Preliminary Draft Documents

Presentation to:
Fairbanks North Star Borough
Assembly
City Councils
Military Leadership

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Air Quality

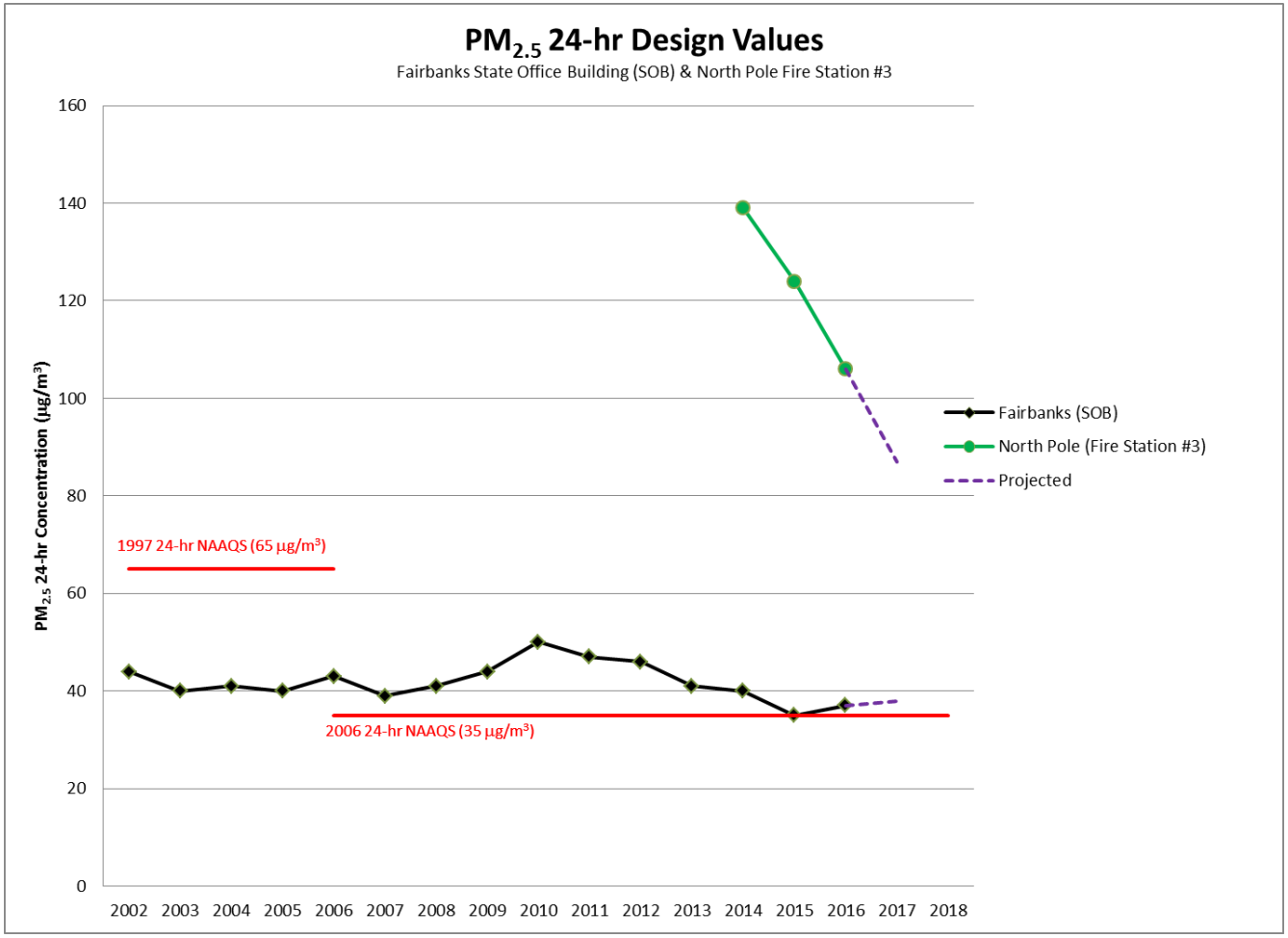
April 3, 2018

Overview

- How did we get here?
- Magnitude of the problem
- Preliminary Draft Documents overview
- Best Available Control Measures

How we got here

Magnitude of the problem



Preliminary Drafts

- Released March 22, 2018
- http://dec.alaska.gov/ under “Current Events”

- Draft Concepts and Approaches - Overview
- Draft Technical Analysis Protocol
- Draft Precursor Modeling Demonstration
- Draft Emission Inventory
- Draft Best Available Control Technology Analysis
- Draft Best Available Control Measure Analysis
- Ultra Low Sulfur Fuel Cost Analysis

Preliminary Drafts

- No final decisions.
- Drafts – Not Complete
- Seeking Additional Information
  - Grey text boxes show where additional information is needed or work still needs to be done.
  - Amount of #1 vs #2 fuel oil used.
  - Comments from EPA on various analysis and approaches

Overview of draft documents

Emission Inventory

Summary of Applicable Inventories for Serious Area $PM_{2.5}$ SP

Class	Type	Geographic Area	Calendar Year	Regulatory Requirements	Status
Planning	Base Year	Nonattainment Area	2013	CAA 172(c)(3)	Preliminary Draft
	Projected, with controls	Nonattainment Area	2019	CAA 172(c)(3)	Under Construction
Modeling	Baseline	Modeling Domain	2013	CAA 189(b)(1)	Preliminary Draft
	Projected, with controls	Modeling Domain	2019	CAA 189(b)(1)	Under Construction

Overview of draft documents cont.

Precursor Analysis

Preliminary Precursor Significance Evaluation Summary

Precursor Pollutant	Modeling Assessment
Volatile Organic Compounds (VOCs)	Not significant for either point sources or comprehensively
Oxides of Nitrogen (NOx)	Not significant for either point sources or comprehensively
Ammonia (NH_3)	Not significant for either point sources or comprehensively
Sulfur Dioxide (SO_2)	Significant for both point sources and comprehensively

Overview of draft documents cont.

Best Available Control Technology

Preliminary Precursor Significance Evaluation Summary

Pollutant	New Control Measure Preliminary Decision	Basis for Preliminary Decision
PM2.5 - direct	No new control measures - currently controlled	Draft BACT Analysis
VOCs Volatile Organic Compounds	No new control measures	Draft Precursor Determination
NOx Nitrous Oxides	No new control measures	Draft Precursor Determination
NH_3 Ammonia	No new control measures	No applicable control measures or technologies
SO_2 Sulfur Dioxide	Yes, new control measures	Draft BACT Analysis/Draft Precursor Determination

Overview of draft documents cont.

Best Available Control Technology

Preliminary BACT Control and Cost Analysis Summary

Facility	ADEC Preliminary BACT Determination	Efficiency	Cost Estimates at this time (Capital Costs)
Aurora	Dry Sorbent Injection	80%	$12,332,076
Fort Wainwright	Dry Sorbent Injection	80%	$10,186,401
GVEA North Pole	Ultra-Low Sulfur Diesel	99.7%	$30,425,130
GVEA Zehnder	Ultra-Low Sulfur Diesel	99.7%	
UAF	Dry Sorbent Injection	75%	$4,394,193
Community Burden			$53,756,800

Overview of draft documents cont.

Facility	ADEC Preliminary BACT/MSM Determination	Efficiency (SO_2 Control)	Cost Estimates at this time (Capital Costs)
Aurora	Spray Dry Absorber	90%	$60,270,115
Fort Wainwright	Spray Dry Absorber	90%	$83,952,795
UAF	Spray Dry Absorber	90%	$18,992,799
Community Burden			$103,005,979

Additional Controls NOT proposed to be implemented for BACT or Most Stringent Measures (MSM)

Facility	ADEC Preliminary BACT/MSM Determination	Efficiency (SO_2 Control)	Cost Estimates at this time (Capital Costs)
Aurora	Wet Scrubber	99%	$65,957,875
Fort Wainwright	Wet Scrubber	99%	$92,078,754
UAF	Wet Scrubber	99%	$20,641,103
Community Burden			$160,100,732

Best Available Control Measure (BACM) Analysis Interim Findings

Analysis Steps

- Develop emission inventory (direct $PM_{2.5}$ & precursors) – draft
- Identify potential control measures – draft
- Assess technological feasibility – draft
- Assess economic feasibility – in progress
- Determine earliest implementation date – in progress

Emission Inventory — 2013 Baseline Winter Season Highlights

- 62% of direct $PM_{2.5}$ – space heating.
- 30% of direct $PM_{2.5}$ – point sources
- 8% of direct $PM_{2.5}$ – other area & mobile sources
- 64% of NOx – point sources
- 22% of NOx – on road vehicles
- 67% of SO_2 – point sources
- 31% of SO_2 – oil-based space heating

Identify Potential Control Measures

- RACM controls determined to be infeasible
  - 27 technologically infeasible
  - 2 economically infeasible
- Reviewed $PM_{2.5}$ SIPs, EPA guidance, public comments, etc.
  - 59 potential controls identified
- Considerable overlap between RACM/Reviewed controls
- All transportation controls consolidated to single measure for analysis
- 71 separate measures identified for analysis

Assess Technological Feasibility Measures Determined to be Equal or Less Stringent

- 45 measures determined to be equal or less stringent
- Basis of technological infeasibility findings:
  - Thresholds less stringent
  - Equivalent requirements
  - More curtailment exemptions
  - Dependence on natural gas availability
  - Lower reliance on registered professionals
  - Ban on burning unseasoned wood trumps moisture content requirements
  - Benefits of controls not included in PM2.5 SIP
  - Etc.

Assess Technological Feasibility Measures Determined to Have Marginal/ Unquantifiable Benefits

- 12 measures determined to have marginal/ unquantifiable benefits
- Basis of technological infeasibility findings:
  - Impact of $30 surcharge on a solid fuel burning device cannot be quantified
  - Device requirement could increase emissions in an arctic environment
  - Device requirement would have no benefits in an arctic environment
  - Impossible to quantify difference between stack height and boundary requirements
  - Differences in time to remove are inconsequential
  - Increased observation time reduces # of homes observed and lowers benefits
  - Impossible to quantify difference between window decal and laptop information
  - Etc.

Assess Economic Feasibility Measures Determined to be More Stringent

Control Measure #/Title	Where Implemented	Expected Economic Feasibility
3. Require Building or Other Permit	Missoula, MT	Feasible
8. Prohibit Installation of Solid Fuel Heating Device in New Construction	Bay Area, CA	Feasible
9. Limit the Density of Solid Fuel Heating Devices in New Construction	San Joaquin, CA	Feasible
10. Install EPA-Certified Device Whenever a Fireplace or Chimney in Remodeled	Bay Area, CA	Feasible
22. Require Registration of All Devices	Missoula, MT	Feasible
24. Require Permanent Installed Alternative Heating Method in Rental Units	Klamath, OR Aurora, CO	Feasible
29. Allow Only NOASH Households to Burn During Curtailment Periods	Utah	Feasible
47. Inspection Warrants	Aurora, CO	Feasible
48. Date Certain Removal of "Coal Only Heater"	Puget Sound, WA	?
51. Ultra-low Sulfur Heating Oil	Northeast States	?
52. Operation and Sale of Small "Pot Burners" Prohibited	Vermont	?
53. No Use Sale or Exchange of Used Oil for Fuel, unless it Meets Constituent Property Limits	Vermont	?
R5. Ban New Installations – Hydronic Heaters	Utah	Feasible
R29. Increase Coverage of the District Heating System	Fairbanks, AK	Not Feasible

BACM/MSM Outlook

- 14 measures determined to be technologically feasible at this time
- EPA review may:
  - Disagree with technological feasibility decisions (e.g., not included in another SIP, benefit included in an existing measure, marginal finding, etc.)
  - Request additional analysis of less stringent measures to support feasibility decisions
  - Identify additional controls to be evaluated
- Currently reviewing SIPs for commercial controls (not residential/transportation)
- **List of feasible BACM requiring adoption likely to expand**
- Additional measures will need to be considered as MSMs
  - Rejected BACM will need to be reconsidered
  - Increased natural gas supply will become available in 2020 and related uses will need to be considered as MSMs

BACM/MSM Requirements

- Code of Federal Regulations (CFR) 51.1010 requires adoption and implementation of all potential measures identified.
- Community should look at each feasible measure and determine how they can implement it; as is, or modified.
- Timing of implementation will determine if it is BACM or MSM.
- Likely additional measures will be needed to show attainment and to meet contingency measure requirements.

Ultra Low Sulfur Diesel (ULSD)

- UAF and DEC economist have prepared a draft economic analysis
- Survey data found price differences between ULSD and #1 and #2 heating oil to range between $0.34 to $0.43 price per gallon
- Cost model developed to explain potential changes in residential home heating expenditures assuming a switch to ULSD;
- Benefit calculations need to account out differences in sulfur and PM emission from changes in fuel use
- Concern that higher fuel prices could drive households to burn more wood
- UAF surveying literature and local data sources for information to quantify impact of higher fuel prices on wood use

Timeline

- Additional information requested by May 23, 2018
  - DEC continues to work on inventories, BACM for commercial entities, BACT, baseline modeling
- Ideally a list of measures from community to begin modeling
- If list available, should begin modeling in July/August
- Full SIP likely released in fourth quarter 2018.