

## 5.10. Contingency Measures

Section 172(c)(9) of the CAA requires nonattainment plans to “provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the (applicable) attainment date . . . .” It further states that such contingency measures shall be structured to take effect, if triggered, without any further action by the State or EPA.

The fully adopted rules or control measures discussed in this section are ready to be implemented, without significant additional action (or only minimal action) by the State, as expeditiously as practicable upon a determination by U.S. EPA that the area has failed to achieve, or maintain reasonable further progress, or attain the NAAQS by the applicable statutory attainment date. This moderate nonattainment area SIP for the FNSB PM<sub>2.5</sub> nonattainment area shows that it is impracticable for the area to demonstrate attainment by the moderate area attainment deadline of 2015, but identifies a path to attainment of the 24-hour PM<sub>2.5</sub> NAAQS by 2019.

The FNSB and ADEC are actively working on implementing additional measures and a number of the contingency measures identified in this section are already either underway or being put in place. These measures will result in further emission reductions in the 2016-2019 time period. As discussed in Section III.D.5.7, two of the primary measures that will assist in bringing the area into attainment are the continuation of the FNSB heating device change out program and the expanded availability and use of natural gas within the nonattainment area. The identified contingency measures can provide SIP creditable emissions reductions that will provide generally linear progress towards achieving the overall level of reductions needed to demonstrate attainment by 2019 as described in Sections III.D.5.6 and III.D.5.9.

### 5.10.1. Continuation of the FNSB Solid-fuel Fired Heating Device Repair, Replacement and Removal Program

The FNSB has an on-going program to replace solid-fuel burning devices with less polluting heating appliances. During the period 2015-2019, this program would be continued as a contingency measure to provide additional PM<sub>2.5</sub> emission reductions.

Starting in June of 2010, the FNSB established an incentive program to encourage homeowners to replace their old, uncertified solid-fuel heaters with new EPA certified heaters. Upgrade or removal of solid-fuel heaters provides for immediate and long term emission reductions in PM<sub>2.5</sub>. As heating fuel costs increased during the past 5 years, a large number of outdoor wood and coal boilers were installed by residents seeking to reduce their heating costs. These large units have proven problematic in some neighborhoods creating significant localized smoke impacts. The volume of solid fuel heaters, whether large or small, have combined to increase PM<sub>2.5</sub> levels significantly and the Borough has identified a number of “hot spot” neighborhoods. In its implementation of the change out program, the Borough has sought to prioritize their funds for upgrading units in areas with high PM<sub>2.5</sub> concentrations.

The change-out program has been popular with local residents and has evolved between 2010 and 2014 as the Borough adapted and improved the program to create additional incentives for participation. From inception through August 2014, the Borough has repaired, replaced, or removed significant numbers of solid-fuel heaters. Between 2008 and 2019, the Borough plans to incentivize the replacement of nearly all the uncertified wood heating devices in the nonattainment area. An estimated 4,640 of heater replacements or removals will be completed by 2019 (2,760 from the Borough's program and 1,880 from natural turnover).

### 5.10.2. Expanded Availability and Use of Natural Gas

As discussed in Section III.D.5.7, the State of Alaska is actively engaged in expanding the availability and use of natural gas in the nonattainment area through the implementation of the Interior Energy Project. A key to reducing fine particulate matter air pollution in the FNSB nonattainment area in the long term is expanding the availability of affordable, cleaner burning fuel options within the nonattainment area. The Interior Energy Project provides the financial tools needed to bring natural gas to the Fairbanks and North Pole area. The project was established through Senate Bill 23 which passed the Alaska Legislature unanimously in April 2013. The legislation authorizes the Alaska Industrial Development and Export Authority (AIDEA) to provide the financing package to partner with the private sector to build a liquefied natural gas (LNG) plant on the North Slope and natural gas distribution system in Fairbanks and North Pole. The current projections indicate that the earliest this project will provide additional natural gas into the community is 2016. This project will result in meaningful emission reductions between 2016 and 2019.

According to a 2014 Cardno-Entrix report prepared for AIDEA that forecasted both natural gas penetration and conversion, a penetration rate (reflecting availability of natural gas) of 36% was estimated across the non-attainment area by the end of 2018. Cardno's economic analysis projected a 77% conversion rate for existing oil and wood-burning homes with natural gas availability based on an expected retail gas price that is roughly half the current cost of heating oil. The combined penetration/conversion rate of 28% ( $36\% \times 77\%$ ) translates to an estimate of just under 10,000 homes expected to convert to natural gas heating by the end of 2018.

North Slope natural gas will be liquefied and trucked to Fairbanks using the Dalton Highway. The Dalton Highway, also known as the "Haul Road" was built to support North Slope oil and gas activities and to handle an estimated 10,000 trips per day. At full production, the initial North Slope LNG plant is anticipated to require 48 trips (30 trucks) daily. The Interior Energy Project will have the capability to expand and produce more LNG as demand grows. The initial North Slope LNG plant is anticipated to produce 6 to 9 billion cubic feet (Bcf) of gas per year. Depending on initial demand, the LNG plant could serve half to three-quarters of estimated residential and commercial heating needs for customers in Interior Alaska.

The Interior Energy Project is anticipated to reduce monthly heating bills by 40 to 50 percent, resulting in up to \$3,000 of annual savings to residential ratepayers. Clean-burning natural gas will help substantially improve Fairbanks and North Pole air quality by providing an affordable substitute to wood-, coal-, and oil-burning heating systems.

The initial cost for the North Slope LNG facility is anticipated to be approximately \$208 million. By 2015 it is expected that \$101 million will be spent on regasification, storage and distribution to the medium-and high-density areas within the Fairbanks North Star Borough, with costs at full build out to be in the range of \$258 million. The Project includes a financial package to act as a catalyst for Alaska Industrial Development Export Authority (AIDEA) and private-sector partners to finance and develop the supply and delivery of natural gas to Interior Alaska. The financing package includes a \$57.5 million appropriation from the Sustainable Energy Transmission Supply and Development Fund (SETS) to serve as the State's equity stake in the project, low-interest SETS loans, coupled with State-backed AIDEA bonds. The project also leverages previous legislation that provides up to \$15 million in natural gas storage credits for each qualifying LNG storage tank. The components of the state financing project include:

#### Sustainable Energy Transmission & Supply Development Program (SETS)

- \$57.5 million appropriation to directly reduce LNG cost
- \$125 million SETS capitalization to provide optimal commercial structure at 3 percent interest

#### AIDEA Bonds

- Authorized for \$150 million to provide low-cost capital for the distribution system build out at an anticipated 3 to 4.5 percent interest rate

#### Existing Natural Gas Storage Credits

- \$15 million per qualifying storage tank to directly reduce the customer utility price

### 5.10.3. Expanding Motor Vehicle Plug-In Infrastructure

As described in detail in Section III.D.5.7, engine preheaters are used extensively throughout Fairbanks when ambient temperatures drop below 0° F to ensure that motor vehicles exposed to these temperatures can be easily started. Local testing programs have confirmed that preheating vehicles, a practice commonly referred to as “plugging-in,” provides a substantial reduction in motor vehicle cold start emissions. Recognizing the many benefits of plugging-in (e.g., reduced emissions, lower need for maintenance, fuel economy, startability, etc.), the Borough has a long-standing practice of expanding the number of parking spaces equipped with electrical outlets. This has been achieved by securing funds for retrofitting existing facilities (e.g., school renovations) and including outlets in new public facilities (e.g., the construction of new schools). It has also been achieved by encouraging the private sector to retrofit existing facilities (e.g., hospital expansions) and including outlets in new private facilities (e.g., Home Depot). This strategy was made more viable with Congress' passage of the Transportation Equity Act for the 21<sup>st</sup> Century that removed the restriction on the use of CMAQ funds for the Section 108(f) transportation control measure (xii) that reduces motor vehicle emissions under extreme cold start conditions. While many of the Borough parking lots have been upgraded with plug-in infrastructure in the past, the Borough will continue to work to secure CMAQ funds from the Federal Highway Administration (FHWA) to continue the program of retrofitting additional public parking lots located in the nonattainment area with electrical outlets.

#### 5.10.4. Continuation of AHFC Energy Programs

As described in Section III.D.5.7, the Alaska Housing Finance Corporation (AHFC) implements several energy programs that are designed to make homes more energy efficient. As homeowners make energy efficiency improvements they reduce the amount of fuel and electricity needed for power and heat leading to corresponding air quality benefits due to the reduced fuels being burned for space heating and power generation. Information on AHFC energy programs is available on the internet at: [www.ahfc.us/efficiency/energy-programs/](http://www.ahfc.us/efficiency/energy-programs/). It is anticipated that AHFC energy programs will continue in the future, assuming continued funding, and, as a result, additional emission benefits will be realized in the 2016-2019 period

#### 5.10.5. State Regulatory Contingency Measures

In addition to these important efforts that are underway, ADEC has included in its regulations additional measures that will act as contingency measures for the moderate area plan. The triggers for these measures are proposed to occur in part upon an EPA re-classification of the nonattainment area to the serious category which will occur, at the latest, when EPA notifies the state of the area's failure to monitor attainment with the NAAQS by the applicable deadline.

##### 5.10.5.1. Reducing Woodburning Emissions through Enhanced Dry Wood Compliance

In order to enhance resident's ability to comply with the state's regulatory requirement to only burn dry wood during the winter season, the ADEC has established a contingency measure in 18 AAC 50.076(c) that requires commercial wood sellers to register with ADEC and provide moisture content information to consumers at the time of wood sale and delivery. The disclosure of wood moisture content to consumers that buy wood provides them with the information needed to make appropriate decisions about seasoning their wood and planning ahead for when it will be ready for use in their wood heater. This additional information will be useful in improving compliance with the state's regulatory dry wood requirement, which results in significant PM<sub>2.5</sub> emission reductions in the area.

##### 5.10.5.2. Requiring Replacement of Older Wood Heating Devices When Properties Are Sold

As described previously, replacing old wood heating devices with new, cleaner units is an important strategy in reducing PM<sub>2.5</sub> air pollution in the community. In order to ensure that older wood heating devices are turned over at a substantial rate, ADEC has established a future contingency measure in 18 AAC 50.077 that requires older wood fired heating devices to be replaced upon the sale of a property. The contingency measure also provides the ability for a local air quality program to substitute a local program in lieu of the state requirement.

### 5.10.6. Process for Identifying Additional Contingency Measures

Beyond the solid fuel-fired heating device change out program, enhanced availability and use of natural gas, and state regulatory contingency measures, the FNSB and ADEC continue to seek additional measures that may be developed and considered for implementation in the coming years. Working with the local community and elected officials, the agencies will evaluate programs that may serve as contingency measures or that can be included in any needed updates to the local air quality control plan.

In October 2014, the residents of the FNSB voted on a ballot initiative that would have retained restrictions on the Borough's authority to address home heaters and fuels. That ballot initiative failed. As a result, the FNSB has a renewed ability to consider additional measures to reduce air pollution resulting from local sources. Should the Borough determine to implement additional local measures, those programs may serve as additional contingency measures and can be included in revisions to the local air quality plan.

In the event monitoring data indicate that violations of the NAAQS continue to occur beyond the moderate attainment deadline of 2015, the FNSB and ADEC would use monitoring data to assess the spatial extent (i.e., hot spot versus region) and severity of violations as well as trends over time. Based on this information, Borough staff in consultation with ADEC would determine additional measures that may be added to the suite of measures currently in place or already identified as contingencies for this plan. Additional measures can be integrated into the air quality planning process and included in future revisions to the area's air quality State Implementation Plan. Once measures are implemented, the Borough will track monitoring data and determine in consultation with ADEC whether additional controls are needed.

Two emerging opportunities for additional PM<sub>2.5</sub> emission reductions are described below:

- *Enhancing the Use of Manufactured Compressed Wood Logs*

An emerging opportunity for additional emission reductions is the use of manufactured, compressed wood logs. Over the past year, locally manufactured logs (also known as pellet logs or energy logs) have been introduced into the Fairbanks firewood market. The FNSB and ADEC have been researching and evaluating this product for its potential use in the local air quality programs. A review of the literature found 1990 vintage test measurements of compressed wood "energy" logs produced in Idaho showed substantial reductions in wood burning particulate (PM) emissions (i.e., 60% for certified stoves and 90% for uncertified stoves) relative to cordwood. Since the cordwood and the manufactured logs used in these tests do not represent the mix of wood products available in Fairbanks, are not of the same dimensions as the locally manufactured logs and may not have equivalent moisture content levels, the FNSB issued a procurement to measure emissions of (1) dry Fairbanks birch cordwood (20% moisture content), (2) manufactured logs (7.5% moisture content) and (3) a 50/50 mix of cordwood and manufactured logs in both an EPA certified stove and an uncertified stove. Representative samples of the cordwood and manufactured logs were shipped to Dirigo Laboratories in Portland, Oregon for PM emission testing at both low-medium and high burn rates. Test results

at low-medium burn rates, which are typical of wood stove operations in Fairbanks and used to quantify emissions in this plan's emission inventory showed:

- reductions in PM emissions for both the manufactured logs and the 50/50 mix relative to dry cordwood, ranged from 18% - 54%, and
- reductions in PM emissions for the 50/50 mix were roughly twice those found when using manufactured logs alone, ranging from 40% - 54%.

ADEC expanded on the initial testing effort by FNSB by commissioning tests of (1) wet Fairbanks birch cordwood (~40% moisture content) and (2) a 50/50 mix of wet cordwood and manufactured logs. Test results at low-medium burn rates showed the 50/50 mix produced:

- 64% reduction in PM emissions for both uncertified and certified stoves relative to wet cordwood.

While the test results are based on limited samples, they indicate substantial emission reduction potential when the manufactured logs are burned in combination with cord wood (wet or dry). Discussions with the vendor producing the manufactured logs indicates that current production capacity is 3,000 tons/year and that engineering plans are being developed to increase that capacity to 15,000 tons per year.

A program targeting manufactured log/cordwood mix use on unhealthy days (defined as days forecasted above 35  $\mu\text{g}/\text{m}^3$ ), which averaged 24 days/winter 2010 – 2013 at the State Office Building, was considered based on current and forecasted manufactured log production capacity.

- Assuming a 60% compliance rate with such a targeted program by 2019, a 50/50 mix program would produce an additional 21.8% reduction in space heating PM emissions using 3,700 tons per/year, which is well below potential production capacity in 2019.

Fairbanks currently provides a \$300 voucher for homeowners participating in the wood stove change out program for the purchase of either pellets or manufactured logs. Additional programs could be targeted to encourage the use of manufactured logs in combination with cordwood. The vendor is tracking sales and will make a decision in the spring of 2015 on whether to expand production capacity.

- *Expansion of Diesel Anti-idling Program*

As discussed in detail in Section III.D.5.7, ADEC and DOT&PF have developed a Fairbanks specific CMAQ-funded pilot program intended to reduce heavy duty diesel emissions in the nonattainment area through anti-idling, maintenance, and other emission reduction opportunities. The focus of the program is to expand the use of auxiliary heaters to reduce idle time thereby reducing emissions and providing an associated cost saving due to less use of diesel fuel. The program has the following elements:

1. Provide support for the existing DOT&PF anti-idling pilot project currently underway in Fairbanks by assisting with telemetric purchase and installation, installation of additional heaters, and assisting with education and training. With assistance from this program, the DOT&PF pilot program will be fully functional and will be able to provide additional information to assist in expanding anti-idling to others.
2. Expand anti-idling to other heavy duty vehicles within the FNSB nonattainment area; state fleets, local government fleets, private fleets, and commercial fleets. This includes working with the heavy duty fleet owners by providing education materials and training, contracting for installations of auxiliary heaters, and providing incentives for participation including purchasing of heaters and auxiliary equipment.
3. During installation of program auxiliary heaters, conduct an inspection of the vehicle to identify where additional emission reduction possibilities could be implemented – such as maintenance (filter, tune-up), if vehicle is a candidate for retrofit technologies or repower, and/or candidate for additional emission reduction equipment (particulate matter traps). Partnership and incentive opportunities with vehicle fleet owners will be explored to further emission reduction benefits while a vehicle is in shop.

This pilot program is intended to develop into an on-going program with respect to new installation of heaters and emission reduction equipment on diesel equipment within the nonattainment area. Should this pilot program prove successful, an on-going measure will be considered for implementation as a future strategy for the local air quality plan. Overall operations and maintenance of the new equipment will be the responsibility of fleet owners. Original startup costs for new fleets (new installation of heaters, initial maintenance, or initial retrofits, additional emission reduction technologies) coming into the program are intended to be covered entirely or in part through the use of CMAQ funds. Once initiated, future installations within a fleet would be limited to actual heater installations and/or telemetrics only.

As envisioned, project funds would be provided for first time installations only, not for replacement of worn out heaters. The cost of a single auxiliary heater installation is approximately \$3500. Conservative estimates indicate auxiliary heaters may save 30% in fuel costs alone along with a 30% reduction in emissions. The cost of the fuel alone, would easily pay for any future replacement of the auxiliary heater and software. The life of the auxiliary heaters is more than ten years, so continued anti-idling use will provide benefits (emission reductions and fuel savings) for the life of the equipment.