

Fairbanks Air Quality Stakeholders Group

Meeting Summary – August 17, 2018

The third meeting of the Air Quality Stakeholders Group was held on July 20, 2018, in the BP Design Theater at the University of Alaska Fairbanks.

Presentation: Quantification of Emission Reductions from “Top 14” Control Measures

Nick Czarnecki, the FNSB Air Quality Manager, gave a presentation on the results of a PM_{2.5} emission reduction model by Sierra Research that looked at 14 control measures stakeholders had prioritized for discussion. A copy of the presentation is available on the Stakeholders Group web page. The results are based on a set of assumptions outlined in the presentation, which are “biased high.” The model results also do not account for overlap, meaning emission reductions that would be captured by more than one control measure are double counted. For this reason, it is not possible to add up to add up the potential reductions from different control measures to get an overall total. The overlap could reduce the overall benefits being modeled by as much as 50%. Modeling was based on values from the emission inventory. Actual emissions reductions will depend on how control measures are implemented and what the compliance rate is. For most control measures a compliance rate of 50 percent was assumed.

With those caveats, the model shows the following potential emission reductions from the 14 control measures it looked at. Again, it is not possible to add these numbers together to get an overall reduction total due to double counting. (The reductions shown below in PM_{2.5} tons per episode day, except where noted.)

- Curtailment: 0.45 (20% compliance) or 1.14 (50% compliance)
Control measures modeled: Registration (M22, M19), GVEA Tariff (S1)
- Future Restrictions: 0.01
Control measures modeled: Permits (M3), Installation Restrictions (MR5, MR8)
- Sulfur Dioxide: 3.55 tons reduction in sulfur dioxide per episode day AND 0.03 tons increase in PM_{2.5} per episode day (due to people switching to wood because of ULSD price sensitivity). Sulfur dioxide is converted to PM_{2.5} at a rate of 5 or 6 to 1, so PM_{2.5} reductions should be 1/5 to 1/6 the number of tons of sulfur dioxide emissions.
Control measures modeled: ULSD (M51) (100% compliance), Boiler Upgrades (E3)
- Removal of Solid Fuel Burning Appliances (SFBA): 0.69
Control measures modeled (Registration (M22), Removal (M16, P9), Prohibit Use (M49)
- Dry Wood: 0.32
Control measures modeled: Required Sales (M31), Exchange (S13)
- Retrofit Control Devices: 0.62
Control measures modeled: Require ESP (S3)

To come into compliance, we need to reduce PM_{2.5} by 80% -- or about 2.1 tons per day. After correcting for double counting (by reducing reductions by 50%) and implementation (25%), the reductions above would get us about 40% of the way to attainment.

Stakeholder questions and comments:

- Could get a 30% reduction in heating demand from weatherization which would reduce emissions. (Response: We don't have numbers but are working on it. Some key numbers are how that program is defined and implemented. If we target weatherization to only those that

heat with solid fuel devices, the reduction would be greater than a broad program that includes every household in the borough.)

- Why is ULSD compliance modeled at 100%? (Response: It can be done on the supply side by restricting what is sold.)
- No sales allowed of #1 and #2? What about outside the nonattainment area? (Response: That hasn't been determined.)
- How much is ULSD going to cost? Could that money be used for something else? (Response: Cost of ULSD could range from 3 cents to 1 dollar a gallon more than heating oil, depending on market conditions. It's currently in the 30 to 40 cent range.)
- Re. removal of SFBA: Did you assume it was straight removal with no replacement? (Response: Date certain removal. Have to check with Tom from Sierra Research. Think they assumed some would replace with EPA certified stoves but some won't replace with another SFBA. Tom: Measure 16, we modeled as people moving from wood stoves to heating oil. Benefits would be less if they moved to certified stoves)
- Volatile Organic Compounds (VOC) numbers are pretty large. Should we include it in Stakeholder Group recommendations? (Response: We recommend not focusing on other pollutants when we have to focus on PM2.5 issues, even though there are plenty of issues with VOCs.)
- Will addressing PM2.5 help VOC numbers? (Response: Yes)
- If using ULSD is mandated, it will factor into everybody's budget, might make some people use more wood. (Response: Yes. Joe Little from UAF has looked at cross-price elasticity. He gave a presentation to the Mobile Sources group on it. We included his assumptions in the model, using 0.2 as a coefficient of price sensitivity. Dr. Little's presentation is on the Stakeholder's Group page.)
- If this group is only looking at PM2.5, why would we consider ULSD if it doesn't move the needle on PM2.5? (Response: PM2.5 is not just a primary pollutant from the stack; when it hits the monitors, it is comprised of secondary PM2.5 which includes NOX, SOX, ammonia, and what other precursors contribute to the problem.)
- 20-50% compliance numbers are depressing. Seeing other people doing it helps, and you are now more likely to. Are there any other resources or other communities who can help us?
- With ULSD, it also has price sensitivity, electrical consumption, and also has lower BTUs. You have to burn more to get same heat output. (Response: Model included price sensitivity of ULSD: small "negative reduction" (i.e. increase) in PM2.5. Re. efficiency of stoves: More efficient burn, saves on maintenance because it puts out less emissions than #1 or #2 heating oil. PM2.5 price elasticity effect was very small. We call it a wash. Re. electrical consumption: We did not factor it in.)

Presentation: Consequences of failure, Alaska DEC

Cindy Heil of ADEC provided an overview and timeline for federal sanctions that will be imposed on the community if a complete and approvable State Implementation Plan (SIP) is not submitted pm time. Some highlights:

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

Impacts

- 2:1 offsets
 - Automatically goes into effect 18 months after the effective date of EPA finding.
 - Affects any air quality permitting action within the nonattainment area.
 - Any new emissions would have to remove twice the amount of existing emissions. This is very difficult to achieve and likely stymie any new growth or make upgrades more difficult and expensive.
- Federal Highway funds
 - Over the past 4 years, the average annual investment of federal highway funds into road projects within the Non-attainment Area boundary has been \$37 million. This number includes both DOT and FMATS projects, and excludes projects funded with CMAQ and HSIP funds.
- Potential Military impacts
 - If solution is not found for attainment, difficult to impossible to add new grown to base.
 - Ft. Wainwright is entering into a “zero growth posture” which could have implications for the future.
- Federal Implementation Plan (FIP)
 - EPA promulgates FIPs to help a states or tribes attain NAAQS.
 - FIPs correct all or a portion of any deficiencies in a SIP.
 - FIPs consists of enforceable control measures or emission limitations.
 - The control measures or techniques could include economic incentives such as auctions, emission allowances or marketable permits (EPA, 2017).
 - FIP likely to be less flexible than a SIP.

Timeline Scenarios –Worst Case Estimates for first Sanction

| Reason | Start Date | Effective Date | Remedy |
|---|---|----------------|---------------------|
| Failure to Submit | Jan/Feb 2019 | June 2020 | Submit SIP |
| SIP Incomplete | July 2019 | December 2020 | Submit Deficiencies |
| SIP Un-approvable (assuming SIP submitted complete) | January 2021 (assumes 6 months+ 18 months review) | July 2022 | Submit Deficiencies |

Stakeholder questions and comments:

- Re. 2:1 offsets: Where can companies get the offsets? (Response: They could buy them, but right now there is no program to do that.)
- Re. Federal highway fund sanctions: Does it apply to 100 percent of funds? (Response: It only applies to projects in the non-attainment and does not apply to safety projects. Hard to project which projects. Currently we get about \$37 million per year. They will cut off funds for projects even if you have started project already.
- There is an indirect impact (from cut in Federal highway dollars) from companies that can’t do their work. It trickles down.
- Cindy Heil (EPA): The Federal Highway money comes into state and they allocate it. They are going to spend it somewhere else if they can’t spend it on projects in the nonattainment area. Fairbanks may not get it back.

- Jackson Fox (FMATS): Alaska gets \$500 million every year for the state. How much of that is being spent in nonattainment area? Over the last four years it has been \$37 million on average. Under the sanctions clock, we could see cuts in mid-2021.
- [Something about sanctions in Montana.] Is it an empty threat? (Response: It is real. It has been done. Remember the Dowling Road project in Anchorage. Conformity was not met, and funding was cut quickly.)
- Ft. Wainwright has already adopted a “zero growth” posture.
- Cindy Heil (EPA): Incompleteness is our biggest worry. Not having sulfur reductions, could make us a target for an incomplete SIP. We have to have a sulfur strategy. BACM needs a strong argument if we don’t use ULSD.
- Re. sulfur: How do you define completeness? (Response: Under moderate SIP, DEC submitted a complete but not approvable SIP. Did not have curtailment in it -- had elements but did not have curtailment plan. We talk to EPA a lot, but they are not going to tell us what the answer is that they are looking for. They are pushing very hard on ULSD. In their minds it should be put in period. We don’t necessarily agree with that. Lots of creative ways we could include ULSD down the road for it to be there and meet the requirements. In 2024, we could have natural gas. There are creative solutions: look at timelines, phasing in controls, tiers.)
- Brian Rogers (Facilitator): We could move from #2 to #1 for point sources and home heating, which would reduce sulfur by 2/3, and include ULSD by 2024 as contingency. It would have much smaller economic impact compared to ULSD.
- Cindy Heil (EPA): A contingency measure should be more painful than a BACM or MSM. It has to be put into regulations and in place and ready to turn on should you fail to attain or show progress.
- Members of the wood burning community brought up that in Mat-Su, they (DEC?) had a memorandum of agreement with EPA. The wood burning community felt supported. (Response: Their issue is different. It was tabled. MOU might come back up in fall.)
- We have much to learn from other people solutions. Is it our size is that a factor in implementing some things? (Response: Size and climate, revenue, population, all are challenges with certain control measures.)
- Population size impacts economic feasibility. (Response: That will have to be taken into account. We haven’t looked at that yet. We are looking at technological feasibility first. It is hard to do economic feasibility if you don’t know what [a control measure] looks like or what the timeline is. If you put it out further, it changes the feasibility.)
- How vulnerable is EPA to lawsuits? (Response: It happens all the time. Court orders change the timeline.)
- Question about splitting nonattainment area: The whole area will be affected by the sanctions but the area causing the problem is small and, from an engineering standpoint, you shouldn’t address the whole area the same way. Focus your resources. (Response: Some might disagree with you. Some areas in Fairbanks are hot spots. The monitor in downtown Fairbanks could show attainment, but the regulations say you must have a high-impact site. If we split the nonattainment area, we wouldn’t have a high-impact spot. We need to find one and collect 3 years of data to get a design value, then we could move on with the paused split request. If split, you would need two SIPs too. We are willing to do that. We’re trying to get a maximum impact site in Fairbanks, three years of data, and design value before split can be official.)
- Can EPA make sanctions retroactive? (Response: No. EPA must follow a formal process; issue a notice in Federal Register of their finding which identifies specifically this issue, how to correct the issues and an effective date. The sanction clock will only start upon that issued effective date.)
- Has the borough considered creating zones around hot spots for more targeted curtailment? (Response: They could try. We have three zones already in the moderate SIP: North Pole,

Fairbanks, and Goldstream. To go smaller would be interesting to document to show attainment and strategies, but we're open to discussion.

- We should focus money on criteria in targeted areas.
- Budget issues are a lot of the reason why we can't get a Fairbanks monitor, because we are focusing resources on SIP. There are not enough funds to do everything at the same time. (Response: Partly. We need a monitor, a saturation study in NP. It's \$400,000 for the study. We can't afford a study in Fairbanks. We are working with EPA to identify where a maximum impact site would go. We hope to put up something this winter. Funding is a challenge. The state general fund pays for zero monitoring. Grants pay for it.)
- Can we get an airshed grant for monitoring? (Response: No. Only available for top 5 areas in country. Once you qualify, it gets competitive. There are extreme restrictions on this money. We have to show emission reductions. Nick has to document everything to show emission reductions, not monitoring.)
- More data would help prove emission reductions. ULSD is equal to emissions of natural gas. If we got natural gas in tomorrow, we lack infrastructure and each individual would have to convert (airshed grant would pay), but it takes time.
- Could you model the emissions reduction for going from heating oil #2 to #1? (Response: Yes. We modeled #2 to ULSD. We could come back with those numbers.)
- What about ULSD to subset instead of entire borough. (Response: Endeavor thinks they have the capacity to cover all FNSB. ULSD could be targeted to a subset, however, that subset would then have the cost increase, and instead of the cost spread across the entire area. Petro-star can make it in Valdez. It appears one of the biggest costs is transportation.)
- If we split the nonattainment area, would the serious impacts only go to one area? (Response: It is too late to avoid 'serious' impacts as the area has already been reclassified as serious. However, splitting the area could avoid the next level of severity, which is if the area fails to meet the 2024 attainment year, then the area must develop a 5% plan. If there was a split and the Fairbanks portion attained the standard and the North Pole portion did not, only the North Pole portion would be subject to the 5% plan.
- Can you use an offset to fund the monitoring effort? (Response: No, they won't give you credit in a SIP, but it would give you long-term planning. It might be a worthwhile investment, especially if it could show attainment by 2024 to support a split.)
- Where would you put one? (Response: Hamilton acres area -- realistically mid-40 range of design value. We strongly encourage you to talk about the split, but don't get too far down into the details because we have the immediate timeline and sanctions. This would be a tool 5 years from now, but not what we need to decide now.)
- We don't want hot spots moving around. Things could get worse. We need to look long term. Don't want to chase some bad cloud for years. (Response: Once we reach attainment that is only the start, there will then need to be a maintenance plan developed that will demonstrate how the area will maintain its air quality even the hot spots.)
- If borough couldn't enforce curtailment measures, would curtailment be enforced by the state? What happens to measures in the SIP? (Response: If the borough can't, DEC will do it using the powers that it has. Chapter 11 of the SIP outlines borough program and state program.)
- Is education in the SIP? Since they are not enforceable, are they not in the SIP? (Response: Not exactly. Some of what the borough is doing is considered voluntary and can be in the SIP, but only gets a certain weight.)

Creative Solutions Discussion

- Should regulate stack height and take the caps off. That will extend emission height by ten feet. At the clinic on Peger road, the vents are too low. During an inversion that smoke comes out very close to the ground. (Ross Adkins)

- Moving electrical generation out of the attainment zone, especially for plants reaching the end of their life. (Karl Hough)
- Electrical subsidy for anyone that will turn off their stoves when the flag goes up. (Karl Hough)
- Low emission wood stove retrofit technology from New Zealand, IntensiFire (<http://intensifire.co.nz/>), endorsed by Brookhaven Laboratories. Fire burns hotter resulting in more complete combustion, greater transfer of heat to the home, and cleaner emissions. (Dan Givens)
- Presentation by Siemens next week to talk about what they could provide the community and Anchorage Combined Heat and Power project. Tuesday August 21st, 4pm, at the IGU board meeting in the City Council chambers and live streamed at city or borough site. (Patrice Lee)
- Retrofit devices on stack. (Jennifer Schmidt)
- Idea discussed at Energy Efficiency brown bag lunch: Targeted “home energy rebate”-like program would result in permanent reduction in energy consumption of around 30%. Cost for 300 homes in North Pole would be about \$2 million. Scott Waterman optimistic that if the borough provided the money, AHFC could gear up to help. (John Davies)
- Energy efficiency would decrease fuel bill and allow us to look at other heat sources that would not have been as economically competitive before. (Karl Hough)
- Wood kiln operated by steam from Aurora’s District Heat system. We can dry wood to under 20% in a day, at .32 tons per day. Aurora is considering this option. There are some logistical challenges, but they are open to discussion. (Dave Fish)
- Wood Burners Assistance Program: technical assistance to help people burn well, so many steps that are important in being efficient, hands on works best. (Dr. Owen Hanley)
- On bill financing for GVEA customers for energy improvements, and for NOASH to put in small electric heating for nonattainment days. (Donna Robertson)
- Woodway has wood burning classes. Make it mandatory to go through class. (Dan Givens)
- Look at behavioral economics: how can we nudge people to make decisions on their own, may help with compliance and enforcement. (Jimmy Fox)
- As part of any outreach or assistance program, help people figure out what other programs they are applicable for. Look at the whole picture, not just wood burning. (Jana Peirce)
- Need someone coordinating energy efforts at the community level like an energy policy manager. (Patrice Lee)
- Neighborhood watch system for burners instead of borough. May help to change people’s minds. (Clark Milne)
- Have incentives for road service areas. (Patrice Lee)
- Wood Burning Gold Star program. Could include an “I Care about Your Air” sign people could post in their yards. (Jennifer Schmidt)
- Look at other places with successful curtailment programs. (Ron Johnson) (Response: Sierra Research talked to every wood burning pm2.5 community. Curtailment is the most difficult to enforce, but also the most important. Oak Ridge, Oregon, had higher penalties, more enforcement, and higher compliance. How much flexibility we want is up to us.)
- Juneau has aggressive enforcement. They are more suburban than our rural area, and police are involved in citations. (John Davies)
- Have people wear masks to protect against health impacts on bad air quality days? Borough would be more effective if they were also giving out masks to focus on health outcomes. Could this be part of the SIP? (Dave Turbovsky) (Response: That could not be part of SIP. It’s not the way the clean air act works.)
- Curtailment is essential for this to work, on NOASH houses as well. It needs to be linked to a strong assistance program as well. (Dr. Owen Hanley)
- As a community, we also have to look outside the government for assistance, to nonprofits and in the hearts of people. We have to be able to help people affected by this. The Chamber of

Commerce is looking at the [Borough ESP] initiative. Is it 90% reduction in PM_{2.5} or 50%? (Rick Solie)

- 50% reduction in PM_{2.5} from ESP is a conservative estimate. Europe is using ESPs to take particulate out of the air. They are not expensive or energy intensive. But timing is important. Have to order them from Switzerland, and they only produce so many. (Patrice Lee) (Response from Nick Czarnecki: Get us the data on ESPs showing a 90% reduction. We haven't seen it. We need to be able to quantify the emissions to prove we would not be backsliding by allowing more exemptions. The testing we did last winter was a good first step, but we need more robust laboratory measures than handheld devices. We cannot relax any rules in the SIP or the EPA would consider it backsliding, which could trigger sanctions. We need to look at the long-term performance of these devices. Europe has strict regulations with annual or bi-annual inspections and more power to prohibit its use if a device doesn't pass inspection.)

Update on proposed response to Borough initiative, Nick Czarnecki

At the last meeting, this group decided to vote on the whether to oppose the voter initiative that would prohibit the Borough from doing anything to regulate home heating appliances and fuels. However, since this group is majority-funded by the Borough, and borough money cannot be used in any way to influence an election, it would be an APOC violation to take a formal position. Discussion of the initiative is OK, and other groups, not funded by the Borough, can voice an opinion.

Presentation: Health Impacts of Fairbanks Air Quality, Dr. Owen Hanley

Following lunch, Dr. Hanley gave a presentation on the health impacts of PM_{2.5}, which is available on the Stakeholders Group page. Highlights:

- What you breathe has a big connection to your health, lung is a filter
- Fairbank pm_{2.5} comes from wood smoke, incomplete combustion --> chemicals
- Safe amount? We have regulatory limits, not safety limits (USA=35 ppm, Australia=25 ppm, WHO=25 ppm, EU=20 ppm)
- Particle shape matters, size matters,
- Pm_{2.5} dangerous, 12x potential of 2nd hand cigarette smoke to cause lung cancer (cig combustion more complete compared to wood stove)
- Masonry stoves are better because they can burn hotter and have more complete combustion.
- Health care expensive in Alaska. One day in a hospital cost more than a years' worth of heating fuel.
- 1 day in the hospital costs more than a year's worth of heating fuel. 1 month of inhalers costs more than a month of heating oil. For every dollar spent decreasing air pollution you will save 12 dollars on health care (World Health Organization).

Work Group Session 1

Four of the work groups met in breakout sessions from 1:40 pm to 2:40 pm. The Wood Devices and Wood Smoke Curtailment groups had a joint session to discuss what a registration program might look like in the non-attainment area. The Mobile Sources & Other (Oil/Coal) Space Heating discussed a phased plan for sulfur emissions reductions, and the Point Sources group continued their discussions of an offset program and issues related to specific plants and producers. Meeting notes for work group discussions will be posted on the Stakeholders Group page

Work Group Session 2

The remaining four work groups Education, Energy Efficiency, Funding, Regulatory Process/Monitoring) met in separate breakout sessions from 2:45 pm to 3:45 pm. Discussion notes will be posted on the Stakeholders Group page.

Plenary: September FNSB Clean the Air Expo and Stakeholder Involvement

Nick Czarnecki announced that the Fairbanks North Star Borough is hosting the 3rd annual Clear the Air: Home Heating Forum & Expo on Friday September 21-22, 2018 at the Wedgewood Resort Hotel. FNSB would like to invite and encourage all stakeholders to attend the conference as their schedules allow. The final recommendations made by the Stakeholders Group are expected to heavily influence the rulemaking process. Due to that influence, the Borough plans to highlight the Stakeholder process on Saturday afternoon and is asking for at least one representative from each of the working groups to attend from 2:00 – 5:00 to discuss the stakeholder process and receive feedback from the public.

Adjourn

The meeting adjourned at 4:00 p.m.