

**ALASKA DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
&
FAIRBANKS NORTH STAR BOROUGH**



**2nd Annual Report
Air Quality
Control Program Implementation Status
Fairbanks North Star Borough PM2.5
Nonattainment Area**

2022

Jason W. Brune, Commissioner

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Report Purpose

The Department of Environmental Conservation (DEC) and the Fairbanks North Star Borough (FNSB) Air Quality Program publish annual reports to provide the community and other interested parties an update on the activities and progress made to implement control programs and improve air quality within the FNSB fine particulate matter (PM_{2.5}) nonattainment area. Wood smoke is the primary cause of the PM_{2.5} exceedances within the nonattainment area. A variety of control strategies and technologies to reduce the wood smoke have been identified and included in the Moderate and Serious Area State Implementation Plans. This report consists of the ongoing DEC/FNSB concerted efforts to reduce wood smoke in the FNSB nonattainment area. Some data in the report is by calendar year, such as monitoring data and programs that operate year-round, while other information is based on the November to March heating season, such as the number of alerts, when most of the exceedances are recorded and where the control measures are targeted. This is not a comprehensive detailed scientific study-level report on all efforts. It is meant to give a high-level overview of efforts primarily conducted by DEC and the FNSB. DEC and the FNSB intend to continue this Annual Air Quality Implementation Report in the coming years.

The report also contains the status of some other air quality efforts continuing in the area. Separately from this report, DEC is required to report to the Environmental Protection Agency (EPA) every three years the progress being made to reach the emission milestones in the State Implementation Plan (SIP). The formal name for this effort is the Reasonable Further Progress (RFP) report and the reporting schedule is located in the Serious SIP. The schedule for submitting RFP reports that address progress in meeting the quantitative milestones (QM) identified in the plan is below.

FNSB Reasonable Further Progress and Quantitative Milestone Analysis Years

RFP and QM Analysis Years
2017, 2020, 2023, 2026

The triennial RFP technical reports are due to the EPA by March 31 after each analysis year. The 2020 report and the 2017 report are posted on DEC’s website at:

<https://dec.alaska.gov/air/anpms/communities/progress-annual-reports>

Background

A portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a PM_{2.5} Nonattainment Area in December 2009. These areas exceed the federal health-based 24-hour PM_{2.5} NAAQS of 35 micrograms/cubic meter.

Analysis shows that local emissions from wood stoves, burning distillate oil, industrial sources, and mobile emissions directly contribute to particulate pollution. For planning purposes, PM_{2.5} is primarily a concern during the winter months (November through March) when extremely strong temperature inversions are frequent and human-caused air pollution impacts increase. Control programs such as curtailments or burn bans have been implemented during inversions to assist in reducing the wood smoke emission. Summertime wildland fire smoke is a health concern and wildland fire events are managed by the Alaska Interagency Coordination Center.

Overview

Past Winter 2021/22 (November through March 31, 2022)/Calendar Year - 2021.

Highlights from the past winter/year:

Effective Dates:

- Starting October 1, 2021, only dry wood may be solid within the nonattainment area. There is an exception for 8-foot rounds, but requirements must be met in order for the exception to apply. See DEC regulations at 18 AAC 50.076(j).
- Starting October 25, 2021, the majority of the regulations regarding the control of wood smoke are federally enforceable. EPA partially approved the Serious SIP.

Achievements

- DEC/FNSB were awarded a new EPA Targeted Air Shed Grant (TAG), bringing an additional \$5.68 million to assist in meeting air quality goals. Additional information is provided later in the report under the Targeted Air Shed Grant section.
- DEC updated the online registration for solid fuel heating devices and expanded the ability for residents to apply online for Stage 1 and No Other Adequate Source of Heat (NOASH) curtailment waivers.
- In 2021 the FNSB Assembly appropriated an additional \$1.0 million for the existing oil to gas conversion program. The new funding allowed the existing oil to gas program to reopen March 25, 2022.
- In 2021 the FNSB change out program completed 212 change outs.
- In August 2021 the FNSB expanded the change out program from the smaller Air Quality Control Zones to the entire nonattainment area.
- DEC made significant progress on its efforts to update its analytical models for use in future SIP development. Additional information is provided later in the report under the “Planning Update Model” section and may be found at: <https://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-sip-development/>
- DEC, using the TAG, successfully hired new seasonal staff to conduct additional compliance and enforcement in the nonattainment area during episodes of poor air quality.
- DEC worked with partner states to successfully petition EPA to revoke a controversial woodstove certification test method that was too easily manipulated. Furthermore, this work that identified federal certification program deficiencies has resulted in the opening of a formal review of the certification program by the EPA Office of Inspector General.
- DEC performed enhanced outreach on Air Alert, Stage 1 and Stage 2 and what individuals need to do when alerts are in effect.
- DEC has completed the first phase of the updated model it uses for SIP planning and determining the effectiveness of future control measures.

Next Winter 2022/23 /Calendar Year 2022

The following items are expected to be completed or worked on over the course of the next year and will be reported in the 3rd annual report.

- DEC/FNSB will apply for another TAG from the EPA and will continue implementation of work under the existing TAG awards.
- DEC will continue to implement control programs identified in the SIP.
- FNSB will continue to implement the woodstove change out and conversion program.
- DEC/FNSB will continue to coordinate marketing of FNSB's change out program and outreach regarding DEC's requirements.
- Starting September 1, 2022, only Diesel number 1 may be sold in the nonattainment area as outlined in the SIP and state regulation.
- DEC will continue to look for funding to conduct verification testing on woodstoves to increase the number of approved devices on the Approved Device lists.
- DEC/FNSB will continue to track EPA's review of the PM_{2.5} standards and the anticipated new proposed standard expected in 2022.
- DEC will continue with its efforts to update the air model used to develop and maintain the SIP.

Design Value Update

The EPA sets air quality standards for air pollutants, and the goal for a community is to remain below the limit set in the standard. The 24-hour PM_{2.5} NAAQS is set at 35 µg/m³. A community attains the 24-hour standard when the 98th percentile of 24-hour PM_{2.5} concentrations for each year, averaged over three years, is less than or equal to 35 µg/m³. This three-year average is called the design value. The 98th percentile value depends on the number of valid monitored days in a year and is typically the 8th highest monitored value at a site within a calendar year. Table 1 below summarizes the 98th percentile concentrations and the design values for previous years. The 98th percentile and design values are listed as either including or excluding exceedances caused by 2019 summer season wildfires. The values that exclude the 2019 exceedances provide a better picture of winter season trends year over year. Data for 2021 have not yet been fully validated and certified by DEC and EPA, therefore the data reported for 2021 are still considered preliminary. DEC is scheduled to certify the 2021 data by May 1, 2022.

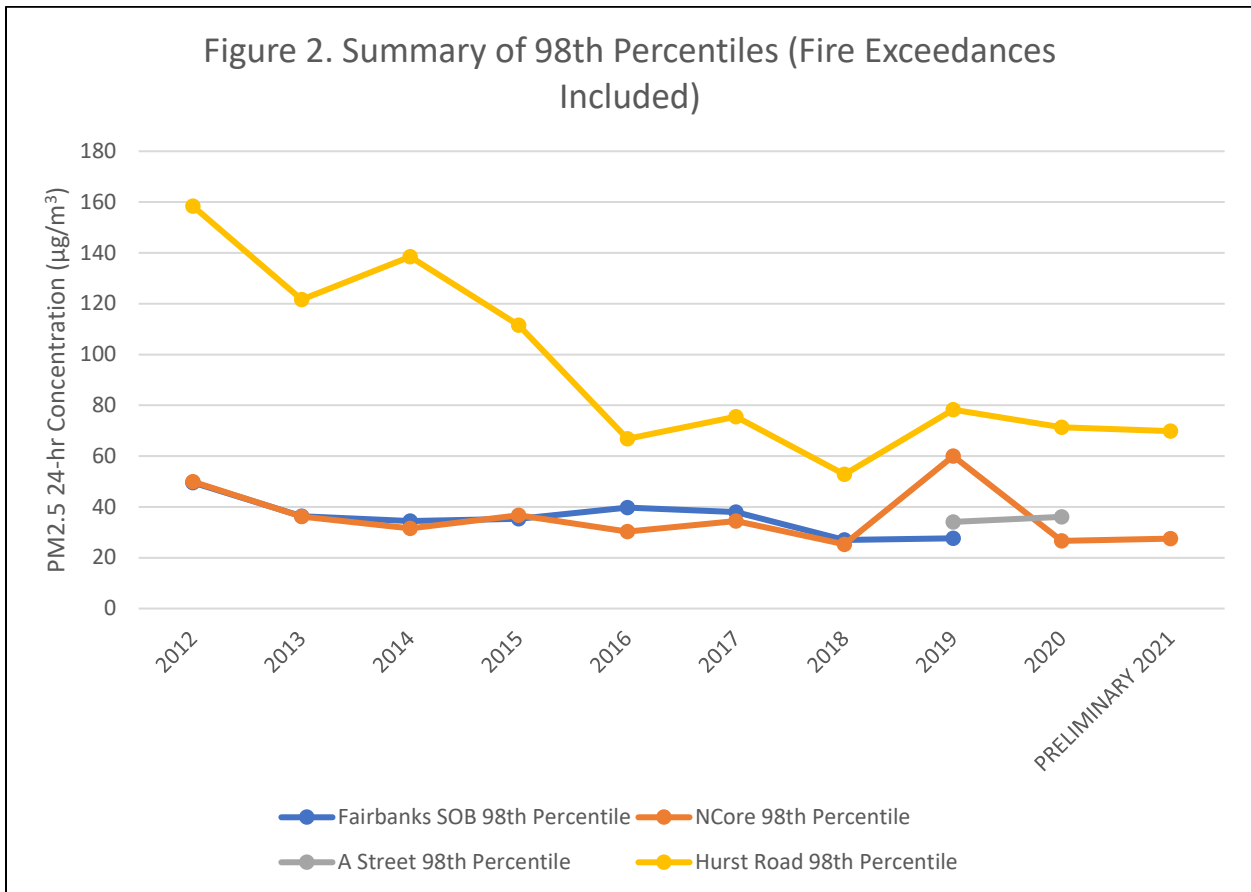
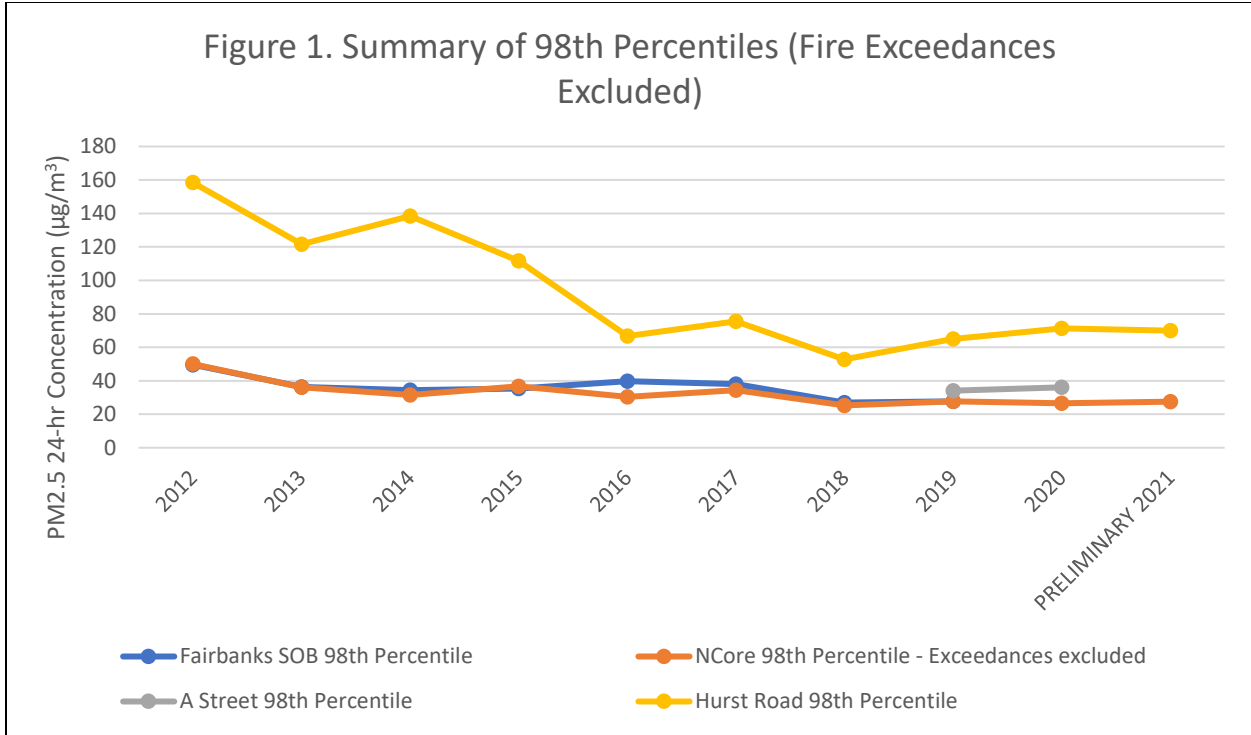
Table 1. Summary of the 98th Percentile and Design Value Concentrations

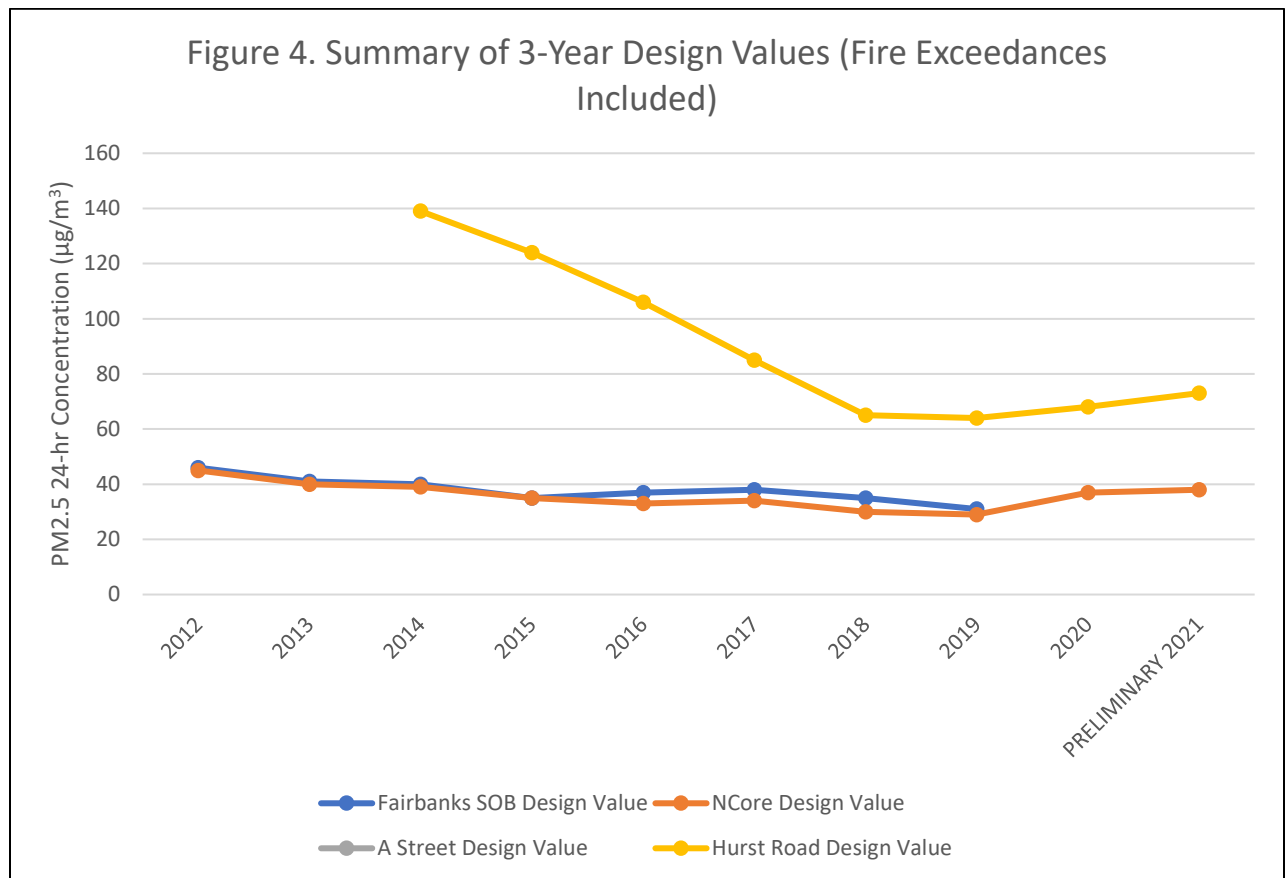
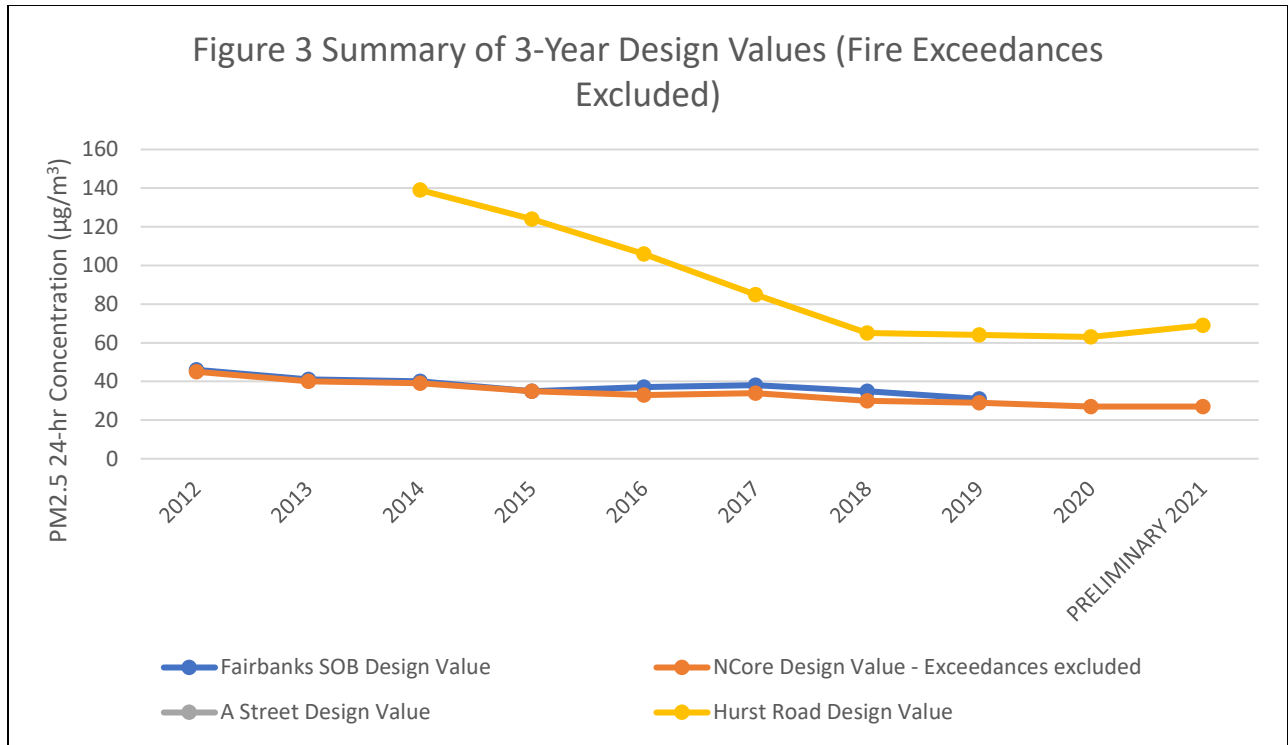
YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 (Prelim)
State Office Building 98th % tile (site discontinued in 2019)	49.6	36.3	34.5	35.3	39.7	38	27	27.7	N/A	N/A
State Office Building Design Value	46	41	40	35	37	38	35	31	--	N/A
NCore 98th % tile - Exceedances Included	50	36.2	31.6	36.7	30.3	34.4	25.3	60	26.6	27.5
NCore 98th % tile - Exceedances Excluded	50	36.2	31.6	36.7	30.3	34.4	25.3	27.7	26.6	27.5
NCore Design Value - Exceedances Included	45	40	39	35	33	34	30	40	37	38
NCore Design Value - Exceedances Excluded	45	40	39	35	33	34	30	29	27	27
A Street 98th % tile								34.1	36.1	N/A*
A Street Design Value										N/A**
Hurst Road 98th % tile - Exceedances Included	158	122	139	112	66.8	75.5	52.8	78.3	71.4	69.9
Hurst Road 98th % tile - Exceedances Excluded	158	122	139	112	66.8	75.5	52.8	65	71.4	69.9
Hurst Road Design Value Included			139	124	106	85	65	64	68	73
Hurst Road Design Value Excluded			139	124	106	85	65	64	63	69

N/A* The site did not meet the required data capture; therefore, a 98th percentile cannot be calculated

N/A** The design value cannot be calculated due to lack of sufficient data

While there was a slight increase in the 2021 NCore 98th percentile, there was a slight decrease in the 98th percentile at the Hurst Road monitoring site when compared with the 2020 data. Although there was an increase in the 2021 design value at Hurst Road site, there was no change in the design value at the NCore site. The State Office Building monitoring site was shut down in mid-2019 and moved to the A-Street site. Due to lack of capture of required data (insufficient data), the 2020 design value and the 98th percentile cannot be calculated for A-Street site. Figures 1 and 2 show the annual trends in the 98th percentile concentrations at each air monitoring site, while Figures 3 and 4 show the 3-year design values. Note that Figure 1 does not include the exceedances caused by the wildfire events, while Figure 2 does. Like Figure 1, Figure 3 also excludes the wildfire exceedances, while Figure 4 includes them.





Targeted Airshed Grants (TAG)

EPA Targeted Air Shed Grants (TAG) are available to those communities that are one of the top 5 worst in the nation for either Ozone, large Particulate Matter (PM₁₀), or small Particulate Matter (PM_{2.5}). The total TAG amount is determined by Congress. EPA determines eligibility based on a community’s rolling three-year average design value that is calculated based on monitored values.

If eligible, a community is allowed to submit applications. Each application is then evaluated against the grant criteria and assigned points. The scores from all applications are ranked, with the applications scoring the highest most likely to be awarded their requested application amount. All eligible communities are competing against each other regardless of the pollutant type that made them eligible.

There are a wide range of requirements associated with the TAG program. Currently, DEC is the only entity in Alaska that may apply for the TAG. However, DEC works in partnership with the FNSB and the Department of Commerce and Community Economic Development (DCCED) to develop applications and implement awards. DEC’s Division of Air Quality does not have authority to issue grants, therefore TAG funding allocated in the grant work plan for the FNSB is passed from DEC to DCCED who subawards the funding to FNSB. DCCED is allocated a portion of the TAG to cover grant administration costs.

Table 2 illustrates the five TAG grants received by DEC, the amount received, and the main focus of the workplan for which the grant was awarded.

Table 2. Targeted Airshed Grant Funding, Workplan Focus, and Amount

TAG Year	Workplan Focus	Funding Amount
FY-16	Wood stove change outs	\$2,477,250
FY-17	Wood stove change out to Oil/Gas/Propane	\$4,000,000
FY-18	Wood stove change out to Oil/Gas/Propane + education funding	\$5,000,000
FY-19/20	Wood-to-Wood & Wood to Liquid + NOASH reduction project, a bounty program, additional supplemental enforcement staff for DEC and funding for highway signs.	\$14,717,265
FY-21	Wood stove change out to Oil/Gas/Propane + funds for installer training + funds to verify emission reductions.	\$5,684,706
Total		31,879,221

Control Program Implementation

Although there are a number of pollution reduction measures contained in both the Moderate SIP and the Serious SIP, this document focuses on the following solid fuel heating measures:

- Public Education/Outreach
 - FNSB Outreach
 - DEC Outreach
 - Highway Signs (CMAQ/TAG)
- Woodstove Change out/Conversion
- Solid-Fuel Burning Curtailment
 - Alerts Called
 - Waivers
 - Compliance and Enforcement
- Wood-Fired Heating Device Registration
- Commercial Wood Sellers
- New Wood Fired Heating Device Emission Standards
 - DEC – Approved Device Lists

Public Education/Outreach

Public education/outreach efforts are conducted by both DEC and FNSB Air Program staff, with each agency focusing on the programs they manage. FNSB has promoted support for the change out and conversion programs and general air quality messaging. DEC outreach has focused on the programs DEC is responsible for implementing; waivers, device registration, curtailments, alerts, wood fired heating device standards, wood heater requirements during real estate transactions, etc.

FNSB Outreach

FNSB education/outreach efforts typically include a combination of media campaigns, as well as phone calls and face to face interactions with the public who visit the office. Due to the ongoing pandemic, face to face interactions were limited.

FNSB completed the following activities in 2021:

- Worked with a public relations firm to create new ads, once again featuring a Yeti as the Borough's spokes-Beast. These ads were used in TV, radio, and online advertising to help further promote the Borough's Change Out Programs. A larger percentage of funds went into online advertising, as opposed to traditional TV and radio ads. A total of 1,646 radio ads and 141 television ads were played over the course of the year.
- A total of \$27,778 was spent on online advertising, including: Facebook ads, Google AdWords, online ads in the Fairbanks Daily News-Miner, and other online media outlets.
- The Borough worked in conjunction with EPA representatives and a public relations firm to develop a behavioral economics campaign. Two websites were developed, which correlated with two different post cards. Recipients of the post cards were directed to the website, and then data was collected on which messaging technique was most effective.

- A contest was run to further promote the Yeti spokes-Beast and give him a name. Borough representatives were present at two local events to promote this contest, along with the Borough's Change Out Program.
- Eddie the Yeti was developed into several different ads of varying lengths. One new ad promoted the Plug It In at +20 campaign. The rest of the ads promoted the different options the Borough has for its Change Out Programs. A website was also created to give the public an easy to find place to request additional information on the Change Out Programs. These campaigns will be played heavily in the first quarter of 2022 to help boost interest in the Change Out Programs.
- FNSB Air Quality staff continued the moisture meter loan program, where members of the public may borrow a moisture meter to test their firewood's moisture content.
- Participants in the Change Out program that were able to switch to a new wood stove were required to complete Burn Wise training, along with training by the installer of the new appliance. This training was to ensure they understand how to use their new appliance, as well as the importance of burning only dry wood.
- The health-based Air Quality 3-day forecast was updated daily on the Borough's website: AQFairbanks.com.
- In November, the Borough and the State of Alaska began working collaboratively on education outreach campaigns. These campaigns will begin to air in the first quarter of 2022. The State will be promoting upcoming changes to regulations, while the Borough will continue to promote the Change Out Programs as a possible solution.

DEC Outreach

While FNSB implements general air quality information outreach, DEC works with others within the community beyond the general public to implement regulations and programs. DEC organizes outreach programs to educate and assist real estate professionals, vendors in the Fairbanks nonattainment area, and commercial wood sellers (see separate section for details). Outreach is increased when new regulations are to be implemented to ensure that affected individuals and businesses are aware of the new requirements. Table 3 provides examples of the outreach completed in the last three years.

Table 3. Control Measure Stakeholder Outreach

Types of outreach for control measure support	2019	2020	2021	2022 through March 31
Number of outreach/informational letters sent to real-estate professionals	1	1	1	1
Solid fuel heating device vendor letters or communications	1	4	1	1
Presentations, Q&A sessions to real-estate professionals, vendors etc.	10	2	1	0
Average weekly real-estate contacts received by DEC	Not tracked	1	1	1
Updated DEC Approved device list (prior to 2020, DEC maintained an EPA certified list on its website)	Monthly or When necessary	Monthly or When necessary	Monthly or When necessary	Monthly or When necessary
Number of real-estate investigations for noncompliance	0	1	7	
Regular contact with solid fuel device vendors	Bimonthly	Bimonthly	Bimonthly	Bimonthly
Number of outreach/information post cards sent out to residents of nonattainment area	0	0	0	1

Due to the COVID pandemic in 2020, physical letters were not mailed out as they were in 2019, and presentations were virtual. All 2020 and 2021 letters were transmitted via email to an electronic address list of those in the target business sector, which includes hundreds of individuals or companies. Each number in the 2020 and 2021 column represents the number of times a letter was sent to an electronic address list. Real-estate professionals and other affected vendors are encouraged to contact DEC to be added to the list. However, DEC also posts all formal letters and other relevant information to its real estate requirement webpage <https://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-real-estate/> and solid fuel heating device standards and requirements web page <https://dec.alaska.gov/air/burnwise/standards/>. DEC will likely continue to use electronic mail versus physical letters where possible to reduce postage. However, for the outreach to the general public, in February 2022, a physical post card was sent reminding residents of the requirement that devices older than 25 years within the nonattainment area need to be removed or replaced before December 31, 2024.

Highlighted below are DEC outreach efforts across several platforms in 2021:

- DEC, worked with a public relations firm, MSI Communications, to conduct several campaigns geared toward increasing understanding on what it means when an air alert is called and outreach on the dry wood requirement that went into effect on October 1, 2021.
- These campaigns focused on the following topics: dry wood (the requirement), how to get a waiver or sign up for air quality alerts, and information to increase knowledge on what it means

when DEC calls an Air Alert and what a Stage 1 and Stage 2 alert means. These messages spanned several mediums and utilized many tactics.

- MSI Communications provided the following statistics on the outreach effort:
 - Collectively, over 2 million impressions were served across all social media platforms resulting in over 2,100 clicks/selection by a viewer.
 - On Facebook, air quality alerts had an average reach of 28,405 people, with the highest performing ad reaching 28,500. In 2021, the DEC's Facebook page grew from 6,704 followers to 7,620.
 - On Twitter, air quality alerts averaged 4,130 impressions, with the highest performing ad reaching 1,659. The DEC's Twitter account grew from 5,390 followers to 5,472.
 - In total, 11,000 impressions were served on Twitter and more than 17,000 impressions on Facebook over various campaigns
 - Also, DEC utilized other outreach tactics, including serving commercials via streaming TV and on the Google network via paid search.
 - Google advertisements continue to perform well above industry standards and have served over 6,000 impressions.
 - Streaming TV is also a top performer for the Fairbanks air quality campaigns and have served about 91,000 impressions in the borough.
 - The average view completion rate (VCR) of 96%, or that viewers watched the ad through to completion, MSI indicates that the messaging is resonating, and DEC has reached an engaged audience.
 - DEC also utilized traditional radio, TV commercials and print placements.

Highway Signs

As mentioned in the previous report, during the local stakeholder process, the use of highway signs to announce alerts was identified as an unmet need for the area. To assist with this outreach, DEC submitted applications for two projects that are now underway to install dynamic highway messaging signs. The Department of Transportation (DOT) will install three highway signs at the Priority 1-3 locations on the map shown in Figure 3. In the winter months these signs will be used to alert thousands of commuters driving on major highway corridors to air quality alerts, advisories, and curtailments.

The plan, specification, and estimate (PS&E) review of the Highway signs took place on March 7, 2022, and the final PS&E will come up on April 11, 2022. At this time, it is expected, barring any unforeseen problems, that construction will be completed in the fall of 2022.

Figure 3. Priority Locations of Highway Signs

In addition to the highway signs, the 2019/20 TAG also provided additional funds for increasing awareness and outreach regarding curtailments and alerts. Concentrated outreach efforts describing what an Air Alert means and what actions individuals should take was conducted during the winter of 2021/2022. This effort is to assist in the understanding of the messaging that will be displayed on the highway signs. Due to limited space and messaging requirements, the highway signs messages will be very short, so it is important that residents understand what Air Alerts, Stage 1 and Stage 2 terms mean and the corresponding action.

Woodstove Changeout/Conversion Program

The Wood Stove Change Out (WSCO) program, is a control measure under the Moderate Area SIP and Serious Area SIP. The WSCO program administered by the FNSB Air Quality Program is primarily funded through EPA's TAG along with local and state funding. Simply stated, the program turns money into permanent emission reductions by upgrading or removing solid fuel-fired and oil-fired heating devices. Since 2010, the change out program has evolved to ensure the best emission outcomes by narrowing eligibility, and what types of devices may be installed.

Currently, DEC has been awarded and oversees five TAGs, passing these funds through to the FNSB for the change out program. FNSB also had \$2 million in funding appropriated by the FNSB Assembly, \$1 million in 2019 and \$1 million in 2021, to support natural gas expansion through conversion of residential oil heating appliances to gas heating appliances. Funding amounts are shown in Figures 4-6 below. Figures 4-5 include a Supplemental Environmental Project (SEP), which is a voluntary agreement between an entity with alleged environmental violations and the regulatory agency with delegated authority to enforce environmental regulations. In a SEP the entity with alleged environmental violations voluntarily agrees to undertake an environmental project as the result of a

settlement agreement. SEPs were funded by Golden Valley Electric Association, Doyon Utilities, LLC, and University of Alaska Fairbanks.

Figure 4. Total Program Funding by Source

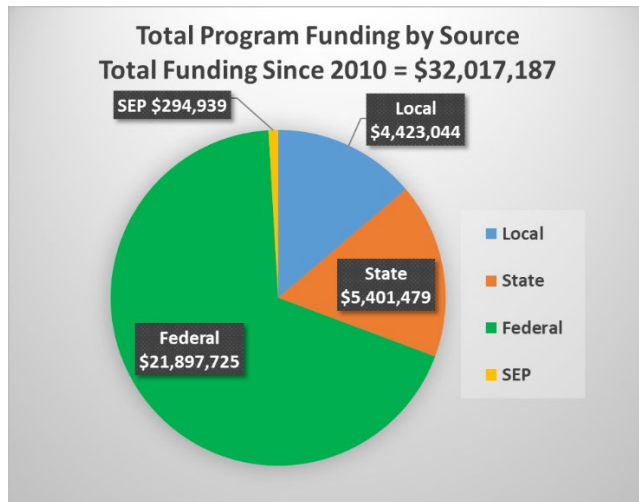


Figure 5. Total Program Expenditure by Source

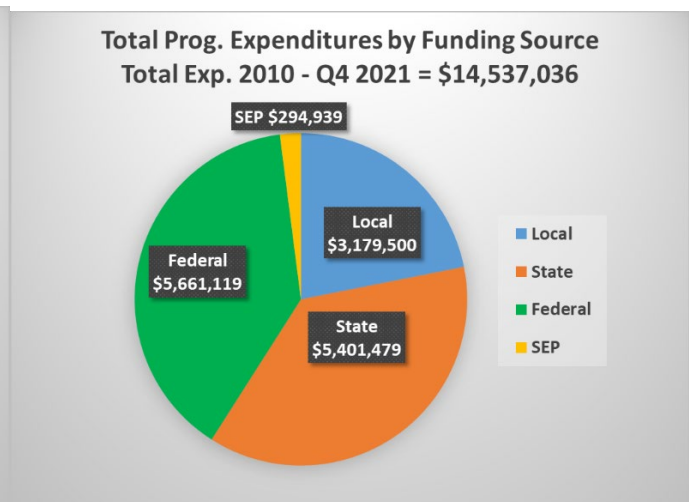


Figure 6. Funding Balance

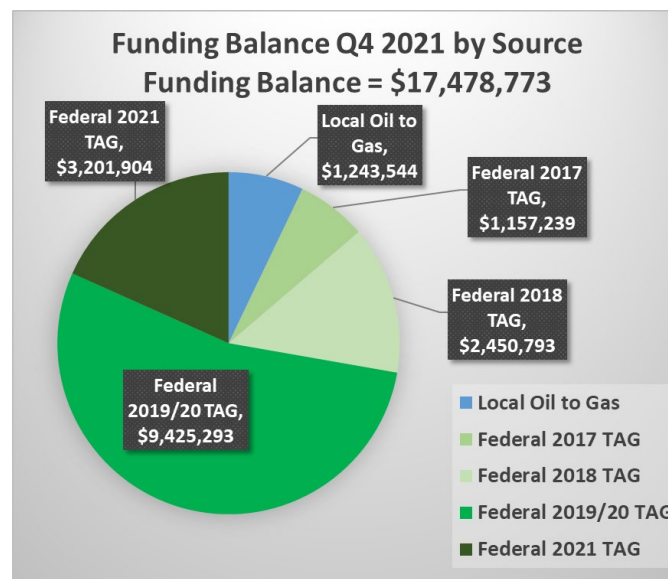


Figure 7 displays the total wood stove change outs from 2010 to 2021, while Figure 8 shows change outs by device replacement type over all the years that a change out program has been in place.

Figure 7. Total Change Outs by Year 2010 - 2021

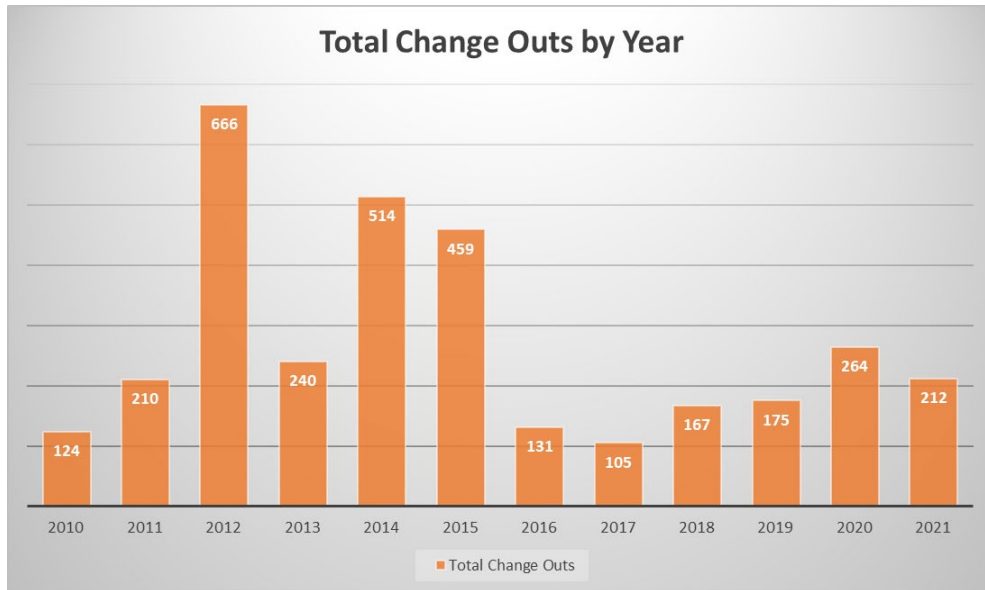
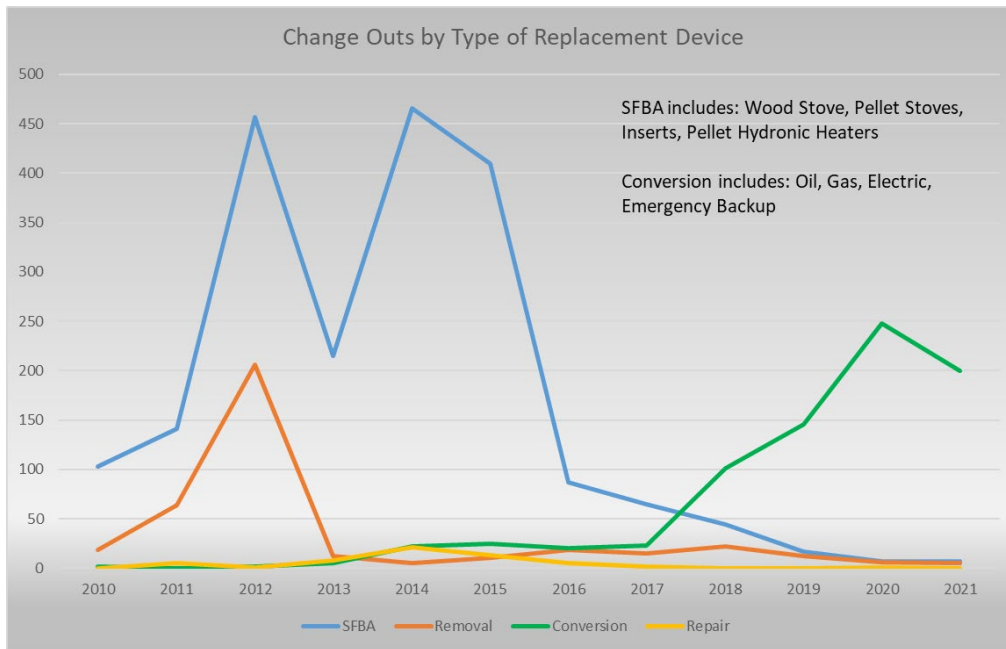


Figure 8. Change Outs by Type of Replacement Device



Emissions from wood stoves are dependent on device, clean dry fuel, professional installation, and proper operation. The effectiveness of change out programs has relied heavily on new wood stoves being substantially cleaner burning as the emissions still depend on the homeowner’s expertise and willingness to operate and fuel the stove correctly. With the systemic issues DEC uncovered in EPA’s certification program, new certified wood stoves could no longer be considered cleaner than the old uncertified appliances they were replacing. With those difficulties in mind the program focus has been shifting towards appliances such as oil and gas that do not depend on EPA’s certification program or behavioral changes to achieve emission reductions. In Figure 8, a decrease in Solid Fuel Burning

Appliance (SFBA) installations with a corresponding increase in conversions to non-SFBA options can be seen beginning in 2017. The shift away from installing new SFBAs with public funding has been accelerated by the focus on conversions to non-SFBA options within the 2017 TAG, 2018 TAG, and the local funding provided through the Oil to Gas program. FNSB’s program has bolstered the shift away from installing new SFBAs by promoting conversions through higher incentive levels, higher priority scoring of applications, and personal interactions at the staff level explaining the benefits of converting to a cleaner appliance.

Solid-Fuel Burning Curtailment

Curtailment continues to be the most effective measure for reducing emissions during winter inversion episodes. DEC issues air quality advisories or alerts when the measured pollution exceeds the thresholds identified in the air quality plan. The levels that trigger an air quality advisory or alert are found in Table 4 and Table 5 below. DEC notifies the public about air quality alerts, episodes, and exemptions through outreach methods including social media, TV, radio, electronic notification (email/text), alert phone line, and the DEC Curtailment and Alerts for FNSB nonattainment area web page at: <http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-curtil-alert/>. To sign up for electronic notifications individuals may go to: Airalertstext.org

A curtailment announcement might include area exemptions for experiencing power outages and residents who have temporary waivers. Exceptions to individual episodes may also be based on the class or type of device or on a device’s particulate emission rate.

Table 4. FNSB Nonattainment Area PM2.5 Advisory Alert Level

Type	24-hour Average PM2.5 Concentration (µg/m³)
Advisory Alert	15

Table 5. FNSB Nonattainment Area PM2.5 Air Quality Episode Thresholds and Exceptions

Episode Feature	Stage 1 Air Alert	Stage 2 Air Alert
PM2.5 Threshold in micrograms per cubic meter (µg/m³)	20	30
Exceptions During a Power Outage	Yes	Yes

Table 6. Number of Stage restrictions/curtailments called by DEC during the heating seasons

Heating Seasons (November - March)	North Pole				Fairbanks			
	Stage 1	Days	Stage 2	Days	Stage 1	Days	Stage 2	Days
2018/2019	13	23.5	23	30.1	14	20.7	1	2
2019/2020	7	6.8	24	28.4	19	18.2	9	15.6
2020/2021	15	12	32	46	30	33.8	15	20.7
2021/2022	5	3.5	31	35.9	27	28.1	5	6

DEC has included the number of days in order to give context to the number of alerts issued as some alerts are active for more than a single 24-hour period. The total number of days is calculated from the total number of active hours, which is what DEC tracks. For example, the shortest alert issued has been 12 hours and the longest alert has been 96 hours or 4 days.

There are times when the use of a wood fired heating device is allowed during curtailment, but only with a waiver. A waiver may be granted by DEC if the applicant meets specified requirements.

There are two types of waivers: No Other Adequate Source of Heat (NOASH) and Stage 1. NOASH waivers allow waiver holders to burn during all curtailments. Stage 1 waivers allow waiver holders to burn during a Stage 1 Alert only. Waivers have a set expiration date when they are issued and require proof of proper installation, maintenance (chimney sweeping), the device meets age restrictions, and proof of the use of dry wood in the form of proper wood storage.

Table 7. Burn restriction waivers issued by DEC during the heating seasons

Heating Seasons (November - March)	DEC NOASH Waivers Issued	DEC Stage I Waivers Issued	Total
2018/2019	27	0*	27
2019/2020	48	26	74
2020/2021	17	24	41
2021/2022	7	21	28

* DEC honored the FNSB issued Stage 1 waivers for the 2018/2019 season

The 2018/2019 season was the first season that DEC issued burn restriction waivers. In October 2018 the administration of the program changed from the FNSB to DEC due to the passage of a local ballot initiative (Proposition 4) which restricted Borough authority over air quality compliance. For that first winter, as indicated in Table 7, DEC only issued NOASH waivers and honored all FNSB issued Stage 1 waivers (*). All 2018/2019 waivers expired on April 1, 2019, after which DEC implemented a full waiver program issuing both Stage 1 and NOASH waivers.

On January 8, 2020, the regulations that supported the Serious SIP went into effect. There were several requirements that affected the ability to qualify for NOASH and Stage 1 waivers. This is likely the reason for the drop in issued NOASH waivers.

Compliance and Enforcement

Prior to the winter of 2018/2019, the FNSB was responsible for compliance and enforcement of curtailments and DEC provided supplemental staffing resources to FNSB's effort. With the passage of proposition 4 in October 2018, FNSB was prohibited from regulating home heating and the responsibility of compliance and enforcement for curtailments was transferred to DEC. As a result of proposition 4, FNSB cut 5 air quality positions reducing the capacity available for compliance and enforcement. Compliance and enforcement of curtailments are triggered upon the effective time and date of an Air Quality Alert that is issued by DEC's meteorologist after consulting weather forecasting models. The additional compliance and enforcement efforts, following proposition 4, were absorbed into the workload of existing DEC staff and resources of the Air Quality Division. Tables 8 and 9 provide information on DEC's curtailment compliance efforts.

Table 8. Number of Stage violations and advisory/compliance written by DEC during the 2021/2022 heating season

Violations of Alert Restrictions/Compliance Letter Sent	
Potential Observed Violations:	142
Advisory/Compliance Letters Sent:	136

Table 9. Curtailment Statistics for Heating Seasons 2018 to 2022

Heating Seasons (November – March)	Potential Observed Violations	Compliance Letters Issued	Advisory Letters Issued	Stage 1 Letters Issued	Stage 2 Letters Issued	Notice of Violation (NOV)
2018/2019	232	15	197	30	161	0
2019/2020	86	14	84	36	43	0
2020/2021	80	16	49	24	44	3
2021/2022	142	30	106	N/A*	N/A*	6

*Stage 1 and Stage 2 Letters are no longer distinguished. ADEC Advisory Letters, Compliance Letters, and NOV's all follow the same procedures. ADEC responds as available on as many alerts as possible, regardless of Stage.

DEC's approach to compliance was to focus on information and advisory notifications when first contacting homeowners during the transition period from the FNSB program to the DEC program. 2018/2019 saw a moderate amount of extended duration inversion events requiring curtailments. DEC encountered some scheduling challenges in deploying field staff to conduct surveillance during shorter duration events.

The 2019/2020 season had an abnormally wet and snowy fall that resulted in shorter inversion events, or the cancellation of alerts compared to the prior year. As a result, there were fewer longer duration events providing fewer opportunities for observations of non-compliance compared to the prior year.

In 2020/2021, social distancing policies due to the COVID pandemic resulted in solo observations, which is less efficient than the program’s usual procedure because of staff time needed to record observation notes while not simultaneously operating a motor vehicle. While not as extreme as 2019/2020, warmer and wetter weather caused some deployment logistic issues. The reduced efficiencies in observation and response resulted in fewer observed violations than 2018/2019 and comparable results to 2020/2021. As noted above, DEC’s approach is to focus on notification and information when approaching violators for the first time. However, DEC has noted repeat violators over the years that have not responded to the informational approach. As DEC tracks these repeat violators, the frequency with which DEC will apply advanced enforcement responses is expected to increase, as seen by the first issuances of formal Notices of Violation in 2020/2021.

In 2021/2022, three supplemental seasonal staff were added with funding from the 2019/20 TAG. However, due to hiring difficulties and staff turnover, there was limited time when all three season staff positions were filled. These additional staff supported expanded observations as well as helped conduct compliance rate surveys. They were given different work schedules to help overcome some of the logistical issues encountered in previous years. The additional supplemental staff will be funded for the next four winter seasons.

Wood-fired Heating Device Registration

One of the requirements of the Serious Area SIP is the registration of wood-fired heating devices. Registration was also one of the strongly supported recommendations that came out of the 2019 local stakeholder process. Effective January 8, 2020, 18 AAC 50.077(h) required the registration of wood-fired heating devices under the following circumstances:

- Upon the sale or conveyance of a wood-fired heating device;
- Before closing, if the wood-fired heating device is being sold, leased, or conveyed as part of an existing building or other property;
- When applying for a burn restriction waiver;
- To participate in the Burn Right Program;
- To participate in any wood-stove change out or conversion programs; and
- Before closeout of any compliance or enforcement action.

Presented in Tables 10 and 11 are the current registration statistics through the end of March 2022.

Table 10. Number of Registered Wood-Fired Heating Devices

Wood-Fired Devices										
Registered by Calendar Year	Cook Stove	Forced Air Furnace	Masonry Heater	Mult-Fuel Device	Wood Hydronic Heater	Pellet Hydronic Heater	Fire Place Insert	Pellet Stove	Wood Stove	Total
Unknown	0	0	0	0	0	3	1	10	62	76
2019	0	0	0	0	0	0	0	0	1	1
2020	3	3	5	0	1	0	6	33	96	147
2021	0	0	3	1	0	1	5	52	122	185
2022 (through March)	0	0	0	0	0	0	0	11	36	47
Total	3	3	8	1	1	4	13	106	327	456

Table 11. Type of Registrations

Reason for Registering									
Registered by Calendar Year	Burn Wise Program	Compliance Close Out	New Device	Real Estate Transaction	Voluntary	Waiver	Change Out Program	Unknown	Total
Unknown	0	0	0	0	0	0	5	71	76
2019	0	0	0	0	0	1	0	0	1
2020	7	8	19	45	27	34	0	7	147
2021	4	4	102	28	22	12	13	0	185
2022 (through March)	0	3	26	10	1	4	3	0	47
Total	11	15	147	83	50	51	21	78	456

DEC developed an online registration form for the general public, vendors, and real estate professionals. In addition to online registration, DEC accepts paper registrations received by mail or email, which are then hand-entered into the database by DEC staff. Some new device registrations shown as registered in 2021 were actually sold in 2020. The delay in submitting the forms to DEC for data entry was expressed as concerns regarding COVID by various local wood stove vendors.

The unknown registrations and registration types in Tables 10 and 11 are for two reasons related to DEC's implementation of the new requirement. First, some registrations occurred before the addition of a required 'reason' in the database. Second, modifications to the registration process made data entry fields mandatory, until then some registrations could occur without filling in the 'reason.' Also, a flaw in the software failed to capture some of the registration dates. These problems were addressed in software updates.

Commercial Wood Sellers Program

The registration of commercial wood sellers and moisture content disclosure to wood buyers was implemented as a voluntary measure under the Moderate Area SIP in 2014. However, the program became mandatory in 2017 after the program was triggered as the Moderate Area SIP contingency measure.

The program requires that commercial wood sellers provide a form to their customers that either documents that the wood is wet or provides the measured moisture content of the wood. DEC receives a copy of the form which allows DEC to track the amount of wood sold in the area, year-round. Table 12 illustrates the information collected since 2014 on the forms submitted by registered commercial wood sellers. On October 1, 2021, the DEC regulations in 18 AAC 50.076 under the Serious Area SIP that require the sale of only dry wood in the FNSB nonattainment area went into effect. Currently, as shown in Table 13 below, there are eight registered commercial wood sellers in FNSB. The list dropped from 16 to eight due to the October 1, 2021, requirements. Seven out of the eight registered wood sellers are recognized as dry wood sellers, and they are required to provide proof to DEC that the wood they sell as 'dry' has a moisture content of 20% or lower. The remaining registered wood sellers are required to provide written documentation of the moisture content of the wood they sell. Wood sold at or above

eight-foot lengths could be either above or below 20% moisture content. DEC staff contacts all the wood sellers approximately once per month to see if they have forms to submit or if anything has changed or is needed.

Table 12. Annual Statistics of Registered Wood Sellers (As of March 2021)

Program Elements	Voluntary Program (2014-2016) # Per Calendar Year			Mandatory Registration Program (2017 to date) # Per Calendar Year					
	2014	2015	2016	2017	2018	2019	2020	2021	2022 Through March
Number of cords tracked	249.4	1107	806	2113	2788	2657	924	1520	81
Average number of tracked cords sold per month	21	92.5	67	176	232	221	77	126.7	40.5

Table 13. Running Total of Statistics for Registered Wood Sellers (As of March 2021)

Number of registered wood sellers	8
Number of cords tracked to date	12730.89

A list of all the registered wood sellers, including the recognized dry wood sellers may be found at this site: <https://dec.alaska.gov/Applications/Air/airtoolsweb/WoodMoistureProgram/>

New Wood Fired Heating Device Emission Standards (Device Requirements)

As mentioned previously, wood smoke is the primary cause of the PM_{2.5} exceedances within the nonattainment area. The current requirements for solid fuel-fired heating devices found in Table 14 include particulate matter emission standards for new devices, installation requirements, and removal requirements.

Table 14. Current Requirements for Solid Fuel-Fired Devices

HEATING DEVICE TYPE	PARTICULATE MATTER EMISSION STANDARDS FOR NEW DEVICES	INSTALLATION REQUIREMENTS	REMOVAL REQUIREMENT
Wood-Fired Hydronic Heaters < 350,000 Btu/hr	New hydronic heaters may not be sold or installed in the Nonattainment Area.	Prohibited	Existing devices removed and rendered inoperable by 12/31/2024 or upon conveyance as part of a real estate transaction, whichever is earlier and rendered inoperable

HEATING DEVICE TYPE	PARTICULATE MATTER EMISSION STANDARDS FOR NEW DEVICES	INSTALLATION REQUIREMENTS	REMOVAL REQUIREMENT
Pellet Fueled Hydronic Heaters < 350,000 Btu/hr	EPA certified AND 0.10 lbs. per million Btu of heat output for each individual burn rate. (DEC listed)	Professionally Installed May not be installed within 330 feet from closest property line or 660 feet from a school, clinic, hospital, or senior housing unit.	Non-EPA certified devices must be removed or replaced by 12/31/2024 or upon conveyance as part of a real estate transaction, whichever is earlier and rendered inoperable.
Woodstoves and Pellet Stoves < 350,000 Btu/hr	EPA certified AND 2.0 grams per hour (DEC listed)	Professionally Installed	Non-EPA certified devices must be removed or replaced by 12/31/2024 or upon conveyance as part of a real estate transaction, whichever is earlier and rendered inoperable.
	AND not exceed 6.0 grams per hour any valid 1-hr filter pull OR TEOM data indicates that no rolling 60-minute period exceeds 4.0 grams per hour. (DEC listed)		EPA certified devices, greater than 2.0 grams per hour AND 25 years or older must be removed or replaced by 12/31/2024 or upon conveyance as part of a real estate transaction, whichever is earlier and rendered inoperable. For devices manufactured less than 25 years before the effective date of the finding, then removal is required when device is 25 years old and rendered inoperable.
Coal-Fired Heating Devices	New coal fired heaters may not be sold or installed in the Nonattainment Area.	Prohibited	Not applicable
Wood-Fired Heating Devices > 350,000 Btu/hr	0.10 lbs. per million Btu of heat output for each individual burn rate	Professionally Installed	Not applicable

DEC-Approved Device Lists

All new heating devices eligible for installation are found on DEC-approved lists. Development of the DEC-approved lists are a multi-step process:

- 1) The device must appear on the EPA list of certified devices
- 2) DEC reviews certification test reports
- 3) DEC applies the state requirements for emission rating and 1-hr data
- 4) DEC updates the device lists as appropriate and publishes the lists at least once a month as necessary

On February 1, 2022, DEC posted a major update to the approved lists that incorporated review findings related to the EPA Deficiency List posted in April 2021. Also, DEC announced its policy regarding renewals of existing certification tests. DEC no longer accepts EPA renewals of existing certification tests (those conducted prior to April 16, 2021) given the deficiencies found. DEC also announced how it would address the use of ASTM 3053 given EPA's revocation of the method for certification testing.

On March 1, 2022, DEC posted a pellet list update that incorporated review findings related to the EPA Deficiency List posted in April 2021. Also, DEC confirmed its earlier announcement regarding the policy on renewals of existing certification tests. DEC no longer accepts EPA renewals of existing certification tests (those conducted prior to April 16, 2021) given the deficiencies found.

DEC will post monthly updates to lists, worksheets, and information as needed. DEC is targeting postings within the first week of the month. One week prior to an anticipated posting, DEC will stop review of any data received to focus on posting preparation. Any data received within a week of a posting will not be posted until the following month. Tables 15 and 16 below represent the simple statistics of the cordwood and pellet stoves after the decision matrix was applied to the reviewed test reports. The summary sheets, lists and simple statistics can be found on the manufacturers-vendors web page at <https://dec.alaska.gov/air/burnwise/manufacturers-vendors/>

Table 15. Overall Summary Statistics of Cordwood Test Reports Review

Cordwood Stoves							
Overall Summary Statistics							
	# of Reports Reviewed	Disapproved (emission threshold)	Disapproved (unable to verify)	No Determination (Report Issues)	Temp. Approval w/ Milestone	Approved/Retest to Renew Cert.	Approved w/ Flags
ASTM E3053	70	33	2	34	1	0	0
EPA M28R	63	23	4	28	8	0	0
Not reported	1	0	1	0	0	0	0
Total	134	56	7	62	9	0	0

ADEC Emission Threshold Statistics				
	2.0 g/hr Avg	6.0 g/hr 1-hr	Both	Total
ASTM E3053	1	24	8	33
EPA M28R	1	21	1	23
Not reported	0	0	0	0
Total	2	45	9	56

Number of ASTM 3053 Reports Reviewed with:						
0 Flags	1 Flag	2 Flags	3 Flags	4 Flags	5 Flags	6 Flags
1	2	4	8	21	18	16

Statistics for ASTM 3053 Flags (Issues 29a-29f)						
Flag Description	Med vs Low Burn (29a)	Log Length (29b)	Atypical Fuel (29c)	50% Squared (29d)	50% Debarked (29e)	Firebox vol diff by over 5% (29f)
# Reports w/ Flags	48	52	58	61	34	63

Decision Matrix Statistics					
Method	E3053	M28R	NR	All Methods	Decision Matrix Description
	33	23	0	56	Moved to Disapproved list (did not meet ADEC's emission threshold)
	2	4	1	7	Moved to Disapproved list (unable to verify emission threshold)
	13	27	0	40	Moved to No Determination list (flags relating to emissions issues)
	6	1	0	7	Remains on No Determination list (post 5/15/2020 cert date emission flags)
	14	0	0	14	Moved to no determination - non representative test concerns
	1	0	0	1	Remains on no determination - non rep. test concerns (post 5/15/2020 cert date)
	1	8	0	9	Remains on the Approved list pending based on milestone data
	0	0	0	0	Remains on Approved List, re-test required to renew certification.
	0	0	0	0	Moved to Approved list, re-test required to renew certification.
	0	0	0	0	Moved to Approved List with flags (post 5/15/2020 cert date)
	0	0	0	0	Remains on Approved List with flags
Total	70	63	1	134	

Table 16. Overall Summary Statistics of Pellet Test Reports Review

Pellet Stoves

Overall Summary Statistics							
	# of Reports Reviewed	Disapproved (emission threshold)	Disapproved (unable to verify)	No Determination (Report Issues)	Temp. Approval w/ Milestone	Approved/Retest to Renew Cert.	Approved w/ Flags
Other (ATM)	2	0	0	0	2	0	0
ASTM 2779	83	3	6	45	29	0	0
Not reported	11	0	11	0	0	0	0

ADEC Emission Threshold Statistics				
	2.0 g/hr Avg	6.0 g/hr 1-hr	Both	Total
Other (ATM)	0	0	0	0
ASTM 2779	0	3	0	3
Not reported	0	0	0	0
Total	0	3	0	3

Decision Matrix Statistics					
Method	Other (ATM)	ASTM 2779	Not reported	All Methods	Decision Matrix Description
	0	3	0	3	Moved to Disapproved list (did not meet ADEC's emission threshold)
	0	6	11	17	Moved to Disapproved list (unable to verify emission threshold)
	0	40	0	40	Moved to No Determination list (flags relating to emissions issues)
	0	5	0	5	Remains on No Determination list (post 5/15/2020 cert date emission flags)
	0	0	0	0	Moved to no determination - non representative test concerns
	0	0	0	0	Remains on no determination - non rep. test concerns (post 5/15/2020 cert date)
	2	29	0	31	Remains on the Approved list pending based on milestone data
	0	0	0	0	Remains on Approved List, re-test required to renew certification.
	0	0	0	0	Moved to Approved list, re-test required to renew certification.
	0	0	0	0	Moved to Approved List with flags (post 5/15/2020 cert date)
	0	0	0	0	Remains on Approved List with flags
Total	2	83	11	96	

Currently, as shown in Tables 15 and 16, there are 9 cordwood stoves and 43 pellet stoves on the temporarily approved lists (with milestones). These stoves will be dropped off the lists on December 6, 2022, unless additional information is provided. DEC continues to work with EPA and manufacturers to address concerns with the testing data from the certification process.

Other Efforts in the Area

Local Kiln

In 2020, Aurora Energy Solutions, LLC installed and began operation of a wood drying kiln in Fairbanks to sell kiln-dried wood with an average moisture content of 15%. As shown in Table 12, Aurora sold a total of 972 cords in 2021 and 81 cords so far in 2022. Although there was a temporary lag in filling orders for the 2021-2022 winter season, the kiln proved beneficial in providing dry wood to the local market and enhancing compliance with the dry wood burning requirements.

Alaskan Layered Pollution and Chemical Analysis (ALPACA)

The Alaskan Layered Pollution and Chemical Analysis (ALPACA) project seeks to close knowledge gaps in understanding of atmospheric chemical mechanisms occurring under cold and dark conditions. These gaps are exacerbated by lack of knowledge of emissions and by wintertime meteorology, which causes stagnation and hinders mixing between cleaner background and polluted air masses. In addition, there are limited measurements in regions with sub-freezing temperatures and low to absent photochemistry.

The ALPACA 2022 field study occurred in January-February 2022. Forty-eight scientists from across the U.S. and Europe traveled to Fairbanks to work with UAF scientists and study air pollution under cold and dark conditions. The researchers rented a house to study indoor and outdoor air quality in the Hamilton Acres neighborhood. Four mass spectrometers in the garage are alternately sampling indoor and outdoor air. Three trailers are set up at the UAF CTC site in downtown Fairbanks. These trailers house instruments that will improve our understanding of chemical processing of pollution under cold and dark conditions. The researchers are also vertically profiling pollution above Fairbanks with remote sensing, mobile monitoring that drives up and down hills, and balloons.

The researchers are expected to deliver findings back to UAF by late summer. The results will be shared with ADEC and the FNSB and with residents who will have the chance to weigh in on possible solutions.

Expanded Availability and Use of Natural Gas

As of August 2020, the Interior Gas Utility (IGU) had completed construction of a 5.25 million gallon liquified natural gas (LNG) storage tank in Fairbanks and had transported over 2 million gallons of LNG inventory¹ from Cook Inlet near Anchorage. On January 19, 2021, to further enhance the steady supply of natural gas, IGU, signed an initial five-year term agreement with Hilcorp, Alaska LLC, a Cook Inlet operator.² This contract has an option of extension for two additional three-year terms.

On February 25, 2021, IGU opened the 150,000-gallon LNG storage tanks in North Pole.³ This increases the availability of affordable clean-burning natural gas to North Pole residents.

As part of the woodstove change out program, the FNSB runs a conversion program to help residents convert from oil to natural gas or propane burning appliances. This is funded by the FNSB Assembly's \$1 million appropriation in 2019 and additional \$1 million appropriation in 2021.

In 2020, the new customers added (service line installed) were 146 for residential users and 63 for commercial users. The total gas usage in 2020 was 67,919.8 Mcf for residential users and 794,959.1 Mcf for commercial users. Interestingly, in 2021, the number of residential users bumped up to 219, and gas usage increased to 83424.1 Mcf (23% increase). Also, the number of commercial users increased to

¹ Interior Gas Utility 2020 Q3 Quarterly Report to the Fairbanks North Star Borough Assembly, <https://www.interiorgas.com/fnsb-quarterly-reports/>

² <https://www.interiorgas.com/interior-gas-utility-announces-long-term-sale-and-purchase-agreement-with-hilcorp/>

³ <https://www.webcenterfairbanks.com/2021/02/26/interior-gas-utility-opens-natural-gas-storage-facility-in-north-pole/>

97, leading to gas usage of 850,014.9 Mcf (6.9%). The increase in service lines installed and the resulting residential and commercial gas usage is a sign of progress toward emissions reduction from the use of cleaner burning natural gas space heating.

Mass Transit – FNSB Transit Fleet Natural Gas Efforts

While not a committed SIP measure, the natural gas transit conversion effort is mentioned in the SIP. Below is the status of the FNSB efforts regarding the transition to natural gas for the transit fleet.

Transit Maintenance and Storage Facility Upgrades

In 2017, the FNSB received a grant of \$12.8 million through the Federal Transit Administration (FTA). An additional FTA award of \$10.4 million was announced in August of 2020. Both grant awards will be used for design and construction of a new natural gas maintenance/storage facility which will be fully compliant with Compressed Natural Gas (CNG) fuel requirements. Testing on the existing property identified inadequate ground stability which would require significant measures and funding to correct. Financial and logistical analysis suggested moving the project to an alternate location. Having completed environmental studies, ground stability determination, and receiving FNSB Assembly approval, the FNSB is finalizing the purchase of the alternate transit facility site.

Transit Fleet Replacement Schedule and Funding Sources

The FNSB has been awarded CMAQ funding to be used towards the purchase of CNG vehicles. These CMAQ awards coupled with other transit-related funding provide the FNSB with the funding needed for a total replacement of 13 buses and 10 paratransit style vehicles, or approximately 90% of the total fleet vehicles over a period of years.

The FNSB FY 22/23 budget continues to include the combined use of FTA funding and local match funds to acquire CNG buses. It is the FNSB's intent to continue to use similar funding combinations in the future to procure transit vehicles and continue the transition process.

Acquisition and Installation of CNG Fueling Infrastructure

In April of 2020, the FNSB received CMAQ funding by FAST Planning for the installation of a CNG fueling infrastructure. The project is programmed for federal fiscal years 2021-22.

Fairbanks Area Surface Transportation (FAST) Planning

Additionally, CMAQ funds are used for some of the Fairbanks Area Surface Transportation (FAST) Planning air quality improvement projects within the FNSB that are relevant to winter season PM_{2.5} emissions. The PM_{2.5} related projects identified in the First Annual Report were FNSB Transportation CNG Infrastructure and the Highway Dynamic Messaging Signs/Motor Vehicle Plug-Ins. These projects are underway as indicated in the paragraphs below:

FNSB Transportation CNG Infrastructure: As described in the previous section, this project is the construction of CNG fueling infrastructure at the FNSB's new maintenance facility to help with the conversion of diesel-fueled transit buses to CNG buses. The funds for the project have been transferred from the Federal Highway Administration (FHWA) to FTA, and the FNSB is in the process of obtaining the transfer letter from FTA.

Highway Dynamic Messaging Signs/Motor Vehicle Plug-Ins: These projects consist of the installation of highway dynamic messaging signs (described previously) and motor vehicle plug-ins in FNSB PM_{2.5} nonattainment area. The messaging signs will be installed along the Richardson Highway and Badger Road to inform drivers of air quality alerts, hazardous road conditions, and detours/ delays. The funds for the project will be used for the design, construction, and operation. The plug-ins will be installed at Birch Hill Recreation area, Chena Lakes recreation area, Tanana Lakes recreation area, and University of Alaska Fairbanks' (UAF) U-Park Facility, and the funds for the project will be used for the design, utilities, construction, and operations of the project.

As mentioned under the Highways Signs section above, the first phase of the PS&E review of the three has been done, and the final PS&E will come up on April 11, 2022. As noted above, all things being equal, the construction of the signs will be completed in the fall, and the operation will begin in the winter of 2022. Also, the first phase of the PS&E review of the motor vehicle plug-ins took place on February 28, 2022, and the final PS&E is scheduled for April 8, 2022. Similarly, the construction of the plug-ins is anticipated for completion in fall of 2022.

Planning Model Update

EPA, industrial sources, and some members of the public have been interested in the status of DEC's efforts to update the models that are used to project attainment. The data used in the models that supported the Serious SIP are from 2008. DEC initiated a multi-year effort to update the various required models used in SIP Planning. The status of the main efforts are:

- DEC completed development of a modeling platform located at the department that allows staff the ability to conduct in-house modeling to augment contractual modeling efforts. This is intended to assist in offsetting modeling costs, by reducing the need for contractor assistance, and complete modeling tasks in a timelier manner.
- The current SIP used Community Multiscale Air Quality (CMAQ) version 4.7.1 and EPA has released a newer version of the CMAQ model, version 5.3.2. To understand the differences between the two versions and what impact it may have on future air quality planning, DEC has completed a setup, using the existing 2008 meteorological data and 2019 emissions (the baseline from the Serious SIP). A comparison of the two versions using the same data was completed as a baseline for understanding the new model version 5.3.2 changes. The results were posted online on the DEC website as a phase 1 modeling report.
- DEC completed identification of new meteorological episodes for use in future planning efforts. Currently, DEC uses 2008 meteorology to represent winter conditions in Fairbanks with two episodes. There is now one episode from winter 2019/2020 using meteorological data set spanning 74 days from December 1, 2019, to February 12, 2020 and PM_{2.5} speciation monitor filter data from Hurst Road in North Pole and Fairbanks and updated emissions inventory. The previous episode used the PM_{2.5} speciation filter data from the Fairbanks downtown monitor.
- A contractor has completed work developing new meteorological data using the 2019/2020 winter episode and the Weather Research and Forecast (WRF) model, including a program that creates input ready files for the air quality model. The current effort will update the meteorology and better represent the winter conditions including the strong inversions present in Fairbanks and North Pole by using additional weather data collected at the Hurst Road monitor and from a study conducted by UAF in the Fort Wainwright area with multiple heights of wind and temperature.

- The new emissions inventory was developed for the same winter 2019/2020 winter weather episode, December 1st to February 12th. These emissions, meteorology and monitoring data during the same time will allow DEC to conduct model performance evaluation of PM_{2.5} and precursor pollutants and better represent future concentrations in the model. The emissions inventory is then run through SMOKE (a program that creates input ready files for the air quality model). The Fairbanks point source emissions were completed through SMOKE and run through the first full air quality model run with only one sector, the point source emissions. Those results are currently being evaluated, while the rest of the emissions inventory is being processed through SMOKE.
- Upcoming tasks: finish the above incomplete items, then begin to develop quality assurance and quality control (QA/QC) runs, performance tests, and then a detailed EPA review of the data from the QA/QC and performance tests. The updated model must gain EPA approval and meet performance standards to be used for future SIPs.

Conclusion

As shown in Table 1, the design value for the FNSB nonattainment area shows improvement in air quality from the previous year and there has been significant progress made to reduce PM_{2.5} since 2014. As the programs identified in the air quality plan continue to be implemented and new programs are initiated, progress toward attainment should continue. The Serious SIP projected attainment of the PM_{2.5} NAAQS in 2024 provided DEC, FNSB, the community and local residents continue to collectively work together in following through with the identified SIP commitments and programs to reduce air pollution. Through the combined actions of local residents and businesses, the area can reach attainment. DEC and the FNSB encourage residents to meet requirements for burning dry wood, update high emitting SFBA's older than 25 years, and cease burning during air alerts. The agencies also encourage residents to learn more about air quality programs and to take advantage of the FNSB change-out and conversion program to update to cleaner burning heating devices. The agencies also acknowledge the efforts of local businesses including real estate firms, retail wood heater vendors, professional installers, chimney sweeps, wood sellers, and industrial operations in meeting requirements in the SIP. The more individuals and businesses can do collectively to reduce air pollution, the faster attainment will come.

DEC and the FNSB acknowledge that not all aspects of the air quality efforts in the community are highlighted in detail. Do you have a suggestion for what could be added in next year's annual report? Are there programs or information that you would like to hear more about? Please let us know by emailing your suggestions to: dec.air.comment@alaska.gov