

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION



Amendments to:

State Air Quality Control Plan

Vol. II: III.D.7.11

Contingency Measures

Public Notice Draft

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Note: DEC proposes to repeal and replace this State Air Quality Control Plan section to address the disapproval of the Fairbanks North Star Borough PM_{2.5} Serious SIP. To aid in the public comment process, the currently adopted section of the air quality plan can be found and referenced at the following internet site: <https://dec.alaska.gov/air/anpms/sip/fbks-pm2-5-regs-amends-2020/>

7.11. Contingency Measures

Section 172(c)(9) of the CAA requires nonattainment plans to include contingency measures that “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[.]” Contingency measures are control measures that will be implemented in the future, and may not be measures that are already implemented. *Bahr v. EPA*, 836 F.3d 1218, 1235 (9th Cir. 2016); *Ass'n of Irrigated Residents v. EPA*, 10 F.4th 937, 946 (9th Cir. 2021).

Such contingency measures shall be structured to take effect, if triggered, with minimal further action by the State or EPA. 40 C.F.R. § 51.1014(a). They are triggered by an EPA determination that the area has failed to meet a reasonable further progress requirement, to meet a quantitative milestone in an attainment plan, to submit a quantitative milestone report, or to attain the NAAQS by the applicable attainment date. 40 C.F.R. § 51.1014(a)(1)–(4). The triggering events are also laid out in Alaska regulation at 18 AAC 50.030(c).

Contingency measures must consist of control measure that are not otherwise included in the control strategy or that achieve emissions reduction not otherwise relied upon in the control strategy, and each contingency measure must specify the timeframe within which its requirements become effective after an EPA determination. 40 C.F.R. 51.1014(b). The attainment plan submission must contain a description of the specific trigger mechanisms for the contingency measures and specify a schedule for implementation. 40 C.F.R. 51.1014(c).

The adopted control measures discussed in this section are ready to be implemented, with only minimal action by the State, as expeditiously as practicable upon a triggering determination by EPA that the area has failed to meet a quantitative milestone, submit a required milestone report, meet reasonable further progress, or attain the NAAQS by the applicable attainment date.

7.11.1. State Regulatory Contingency Measures – Serious Nonattainment Area SIP and 189(d) plan Amendments

In the Serious Area Plan submitted in 2019, DEC included in its regulations a measure that acted as the contingency measure for the serious area plan. The serious nonattainment area SIP for the FNSB PM_{2.5} nonattainment area demonstrated that it was not possible for the area to reach attainment by the statutory serious area attainment deadline of 2019. In the 189(d) plan amendments adopted in November 2020, DEC included an additional contingency measure, because the contingency measure adopted in November 2019 with the Serious SIP submission was triggered in October 2020 and was no longer prospective.

7.11.1.1. Serious SIP, November 2019 adoption, requiring older EPA certified devices to be removed by 2024 and thereafter.

This contingency measure targeted older EPA certified devices and has provided emission reduction benefits. In order to ensure that older wood heating devices are turned over at a

substantial rate, DEC had established a contingency measure in 18 AAC 50.077(n) that requires older wood-fired heating devices with an emission rating above 2.0 g/hr manufactured 25 years before the effective date of a triggering EPA finding to be replaced before December 31, 2024. After 2024, the regulation continues to require that wood fired heating devices that are 25 years old be replaced, meaning that each year a number of existing stoves will reach the 25-year threshold and be required to be removed. This contingency measure will provide emission reductions in all future years. This contingency measure was triggered on October 2, 2020, the effective date of EPA’s finding that the area failed to attain the standard by the outermost serious area attainment date of December 31, 2019.¹

7.11.1.2. 189(d) amendment, November 2020 adoption, lowering curtailment threshold for stage 2 air alerts.

In the 189(d) plan amendments adopted in November 2020, DEC established a contingency measure that would be triggered by an EPA finding and that would lower the Stage 2 air alert level in the curtailment program from 30 $\mu\text{g}/\text{m}^3$ to 25 $\mu\text{g}/\text{m}^3$ as included in Section III.D.7.12, Fairbanks Emergency Episode Plan, Table 7.12-1 “Air Quality Episode Thresholds and Exceptions/Contingency Measure.” This is currently the only contingency measure in place that can be triggered.

EPA approved this contingency measure as SIP strengthening,² but determined that this contingency measure alone was insufficient to meet contingency measure requirements. EPA disapproved the contingency measure as not meeting the full contingency measure requirements³ because:

1. The contingency measure would not achieve emission reductions equal to One Year’s Worth (OYW) of Reasonable Further Progress (RFP),
2. The contingency measure would not achieve emission reductions of all plan precursors, including SO₂ and NH₃, and
3. Alaska did not include an adequate reasoned justification for why any additional potential contingency measures were infeasible.

One of the contingency measures selected with these 2024 Amendments includes lowering the alert levels in the curtailment program, Stage 2 alerts would be lowered from 30 $\mu\text{g}/\text{m}^3$ to 20 $\mu\text{g}/\text{m}^3$ rendering irrelevant the contingency measure that lowered the same alert level to 25 $\mu\text{g}/\text{m}^3$. The 189(d) contingency measure that lowered the Stage 2 alert.

7.11.1.3. Emission Reductions

These contingency measures will provide emission reductions that achieve the OYW attainment target defined in EPA’s 2023 draft contingency measure guidance as explained below in Section III.D.7.11.2. DEC acknowledges that the OYW of attainment target defined in the 2023 draft contingency measure guidance is different than previous guidance which is based on OYW of RFP. While this chapter presents emission reduction compared to the 2023 draft contingency

¹ 40 CFR Part 52, 85 Fed. Reg. at 54509 (Sept. 2, 2020).

² 40 CFR Part 52, 88 Fed. Reg. at 84663 (Dec. 5, 2023).

³ *Id.*

measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

7.11.2 State Regulatory Contingency Measures – 2024 Amendment

Under the 2024 Amendment, DEC developed a contingency measure package that will be implemented in the event that EPA issues any of the findings identified in 18 AAC 50.030(c).

EPA published draft guidance^{4,5} in March 2023 for contingency measure (CM) requirements in ozone and particulate matter nonattainment areas. Longstanding EPA policy preceding this 2023 draft guidance recommended that CMs provide emission reductions equal to or exceeding one year's worth (OYW) of RFP (based on the linear RFP trajectory). The 2023 draft guidance continues to recommend an annual progress-based approach but revises the metric to OYW reductions relative to attainment, rather than RFP, at the time CMs would be triggered. Thus, this subsection provides a comparison of CM reductions to the new metric, OYW of attainment, contained in the 2023 draft guidance. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

In accordance with 40 C.F.R. § 51.1014, the package of additional controls that will serve as contingency measures for the 2024 Amendments consists of three components:

1. *Reduced Alert Levels* – increasing the stringency of the Stage 1 and Stage 2 alert levels under the Solid Fuel-Burning Appliance Curtailment Program from 20 $\mu\text{g}/\text{m}^3$ and 30 $\mu\text{g}/\text{m}^3$ to 15 $\mu\text{g}/\text{m}^3$ and 20 $\mu\text{g}/\text{m}^3$, which will result in more frequent application of burn restrictions.
2. *Enhanced Curtailment Program* – an enforceable commitment to increase staff hours that are devoted to compliance and enforcement activities for the wood heater curtailment program; and
3. *Enhanced Wood Device Removal* – an enforceable commitment to increase staff hours that are devoted to compliance and enforcement for SIP control measure STF-17 (Wood Device Removal).

This contingency measure package is discussed further below.

Consideration of SO₂ contingency measures.

Table 7.6-8 from Chapter III.D.7.06 is reproduced below and shows SO₂ emissions by source sector in tons/day. In section 7.11.2.4 of this chapter, OYW of progress for SO₂ emissions is estimated at 0.116 tons/day. The only source sectors with sufficient SO₂ emissions to obtain OYW of progress are point sources, fuel oil space heating, and aircraft.

⁴ <https://www.epa.gov/air-quality-implementation-plans/draft-contingency-measures-guidance>

⁵ 88 Fed. Reg. 17571 (March 23, 2023).

Table 7.6-8
2020 Baseline Episode Average Daily Emissions (tons/day) by Source Sector

Source Sector	<i>Modeling Inventory</i> <i>Grid 3 Domain Emissions (tons/day)</i>					<i>Planning Inventory</i> <i>NA Area Emissions (tons/day)</i>				
	PM _{2.5}	NO _x	SO ₂	VOC	NH ₃	PM _{2.5}	NO _x	SO ₂	VOC	NH ₃
Point Sources	0.58	13.54	6.63	0.04	0.088	0.58	13.54	6.63	0.04	0.088
Area, Space Heating	2.14	2.32	3.95	7.14	0.117	1.97	2.17	3.61	6.66	0.109
Area, Space Heat, Wood	2.06	0.27	0.05	7.02	0.074	1.89	0.23	0.04	6.55	0.067
Area, Space Heat, Oil	0.07	1.83	3.88	0.10	0.004	0.06	1.72	3.54	0.10	0.003
Area, Space Heat, Coal	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.000
Area, Space Heat, Other	0.02	0.22	0.02	0.01	0.039	0.02	0.22	0.02	0.01	0.039
Area, Other	0.18*	1.24	0.67	2.30	0.051	0.11	0.36	0.03	2.12	0.047
Mobile, On-Road	0.10	1.77	0.00	1.86	0.063	0.07	1.18	0.00	1.42	0.040
Mobile, Aircraft	0.19	0.65	8.27	0.31	0.000	0.12	0.43	5.44	0.15	0.000
Mobile, Non-Road less aircraft	0.12	0.84	0.00	3.32	0.002	0.09	0.29	0.00	2.64	0.001
TOTALS	3.32*	20.37	19.53	14.97	0.321	2.95	17.96	15.71	13.04	0.285

*Reflects corrected emissions for Other Area Sources within the modeling domain but outside the nonattainment area.

Point sources SO₂ controls were not identified as a contingency measure because a major stationary point source SO₂ precursor demonstration is included in Chapter III.D.7.08. That demonstration shows that SO₂ emissions from all existing major stationary sources located in the Fairbanks PM_{2.5} nonattainment area do not contribute significantly to PM_{2.5} levels. 40 C.F.R. § 51.1010 states that, with the major stationary point source SO₂ precursor demonstration, DEC is not required to identify and evaluate potential control measures to reduce SO₂ emissions from major stationary sources. The contingency measure guidance suggests that all control measures rejected as either technically or economically infeasible be reevaluated for feasibility as a contingency measure. The SO₂ control measures for major stationary sources were not identified or evaluated under 40 C.F.R. § 51.1010, were never rejected as technically or economically infeasible, and are therefore not identified as a contingency measure.

Aircraft are under federal jurisdiction. No controls have been identified for the aircraft source sector within the Minor, Serious, or 189(d) plan submissions. Therefore, there are no contingency measures to reduce SO₂ emissions within the aircraft source sector.

DEC also evaluated Ultra Low Sulfur Diesel (ULSD) heating oil as a candidate contingency measure, and ultimately rejected it from the proposed contingency measure package because any SO₂ emission reductions from a ULSD mandate would not be realized until **three years** after such a contingency measure was triggered. In the BACM analysis, DEC documented the following three major infrastructure issues associated with the feasibility of ULSD for the Fairbanks market:

1. *ULSD could not be produced locally because of the impossible economy of scale* - The greater Fairbanks area has one refinery, which is located in North Pole and owned by Petro Star (“North Pole refinery”). For heating oil, it switched from making #2 to #1 fuel oil in September 2022, in response to the requirement and timeline in 18 AAC 50.078(b). The

North Pole refinery has none of the infrastructure necessary to make ULSD.⁶ To make ULSD, the refinery would need to build a new ULSD plant and connect it to the existing plant.⁷ For the Fairbanks market, the size of that ULSD plant would be so small as to create a negative economy of scale.⁸ Realistically, ULSD cannot be produced locally.

2. *Fuel transportation networks to Fairbanks could not logistically support a switch to ULSD heating oil* - In Alaska, ULSD is produced at two refineries: Petro Star produces it in Valdez, and Marathon produces it in Nikiski.⁹ To get ULSD to Fairbanks it would first be transported to Anchorage, via barge for Petro Star and pipeline for Marathon, and then from Anchorage the fuel is transported by rail.¹⁰ For Petro Star, the backup logistics would be to truck ULSD from Valdez to Fairbanks.¹¹ If ULSD was mandated for heating oil in the Fairbanks Nonattainment Area, Petro Star estimates that it would have to add 30-40 million gallons per winter of logistical capacity to transport heating oil to Fairbanks.¹²

The existing logistical network for trucking and rail transport is operating at near capacity. Other fuel products for non-heating uses must also be shipped to Fairbanks, like gasoline and jet fuel. The Alaska Railroad, which runs 470 miles from Seward to Fairbanks (through Anchorage), is the primary and most economical mode of transportation for fuel going to Fairbanks.¹³ Trucking, which comes at an increased cost from rail transport, is also at capacity in Alaska.¹⁴ New truckers are not meeting the demand created by retiring truckers, and incomes from trucking in the continental United States have increased, reducing the incentive for truckers to weather the dark and icy conditions in Alaskan winters.¹⁵

In Alaska, the fuel demand for heating, electricity, and transportation all peak in the winter.¹⁶ It is cold and dark, and residents need more light and heat for more hours every day.

⁶ Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*; see also McDowell Group, Statewide and Port of Alaska Long Range Fuel Forecast (November 20, 2020), available at https://www.portofalaska.com/wp-content/uploads/Alaska-PoA_Fuel_Forecast_Nov2020.pdf.

¹¹ *Id.*; see also FMATS Freight Mobility Plan (January 2019), available at <https://fastplanning.us/wp-content/uploads/2019/07/freight-mobility-plan-for-approval.pdf>.

¹² Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).

¹³ *Id.*; see also FMATS Freight Mobility Plan (January 2019).

¹⁴ Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).

¹⁵ *Id.*

¹⁶ *Id.*

Existing transportation capacity is insufficient to absorb the additional peaks in winter demand that would be caused by mandating ULSD.¹⁷

3. *The greater Fairbanks area has materially different fuel transportation conditions than rural Alaska, which uses a different ultra-low sulfur fuel* - Unlike Fairbanks, rural Alaskan communities that are not on the road or rail system use an ultra-low sulfur fuel.¹⁸ This fuel is not the same as ULSD.¹⁹ Rather, it is a hybrid product that can also be used for jet fuel (“ULS/jet”), and is produced by an Asia refinery with a different method from that used to produce ULSD.²⁰ Rural Alaskan communities need this multi-use fuel because of their limited fuel storage capacity. With ULS/jet, rural communities can use one storage tank and one fuel for both transportation and heat.

The circumstances and reasoning for this type of ULS/jet product are different from the circumstances surrounding the heating oil needs in the Fairbanks North Star Borough. It has a much higher population²¹ than rural Alaska communities and requires separate storage tanks for ULSD and other higher sulfur distillate oil. The logistics and costs associated with ULS/jet, and its transport from Asia through Bristol Bay to rural Alaska, are distinct from the logistics and costs that would be associated with transporting ULSD from different refineries, through different transportation methods, to the Fairbanks North Star Borough that needs more than one tank to survive the winter.

These three limiting factors impact the timeline for implementation and realization of SO₂ emission reductions. The infrastructure required to ensure an uninterrupted supply of ULSD to the Fairbanks North Star Borough include dedicated tanks to store ULSD and 30-40 million gallons of additional transportation capacity. The ULSD tanks would be filled during the summer months when usage is low and transportation by truck is safer and easier than in the dark and cold winter months. During the winter months, higher usage would deplete the storage in the tanks when the transportation infrastructure cannot keep up with heating needs of the community. To prepare for the first winter of a ULSD mandate, the ULSD storage tanks would need to be commissioned and operational in the early spring to provide sufficient time to fill the tanks prior to the winter heating needs which ramp up in September or October. Any construction or repurposing of tanks would need to be completed during the short summer construction season. Given these constraints, two summers would be required to commission

¹⁷ *Id.*

¹⁸ 40 C.F.R. Part 80; 71 Fed. Reg. at 32450.

¹⁹ Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).

²⁰ *Id.*

²¹ Approximately 95,593, as of 2021. U.S. Census Bureau, QuickFacts: Fairbanks city, Alaska; Fairbanks North Star Borough, Alaska, available at <https://www.census.gov/quickfacts/fact/table/fairbankscityalaska,fairbanksnorthstarboroughalaska/PST045221>.

and fill the required ULSD storage tanks. During this time, the logistics of adding an additional 30-40 million gallons of transportation capacity could hopefully be addressed.

Once an uninterrupted supply of ULSD was made available to the community, the ULSD would need to be purchased and filled into all residential home heating oil tanks. Prior to any emission reductions being achieved, the ULSD would need to flush and displace all the existing #1 fuel in the residential tanks. With size ranges from 100 gallons to 1,500 gallons, up to a year's worth of heating oil can typically be stored in a residential tank. It is a fair assumption that most residential fuel oil tanks would be filled to capacity prior to any ULSD mandate, given the perceived price premium of ULSD compared to #1 fuel oil. Therefore, any SO₂ emission reductions from a ULSD mandate would not be realized until **three years** after such a contingency measure was triggered. Current and draft future guidance for contingency measures states that they should take effect within 60 days and should achieve emission reductions within one year (and two years at the maximum).²² As such, a ULSD measure where reductions would not begin to be realized for three years after triggering is not eligible to be a contingency measure. Having exhausted the available contingency measures for SO₂, DEC will be relying on excess PM_{2.5} emission reductions and inter-pollutant trading as described in section 7.11.2.4.

1. DEC reviewed a pellet only measure as a PM_{2.5} contingency measure. The pellet only measure reviewed through BACM was Measure 7 from Missoula Montana. The Missoula City-County wood heating control regulations require installation permits for the installation and use of all wood heating devices after July 1, 1986, in the Air Stagnation Zone (Section 9.202.1). Within the Air Stagnation Zone, installation permits are authorized only for pellet stoves emitting no more than 1.0 g/hr (Section 9.203.1.a). Alaska adopted regulations under 18 AAC 50.077(a) – (e) as equivalent to Missoula's measure under BACM, and EPA approved Alaska's adopted measures as meeting BACM. While allowing cordwood stoves, Alaska's regulations adopted a new standard of 6.0 g/hr for the one-hour filter pull and required a review of the underlying test data. Alaska's regulations under 18 AAC 50.077(a) – (e) have resulted in pellet stoves being removed from Alaska's list that would be allowed under Missoula's 1.0 g/hr pellet only requirement. Given all the documented issues with EPA's wood heater certification program adopting a pellet only requirement at 1.0 g/hr may not result in emission reductions beyond the limitations already adopted under 18 AAC 50.077(a) – (e). There are technical issues with adopting a pellet only requirement. During the 2018 stakeholder meetings, the community stated the need to maintain cordwood as an option. Pellet stoves must be plugged into an electric outlet to operate. Cordwood stoves do not need any external power source to operate. Many citizens rely on wood stoves as backup heat. Given the subarctic climate and periodic power failures, the community expressed real safety concerns for themselves and their families as well as concern about damage to property if wood stoves were not available as backup. While there are emerging technologies, none are proven. Due to the importance of these systems to ensure citizen

²² EPA, *DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter* (March 17, 2023), at 40–41.

safety in an arctic climate, it is not prudent to exclude an entire sector of proven residential heating technology that many citizens rely on for an immediate safety concern. A pellet only measure would rely on device turnover to achieve emission reductions. In the control measure analysis DEC assumes a useful life of 20 years and a replacement rate of 5% per year for pellet appliances. At a penetration rate of 5% per year the PM_{2.5} emission reductions realized within the first two years of a pellet only contingency measure would be insignificant. Therefore, due to: An equivalent measure already adopted

2. Technological infeasibility and
3. Lack of emission reductions within 2 years of triggering

A pellet only measure was not selected as a contingency measure.

The following subsections provide more information about each component of the proposed contingency measure package under the 2024 Amendment, followed by an analysis of their combined emission reductions and a comparison to the OYW attainment targets recommended under EPA's draft 2023 guidance. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

7.11.2.1. Enforceable Commitments

1. Within 60 days following the effective date of any of the determinations in 40 C.F.R. § 51.1014(a)(1)–(4) and 18 AAC 50.030(c)(1)(B) triggering contingency measures, DEC commits to increasing the staff hours for wood stove curtailment program (18 AAC 50.075(e) and (d); State Air Quality Control Plan Chapter II.III.D.7.12 Fairbanks Emergency Episode Plan) compliance and enforcement to at least 2,800 hours per winter season (October 1 through March 31). For the purposes of this commitment, wood stove curtailment program compliance and enforcement includes but is not limited to field observations, as well as administrative work, research, and peer review for advisory letters, compliance letters, and notices of violation..

a. DEC commits to maintaining at least 2,800 staff hours per winter until such time that the contingency measure can be relaxed through a formal SIP revision that complies with section 110(l) of the CAA.

b. DEC commits to publishing an annual report available to the public by May 31 of each calendar year that includes the staff hours for curtailment compliance and enforcement for the preceding winter season. The Air Quality Division Director or equivalent shall certify as to the truth and accuracy of the annual reports.

i. DEC's commitment is to maintain at least 2,800 staff hours per winter. The increase in staffing hours will lead to more observations, more advisory letters, more violations, and increased enforcement presence in the community. The cumulative effect will be behavioral changes within the community that lead to a higher compliance rate. Compliance rates for curtailment programs are inherently difficult to determine and not an appropriate parameter to base an enforceable commitment on. However, DEC has documented a method to monitor the curtailment program compliance rate on a per

winter basis which is described in Appendix III.D.7.09. There is substantial benefit to maintaining the compliance rate observations as they can provide another benchmark for progress. DEC shall continue to conduct annual assessments of the compliance rate, as described in Appendix III.D.7.09, through the modeled attainment year of 2027 and shall report the results with the annual report published by May 31 of each calendar year. Should any of the determinations in 40 C.F.R. § 51.1014(a)(1)–(4) and 18 AAC 50.030(c)(1)(B) trigger the contingency measures DEC will continue to conduct the annual assessments of the compliance rate as described in Appendix III.D.7.09 and report the results with the annual report published by May 31 of each calendar year.

2. Within 60 days following the effective date of any of the determinations in 40 C.F.R. § 51.1014(a)(1)–(4) and 18 AAC 50.030(c)(1)(B) triggering contingency measures DEC commits to increasing the staff hours for wood device removal (18 AAC 50.077(l - n)) compliance and enforcement 300 hours per year. For purposes of this commitment, wood device removal compliance and enforcement includes but is not limited to processing wood device registration, identifying potential violations, cross-referencing wood device data sets, administrative work, research, and peer review for advisory letters, compliance letters, and notices of violation.

a. DEC commits to maintaining this increased staffing level until such time that the contingency measure can be relaxed through a formal SIP revision that complies with section 110(l) of the CAA.

b. DEC commits to publishing an annual report available to the public by May 31 of each calendar year that includes the staffing hours for wood device removal compliance and enforcement for the preceding year. The Air Quality Division Director or equivalent shall certify as to the truth and accuracy of the annual reports.

7.11.2.1. Implementation of Enhanced Solid-Fuel Curtailment Program Elements

This component of the CM package will increase the stringency of the Stage 1 and Stage 2 alert levels under the Solid Fuel-Burning Appliance Curtailment Program from 20 $\mu\text{g}/\text{m}^3$ and 30 $\mu\text{g}/\text{m}^3$ to 15 $\mu\text{g}/\text{m}^3$ and 20 $\mu\text{g}/\text{m}^3$. This will result in more frequent application of burning restrictions under both stages, including Stage 2, which prohibits all solid fuel burning except in No Other Adequate Source of Heat (NOASH) households.

In addition, under the contingency measure DEC will mobilize additional staffing from within DEC to expand compliance and enforcement activities that are expected to result in an increased Curtailment Program compliance rate of 65%.

DEC has reviewed the performance of the curtailment program and concluded that the contingency measure should focus additional staffing on compliance and enforcement activities to achieve a higher compliance rate and greater emission reductions. Reviewed elements of the curtailment program include:

1. Real time monitoring of PM_{2.5} levels.

DEC operates and maintains a federally approved ambient monitoring network, details can be found in Chapter III.D.7.5 (PM_{2.5} Network & Monitoring Program). FNSB operates an additional network of low-cost sensors within the nonattainment area. Both FNSB and DEC make real time PM_{2.5} data available for the public on their respective websites. Real time monitoring is sufficient to provide DEC with information necessary to forecast and call accurate alerts. Real time monitoring is sufficient to inform the public of current PM_{2.5} concentrations. Dedicating additional resources to this portion of the curtailment program would not result in additional emission reductions.

2. Forecasting PM_{2.5} levels to accurately predict and issue air quality alerts.

DEC relies on a staff meteorologist to determine when air alerts are issued and the appropriate stage level to issue. DEC staff use all available forecasting and data to inform decisions on when to issue air alerts. Additionally, a specialized tool for the nonattainment area has been developed, the AQ Alert Model. The AQ Alert Model is used by DEC air quality staff to assess the need for advisories. It retrieves a range of meteorological observations and forecasts for both surface and upper-air conditions and uses statistical equations developed from past experience turn the meteorological information into predictions of PM_{2.5} concentrations at the monitors. The performance assessment presented in Appendix III.D.7.09 shows that both the Alert Model and the DEC air advisory program perform more than sufficiently to predict and issue air quality alerts. Dedicating additional resources to this portion of the curtailment program would not result in additional emission reductions.

3. Communicating alerts to the community in a timely and effective manner.

Alerts need to be communicated to the public quickly, usually within 3 hours of notification, for the curtailment program to effectively reduce emissions. 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, electronic highway message boards, and the DEC Curtailment and Alerts web page. DEC has not identified another platform that could be used to communicate alerts within the time required. Dedicating additional resources to this portion of the curtailment program would not result in additional emission reductions.

4. Conducting outreach to ensure that the community knows the appropriate action to take.

Between FNSB and DEC a curtailment program has been operating since the winter of 2015-2016. During those 9 years, significant outreach regarding the curtailment program has been conducted, and as a result the community has a high awareness of the curtailment program. DEC contracted with a professional marketing firm to develop strategies for creative material, platform selections, and ad purchases. As a representative example, during the 2023-2024 winter DEC conducted a multiplatform campaign around the curtailment program. The campaign had significant online presence on the following platforms: Facebook, Hulu, StackAdapt, YouTube, iHeart Media, Pandora, and Spotify. A direct mailer on the curtailment program was sent to all residential addresses within the nonattainment area. Traditional radio and television were also run. Recent market analysis show that DEC's marketing campaign is above industry benchmarks for all of the online platforms with the exception of digital radio performance.

Dedicating additional resources to this portion of the curtailment program would not necessarily result in additional marketing reach or additional emission reductions.

5. Analyzing and processing waivers.

Waivers represent exemptions to the curtailment program. Lower emissions correspond to a lower number of waivers. During the 2023-2024 winter there were 13 active NOASH waivers and 24 active Stage 1 waivers. The waivers represent an incredibly small fraction of the approximately 14,000 solid fuel burning appliances estimated to be in the nonattainment area. Further reduction of waivers is infeasible and therefore dedicating additional resources to this portion of the curtailment program would not result in emission reductions.

6. Assessment of compliance rate.

DEC conducts assessments of the compliance rate each winter, as described in Appendix III.D.7.09. This activity is an assessment of the compliance rate. Dedicating additional resources to this portion of the curtailment program would not result in emission reductions.

7. Compliance observations and enforcement activities.

Compliance observations in North Pole and Fairbanks are difficult to conduct and resource intensive from a staffing perspective. The observations require daylight and are limited to generally between 10:30 am and 2:30 pm during the winter curtailment season. Only a small fraction of households can be observed during a given air quality alert with current staffing levels. Observed violations require a significant administrative workload to resolve. DEC has determined that dedicating additional resources to this portion of the curtailment program would increase the compliance rate and result in emission reductions by increasing the number of observations made and adding capacity to move observed violations through the administrative process.

Compliance and enforcement activities are seasonal, these activities are performed October 1 through March 31 of each year. Due to the seasonality, DEC has determined that measuring staff hours spent on these activities is an appropriate parameter to indicate the level of resources DEC has dedicated to compliance and enforcement. Other parameters considered included Full Time Equivalents (FTEs), which were not selected because hours were a more descriptive parameter given the seasonality. The number of observed violations is currently tracked, however that parameter was not selected because the number of observed violations should drop as the compliance rate increases, so it is not a reliable indicator. The number of observed violations are also dependent on the meteorology and the number of alerts called per winter season. Compliance letters are also tracked but were not selected due to the same issues as the number of observed violations.

Currently, DEC allocates approximately 2,200 staff hours per winter season to curtailment compliance and enforcement. For perspective, one FTE during the winter season can contribute approximately 650 staff hours, so the current resources represent about 3.4 FTEs. For the contingency measure, DEC is claiming that compliance rates will increase from 38% to 65% due to dedicating additional staffing resources to compliance activities, which represents a 27% increase in compliance rate. DEC is not aware of any existing studies or information that could inform how much additional staffing is needed to increase the compliance rate by 27%. In the

absence of existing studies or information, DEC is using a one-to-one ratio and will increase staffing resources by 27%—increasing from 2,200 staff hours per winter season to 2,800 staff hours per winter season. For perspective, that is roughly equal to adding one FTE.

7.11.2.2. Enhanced Wood Device Removal

The second component of the CM package consists of emission reductions through enhanced compliance with SIP control measure STF-17 under 18 AAC 50.077(l-n), which requires the surrender or removal of uncertified wood devices (including hydronic heaters) by December 31, 2024. DEC has modeled the effectiveness of this measure over time based on a 30% compliance rate by that 2024 date. In the event this contingency measure package is triggered, DEC projects that enhanced Curtailment Program stringency and enforcement will yield collateral, accelerated compliance with 18 AAC 50.077(l-n), increasing its effective compliance rate to 45%. This forecast is based on the expectation that the increase in called alerts with the decrease of their thresholds (to 15 $\mu\text{g}/\text{m}^3$ and 20 $\mu\text{g}/\text{m}^3$), coupled with enhanced staffing, increased compliance, and other solid fuel device registration triggers (such as NOASH), will further disincentivize wood use and retention of wood-burning devices. DEC projects this will provide collateral emission reductions based an increase in compliance/penetration rate under 18 AAC 50.077(l-n) from 30% to 45% under this proposed CM package.

DEC reviewed the performance of wood device removal and concluded that the contingency measure should focus additional staffing on compliance and enforcement activities to achieve a higher compliance rate and greater emission reductions. Reviewed elements of the wood device removal program include:

1. Implementation timelines.

There are multiple timelines for implementation of various components of the wood device removal requirements. In January 2020, the regulations adopted with the Serious SIP submission required that wood devices without a valid certification from EPA, i.e., uncertified wood devices, had to be removed but only during real estate transactions. In October 2020, a contingency measure was triggered that included a subset of older and higher emitting EPA-certified devices to be removed, but only during real estate transactions. After December 31, 2024, the removal requirement is significantly broadened by not being limited to only real estate transactions. After December 31, 2024, all existing uncertified wood devices along with older and higher emitting EPA-certified devices are required to be removed. Assuming that any contingency measure would be triggered after December 31, 2024, there are no implementation timelines that could be expedited as a contingency measure.

2. Emission thresholds for removals.

Like lowering the alert levels for curtailment, DEC considered lowering the emission thresholds for removal. DEC's regulations require certain EPA certified wood devices to be removed in addition to all uncertified wood devices. DEC's current thresholds for removal are any wood devices with an EPA-certified value greater than 2.0 grams per hour (g/hr) and older than 25 years. DEC has been reviewing EPA wood heater certification reports since 2020. As a result of DEC's reviews and work by Northeast States for Coordinated Air Use Management

(NESCAUM), it has been shown that EPA’s wood heater certification program is not a reliable indicator of wood device emissions. NESCAUM’s March 2021 report *Assessment of EPA’s Residential Wood Heater Certification Program*²³ classified the EPA’s wood heater program as “dysfunctional,” highlighting deficiencies in lab testing, manipulation of test methods, ineffective third-party certifier system, and improper complicity between third-party reviewers and manufacturers. EPA’s Office of Inspector General report issued a February 28, 2023, report titled *The EPA’s Residential Wood Heater Program Does Not Provide Reasonable Assurance that Heaters Are Properly Tested and Certified Before Reaching Consumers*²⁴ that further validates DEC’s position.

Testing data shown in Figures 1 and 2 show that lower certification values do not necessarily equate to lower emissions.

Figure 7.11-1, Certain EPA Certification Emissions are Not Repeatable or Reliable

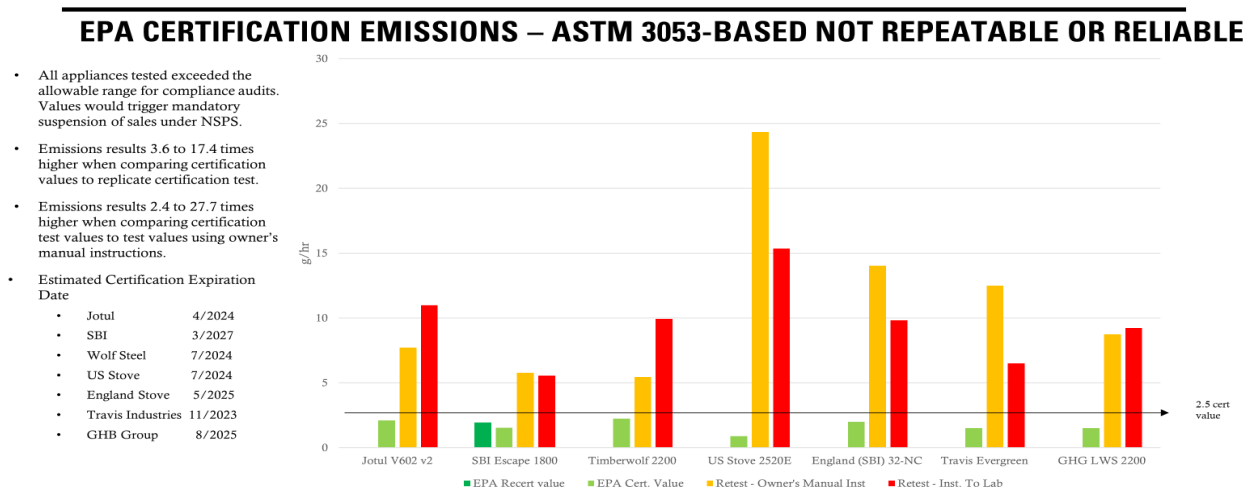
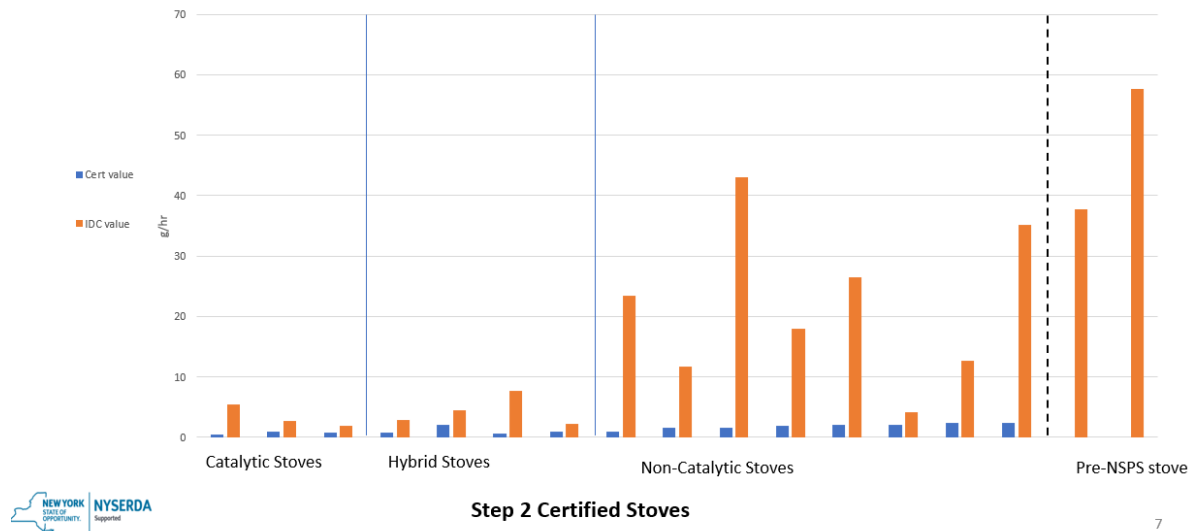


Figure 7.11-2, EPA Certification Test Results compared to Integrated Duty Cycle (IDC) Test Results

²³ <https://www.nescaum.org/documents/nescaum-review-of-epa-rwh-nsps-certification-program-rev-3-30-21.pdf>

²⁴ <https://www.epa.ig.gov/reports/evaluation/epas-residential-wood-heater-program-does-not-provide-reasonable-assurance>

Certification vs. IDC Results



Based on the available body of evidence, DEC concluded that lowering the removal threshold below the current level of 2.0 g/hr could potentially *increase* emissions because some of the wood stoves with the lowest EPA certification value appear to have the highest emissions when retested.

3. Conducting outreach regarding removal of wood devices.

Because the current removal requirements are triggered only by a real estate transaction, DEC's outreach efforts have focused on educating real estate professionals. Between 2016 and 2021 DEC has sent 7 letters to real estate professional groups and has met with the local real estate association on multiple occasions. For date certain removal after December 31, 2024, DEC has sent two direct mailers, one in 2022 and another in 2024, to all residential addresses within the nonattainment area. FNSB and DEC have coordinated on ad campaigns to ensure that the community is aware of the DEC regulation and the December 31, 2024, deadline, while highlighting the FNSB change out program as providing financial incentive to comply with DEC's regulation. FNSB and DEC will continue to conduct outreach at similar levels as funding allows. Dedicating additional resources to this portion of wood device removal would not necessarily result in emission reductions.

4. Compliance observations and enforcement activities.

All historical compliance and enforcement efforts have been limited to real estate transactions because the date certain removal of December 31, 2024, has yet to be implemented. Present efforts rely substantially on self-reporting and referrals from the FNSB change out program, which is reflected in the current level of effort. Presently, DEC allocates approximately 150 staff hours per year for wood device removal compliance and enforcement. For this contingency measure, DEC is claiming that compliance rates will increase from 30% to 45% due to dedicating additional staffing resources to compliance activities, which represents a 15% increase in the compliance rate. The curtailment contingency measure in this package uses a

one-to-one ratio to determine the staffing increase. If that same metric is applied in the wood device removal it would equate to only an additional 22.5 hours. DEC has determined that a one-to-one ratio is not appropriate in this case because the measure has not yet been fully implemented, and so the current number of hours are not representative of full implementation. DEC anticipates that increased compliance with wood device removal will result from identification of potential violations. Identification of potential violations are expected to increase as DEC's registration dataset grows and it can be cross referenced with other datasets such as the change out program, assessors, and real estate. DEC expects some collateral benefits with the increase in curtailment compliance because that will drive the need for waivers, which require wood device registration. In addition to the collateral benefits from curtailment, DEC has determined that doubling the staff hours from 150 to 300 to cross reference datasets to identify violations will be sufficient to increase the compliance rate from 30% to 45%.

7.11.2.3. Legal Sufficiency of Commitments

DEC's contingency measure commitments are legally permissible and sufficiently enforceable. The CAA allows approval of enforceable commitments that are limited in scope where circumstances warrant using such commitments in place of adopted measures. Once EPA determines that circumstances warrant consideration of an enforceable commitment, EPA considers three factors in determining whether to approve the CAA requirement that relies on the enforceable commitment:

- (1) whether the commitment addresses a limited portion of the CAA requirement;
- (2) whether the state is capable of fulfilling its commitment; and
- (3) whether the commitment is for a reasonable and appropriate period of time.

Med. Advocs. for Healthy Air v. EPA, No. 20-72780, 2022 WL 1109656, at *2 (9th Cir. Apr. 13, 2022) (unreported); *BCCA Appeal Grp. v. EPA*, 355 F.3d 817, 840 (5th Cir. 2003).

The Ninth Circuit (as well as other Circuits) has also analyzed whether the CAA permits state implementation plans to rely on enforceable commitments. The Ninth Circuit has determined that enforceable commitments can meet the requirement in CAA Section 110(a)(2)(A) for the SIP to include "other control measures, means, or techniques . . . as well as timetables for compliance." Enforceable commitments that meet these SIP requirements also meet the definition of "emission standard or limitation" in CAA Section 304(f) (CAA citizen suit provision). Thus, if a state does not fulfill its commitment, the public can seek a remedy pursuant to CAA Section 304. The Ninth Circuit evaluates the following factors in determining whether an enforceable commitment is a permissible component of a SIP control strategy under CAA Section 110(a)(2)(A), and meets the definition of emission standard or limitation under CAA Section 304(f):

- (1) whether the commitment is written as enforceable and not simply an aspirational, unenforceable goal, and

- (2) whether the commitment is enforceable as a practical matter, with enough public information for the public to enforce the state's compliance with its commitment.

Comm. for a Better Arvin v. EPA, 786 F.3d 1169, 1181 (9th Cir. 2015).

DEC's contingency measure package in this chapter includes a lowering of the curtailment threshold that would be automatically triggered, as well as two enforceable commitments: increasing staff hours for curtailment compliance and enforcement and increasing staff hours for wood device removal. Both commitments are both permissible and enforceable under the applicable analyses.

a. DEC's commitments are legally permissible.

As to the three-part test, first, the commitments address a limited portion of the statutorily required program. When the commitment is part of the control strategy designed to achieve attainment, EPA has historically accepted commitments that account for no more than 10% of the necessary emissions reductions. This is not a statutory or regulatory requirement, however. As such, EPA has on occasion approved commitments that account for more than 10% of the emissions reductions necessary to achieve attainment. In the contingency measure context, EPA has interpreted the CAA as requiring that the contingency measure achieve OYW of RFP unless the state provides a reasoned justification for why some lesser amount is acceptable. In draft guidance, EPA provided a OYW of progress as an alternative metric for contingency measures. Here, reducing the curtailment alert levels (the automatically triggered, non-commitment portion of this contingency measure package) leads to PM_{2.5} reductions of 0.77 tons/day (with interpollutant trading, discussed below) that are 62% of the OYW target and 58% of total contingency measure package reductions. This means that the two enforceable commitments combined (increased staff hours for curtailment plus wood device removal) represent a minority, i.e., a limited portion, of statutorily required contingency measures.²⁵

Second, the state is capable of fulfilling its commitments. In *BCCA Appeal Group*, this factor was met because Texas provided EPA with sufficient information to assure EPA it was capable of adopting controls to achieve the necessary level of emission reductions. 355 F.3d at 841. In *Medical Advocates for Healthy Air*, this factor was *not* met because California, by its own calculations, had a potential \$2.6 billion shortfall in funding for its incentive-based control measure commitments. 2022 WL 1109656, at *2. Here, DEC would move staff hours within its existing, assured Air Quality Division budget. Unlike California in *Medical Advocates for Healthy Air*, DEC has no budget shortfall; it has the capacity to adopt these staffing contingency measures and maintain them indefinitely.

Third, the commitments are for a reasonable and appropriate period of time. Prior case law addresses commitments for emissions reductions as part of total control strategies, not contingency measures, and so they are inapposite. Here, under current and draft future guidance for contingency measures, they should take effect within 60 days, and should achieve emission reductions within one year (and two years at the maximum).²⁶ As discussed above, DEC commits to maintain increased staffing levels for both curtailment and wood device

²⁵ Note that this legal test was made for nonattainment areas whose control strategies could not account for all needed emission reductions, and who therefore needed to make enforceable future commitments. Here, DEC's control strategy accounts for all needed emission reductions, and its enforceable commitments are reserved for a portion of its contingency measures.

²⁶ EPA, *DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter* (March 17, 2023), at 40–41.

commitments until such time that the contingency measure can be relaxed through a formal SIP revision that complies with section 110(l) of the CAA. In other words, DEC commits to maintaining the increasing staffing indefinitely, barring an EPA-approved SIP revision.

As such, DEC's enforceable commitments meet the three-factor legal test applied in *Med. Advocs. for Healthy Air v. EPA* (9th Cir. 2022) (unreported) and *BCCA Appeal Grp. v. EPA* (5th Cir. 2003).

b. DEC's commitments are sufficiently enforceable.

DEC's commitments meet the generalized two-part analysis in *Comm. for a Better Arvin v. EPA* (9th Cir. 2015), to ensure that control measures can be enforced by individuals and the EPA. 786 F.3d at 1175. In *Better Arvin*, petitioners argued that California's commitments were merely unenforceable aspirational goals and contained no specific strategies or measures. Alternatively, petitioners argued that even if the commitments were not merely aspirational goals, they were still unenforceable because California could change them, and it was practically impossible to bring a timely enforcement action. 786 F.3d at 1179.

First, DEC's commitments are enforceable and not merely aspirational. In *Better Arvin*, the court decided that California's commitments were not merely aspirational because they used mandatory and nondiscretionary language to commit to adopting and implementing measures that will achieve specific emissions reductions by specific years, and because they required action within the state agency's control. 786 F.3d at 1179–1180; *see also Physicians for Soc. Resp.-Los Angeles v. EPA*, 607 F. App'x 718, 719 (9th Cir. 2015) (unreported). Both of DEC's enforceable commitments meet these standards. For curtailment compliance and enforcement, DEC commits to increasing the staff hours for curtailment compliance and enforcement from 2,200 hours per winter to 2,800 hours per winter within 60 days of any finding that triggers the contingency measure. For wood device removal, DEC commits to increasing the staff hours for wood device removal compliance and enforcement from 150 hours per year to 300 hours per year within 60 days of any finding that triggers the contingency measure. These are mandatory, nondiscretionary, and measurable contingency measures that require action within DEC's control.

Second, DEC's commitments are enforceable in a practical sense. In *Better Arvin*, the court decided that California's commitments were enforceable because its emission reduction commitments were binding on the state through its EPA-approved SIP, and its procedures for adopting emission control measures and achieving emission reductions all included publicly available information for determining compliance. 786 F.3d at 1181; *see also Ass'n of Irrigated Residents v. EPA*, 10 F.4th 937, 947 (9th Cir. 2021). DEC's commitments meet these standards, as well. Both commitments will be binding on the state through this SIP, once approved by EPA. And both commitments, set out above, include aspects of making information public for the public and EPA to assess DEC's compliance with its commitments.

As such, DEC's contingency measure commitments meet the analysis in *Better Arvin* (9th Cir. 2015) for sufficiently enforceable control measure commitments.

7.11.2.4 Emission Reductions and Comparison to One Year's Worth Attainment Targets

Emission benefits from enhanced stringency and staffing-based increases in compliance from these two components under the contingency measure package for the 2024 Amendment were estimated for calendar year 2028 (one year after forecasted attainment in 2027).

As noted above, both control components work to suppress/remove wood device usage for space heating. Consistent with development of the 2024 Amendment Control inventories, this is expected to result in heating energy from suppressed or removed wood devices to be replaced by that from heating oil devices (the most common space heating devices in the Nonattainment Area). Thus, as was performed in the Control inventories, emissions impacts of the contingency measure package were calculated for both direct PM_{2.5} and SO₂ using the same methodologies as follows.

The CM package would be triggered by a finding under 40 C.F.R. § 51.1014(a)(1)–(4) with the most probable trigger being a finding of failure to attain the standard by the modeled December 31, 2027 attainment date. Assuming a finding of failure to attain, the 2027 Control inventory was the “starting point” inventory upon which the contingency measure emission reductions were calculated. The assessment based on the 2027 control inventory is representative of the emissions reductions achieved if the contingency measures are triggered before the modeled December 31, 2027 attainment date.

Basic Emission Reductions – For the Enhanced Curtailment Program, DEC evaluated a range of both alert stage stringency levels (down to 12 µg/m³) and compliance rates up to 90% (the rate estimated by the San Joaquin Valley for their curtailment program). The effects of the alert stage stringencies were modeled based on how many days within the 74-day modeling episode would trigger Stage 1 and Stage 2 alerts. DEC also considered the potential impacts of setting the alert levels so low that they would occur so frequently in the winter that they might adversely impact the compliance rate. As a result, DEC established alert levels of to 15 µg/m³ for Stage 1 and 20 µg/m³ for Stage 2. DEC will also mobilize additional staffing from within the DEC Air Quality Division during wintertime to provide expanded compliance monitoring and enforcement, which is expected to increase the compliance rate to 65%. Based on these alert stage stringency and compliance rate increases, the Enhanced Curtailment Program (applied as a contingency measure after 2027) is expected to yield an additional 0.090 tons/episode day reduction in PM_{2.5} and an increase in SO₂ emissions of 0.038 tons/episode day. (The SO₂ increase results from displaced wood heating energy shifting to heating oil.)

As noted earlier, “collateral” benefits of the Enhanced Curtailment Program are expected to produce an increase in compliance/penetration with DEC’s Wood Device Removal measure, increasing the compliance rate from 30% to 45% in 2027/2028. As a result of this increase in compliance, the Enhanced Wood Device Removal measure will result in additional reductions of 0.062 tons/episode day of PM_{2.5}, with a less than 0.0005 tons/episode day increase in SO₂.

Table 7.11-1 summarizes the PM_{2.5} and SO₂ emission reductions for DEC’s contingency measure package. (Emission increases are negative reductions shown in red.) Reductions are

shown for each component (Enhanced 2-Stage Curtailment Program and Enhanced Wood Device Removal), with the total reductions below. The last (green highlighted) row in Table 7.11-1 shows net emission reductions from the combined contingency measure package after accounting for overlapping effects between both components. These highlighted reductions were then compared to OYW attainment emission reduction targets as explained below. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

**Table 7.11-1
Basic Contingency Measure Emission Reductions**

Contingency Measure Component	Emission Reductions (tons/episode day)	
	PM _{2.5}	SO ₂
Enhanced 2-Stage Curtailment	0.089	-0.038
Enhanced Wood Device Removal	0.062	-0.000
Total Contingency Measure Package	0.151	-0.038
Total Package Discounted for Overlap	0.142	-0.038

OYW Attainment Targets – In accordance with EPA’s Draft 2023 Contingency Measure guidance, OYW attainment targets were calculated as the linear reductions in annual nonattainment area emissions of the modeling inventory between the 2020 Baseline year and the 2027 modeled attainment year, scaled by attainment year emissions as follows:

$$OYWA_p = \frac{(E_{Base,p} - E_{Attn,p})}{(CY_{Attn} - CY_{Base})} \times \frac{E_{Attn,p}}{E_{Base,p}}$$

Where $OYWA_p$ is One Year’s Worth of attainment reduction target for pollutant p (in tons/episode day), $E_{Base,p}$ and $E_{Attn,p}$ are the Baseline and Attainment year nonattainment area emissions, respectively (in tons/episode day), and CY_{Base} and CY_{Attn} are the Baseline and Attainment calendar years, respectively.

As presented in Section 7.6.9 and 7.6.11 of the 2024 Amendment, PM_{2.5} nonattainment area 2020 Baseline and 2027 Attainment year emissions are 2.947 tons/episode day and 1.744 tons/episode day, respectively. Substituting these values into the equation above yields an OYW attainment target for PM_{2.5} of 0.102 tons/episode day. The SO₂ OYW attainment target of 0.116 tons/episode day was similarly calculated.

Based on these calculated targets, DEC’s contingency measure package achieves OYW attainment for PM_{2.5}. However, since DEC’s contingency measure package results in small SO₂ emission increases, the basic approach does not yield OYW attainment progress for both pollutants of significance. Therefore, as discussed below, OYW attainment was evaluated across both pollutants using an inter-pollutant trading technique used by EPA.

Use of Inter-Pollutant Trading (IPT) – The EPA considers it reasonable to apply the inter-pollutant trading (IPT) concept to contingency measures, including substitutions of emissions reductions between direct PM_{2.5} and PM_{2.5} plan precursors.²⁷ Although not specifically included in EPA’s contingency measure guidance, EPA Region 9 included an evaluation of whether contingency measures for the San Joaquin Valley Federal Implementation Plan for Contingency Measures for the Fine Particulate Matter Standards could achieve OYW of RFP or OYW of progress if inter-pollutant trading of emission reductions for PM_{2.5} and precursors of significance were considered.²⁸ This approach utilized an ambient air quality-based weighting of emission reductions from both direct PM_{2.5} and precursors to combine reductions across all pollutants of significance for comparison to OYW attainment. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

For the Fairbanks 2024 Amendment Plan, a local speciated monitoring and model study²⁹ indicates that secondary sulfate (i.e., that converted to PM_{2.5} from SO₂) represents no more than 10% of total ambient PM_{2.5} across the Fairbanks nonattainment area during episodic wintertime conditions. To evaluate use of IPT for OYW attainment in Fairbanks, DEC conservatively assumed SO₂ contributes 20% to ambient PM_{2.5}, corresponding to a ratio of 5:1 of SO₂ emissions to total PM_{2.5}. Using this 5:1 ratio, the 0.038 tons/episode day increase in SO₂ emissions from the contingency measure package shown earlier in Table 7.11-1 was discounted by 20% and added to the non-overlapping 0.142 tons/episode day PM_{2.5} reduction yielding and inter-pollutant combined reduction of 0.141 tons/episode day as follows:

$$0.142_{\text{PM}_{2.5}} + 20\% \times (-0.038_{\text{SO}_2}) = 0.142 - 0.008 = 0.141 \text{ tons/episode day}$$

Similarly, the OYW attainment target with inter-pollutant trading using a 5:1 SO₂ to PM_{2.5} ratio was calculated as:

$$0.102 \text{ tons/day OYW}_{\text{PM}_{2.5}} + 20\% \times 0.116 \text{ tons/day OYW}_{\text{SO}_2} = 0.125 \text{ tons/day}$$

Thus, using a conservative 5:1 ratio for SO₂ to PM_{2.5} in Fairbanks during winter, DEC’s contingency measure package achieves OYW attainment including inter-pollutant trading.

DEC conducted an analysis of the control measures to determine the amount of emission reductions that are due to the discrete act of lowering the alert thresholds within the curtailment program. Using monitoring data from the 2019-2020 episode the number of days, within the 74 day episode, that fall under each alert level are shown in Table 7.11-2. As expected, lowering the alert levels results in more total Stage 1 and Stage 2 alert days.

Table 7.11-2 Comparison of Expedited Alert Days with Lower Alert Levles

²⁷ Federal Implementation Plan for Contingency Measures for the Fine Particulate Matter Standards; San Joaquin Valley, California, 88 Fed. Reg. 53431, 53439 (Aug. 8, 2023).

²⁸ *Id.* at n. 63 (noting that EPA previously approved IPT for CMs in the 2008 San Joaquin Valley plan, 79 Fed. Reg. 29327 (May 22, 2014), as well as for showing that aggregate commitments for emissions reductions have been met, for example in 85 Fed. Reg. 44192).

²⁹ A. Moon, et al., “Primary Sulfate Is the Dominant Source of Particulate Sulfate during Winter in Fairbanks, Alaska”, ACS EST Air 2024, 1, 139–149.

		Ep Days		Ep Days
< 15 µg/m3	Stage 0:	29	< 20 µg/m3	49
> 15 µg/m3	Stage 1:	7	> 20 µg/m3	17
> 20 µg/m3	Stage 2:	38	> 30 µg/m3	8

Relative reductions were estimated for all stages of the curtailment program with a constant 38% compliance rate. Table 7.11-3 shows a comparison of emissions reductions for the current alert levels compared to the lower levels for the contingency measure while holding compliance constant at 38%. The table on the right contains 2028 space heating emissions by source category for projected control reductions from all other measures being adopted/implemented with the revised SIP except for curtailment. The table on the left then shows what these emissions will be if the alert levels are reduced with the contingency measure. The emission reductions in the rightmost table of 7.11-3 are calculated based on the distribution of alert days in table 7.11-2, where Stage 0 is no alert, and the applicable relative reductions. Incremental reductions are summarized at the bottom right of Table 7.11-3 and compared to both the OYW target and the total CM package reductions on a percentage basis. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

Table 7.11-3 Emission Reductions from Lowering Alert Levels

Analysis of 2028 Emission Reductions Due to Just Dropping Stage Alerts from 20/30 to 15/20 ug/m3												
Source Category	SCC	Emissions (tpd)		Emissions (tpd)				Incremental Reductions (tpd)				
		2028 Pre-Curtailment		Alerts 15/20 ug/m3		Alerts 20/30 ug/m3		PM2.5	SO2	PM2.5		
FP	2104008100	0.242	0.006	0.195	0.006	0.232	0.006					
Ins-Conv	2104008210	0.008	0.000	0.006	0.000	0.007	0.000					
Ins-NonCat	2104008220	0.020	0.001	0.016	0.003	0.019	0.002					
Ins-Cat	2104008230	0.029	0.002	0.023	0.005	0.027	0.003					
WS-Conv	2104008310	0.026	0.002	0.020	0.004	0.022	0.003					
WS-NonCat	2104008320	0.110	0.011	0.087	0.028	0.101	0.018					
WS-Cat	2104008330	0.170	0.017	0.135	0.042	0.156	0.027					
PS-Exempt	2104008410	0.002	0.000	0.001	0.001	0.001	0.001					
PS-EPA Cert	2104008420	0.015	0.003	0.012	0.011	0.013	0.008					
OWBWtd	2104008610	0.016	0.002	0.012	0.003	0.014	0.002					
COil-Res/Prtbl/DV	2104004000	0.013	1.527	0.013	1.527	0.013	1.527					
COil-Com	2103004001	0.008	0.393	0.008	0.393	0.008	0.393					
NtGas-Res	2104006010	0.000	0.000	0.000	0.000	0.000	0.000					
NtGas-Com	2103006000	0.014	0.001	0.014	0.001	0.014	0.001					
CoalHt	2104002000	0.000	0.001	0.000	0.001	0.000	0.001					
Coal-Com	2103002000	0.000	0.000	0.000	0.000	0.000	0.000					
Wood-Com	2103008000	0.000	0.000	0.000	0.000	0.000	0.000					
WasteOil	2102012000	0.003	0.019	0.002	0.048	0.002	0.035	PM2.5	SO2	IPT		
Emission Totals (tpd):		0.676	1.986	Emission Totals (tpd):		0.544	2.073	0.630	2.027	0.086	-0.047	0.077
								IPT Target:			0.125	
								Relative Fraction of IPT Target:			62%	
								Total CM Package Reduction (w/IPT):			0.134	
								Relative Fraction of IPT Target:			58%	

The detailed contingency measure emission reduction calculations are contained in the “2024Amendment_ControlMeasureBenefits_DftFinal.xlsx” spreadsheet which is part of the electronic materials included with Appendix 7.06. The ReadMe tab in the spreadsheet explains where the contingency measure calculations are contained.”

7.11.3. Process for Identifying Contingency Measures

The FNSB and DEC 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 additional measures that 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 DEC whether additional controls are needed.

Ammonia (NH₃) Emission Reductions – As explained earlier in Sections III.D.7.6 and III.D.7.10, control measure emission reductions were quantified for directly-emitted PM_{2.5} and SO₂. They were not rigorously calculated for ammonia due to large uncertainty in NH₃ emission factors for key sources. With that caveat, an estimate of NH₃ emission reductions for the contingency measure package was also developed to quantify those reductions expected from the package. The estimated NH₃ reductions were based on differences in residential wood and heating oil emission factors and the shift from wood to oil use reflected under the Curtailment Program as explained below.

Table 7.11-4 lists 2028 Projected Baseline episodic energy use along with both direct PM_{2.5} and NH₃ emission factors in units of lb/mmBTU for relevant sources categories within the space heating sector. The 2028 episodic energy use estimates and emission factors are contained in the “DevSumOut-2028BSR” tab of the “2024Amendment_ControlMeasureBenefits_DftFnL.xlsx” spreadsheet appendix to Section III.D.7.6. (The emission factors were converted from lb/ton or lb/gallon units to lb/mmBTU based on wood and heating oil energy contents described in Appendix III.D.7.6.)

**Table 7.11-4
2028 Episodic Energy Use and Emission Factors for
Scaling Contingency Measure Package NH₃ Reductions**

Source Category	Episodic Energy Use (mmBTU/day)	Emission Factors (lb/mmBTU)	
		PM _{2.5}	NH ₃
Fireplace	841	2.150	0.112
Insert, Non-certified	32	1.902	0.106
Insert, Certified, Non-Catalytic	121	0.746	0.056
Insert, Certified, Catalytic	176	0.808	0.056
Woodstove, Non-certified	260	0.755	0.025
Woodstove, Certified, Non-Catalytic	990	0.493	0.016
Woodstove, Certified, Catalytic	1,438	0.547	0.016
Pellet Stove, Exempt	40	0.193	0.005
Pellet Stove, Certified	375	0.193	0.005
Hydronic Heater	200	0.613	0.015
All Wood, Weighted Composite	4,473	0.844	0.036
Residential Oil, Weighted Composite	31,132	0.00341	0.00018
Ratio of Oil to Wood Emission Factors		0.00404	0.00502

The first two boldface rows near the bottom of Table 7.11-4 present composite emission factors for all residential wood and residential oil use that are weighted by episodic energy use across each individual source category. (The individual source categories for residential oil: central oil, direct vent, and portable heaters are not listed in Table 7.11-4 since they have the same PM_{2.5} and NH₃ emission factors.) As shown in Table 7.11-4, composite PM_{2.5} emission factors are 0.844 lb/MMBTU and 0.00341 lb/mmBTU for wood and heating oil, respectively. Similarly, composite NH₃ emission factors are 0.036 lb/MMBTU for wood and 0.00018 lb/mmBTU for heating oil.

Below these composite emission factors, Table 7.11-4 provides the calculated ratios of Oil to Wood emission factors for each pollutant. For example, the PM_{2.5} Oil to Wood ratio was calculated as follows:

$$\text{Oil-To-Wood Ratio, PM}_{2.5} = 0.00341 \div 0.844 = 0.00404$$

As seen at the bottom of Table 7.11-4, the NH₃ ratio of 0.00502 is similar to that for PM_{2.5}.

These ratios were then used to calculate scaled NH₃ emission reductions from the contingency measure package that reflects enhancements to the Curtailment Program as explained earlier in this section. These calculations and resulting NH₃ emission reductions are presented below in Table 7.11-5.

Table 7.11-5
Contingency Measure Package NH₃ Reductions (tons/episode day)

Parameter	PM _{2.5}	NH ₃
2028 Projected Baseline Space Heating Emissions (tons/episode day)	1.972	0.124
Contingency Measure Package PM _{2.5} Reductions* (tons/episode day)	0.142	n/a
Scaled CM Package NH ₃ Reductions (tons/episode day)	n/a	0.007

* Reflects non-overlapping benefits

n/a – Not applicable

The top row of Table 7.11-5 lists 2028 projected baseline nonattainment area space heating emissions of PM_{2.5} and NH₃ also contained in the “DevSumOut-2028BSR” tab of the “2024Amendment_ControlMeasureBenefits_DftFnI.xlsx” spreadsheet appendix to Section III.D.7.6. Below that, the non-overlapping PM_{2.5} reductions calculated for the contingency measure package of 0.143 tons/episode day shown earlier in Table 7.11-1 were used in conjunction with the projected baseline emissions to estimate commensurate NH₃ emission reductions of 0.007 tons/episode day shown at the bottom of Table 7.11-5. These NH₃ reductions were scaled based on the differences in baseline emissions between PM_{2.5} and NH₃, the relative reduction in PM_{2.5}, and the Oil to Wood emission factor ratios computed earlier in Table 7.11-4 as follows.

$$\text{CM Package NH}_3 \text{ Reductions} = 0.124 \times \frac{0.143}{1.972} \times \frac{0.00404}{0.00502} = 0.007 \text{ tons/episode day}$$

Thus, it was estimated that the contingency measure package will also provide NH₃ emission reductions of 0.007 tons/episode day.