due to DEC staffing and budget limitations



## Saturation Study

- Goal

Make the needed measurements necessary for evaluating the spatial characteristics of ambient  $PM_{2.5}$  concentrations across the North Pole area during wintertime episodes.

- To identify ambient  $PM_{2.5}$  concentrations residents are being exposed to beyond the NPFS monitor; and
- To evaluate where a new monitor could be placed, if necessary, to better represent neighborhood scale impacts.

### Organization:

- DEC: Technical Assistance, Outreach, Funding, Oversight
- FNSB: Technical Assistance, Site selection, Outreach
- Sierra Research: Project Planning and Management, Data Analysis,
- T&B Systems: Equipment Selection, Data Collection, Quality Assurance



# Saturation Study Design

- Based on hourly BAM data collected at the NPFS monitoring station from 2013-2015, and the special study and mobile “sniffer” PM survey data previously collected by the FNSB
- Fixed-Site Monitoring
  - Twelve fixed-site monitors will be placed and operated continuously during the study period.
  - Siting will be off the main roads and away from local sources to try to capture the most representative data of a neighborhood scale within a broad area of North Pole
  - Extend roughly 2 miles outward from the NPFS site
- Mobile Monitoring
  - Using a vehicle equipped with a real-time PM<sub>2.5</sub> monitor that will be used for “virtual site” data collection.
  - Use a multiple pass method to repetitively drive about 5 traverses per averaging period past the same locations.
  - Data at these fixed locations along the traverse will be accumulated and averaged over the hour to provide hourly average concentrations at the “virtual sites.”
  - Provides a very dense network of sites to directly address and answer questions about small scale variations that may be associated with local sources and microscale phenomena in the region.



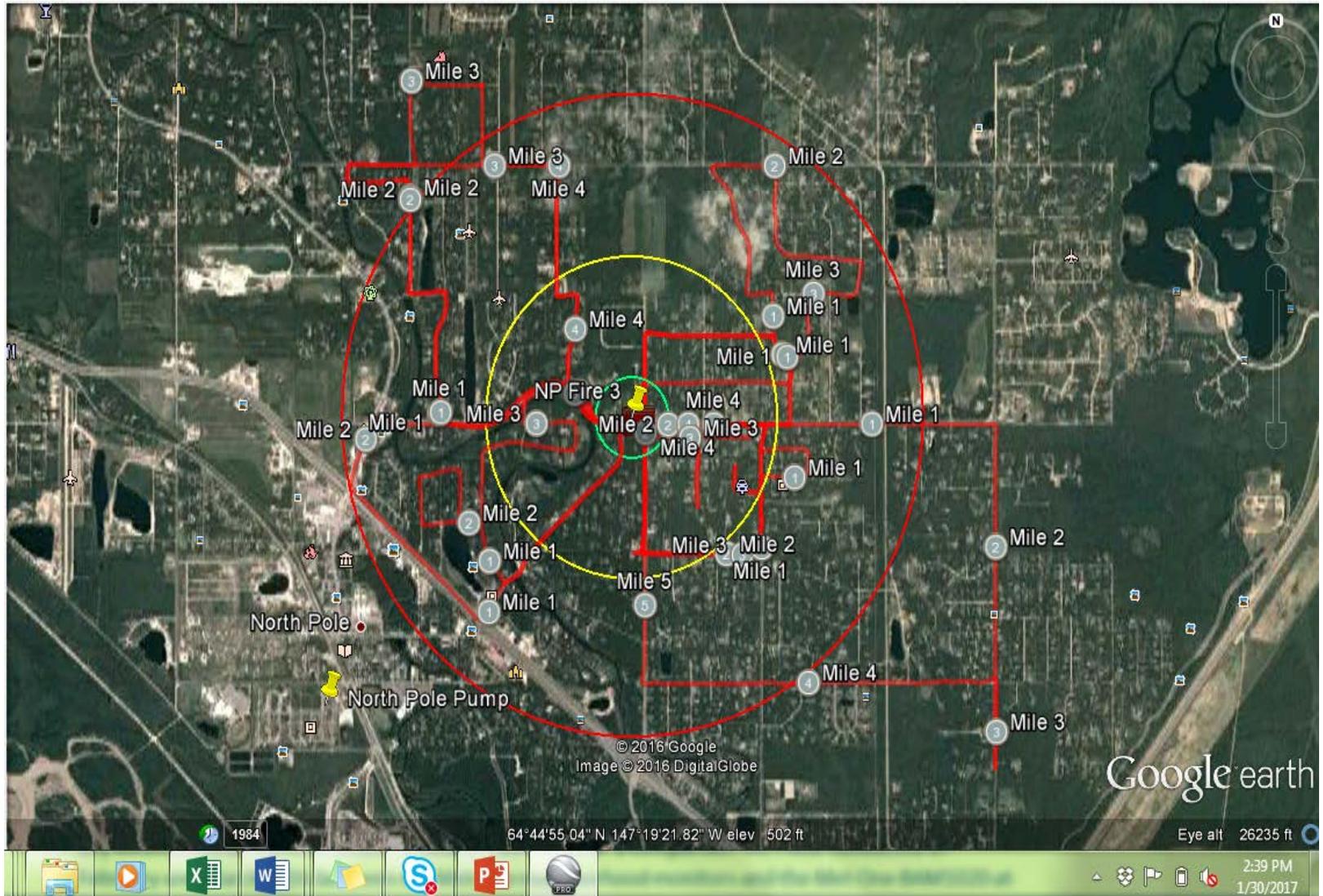
## Saturation Study: Equipment and Timeline

- Thermo Personal Data Ram (pDR) Model 1500 samplers will be used for all PM<sub>2.5</sub> measurements
  - Used for stationary and mobile monitoring
  - Same as 'sniffer' vehicle set-up
- 2 Additional meteorological sites
- 3 week study in February
  - Some daily PM<sub>2.5</sub> concentrations > 35 µg/m<sup>3</sup>
  - Some daily average temperatures < -15°F.
- Final report expected by early fall 2017





# Proposed Mobile Monitoring Routes





## Moderate SIP

- Moderate Area SIP submitted to EPA in December 2014.
- DEC amended the Moderate SIP during 2016 incorporating the FNSB ordinances and updating regulations. DEC submitted amendment to EPA in time to be incorporated in EPA's finding on the Moderate SIP.
- EPA will propose full approval of Moderate SIP. (No conformity freeze.)
- Once published in the Federal Register, 2/2, there will be a 30 - day public comment period.



## New PM<sub>2.5</sub> Implementation Rule

- New PM<sub>2.5</sub> Implementation rule lays out specific requirements for PM<sub>2.5</sub> and its precursors.
- Based on the rule, the Serious SIP will be a major effort.
  - Moderate SIP was based on reasonable control measures
  - Serious SIP will be based on best and most stringent control measures
  - Increased amount of documentation and evidence required
  - New rule clarified the requirements to control not only direct PM but also the precursors (NO<sub>x</sub>, SO<sub>2</sub>, VOCs, Ammonia). So some control measures may be difficult to comprehend by public because they control a precursor vs wood smoke.
  - New rule has some benefits: Precursor Demonstration. Precursor Demonstration Guidance currently out for public comment. A successful demonstration could mean limited or reduced control requirements - example ammonia.



## Timeline

- FNSB will be reclassified as a Serious Non-Attainment Area
  - EPA reclassifies per Clean Air Act based upon NPFS monitoring data
  - EPA proposed FNSB reclassification in Federal Register (Dec 16, 2016)
  - EPA is under court order to finalize reclassification by April 28, 2017. Reclassification likely effective end of May 2017.
  - EPA has indicated (PM<sub>2.5</sub> Implementation Rule in Oct 2016) that Serious SIP is due December 2017.



## Timeline continued

- New Implementation Rule (40 CFR 51.1003(b)(2)(ii)) requires SIPs to be submitted 18 months after the effective date of reclassification **OR** 2 years prior to the attainment date which ever is earlier.
- Serious SIP is due, according to the Implementation Rule, is December 14, 2017.
- The Clean Air Act section 189(b)(2) specifies that SIPs submitted in response to mandatory reclassifications are due 18 months after classification.
- DEC's intention is to develop a Serious SIP that is complete and has adequate public involvement.



## Serious Nonattainment Area SIP

- Serious Area SIP must:
  - Include all control measures for all sources (area sources, point sources, mobile sources)
    - Unless found to be technical or economically infeasible
    - What has been implemented in other areas sets the level of expectation for the control measure test.
  - Include Best Available Control Technology on all major point sources
  - Demonstrate attainment by 2019, unless an extension is requested.
    - If extension requested, must be included in SIP at time of submittal and include framework for Most Stringent Measures (MSM).
  - Include Reasonable Further Progress (RFP) milestones for PM<sub>2.5</sub> and Precursors. Failure to meet RFP milestones triggers contingency measures.



## Control Measures

- DEC reviewed other states and communities':
  - PM<sub>2.5</sub> SIPS
  - Regulations
  - Ordinances
  - Included areas that are in attainment
- Developed a large list of control measures from this review
- Submitted list to FNSB Air Quality program
- List shows control measures from other areas that need to be analyzed and implemented in FNSB.
- Any control measure not implemented will need documentation that it is technological or economically infeasible OR how an “Alaskanized” measure is equivalent.



## Control Measures continued

- Examples of types of control measures in other areas (not complete list)
  - Curtailment at lower concentration threshold.
  - Date certain removal of all uncertified solid fuel fired devices
  - Surcharge on device sales
  - Installations only by certified installers
  - Require installation of thermal mass for new or existing outdoor hydronic heaters
  - Prohibit advertising of used devices
  - Zero visible emissions during curtailment
  - Registration and inspection of devices to qualify for exemptions from curtailments or to remain in place
  - Prohibit new installation of hydronic heaters or coal fired devices
  - Require sale of dry wood only during late summer to end of winter
  - Prohibit use of used oil
  - I/M program
  - Require only low sulfur oil for all sources (home heating, point sources)



## Control Measures continued

- Three Types of Control Measures – BACM, MSM, Contingency
- BACM = ‘Best’ Available Control Measures
  - Serious SIP requires BACM
  - ‘Best’ is typically defined by what has been implemented in other areas
  - Challenge will be documenting or coming up with ‘equivalencies’ between FNSB control measures and Lower 48 control measures and then proving the equivalency for EPA’s approval.
  - Control measures implemented before December 2019 and meet the ‘Best’ test is considered BACM.



## Control Measures continued

- MSM = Most Stringent Measure
  - MSM is a control measure that can't be implemented before 2019, but must be implemented before any new attainment date.
  - MSM's are measures that usually require more lead time to implement
  - MSM framework must be included in a Serious SIP if requesting an extension of the attainment date beyond 2019
  - Only one extension request may be submitted – 1 year increments up to 5 years total.
  - Example of a possible MSM – date certain removal of all noncertified devices in nonattainment area. Removing all devices by 2019 may not be possible but removing all devices between 2019-2024 may be possible.



## Sanctions

- Sanction Clock starts when EPA determines there has been:
  - Failure to submit a SIP
  - A SIP was submitted and found to be incomplete
  - A SIP has been found complete but is disapproved or partially disapproved
  - A failure to implement a committed measure in an approved SIP
- Three Sanction Clocks
  - 18-months – until first sanction – likely 2:1 offsets
  - 24-months – until second sanction – likely federal highway funds
  - 24-months- until Federal Implementation Plan
- Clocks may reset or pause depending on issue and remedy
- These sanctions are in the Clean Air Act



Questions?

# Thank You!

For more information:

[http://dec.alaska.gov/air/anpms/comm/fbks1\\_pm.htm](http://dec.alaska.gov/air/anpms/comm/fbks1_pm.htm)