State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-098-19

UTAH AIR QUALITY BOARD MEETING

FINAL AGENDA

Wednesday, September 4, 2019 - 1:30 p.m.
195 North 1950 West, Room 1015
Salt Lake City, Utah 84116

I. Call-to-Order

II. Date of the Next Air Quality Board Meeting: October 2, 2019

III. Approval of the Minutes for August 7, 2019, Board Meeting.

IV. Propose for Final Adoption: R307-204. Emission Standards: Smoke Standards. Presented by Liam Thrailkill.

V. Propose for Final Adoption: SIP Sections X, Part A, Vehicle Inspection and Maintenance Program, General Requirements and Applicability and X, Part F, Vehicle Inspection and Maintenance Program, Cache County. Presented by Mat Carlile.

VI. Propose for Final Adoption: R307-110-31. Section X. Vehicle Inspection and Maintenance Program, Part A, General Requirements and Applicability; and R307-110-36. Section X, Vehicle Inspection and Maintenance Program, Part F, Cache County. Presented by Liam Thrailkill.

VII. Propose for Public Comment: SIP Subsection IX.A.36: PM2.5 Maintenance Provisions for Salt Lake City, UT. Presented by Becky Close.

VIII. Propose for Public Comment: SIP Subsection IX.A.27: PM2.5 Maintenance Provisions for Provo, UT. Presented by Becky Close.

IX. Propose for Public Comment: SIP Subsection IX.A.28: PM2.5 Maintenance Provisions for Logan, UT-ID. Presented by Becky Close.

X. Propose for Public Comment: R307-110-10. Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter. Presented by Liam Thrailkill.

XI. Propose for Public Comment: SIP Section IX, Part H.21(e) General Requirements: Control Measures for Area and Point Sources, Emission Limits and Operating Practices, Regional Haze Requirements. Presented by Jay Baker.

XII. Propose for Public Comment: R307-110-17. Section IX, Control Measures for Area and Point Sources, Part H, Emission Limits. Presented by Liam Thrailkill.

XIII. Propose 5-Year Reviews: R307-125. Clean Air Retrofit, Replacement, and Off-Road Technology; R307-501. Oil and Gas Industry: General Provisions; R307-502. Oil and Gas Industry: Pneumatic Controllers; R307-503. Oil and Gas Industry: Flares; and R307-504. Oil and Gas Industry: Tank Truck Loading. Presented by Liam Thrailkill.

XIV. Western Water Solutions, Inc. Settlement Agreement. Presented by Rik Ombach.

XV. Informational Items.
- A. Air Toxics. Presented by Bob Ford.
- B. Compliance. Presented by Harold Burge and Rik Ombach.
- C. Monitoring. Presented by Bo Call.
- D. Other Items to be Brought Before the Board.
- E. Board Meeting Follow-up Items.

In compliance with the Americans with Disabilities Act, individuals with special needs (including auxiliary communicative aids and services) should contact Larene Wyss, Office of Human Resources at (801) 536-4281, TDD (801) 536-4284 or by email at lwyss@utah.gov.

ITEM 4

State of Utah
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DAQ-080-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Joel Karmazyn, Environmental Scientist

DATE: September 4, 2019

SUBJECT: PROPOSE FOR FINAL ADOPTION: Amended R307-204. Emission Standards: Smoke Management.

On June 5, 2019, the Air Quality Board proposed for public comment amendments to R307-204 to include requirements established by the Legislature set forth in 2019 House Bill 155.

Other proposed amendments were put forward to reduce redundancies, eliminate outdated portions, and streamline the rule.

The public comment period was held from July 1 - 31, 2019. Staff received one comment that recommended minor wording adjustments. Staff agreed with the changes which are noted in the rule. Following approval of the rule, a separate filing for nonsubstantive changes will be made to correct the language.

No public hearing was requested.

Recommendation: Staff recommends that the Board adopt R307-204 as amended.

Appendix 1: Regulatory Impact Summary Table*

Fiscal Costs	**FY 2020**	**FY 2021**	**FY 2022**
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Person	$0	$0	$0
Total Fiscal Costs:	**$0**	**$0**	**$0**
Fiscal Benefits			
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Persons	$0	$0	$0
Total Fiscal Benefits:	**$0**	**$0**	**$0**
Net Fiscal Benefits:	**$0**	**$0**	**$0**

***This table only includes fiscal impacts that could be measured. If there are inestimable fiscal impacts, they will not be included in this table. Inestimable impacts for State Government, Local Government, Small Businesses and Other Persons are described in the narrative. Inestimable impacts for Non-Small Businesses are described in Appendix 2.**

Appendix 2: Regulatory Impact to Non-Small Businesses

This rule change is not expected to have any fiscal impacts on non-small businesses revenues or expenditures, because the amendments make minor wording adjustments to the rule.

The Executive Director of the Department of Environmental Quality, Alan Matheson, has reviewed and approved this fiscal analysis.

****"Non-small business" means a business employing 50 or more persons; "small business" means a business employing fewer than 50 persons.**

R307. Environmental Quality, Air Quality.
R307-204. Emission Standards: Smoke Management.
R307-204-1. Purpose and Goals.

(1) The purpose of R307-204 is to establish by rule procedures that mitigate the impacts on air quality and visibility from prescribed fire.

R307-204-2. Applicability.

(1) R307-204 applies to all persons using prescribed fire on land they own or manage.

(2) R307-204 does not apply to agricultural activities specified in 19-2-114 and to those regulated under R307-202, or to

activities otherwise permitted under R307.

R307-204-3. Definitions.

The following additional definitions apply only to R307-204.

"Annual Emissions Goal" means the annual establishment of a planned quantitative value of emissions reductions from prescribed fire.

"Best Management Practices" means smoke management and dispersion techniques used during a prescribed fire that affect the direction, duration, height or density of smoke.

"Burn Window" means the period of time during which the prescribed fire is scheduled for ignition.

"Emission Reduction Techniques (ERT)" mean techniques for controlling emissions from prescribed fires to minimize the amount of emission output per unit or acre burned.

"Federal Class I Area" means any Federal land that is federally classified or reclassified Class I.

"Land Manager" means any federal, state, local or private entity that owns, administers, directs, oversees or controls the use of public or private land, including the application of fire to the land.

"Non-burning Alternatives to Fire" means non-burning techniques that are used to achieve a particular land management objective, including but not limited to reduction of fuel loading, manipulation of fuels, enhancement of wildlife habitat, and ecosystem restructuring. These alternatives are designed to replace the use of fire for at least five years.

”Nonfull suppression event” means a naturally ignited wildland fire (wildfire) for which a land manager secures less than full suppression to accomplish a specific prestated resource management objective in a predefined geographic area.

"Particulate Matter" means the liquid or solid particles such as dust, smoke, mist, or smog found in air emissions.

"Pile" means natural materials or debris resulting from some type of fuels management practice that have been relocated either by hand or machinery into a concentrated area.

"Pile Burn" means burning of individual piles.

"Prescribed Fire or Prescribed Burn" means a wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan.

"Prescribed Fire Plan" means the plan required for each fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate agency administrator prior to implementation. Each plan follows specific agency direction and must include critical elements described in agency manuals.

"Prescription" means the measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicates other

required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

"Smoke Sensitive Receptors" means population centers such as towns and villages, campgrounds and trails, hospitals, nursing homes, schools, roads, airports, Class I areas, nonattainment and maintenance areas, areas whose air quality monitoring data indicate pollutant levels that are close to health standards, and any other areas where smoke and air pollutants can adversely affect public health, safety and welfare.

“Wildfire” means unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires.

"Wildland" means an area in which development is essentially non-existent, except for pipelines, power lines, roads, railroads, or other transportation or conveyance facilities. Structures, if any, are widely scattered.

"Wildland Fire" means any non-structure fire that occurs in the wildland.

R307-204-4. General Requirements.

(1) Management of On-Going Fires. The land manager shall notify the Division of all wildfires, including nonfull suppression events. If, after consultation with the land manager, the Director determines that a prescribed fire, wildfire, or any smoke transported from other locations, is degrading air quality to levels that could violate the National Ambient Air Quality Standards or burn plan conditions, the land manager shall promptly stop igniting additional prescribed fires.

(2) Non-burning Alternatives to Fire. Each land manager shall submit to the Director annually, by March 15, a list of areas treated using non-burning alternatives to fire during the previous calendar year, including the number of acres, the specific types of alternatives used, and the location of these areas.

(3) Annual Emissions Goal. The Director shall provide an opportunity for an annual meeting with land managers for the purpose of evaluation and adoption of the annual emission goal. The annual emission goal shall be developed in cooperation with states, federal land management agencies and private entities, to control prescribed fire emissions increases to the maximum feasible extent.

(4) Long-term Fire Projections. Each land manager shall provide to the Director by March 15 annually long-term projections of future prescribed fire activity for annual assessment of visibility impairment.

R307-204-5. Burn Schedule.

(1) Any land manager planning prescribed fire burning more than 50 acres per year shall submit [~~the~~]a burn schedule to the Director

on forms provided by the Division, and shall include the following information for all prescribed fires including those smaller than 20 acres:

(a) Project name and de minimis status;

(b) Latitude and longitude;

(c) Acres for the year, fuel type, and planned use of emission reduction techniques to support establishment of the annual emissions goal; and

(d) Expected burn dates and burn duration.

(2) Each land manager shall submit each year's burn schedule no later than March 15 of that year.

(3) Any land manager who makes changes to the burn schedule shall submit an amendment to the burn schedule within 10 days after the change.

R307-204-6. Small Prescribed Fires (de minimis).

(1) A prescribed fire that covers less than 20 acres per burn or less than 30,000 cubic feet of piled material shall only be ignited either when [~~(1)~~ the clearing index is 500 or greater [~~,~~] or [~~(2)~~] when the clearing index is between 400 and 499, if;

(a) The prescribed fire is recorded as a de minimis prescribed fire on the annual burn schedule;

(b) The land manager obtains approval from the Director by e-mail or phone prior to ignition of the burn; and

(c) The land manager submits to the Director hourly photographs, a record of any complaints, hourly meteorological conditions and an hourly description of the smoke plume.

R307-204-7. Large Prescribed Fires.

(1) For a prescribed fire that covers 20 acres or more per burn or 30,000 cubic feet of piled material or more, the land manager shall submit to the Director a prescribed fire plan at least one week before the beginning of the burn window. The plan shall include a prescription and description of other state, county, municipal, or federal resources available on scene, or for contingency purposes.

(2) The land manager shall submit pre-burn information to the Director at least two weeks before the beginning of the burn window. The pre-burn information shall be submitted to the Director on the appropriate form provided by the Division and shall include the following information:

(a) The project name, total acres, and latitude and longitude;

(b) Summary of ignition method, burn type, and burn objectives, such as restoration or maintenance of ecological functions or hazardous fuel reduction;

(c) Any sensitive receptor within 15 miles, including any Class I or nonattainment or maintenance area, and distance and direction in degrees from the project site;

(d) The smoke dispersion or visibility model used and results;
(e) The estimated amount of total particulate matter anticipated;
(f) A description of how the public and land managers in neighboring states will be notified;
(g) A map depicting both the daytime and nighttime smoke path and down-drainage flow for a minimum of 15 miles from the burn site with smoke-sensitive areas delineated;
(h) Safety and contingency plans for addressing any smoke intrusions;
(i) Planned use of emission reduction techniques to support establishment of an annual emissions goal, if not already submitted under R307-204-5; and
(j) Any other information needed by the Director for smoke management purposes, or for assessment of contribution to visibility impairment in any Class I area.
(3) Burn Request.
(a) The land manager shall submit to the Director a burn request on the form provided by the Division by 1000 hours at least two business days before the planned ignition time. The form must include the following information:
(i) The project name;
(ii) The date submitted and by whom;
(iii) The burn manager conducting the burn and phone numbers; and
(iv) The dates of the requested burn window.
(b) No large prescribed fire shall be ignited before the Director approves the burn request.
(c) If a prescribed fire is delayed, changed or not completed following burn approval, any significant changes in the burn plan shall be submitted to the Director before the burn request is submitted.
(4) Daily Emissions Report. By 0800 hours on the day following the prescribed fire, for each day of prescribed fire activity covering 20 acres or more, the land manager shall submit to the Director a daily emission report on the form provided by the Division including the following information:
(a) Project name;
(b) The date submitted and by whom;
(c) The start and end dates and times of the burn;
(d) Emission information, to include total affected acres, black acres, tons fuel consumed per acre, and tons particulate matter produced;
(e) Public interest regarding smoke;
(f) Daytime smoke behavior;
(g) Nighttime smoke behavior;
(h) Emission reduction techniques applied; and
(i) Evaluation of the techniques used by the land manager to

reduce emissions or manage the smoke from the prescribed burn.

(5) Emission Reduction and Dispersion Techniques. Each land manager shall take measures to prevent smoke impacts. Such measures may include best management practices such as dilution, emission reduction or avoidance in addition to others described in the pre-burn information form provided by the Division. An evaluation of the techniques shall be included in the daily emissions report required by (4) above.

(6) Monitoring. Land managers shall monitor the effects of the prescribed fire on smoke sensitive receptors and on visibility in Class I areas, as directed by the burn plan. Hourly visual monitoring and documentation of the direction of the smoke plume shall be recorded on the form provided by the Division or on the land manager's equivalent form. Complaints from the public shall be noted in the land managers project file. Records shall be available for inspection by the Director for six months following the end of the fire.

KEY: air quality, prescribed fire, smoke
Date of Enactment or Last Substantive Amendment: 2019
Notice of Continuation: February 5, 2015
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

ITEM 5

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DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-081-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Mat Carlile, Environmental Planning Consultant

DATE: August 16, 2019

SUBJECT: PROPOSE FOR FINAL ADOPTION: Amend SIP Section X, Part A, Vehicle Inspection and Maintenance Program, General Requirements and Applicability; and Part F, Vehicle Inspection and Maintenance Program, Cache County.

Utah Code Annotated 41-6a-1642 gives authority to each county to design and manage a vehicle inspection and maintenance (I/M) program when it is required to attain and maintain any national ambient air quality standard. Section X incorporates these county programs into the Utah State Implementation Plan (SIP). Section X, Part A summarizes I/M requirements that are common among all I/M programs. Subparts B through F contain the requirements for each county's unique I/M program. Section X, Part F is the section unique to Cache County's I/M program. On June 5, 2019, the Board proposed for public comment the amendments to SIP Section X, Parts A and F.

The amendments to Part A incorporate amendments to Utah Code 41-6a-1642. Additionally, language has been added to clarify that counties must consult with the DAQ before making any changes to their program. These amendments do not change the overall I/M programs. The amendments to Part F remove the tailpipe emission inspection two speed idle Test (TSI) currently required for vehicles manufactured before 1996.

During the public comment period, a backsliding demonstration was provided that demonstrated that the removal of TSI would not interfere with any Clean Air Act (CAA) requirement concerning attainment of an air quality standard. This analysis is required under Section 110(1) of the CAA when removing control measures from the SIP.

A public comment period was held from July 1 to July 31, 2019. No comments were received and no public hearing was requested.

Recommendation: Staff recommends the Board adopt the amended SIP Section X, Parts A and F as proposed.

UTAH STATE IMPLEMENTATION PLAN

SECTION X

VEHICLE INSPECTION AND MAINTENANCE PROGRAM

PART A

GENERAL REQUIREMENTS AND APPLICABILITY

Adopted by the Utah Air Quality Board

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GENERAL REQUIREMENTS AND APPLICABILITY

1. General Requirements

Federal I/M Program requirements: Utah was previously required by Section 182 and Section 187 of the Clean Air Act to implement and maintain an Inspection and Maintenance (I/M) program in Davis, Salt Lake, Utah, and Weber counties that met the minimum requirements of 40 code of federal regulation (CFR) Part 51 Subpart S and that was at least as effective as the EPA's Basic Performance Standard as specified in 40 CFR 51.352. The Basic Performance Standard requirement is no longer applicable as the relevant nonattainment areas in Davis, Salt Lake, Utah, and Weber counties have been redesignated to attainment / maintenance for the carbon monoxide (CO) National Ambient Air Quality Standards (NAAQS) and the 1-hour ozone NAAQS. Parts A, B, C, D, and E of Section X, together with the referenced appendices, continue to demonstrate compliance with the 40 CFR Part 51 provisions for Inspection and Maintenance Program Requirements for Davis, Salt Lake, Utah, and Weber counties and produce mobile source emission reductions that are sufficient to demonstrate continued maintenance of the applicable CO and 1-hour ozone NAAQS. In addition, the Cache, Davis, Salt Lake, Utah, and Weber counties' I/M programs are also utilized as a control measure to attain and maintain EPA's particulate NAAQS ($PM_{2.5}$ and PM_{10}).

On-Board Diagnostics (OBD) Checks: By January 1, 2002, OBD checks and OBD-related repairs are required as a routine component of Utah I/M programs on model year 1996 and newer light-duty vehicles and light-duty trucks equipped with certified on-board diagnostic systems. The federal performance standard requires repair of malfunctions or system deterioration identified by or affecting OBD systems.

Utah I/M program history and general authority: The legal authority for Utah's I/M programs, Utah Code Annotated Section 41-6-163.6[1], was enacted during the First Special Session of the Utah legislature in 1983. I/M programs were initially implemented by Davis and Salt Lake counties in 1984, by Utah County in 1986, and by Weber County in 1990.

In 1990, the legislature enacted Section 41-6-163.7[2] that requires that counties with I/M programs use computerized I/M testing equipment, adopt standardized emission standards, and provide for reciprocity. Those requirements were fully implemented by Davis, Salt Lake, and Utah counties on September 1, 1991, and by Weber County on January 1, 1992.

1 Renumbered and recodified in 2005 at Utah Code Annotated 41-6a-1642
2 Renumbered and recodified in 2005 at Utah Code Annotated 41-6a-1643

Section 41-6-163.6 was again amended by the legislature in 1992 to include vehicles owned and operated by the federal government, federal employees, and students and employees of colleges and universities. The 1992 revision of 41-6-163.6 also established more stringent restrictions for vehicles that qualify for a farm truck exemption.

Section 41-6-163.6 requires that, if identified as necessary to attain or maintain any NAAQS, a county must create an I/M program that follows the criteria outlined in 41-6-163.6. Once a county enacts regulations or ordinances, amendments to Section 19-2-104 in 1992 authorized the Utah Air Quality Board to formally establish those requirements for county I/M programs after obtaining agreement from the affected counties. Section 41-6-163.6 was also amended to allow the counties to subject individual motor vehicles to inspection and maintenance at times other than the annual inspection.

Section 41-6-163.6 was amended in 1994 to authorize implementation of I/M programs stricter than minimum federal requirements in counties where it is necessary to attain or maintain ambient air quality standards. Section 41-6-163.6 requires preference be given to a decentralized program to the extent that a decentralized program will attain and maintain ambient air quality standards and meet federal requirements. It also requires affected counties and the Air Quality Board to give preference to the most cost effective means to achieve and maintain the maximum benefit with regard to air quality standards and to meet federal air quality requirements related to motor vehicles. The legislature indicated preference for a reasonable phase-out period for replacement of air pollution test equipment made obsolete by an I/M program in accordance with applicable federal requirements and if such a phase-out does not otherwise interfere with attainment of ambient air quality standards.

House Concurrent Resolution No. 9 of the 1994 General Session of the legislature (H.C.R. 9) was a concurrent resolution of the legislature and the governor expressing opposition to the EPA position regarding the implementation of enhanced vehicle inspection and urging the EPA to recognize the benefits of other vehicle inspection program options and to work with the state to develop workable plans for attaining ambient air quality standards and protecting public health.

In 1995, the legislature amended Section 41-6-163.7 to rescind the requirement for I/M program standardization and reciprocity between counties. While advantageous, standardization and reciprocity between I/M counties is no longer required, and each I/M county is free to develop an I/M program that best meets the respective county's needs.

In 2002, the Legislature amended Section 41-6-163.7 to allow for inspection every other year for cars that are six years old or newer on January 1 each year. This provision is applicable to the extent allowed under the current state implementation plan for each area.

In 2005, the Legislature renumbered Section 41-6-163.6 and re-codified it as Section 41-6a-1642. The Legislature also amended Section 41-6a-1642 to allow counties with an

I/M program to require college students and employees who park a motor vehicle on college or university campus that is not registered in a county subject to emission inspection to provide proof of compliance with an emission inspection.

Section 41 6a-1642 was amended in 2008 to provide an exemption for vintage vehicles, which are defined in Section 41-21-1. Section 41 6a-1642 was again amended in 2009 to provide an exemption for custom vehicles, which are defined in Section 41-6a-1507.

In 2010, the legislature enacted Section 41-1a-1223 that allows counties with an I/M program to impose a local emissions compliance fee of up to three dollars. This same bill amended Section 41-6a-1642 to require I/M counties that impose the fee to use revenues generated from the fee to establish and enforce an emission inspection and maintenance program.

Section 41-6a-1642 was amended in 2011 to require I/M counties' regulations and ordinances to be compliant with the analyzer design and certification requirements contained in the SIP.

In 2012, the Legislature amended Section 41-6a-1642 to allow a motor vehicle that is less than two years old as of January 1 of any given year to be exempt from being required to obtain an emission inspection. This provision is applicable to the extent allowed under the current SIP for each area. This bill went into effect on October 1, 2012. In addition, the legislature also amended Section 41-1a-205 to allow a safety and emissions inspection issued for a motor vehicle during the previous 11 months may be used to satisfy the safety and emissions inspection requirements[3]. The effective date of this bill is January 1, 2013. The legislature also amended Section 41-1a-1223 to allow the counties to collect a $2.25 fee for those vehicles that are registered for a six-month period under Utah Code Annotated 41-1a-215.5. The effective date of this bill is July 1, 2013.

Section 41-6a-1642 was amended in 2013 to include the date that notice is required and the date the enactment, change, or repeal will take effect if a county legislative body enacts, changes, or repeals the local emissions compliance fee. Section 41-6a-1642 provides that for a county required to implement a new vehicle emissions inspection and maintenance program, but for which no current federally approved state implementation plan exists, a vehicle shall be tested at a frequency determined by the county legislative body, in consultation with the Air Quality Board, that is necessary to comply with federal law or attain or maintain any national ambient air quality standard and establishes procedures and notice requirements for a county legislative body to establish or change the frequency of a vehicle emissions inspection and maintenance program.

In 2017, the Legislature amended Section 41-6a-1642 to allow a county that imposes a local emissions compliance fee to use revenue generated from the fee to promote programs to maintain a national ambient air quality standard. At that time the legislature

3 Utah Code 41-6a-1642(7) states that "the emissions inspection shall be required within the same time limit applicable to a safety inspection under Section 41-1a-205."

also amended 41-6a-1642 to state that vehicles may not be denied registration based solely on the presence of a defeat device covered in the Volkswagen partial consent decrees or a United States Environmental Protection Agency-approved vehicle modification.

Notification of Programmatic Changes: The legislative body of a county identified in Utah Code 41-6a-1642 (1) shall consult with the Director of the Utah Division of Air Quality prior to their public comment process for any amendments to their I/M regulations or ordinances. Consultation should include a written notice describing the proposed changes to the I/M program.

2. Applicability

General Applicability: Utah Code Annotated 41-6a-1642 gives authority to each county to implement and manage an I/M program to attain and maintain any national ambient air quality standard (NAAQS). Davis, Salt Lake, Utah, and Weber counties were required under Section 182 and 187 of the Clean Air Act to implement an I/M program to attain and maintain the ozone and carbon monoxide NAAQS. All of Utah's ozone and carbon monoxide maintenance areas are located in Davis, Salt Lake, Utah, and Weber counties. In addition, a motor vehicle I/M program is a control measure for attaining the particulate matter NAAQS in Cache, Davis, Salt Lake, Utah, and Weber counties. Utah's SIP for I/M is applicable county-wide in Cache, Davis, Salt Lake, Utah, and Weber counties.

3. General Summary

Below is a general summary of Utah's I/M programs. Part B, C, D, E and F of this section of the SIP provide a more specific summary of I/M programs for Cache, Davis, Salt Lake, Utah, and Weber counties. These parts also incorporate the individual county I/M ordinances/regulations and policies that provide for the enforceability of the respective I/M programs.

Network Type: All Utah I/M programs are comprised of a decentralized, test-and-repair network.

I/M program funding requirements: Counties with I/M programs allocate funding as needed to comply with the relevant requirements specified in Utah's SIP; the Utah statutes; county ordinances, regulations and policies; and the federal I/M program regulation. Program budgets include funding for resources necessary to adequately manage the programs conduct covert and overt audits, including repairs; assist and educate inspectors, station owners, and the public; manage, analyze, and report data; ensure compliance with the program by inspectors, stations, and vehicle owners; and evaluate and upgrade the programs.

Funding mechanisms: Utah's I/M programs are funded through several mechanisms including, but not limited to, a fee which is collected at the time of registration by the Utah Tax Commission Division of Motor Vehicles or the county Assessor's Office. Those monies are remitted to the county in which the vehicle is registered. The collection of fees for various permitting activities and the selling inspection certificates to inspection stations are the other mechanisms. A fee schedule can be found in an appendix to each county I/M ordinance or regulation.

Government fleet: Section 41-6a-1642(1)(b) of the Utah Code requires that all vehicles owned or operated in the I/M counties by federal, state, or local government entities comply with the I/M programs.

Vehicles owned by students and federal employees: Section 41-6a-1642(5) provides a provision that counties may require universities and colleges located in Utah's I/M areas to require proof of compliance with the I/M program for vehicles which are permitted to park on campus regardless of where the vehicle is registered. Vehicles operated by federal employees and operated on a federal installation located within an I/M program area are also subject to the I/M program regardless of where they are registered. Proof of compliance consists of a current vehicle registration in an I/M program area, an I/M certificate of compliance or waiver, or evidence of exempt vehicle status.

Rental vehicles: All vehicles available for rent or use in an I/M county are subject to the county I/M program. To the extent practicable, all vehicles principally operated in the county are subject to the I/M program.

Farm truck exemption: Eligibility for the farm truck exemption from the I/M programs is specified in Section 41-6a-1642(4) and must be verified in writing by county I/M program staff.

Out-of-state exemption: Vehicles registered in an I/M county but operated out-of-state are eligible for an exemption. The owner must complete Utah State Tax Commission form TC-810 in order to be registered without inspection documentation. The owner must explain why the vehicle is unavailable for inspection in Utah. Common situations include Utah citizens that are military personnel stationed outside of the state, students attending institutions of higher education elsewhere, and people serving religious assignments outside the area. If the temporary address of the owner is located within another I/M program area listed on the back of the form, the owner must submit proof of compliance with that I/M program at the time of, and as a condition precedent to, registration or renewal of registration. The vehicle owner must identify their anticipated date of return to the state and is required to have the vehicle inspected within ten days after the vehicle is back in Utah.

Motorist Compliance Enforcement Mechanism: The I/M programs are registration-enforced on a county-wide basis. A certificate of emissions inspection or a waiver or other evidence that the vehicle is exempt from the I/M program requirements must be

presented at the time of, and as a condition precedent to, registration or renewal of registration of a motor vehicles as specified in Section 41-6a-1642(1)(a). Owners of vehicles operated without valid license plates or with expired license plates are subject to ticketing by peace officers at any time. Proof of compliance consists of a current vehicle registration in an I/M program area or an I/M certificate of compliance or waiver, or evidence of exempt vehicle status.

Valid registration required: A certificate of emissions inspection or a waiver or other evidence that the vehicle is exempt from the I/M program requirements must be presented at the time of, and as a condition precedent to, registration or renewal of registration of a motor vehicles as specified in Section 41-6a-1642 and 41-1a-203(1)(c). The I/M inspection is required within two months prior to the month the registration renewal is due as specified in Section 41-6a-1642(7) and 41-1a-205(2)(a). Owners of vehicles operated without valid license plates or with expired license plates are subject to ticketing by peace officers at any time. Registration status is also checked on a random basis at roadblocks and in parking lots at various locations around the state. Per Section 41-1a-402, Utah license plates indicate the expiration date of the registration. Per Section 41-1a-1303, it is a Class C misdemeanor for a person to drive or move, or for an owner knowingly to permit to be driven or moved, upon any highway any vehicle of a type that is required to be registered in the state that is not registered in the state. Section 41-1a-1315 specifies that it is a third degree felony to falsify evidence of title and registration.

Change of ownership: Vehicle owners are not able to avoid the I/M inspection program by changing ownership of the vehicle. Upon change of vehicle ownership the vehicle must be re-registered by the new owner. The new owner must present an emissions certificate, waiver, or proof of exemption from the I/M program as a condition precedent to registration[4]. The new annual registration and I/M inspection dates for the vehicle will be the date of registration.

Utah Tax Commission, and County Assessors roles: The Utah Tax Commission Motor Vehicle Division and county assessor deny applications for vehicle registration or renewal of registration without submittal of a valid certificate of compliance, waiver, or verified evidence of exemption. Altered or hand-written documents are not accepted. All certificate data is collected by county I/M program auditors and subjected to scrutiny for evidence of any improprieties.

Database quality assurance: The vehicle registration database is maintained and quality assured by the Utah Division of Motor Vehicle (DMV). Each county I/M inspection database is maintained and quality assured by the county I/M program staff. The county I/M program has access to the DMV database and utilizes it for quality assurance purposes. All databases are subject to regular auditing, cross-referencing, and analysis. The databases are also evaluated using data obtained during roadblocks and parking lot

4 See Utah Code Section 41-6a-1642 (7) and 41-1a-205(2)(b) and (c)

surveys. Evidence of program effectiveness may trigger additional joint enforcement activities.

Oversight provisions: The oversight program includes verification of exempt vehicle status through inspection, data accuracy through automatic and redundant data entry for most data elements, an audit trail for program documentation to ensure control and tracking of enforcement documents, identification and verification of exemption-triggering changes in registration data, and regular audits of I/M inspection records, I/M program databases, and the DMV database.

Enforcement staff quality assurance: County I/M program auditors and DMV clerks involved in vehicle registration are subject to regular performance audits by their supervisors. All enforcement personnel (direct and indirect) involved in the motorist enforcement program are subject to disciplinary action, additional training, and termination for deviation from procedures. Specific provisions are outlined in the DMV procedures manual which is available upon request. The county I/M audit policy documents are provided in their respective part of this section.

Quality Control: The I/M counties maintain records regarding inspections, equipment maintenance, and the required quality assurance activities. The I/M counties analyze I/M program data and submit annual reports to the U.S. Environmental Protection Agency and UDAQ upon request.

Analyzer data collection: Each county's I/M analyzer data collection system meets the requirements specified under 40 CFR 51.365.

Data analysis and reporting- Annual: The I/M counties analyze and submit to EPA and UDAQ an annual report for January through December of the previous year, which includes all the data elements listed in 40 CFR Subpart S 51.366 by July of each year. If a report is required earlier than annually, the counties will accommodate the request.

General enforcement provisions: The county I/M programs are responsible for enforcement action against incompetent or dishonest stations and inspectors. Each county I/M ordinance or regulation includes a penalty schedule.

General public information: The I/M counties have comprehensive public education and protection programs, including providing strategies to educate the public on Utah's air quality problems; ways that people can reduce emissions; the requirements of state and federal law; the role of motor vehicles in the air quality problem; the need for and benefits of a vehicle emissions inspection program; ways to operate and maintain a vehicle in a low-emission condition; how to find a qualified repair technician; and the requirements of the I/M program. Information is provided via county websites and direct response to inquiries for information, reports, classes, pamphlets, fairs, school presentations, workshops, news releases, posters, signs, and public meetings. Utah

Department of Environmental Quality also provides information on its website about ways to operate and maintain a vehicle in a low-emission condition.

County I/M technical centers: Each I/M county operates an I/M technical center staffed with trained auditors and capable of performing emissions tests. A major function of the I/M technical centers is to serve as a referee station to resolve conflicts between permitted I/M inspectors, stations, and motorists. Auditors actively protect consumers against fraud and abuse by inspectors, mechanics, and others involved in the I/M program. Complaints are received and investigated fully. Auditors advise motorists regarding emissions warranty provisions and assist the owners in obtaining warranty covered repairs for eligible vehicles. The I/M technical centers also provide motorists with information regarding the I/M program, general air pollution issues, and emissions-related vehicle repairs.

Vehicle inspection report: A vehicle inspection report (VIR) will be issued to the motorist after each vehicle inspection. The VIR includes a public awareness statement about vehicle emissions and lists additional ways that the public can reduce air pollution. The test results are detailed on the VIR. Information about vehicle emissions warranties and the benefits of emissions-related repairs are printed for vehicles that failed the test. If the vehicle fails a retest, information about wavier requirements, application procedures and the address and telephone number of the applicable I/M technical center are printed on the VIR.

Reciprocity between County I/M programs: Utah I/M programs are conducting the same test procedures and thereby agreed to recognize the validity of a certificate granted by any Utah I/M program.

UTAH STATE IMPLEMENTATION PLAN

SECTION X

VEHICLE INSPECTION AND MAINTENANCE PROGRAM

Part F

Cache County

Adopted by the Utah Air Quality Board
[month day], 2019

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SECTION X Part F
Cache County Emission Inspection/ Maintenance Program
APPENDICES

1. Cache County Emission Inspection/ Maintenance Program Ordinance 2018-15
2. Bear River Health Department Regulation 2013-1

UTAH STATE IMPLEMENTATION PLAN
SECTION X, PART F
VEHICLE INSPECTION AND MAINTENANCE (I/M) PROGRAM

1. Applicability

Cache County I/M program requirements: Cache County was designated nonattainment for the $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS) on December 14, 2009 (74 FR 58688, November 13, 2009). Accordingly, Cache County implemented control strategies to attain the $PM_{2.5}$ NAAQS. A motor vehicle emission inspection and maintenance (I/M) program was identified by the $PM_{2.5}$ State Implementation Plan (SIP) as a necessary control strategy to attain the $PM_{2.5}$ NAAQS as expeditiously as practicable. Therefore, pursuant to Utah Code Annotated 41-6a-1642, Cache County implemented an I/M program that complies with the minimum requirements of 40 CFR Part 51 Subpart S. Cache County implemented its I/M program county-wide. This program was approved by EPA on October 9, 2015 (80 FR 54237 September 9, 2019). Parts A and F of Section X demonstrate compliance with 40 CFR Part 51 Subpart S for Cache County.

2. Description of Cache I/M Programs

Below is a summary of Cache County's I/M program. Section X, Part F Appendices 1 and 2 contain the essential documents for Cache County's I/M program.

Network Type: Cache County's I/M program will comprise of a decentralized test-and-repair network.

Test Convenience: Cache County will make every effort to ensure that its citizens will have stations conveniently located throughout Cache County. Specific operating hours are not specified by the county; however, its Regulation requires that stations be open and available to perform inspections during a major portion of normal business hours of 8:00 a.m. to 5:00 pm Mondays through Fridays.

Subject fleet: All model year 1996 and newer vehicles registered or principally-operated in Cache County are subject to the I/M program except for exempt vehicles.

Station/inspector Audits: Cache County's I/M program will regularly audit all permitted I/M inspectors and stations to ensure compliance with county I/M ordinances, regulations, and policies. Particular attention will be given to identifying and correcting any fraud or incompetence with respect to vehicle emissions inspections. Compliance with recordkeeping, document security, analyzer maintenance, and program security requirements will be scrutinized. The Cache County I/M program will have an active covert compliance program to minimize potential fraudulent testing.

Waivers: Cache County's I/M program allows for the issuance of waivers under limited circumstances. The procedure for issuing waivers is specified in Cache County's I/M regulation provided in Section 9 of Appendix 2 of this part of the SIP and meets the minimum waiver issuance criteria specified in 40 CFR Subparts 51.360.

Test frequency: Vehicles less than six years old as of January 1 on any given year will be exempt from an emissions inspection. All model year 1996 and newer vehicles are subject to a biennial test.

Test Equipment: Specifications for the I/M test procedures, standards and analyzers are described in Cache County's I/M regulation provided in Appendix 2. Specifications for the test procedure and equipment were developed according to good engineering practices to ensure test accuracy. Certified testing equipment and emissions test procedures meet the minimum standards established in Appendix A of the EPA's I/M Guidance Program Requirements, 40 CFR Part 51 Subpart S.

Test Procedures:

- The following vehicles are subject to an on-board diagnostic (OBD) II inspection:
    - 1996 and newer light duty vehicles[1] and
    - 2008 and newer medium duty vehicles[2]

Test procedures are outlined in Appendix 2 of this part of the SIP

3. I/M SIP Implementation

The I/M program ordinance, regulations, policies, procedures, and activities specified in this I/M SIP revision shall be implemented by January 1, 2021 and shall continue until a maintenance plan without an I/M program is approved by EPA in accordance with Section 175 of the Clean Air Act.

1 Light duty vehicles have a Gross Vehicle Weight of 8500 lbs or less.
2 Medium duty vehicles have a Gross Vehicle Weight greater than 850[~~0~~]1 lbs but less than 14,000 lbs

Regulation No. 2013-1

VEHICLE EMISSIONS INSPECTION AND MAINTENANCE PROGRAM

Adopted by the Bear River Board of Health
May 9, 2013

Updated May 27, 2015

Updated April 10, 2019

Under Authority of Section 26A-1-121
Utah Code Annotated, 1953, as amended

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1.0 DEFINITIONS

For the purpose of this Regulation, the following terms, phrases, and words shall have the following meanings, unless otherwise defined:

Alternative Fuel: A fuel that is derived from resources other than petroleum. This includes but is not limited to: natural gas, propane, ethanol, and bio-diesel.

Bi-fuel Vehicle: A vehicle that has two separate fueling systems that enables the vehicle to run on one or the other (ex. Gasoline and natural gas). These vehicles may be switchable or non-switchable.

Board: See Board of Health.

Board of Health: The Bear River Board of Health.

Cache County Council: The elected Cache County Council representatives.

Certificate of Compliance: Proof that a vehicle meets all applicable requirements of the I/M Program. This proof may be sent in an electronic format to the Utah State Tax Commission.

Certification: Assurance by an authorized source, whether it be a laboratory, the manufacturer, the State, or the Department, that a specific product or statement is in fact true and meets all required requirements.

Certified Emissions Inspector: A person who has successfully completed all certification requirements and has been issued a current, valid Certified Emissions Inspector Certification by the Department.

Certified Testing Equipment: An official test instrument that has been approved by the Department to test motor vehicles for compliance with this Regulation.

Compliance: Verification that certain submission data and hardware submitted by a manufacturer for accreditation consideration, meets all required accreditation requirements.

Compliance Assurance Inspection: A more detailed emissions inspection performed at the I/M Technical Center. Details of this inspection are found in Appendix D, Test Procedures.

Compliance Assurance List: A list created and maintained by the Department that identifies vehicles for Compliance Assurance Inspections. Vehicles placed on this list, as required in Section 6.8 and Appendix D, Test Procedures, shall be inspected at the I/M Technical Center.

Contractor: The emission inspection system contractor selected by the Department to provide specialized services related to the I/M Program in Cache County.

Council: See Cache County Council.

County: Cache County, Utah.

Department: The Bear River Health Department.

Director: The Director of the Bear River Health Department or his authorized representative.

DLC: Data Link Connector used in OBD applications is a 16 pin connector used by scan tools and other emission diagnostic equipment to communicate with the vehicle's computer for the purpose of collecting emissions related data.

DTC: Diagnostic Trouble Code is a standardized 5 digit code that is used to identify a specific fault that has occurred or is occurring in a vehicle.

Dual Fuel Vehicle: See Flexible Fuel Vehicle.

Emissions Control Systems: Parts, assemblies or systems originally installed by the manufacturer in or on a vehicle for the sole or primary purpose of reducing emissions.

EPA: The United States Environmental Protection Agency.

Flexible Fuel Vehicle: Also called Flex-Fuel Vehicle. A vehicle that is designed to run on more than one fuel, usually gasoline blended with ethanol (0-85%), and both fuels are stored in the same common tank.

I/M Program: See Vehicle Emissions Inspection and Maintenance Program.

I/M Program Station: A stationary Vehicle Emissions Inspection and Maintenance Station that qualifies and has a valid permit, issued by the Department, to operate as an emissions inspection and maintenance station in the I/M Program.

I/M Technical Center: A facility operated by the Department for technical or administrative support of the I/M Program.

Inspection: An official vehicle emissions test performed for the purpose of issuing a Certificate of Compliance or Waiver.

Inspector: A Certified Emissions Inspector.

MIL: Malfunction Indicator Light is an indicator located on the instrument panel that notifies the operator of an emissions fault.

Motor Vehicle: A self-propelled motorized vehicle with an internal combustion powered engine which is licensed for operation on public roads and/or streets. Motor Vehicles exempted from the inspection requirements of this Regulation are listed in Section 6.4 of this Regulation.

Non-certified Inspector: Any person who has not been certified by the Department to perform official emissions tests.

OBD: On Board Diagnostic refers to a vehicle's monitoring and diagnostic capabilities of its emissions systems.

Publicly-owned Vehicles: A motor vehicle owned by a government entity, including but not limited to the federal government or any agency thereof, the State of Utah or any agency or political subdivision thereof.

Readiness: Readiness is used to identify the state of a vehicle's emissions monitors as they are tested. Readiness does not indicate whether the monitors passed or failed the test, it only indicates whether or not the test has been run for any particular monitor.

Referee Inspection: An emissions inspection performed at the I/M Technical Center for the purpose of resolving disputes or overriding inspection criteria for cause.

Regulation: A regulation of the Bear River Health Department for a vehicle emissions inspection and maintenance program.

Rejection: A condition where a vehicle subject to an OBD inspection has not met the Readiness requirements as set forth by this Regulation. The vehicle has not failed the inspection but it must be driven additional miles until Readiness monitors are set "ready" or repairs have been made allowing readiness flags to set ready.

Station: An I/M Program Station.

Training Program: A formal program administered, conducted, or approved by the Department for the education of emission inspectors in basic emission control technology, inspection procedures, I/M Program policies, procedures, and this Regulation.

Vehicle Emission Control Information Label (VECI Label): An EPA required label found on a vehicle that contains the manufacturer's name and trademark, and an unconditional statement of compliance with EPA emission regulations. The label often contains a list of emissions control devices found on the vehicle.

Vehicle Emissions Inspection and Maintenance Program: The program established by the Department pursuant to Section 41-6a-1642 Utah Code Annotated, 1953, as amended, and Cache County Code Chapter 10.20.

Waiver: Documentation of proof that a vehicle which has not been able to meet applicable test requirements, has met the applicable repair and/or adjustment requirements of Section 9.5 of this Regulation.

2.0 PURPOSE

It is the purpose of this Regulation to reduce air pollution levels in Cache County by requiring inspections of in-use motor vehicles and by requiring emission related repairs and/or adjustments for those vehicles that fail to meet the prescribed standards so as to:

2.1 Protect and promote the public health, safety, and welfare;

2.2 Improve air quality;

2.3 Comply with the applicable federal requirements for I/M Programs as defined in 40 CFR Part 51, Subpart S;

2.4 Comply with the law enacted by the Legislature of the State of Utah, Sections 41-6a-1642 Utah Code Annotated, 1953, as amended; and

2.5 Comply with Cache County Code Chapter 10.20, Vehicle Emissions and Maintenance Program, as amended.

3.0 AUTHORITY AND JURISDICTION OF THE DEPARTMENT

3.1 Under Chapter 10.20.020(C) of Cache County Code, the Cache County Council (hereafter, Council) delegates its authority as an administrative body under Section 41-6a-1642, Utah Code Annotated, 1953, as amended, to the Bear River Board of Health (hereafter Board), to address all issues pertaining to the adoption and administration of the Vehicle Emissions Inspection and Maintenance Program (hereafter I/M Program).

3.2 Under Chapter 10.20.020(D) of Cache County Code, the Council directs the Board to adopt and promulgate regulations to ensure compliance with State Implementation Plan requirements with respect to an I/M Program.

3.3 The Board is authorized to make standards and regulations pursuant to Section 26A-1-121(1) of the Utah Code Annotated, 1953, as amended.

3.4 The Board is authorized to establish and collect fees pursuant to Section 26A-1-114(1)(h)(i) of the Utah Code Annotated, 1953, as amended.

3.5 All aspects of the I/M Program within Cache County enumerated in Section 2.0 of this Regulation shall be subject to the direction and control of the Bear River Health Department (hereafter Department).

4.0 POWERS AND DUTIES

4.1 The Department shall be responsible for the enforcement and administration of this Regulation and any other powers vested in it by law and shall:

4.1.1 Make policies and procedures necessary to ensure that the provisions of this Regulation are met and that the purposes of this Regulation are accomplished;

4.1.2 Require the submission of information, reports, plans, and specifications from I/M Program Stations as necessary to implement the provisions, requirements, and standards of this Regulation;

4.1.3 Issue permits, certifications, and charge fees as necessary to implement the provisions, requirements, and standards of this Regulation; and

4.1.4 Perform audits of any I/M Program Station, issue orders and/or notices, hold hearings, and levy administrative penalties, as necessary to effect the purposes of this Regulation.

4.2 The Department may suspend, revoke, or deny a permit, subject to the Penalty Schedule in Appendix C, of an I/M Program Station and/or require the surrender of the permit of such I/M Program Station upon showing that:

4.2.1 A vehicle was inspected and issued a Certificate of Compliance by the station personnel that did not, at the time of inspection, comply with all applicable policies, procedures, and this Regulation;

4.2.2 A vehicle was inspected and failed by the I/M Program Station when, in fact, the vehicle was determined by the Department to be in such condition that it did comply with the requirements of this Regulation;

4.2.3 The I/M Program Station has violated any provisions of this Regulation, or any rule, regulation, or Department policy properly promulgated for the operation of an I/M Program Station;

4.2.4 The I/M Program Station is not operating from a location specified on the permit;

4.2.5 An official inspection was done by a Non-certified Inspector or a Non-certified Inspector has gained access to the official testing portion of the Certified Testing Equipment;

4.2.6 The Certified Emissions Inspector logged in to the official testing portion of the Certified Testing Equipment did not perform the inspection;

4.2.7 The Certified Testing Equipment has been tampered with or altered in any way contrary to the certification and maintenance requirements of the Certified Testing Equipment;

4.2.8 The I/M Program Station denies access to a representative of the Department to conduct an audit or other necessary business during regular business hours;

4.2.9 The I/M fee has been determined by the Department to be discriminatory in that different fees are assessed dependent upon vehicle ownership, vehicle make or model, owner residence, etc; or

4.2.10 The I/M Program Station that also contracts with the State of Utah as an On the Spot Station renewed a vehicle registration without a valid Certificate of Compliance for that vehicle. This is considered an intentional pass.

4.3 The Department may suspend, revoke, or deny the certificate of a Certified Emissions Inspector, subject to the Penalty Schedule in Appendix C, and require the surrender of this certificate upon showing that:

4.3.1 The Certified Emissions Inspector caused a Certificate of Compliance to be issued without an approved inspection being made;

4.3.2 The Certified Emissions Inspector denied the issuance of a Certificate of Compliance to a vehicle that, at the time of inspection, complied with the law for issuance of said certificate;

4.3.3 The Certified Emissions Inspector issued a Certificate of Compliance to a vehicle that, at the time of issuance, was in such a condition that it did not comply with this Regulation;

4.3.4 Inspections were performed by the Certified Emissions Inspector, but not in accordance with applicable policies, procedures, and this Regulation;

4.3.5 The Certified Emissions Inspector allowed a Non-certified Inspector to perform an official Inspection or gain access to the official testing portion of the Certified Testing Equipment;

4.3.6 The Certified Emissions Inspector logged in to the official testing portion of the Certified Testing Equipment did not perform the inspection;

4.3.7 The Certified Emissions Inspector signed an inspection form or certificate stating that he had performed the emissions test when, in fact, he did not; or

4.3.8 The Certified Emissions Inspector employed at an I/M Program Station that also contracts with the State of Utah as an On the Spot Station renewed a vehicle registration without a valid Certificate of Compliance for that vehicle. This is considered an intentional pass.

4.4 The Department shall respond, according to the policies and procedures of the Department, to public complaints regarding the fairness and integrity of the inspections they receive and shall provide a method that inspection results may be challenged if there is a reason to believe them to be inaccurate.

5.0 SCOPE

It shall be unlawful for any person to fail to comply with any policy, procedure, or regulation promulgated by the Department, unless expressly waived by this Regulation.

6.0 GENERAL PROVISIONS

Subject to the exceptions in Section 6.4 and pursuant to the schedule in Section 6.1, motor vehicles that are registered in Cache County, or principally operated within Cache County shall be subject to an emission inspection. Owners of vehicles that meet the requirements of Section 6.2 or 6.3 shall comply with the inspection requirements regardless of the county of registration.

6.1 Motor vehicles are subject to a biennial emissions inspection. Emissions inspections will be required in odd-numbered years for a vehicle with an odd-numbered model year. Emissions inspections will be required in even-numbered years for a vehicle with an even-numbered model year.

6.1.1 A Certificate of Compliance, or evidence that the motor vehicle is exempt from the I/M Program requirements (as defined in Section 6.4) shall be presented to the Cache County Assessor or the Utah State Tax Commission as conditions

precedent to registration or renewal of registration of a motor vehicle in odd-numbered years for a vehicle with an odd-numbered model year. Persons who register a vehicle without meeting the requirements listed may be subject to the penalties referenced in Section 14 of this Regulation.

6.1.2 A Certificate of Compliance, or evidence that the motor vehicle is exempt from the I/M Program requirements (as defined in Section 6.4) shall be presented to the Cache County Assessor or the Utah State Tax Commission as conditions precedent to registration or renewal of registration of a motor vehicle in even-numbered years for a vehicle with an even-numbered model year. Persons who register a vehicle without meeting the requirements listed may be subject to the penalties referenced in Section 14 of this Regulation.

6.1.3 The Air Pollution Control Fee shall be paid annually, as per Chapter 10.20.040(E) of Cache County Code, (see also Section 6.7 of this Regulation) as conditions precedent to registration or renewal of registration of a motor vehicle.

6.1.4 A Certificate of Compliance shall be valid for a period of time in accordance with Section 41-6a-1642(10) Utah Code Annotated, 1953, as amended.

6.2 Publicly-Owned Vehicles. Owners of publicly-owned vehicles shall comply with the inspection program requirements. Federally-owned vehicles and vehicles of employees operated on a federal installation that do not require registration in the State of Utah shall comply with the emissions testing requirements.

6.3 Vehicles of employees and/or students parked at a college or university that do not require registration in Cache County shall comply with the emissions testing requirements as authorized by 41-6a-1642(5)(a) Utah Code Annotated, 1953, as amended.

6.3.1 College or university parking areas that are metered or for which payment is required per use are not subject to the requirements in Section 6.3.

6.4 Vehicle Exemption. The following vehicles are exempt from these emissions testing requirements:

6.4.1 An implement of husbandry as provided in Section 41-1a-102 Utah Code Annotated, 1953, as amended;

6.4.2 A motor vehicle that meets the definition of a farm truck as provided in Section 41-1a-102 Utah Code Annotated, 1953, as amended, and has a gross vehicle weight rating of 12,001 pounds or more;

6.4.3 A vintage vehicle as defined in Section 41-21-1 Utah Code Annotated, 1953, as amended;

6.4.4 A custom vehicle as defined in Section 41-6a-1507 Utah Code Annotated, 1953, as amended;

6.4.5 A pickup truck, as defined in Section 41-1a-102 Utah Code Annotated, 1953, as amended, with a gross vehicle weight rating of 12,000 pounds or less that meets the requirements provided in Section 41-6a-1642(4)(f) Utah Code Annotated, 1953, as amended;

6.4.6 A motorcycle as defined in Section 41-1a-102 Utah Code Annotated, 1953, as amended;

6.4.7 A motor vehicle powered solely by electric power;

6.4.8 Any gasoline or non-diesel based Alternative Fuel powered vehicle of model year 1995 or older;

6.4.9 Any gasoline or non-diesel based Alternative Fuel powered vehicle, with a gross vehicle weight rating greater than 8,500 pounds, and of model year 2007 or older;

6.4.10 Any gasoline or non-diesel based Alternative Fuel powered vehicle, with a gross vehicle weight rating greater than 14,000 pounds, and of model year 2008 or newer;

6.4.11 Any vehicle that is less than six years old on January 1 based on the age of the vehicle as determined by the model year identified by the manufacturer;

6.4.12 Any diesel or diesel based Alternative Fuel powered vehicle 1997 and older;

6.4.13 Any diesel or diesel based Alternative Fuel powered vehicle with a gross vehicle weight rating greater than 14,000 pounds; and

6.4.14 Any vehicle that qualifies for exemption under Section 41-6a-1642 Utah Code Annotated, 1953, as amended.

6.5 If a vehicle exempted by Section 6.4 of this Regulation is brought to the Certified Emissions Inspector for an official Inspection it shall be the responsibility of the Certified Emissions Inspector to inform the owner/operator of the vehicle that the vehicle is not required to have an official Inspection.

6.6 Official Signs.

6.6.1 All I/M Program Stations shall display in a conspicuous location on the premises an official sign provided and approved by the Department;

6.6.2 The readiness requirements for an OBD test as referenced in Appendix D shall be posted in a conspicuous place on the station's premises;

6.6.3 The station shall post on a clear and legible sign and in a conspicuous place at the station, the fees charged by that station for the performance of the emissions inspection;

6.6.4 The free re-inspection policy as referenced in Section 9.4 shall be posted in a conspicuous place on the station's premises;

6.6.5 The signs required by Sections 6.6.1 through 6.6.4 shall be located so as to be easily in the public view.

6.7 Fees.

6.7.1 The fees assessed upon I/M Program Stations and Certified Emissions Inspectors shall be determined according to a fee schedule adopted by the Board. The fee schedule is referenced in Appendix A to this Regulation and may be amended by the Board as necessary.

6.7.2 An Air Pollution Control Fee is hereby assessed upon every motor vehicle registered in Cache County as per Chapter 10.20.040 of Cache County Code. The fee will be assessed annually at the time of registration of the vehicle.

6.7.2.1 This fee assessment is included upon all motorized vehicles including those that are exempted from the inspection requirements of this Regulation by Section 6.4.

6.7.2.2 A motor vehicle that is exempt from the registration fee, and a commercial vehicle with an apportioned registration shall be exempt from this fee as per Section 41-1a-1223, Utah Code Annotated, 1953, as amended and Chapter 10.20.040 of Cache County Code.

6.7.3 I/M Program Stations may charge a fee for the required service. The fee may not exceed, for each vehicle inspected, the amount set by the Board and referenced in Appendix A of this Regulation.

6.7.3.1 The inspection fee pays for a complete inspection leading to a Certificate of Compliance, a Rejection, or a failure. If a vehicle fails, or is rejected from an inspection, the owner/operator is entitled to one free re-inspection if he returns to the I/M Program Station that performed the original inspection within fifteen (15) calendar days from

the date of the initial inspection. The I/M Program Station shall extend the fifteen day free re-inspection to accommodate the vehicle owner/operator if the I/M Program Station is unable to schedule the retest of the vehicle within the fifteen day time period. The inspection fee shall be the same whether the vehicle passes or fails the emission test.

6.7.4 If a vehicle fails the inspection and is within the time and mileage requirements of the federal emissions warranty contained in section 207 of the Federal Clean Air Act, the Certified Emissions Inspector shall inform the owner/operator that he may qualify for warranty coverage of emission related repairs as provided by the vehicle manufacturer and mandated by the Federal Environmental Protection Agency (see 40 CFR Part 85, Subpart V).

6.8 Compliance Assurance List.

6.8.1 The Department reserves the right to recall a vehicle and perform a Compliance Assurance Inspection at the I/M Technical Center for the following reasons:

6.8.1.1 Suspected fraudulent registration;

6.8.1.2 Suspected fraudulent emissions inspection;

6.8.1.3 Suspected tampering of emissions control devices;

6.8.1.4 Violations of Section 41-6a-1626, Utah Code Annotated, 1953, as amended, regarding visible emissions; and

6.8.1.5 Any item listed in Appendix D, Test Procedures, that cause the vehicle to be flagged during an emissions inspection.

6.8.2 The Department shall create and maintain a list of vehicles that are subject to a Compliance Assurance Inspection at the I/M Technical Center.

6.8.2.1 The Compliance Assurance Inspection criteria listed in Appendix D, Test Procedures, shall be followed.

6.8.2.2 A vehicle that passes the Compliance Assurance Inspection may be removed from the Compliance Assurance List by Department personnel.

6.8.2.3 A vehicle that fails the Compliance Assurance Inspection may be subject to penalties as described in Section 14 of this regulation.

7.0 PERMIT REQUIREMENTS OF THE VEHICLE EMISSIONS I/M PROGRAM STATION

7.1 Permit Required.

7.1.1 No person shall in any way represent any place as an official I/M Program Station unless the station is operated under a valid permit issued by the Department.

7.1.2 The Department is authorized to issue or deny permits for I/M Program Stations.

7.1.3 No permit for any official I/M Program Station may be assigned, transferred, or used by any person other than the original owner identified on the permit application for that specific I/M Program Station.

7.1.4 The permit shall be posted in a conspicuous place within public view on the premises.

7.1.5 Application for an I/M Program Station permit shall be made to the Department upon a form provided by the Department. No permit shall be issued unless the Department finds that the facilities, and equipment of the applicant comply with the requirements of this Regulation and that competent personnel, certified under the provisions of Section 8.0, are employed and will be available to make inspections, and the operation thereof will be properly conducted in accordance with this Regulation.

7.1.5.1 An I/M Program Station shall notify the Department and cease any emission testing if the station does not have a Certified Emissions Inspector employed.

7.1.5.2 An I/M Program Station shall notify the Department upon termination and/or resignation of any Certified Emissions Inspector employed by the station.

7.1.5.3 An I/M Program Station shall comply with all the terms stated in the permit application and all the requirements of this Regulation.

7.1.5.4 An I/M Program Station shall provide a dedicated internet connection for the Certified Testing Equipment. A wireless internet connection may be required by the Contractor.

7.2 Permit Duration and Renewal

7.2.1 The permit for I/M Program Stations shall be issued annually and shall expire on the last day of the month, one year from the month of issue. The permit shall be renewable sixty days prior to the date of expiration.

7.2.2 It is the responsibility of the owner/operator of the I/M Program Station to pursue the permit renewal through appropriate channels.

7.3 I/M Program Station to hold Department Harmless

7.3.1 In making application for a permit or for its renewal, such action shall constitute a declaration by the applicant that the Department shall be held harmless from liability incurred due to action or inaction of I/M Program Station's owners or their employees.

7.4 An I/M Program Station shall be kept in good repair and in a safe condition for inspection purposes free of obstructions and hazards.

8.0 TRAINING AND CERTIFICATION OF INSPECTORS

8.1 Certified Emissions Inspector Certification Required.

8.1.1 No person shall perform any part of the inspection for the issuance of a Certificate of Compliance unless the person possesses a valid Certified Emissions Inspector Certification issued by the Department.

8.1.2 Applications for a Certified Emissions Inspector Certification shall be made upon an application form prescribed by the Department. No certification shall be issued unless:

8.1.2.1 The applicant has shown adequate competence by successfully completing all portions of the Certified Emissions Inspector Certification requirements as specified in this Regulation; and

8.1.2.2 The applicant has paid the required permit fees as set by the Board and referenced in Appendix A of this Regulation.

8.1.3 An applicant shall comply with all of the terms stated in the application and with all the requirements of this Regulation.

8.1.4 An applicant shall complete a Department approved training course and shall demonstrate knowledge and skill in the performance of emission testing and

use of the Certified Testing Equipment. Such knowledge and skill shall be shown by passing at minimum:

8.1.4.1 Operation and purposes of emission control systems;

8.1.4.2 Inspection procedures as outlined in this Regulation and prompted by the Certified Testing Equipment ;

8.1.4.3 Operation of the Certified Testing Equipment;

8.1.4.4 The provisions of Section 207(b) warranty provisions of the Federal Clean Air Act, and other federal warranties;

8.1.4.5 The provisions of this Regulation and other applicable Department policies and procedures; and

8.1.4.6 A performance qualification test including but not limited to the following:

(a) Demonstration of skill in proper use, care, and maintenance, of the Certified Testing Equipment;

(b) Demonstration of ability to conduct the inspection; and

(c) Demonstration of ability to accurately enter data in the Certified Testing Equipment.

8.1.5 The Department shall issue a Certified Emissions Inspector Certificate to an applicant upon successful completion of the requirements of this section.

8.1.6 The Certified Emissions Inspector Certificates are and remain the property of the Department, only their use and the license they represent is tendered.

8.1.7 Certified Emissions Inspector Certifications shall not be transferred from one person to another person.

8.2 Recertification Requirements for Certified Emissions Inspectors

8.2.1 The Department may renew certifications for an existing Certified Emissions Inspector after a properly completed renewal form is submitted, reviewed, and approved, the recertification requirements have been completed, the fees are paid and the Certified Emissions Inspector has complied with this Regulation.

8.2.2 Certified Emissions Inspectors shall be required to recertify annually. Failure to recertify shall result in suspension or revocation of the Certification as described in this Regulation.

8.2.3 Certified Emissions Inspectors shall complete a Department approved refresher course every 2 years. Applicants for recertification shall complete a Department approved refresher course no more than sixty days prior to the date of expiration.

8.3 Certification Expiration

8.3.1 The Certified Emissions Inspector Certification shall be issued annually and shall expire on the last day of the month one year from the month of issue. The certification shall be renewable sixty days prior to the date of expiration.

8.3.2 It is the responsibility of the Certified Emissions Inspector to pursue the renewal of the Certification.

8.4 Certified Emissions Inspector Certification Denial, Suspension and Revocation

8.4.1 Certified Emissions Inspector Certifications may be suspended or revoked by the Department for violations of this Regulation.

8.4.2 Suspension or revocation of Certified Emissions Inspector Certifications shall follow the provisions of Appendix C of this Regulation.

8.4.3 The Department may deny issuance of a Certified Emissions Inspector Certification to an individual that works as an emissions inspector in another county in Utah and is currently under suspension or revocation in that program.

9.0 INSPECTION PROCEDURE

9.1 The official emissions inspection shall be solely performed by a Certified Emissions Inspector at an I/M Program Station, and Department approved inspection procedures, as referenced in this section and Appendix D, Test Procedures, are to be followed.

9.2 A complete official test must be performed any time an inspection is requested. The Certified Emissions Inspector shall not perform any part of the inspection without initiating an official test on the Certified Testing Equipment.

9.3 The Certified Emissions Inspector shall perform the official vehicle emissions test using the proper testing procedure.

9.3.1 All gasoline, and non-diesel based Alternative Fuel powered vehicles, including Bi-Fuel vehicles, model year 1996 and newer, with a gross vehicle weight rating 8,500 pounds or less, shall be tested as specified in Appendix D, OBDII Test Procedures, unless specifically exempted by this Regulation.

9.3.2 All gasoline and non-diesel based Alternative Fuel powered vehicles, including Bi-Fuel vehicles, model year 2008 and newer with a gross vehicle weight rating greater than 8,500 pounds and less than 14,001 pounds shall be tested as specified in Appendix D, OBDII Test Procedures, unless specifically exempted by this Regulation.

9.3.3 All diesel and diesel based Alternative Fuel powered vehicles model year 1998 and newer with a gross vehicle weight rating less than 14,001 pounds shall be tested as specified in Appendix D, Diesel Test Procedures, unless specifically exempted by this Regulation.

9.4 Retesting Procedures

9.4.1 If the vehicle fails the initial emissions inspection, the owner/operator shall have fifteen calendar days in which to have repairs or adjustments made and return the vehicle to the I/M Program Station that performed the initial inspection for one (1) free re-inspection.

9.4.2 If the vehicle is Rejected from the initial emissions inspection for failure to complete Readiness requirements, the owner/operator shall have fifteen calendar days in which to return the vehicle to the I/M Program Station that performed the initial inspection for one (1) free re-inspection.

9.4.3 If the vehicle owner/operator does not return to the I/M Program Station that performed the initial inspection within fifteen calendar days the I/M Program Station is under no obligation to offer a free re-inspection.

9.5 Waivers

9.5.1 A Waiver may be granted and a Certificate of Compliance issued for 1996 and newer model year vehicles if all of the following requirements are met:

9.5.1.1 Air pollution control devices identified in the VECI Label are in place and apparently operable on the vehicle. If the VECI Label is missing, the Department may use reference material to identify the air pollution control devices required for the vehicle. If the devices have been removed

or rendered inoperable, they shall be replaced or repaired before a Waiver is granted;

9.5.1.2 The vehicle continues to fail the inspection after $200.00 has been spent on acceptable emissions related repair costs for that specific vehicle, and proof of repair costs for that specific vehicle have been provided to the Department in the form of an itemized bill, invoice, work order, manifest, or statement in which emissions related parts are specifically identified. If repairs are made at a repair station that employs individuals with current ASE L1, ASE A8, or another certification approved by the Department, the cost of labor may be included in the $200.00;

9.5.1.3 The vehicle is not within the time and mileage requirements of the federal emissions warranties. Any vehicle that is within time and mileage requirements of the federal emissions warranties shall not be eligible for a Waiver, but shall be repaired to pass the testing requirements; and

9.5.1.4 A vehicle that is Rejected from the OBD Inspection may qualify for a Waiver if it meets requirements set forth in Appendix F, Waivers for "Not Ready" Vehicles.

9.5.2 As used in 9.5.1, acceptable emissions related repairs:

9.5.2.1 May include repairs performed up to 60 days prior to the official emissions test, provided appropriate documentation is supplied to the Department;

Diagnostic work performed, including Diagnostic Trouble Codes if applicable, must be properly documented to justify any repairs performed;

9.5.2.2 Does not include the fee paid for the test;

9.5.2.3 Does not include costs associated with the repairs or replacements of air pollution control equipment on the vehicle if the need for such adjustment, maintenance, replacement, or repair is due to disconnection of, tampering with, or abuse of the emissions control systems;

9.5.2.4 Refers to repairs, maintenance, and diagnostic evaluations done in accordance with manufacturer's specifications, to the extent that the purpose is to reduce emissions;

9.5.2.5 Repairs performed on OBD compliant vehicles should be directly related to the diagnostic trouble codes identified by the vehicle and by further diagnostic tests on the vehicle;

9.5.2.6 Does not include parts replaced on OBD compliant vehicles that cannot be justified through diagnostic trouble codes or further diagnostic tests on the vehicle.

9.5.3 A Waiver shall only be issued by the Department. A Waiver shall only be issued after determining that the vehicle complies with the requirements of this Section.

9.5.4 A Waiver shall only be issued once to any vehicle that qualifies, throughout the lifetime of the vehicle.

9.5.5 A vehicle must meet the requirements of Section 41-6a-1626, Utah Code Annotated 1953, as amended, regarding visible emissions in order to qualify for a Waiver.

9.6 The Department shall explore new technologies related to emissions inspections. As part of this exploration the Department may perform studies, run pilot projects, collect and analyze data, and make recommendations to the Board. If a new technology can be shown to be as effective as current technologies in reducing emissions and preventing fraud, the Department shall present these findings to the EPA. The Department shall then work with the EPA, the Board, and the Council to seek approval to incorporate the new technology as a testing method.

10.0 ENGINE SWITCHING

10.1 Engine switching shall be allowed only in accordance with EPA policy, as detailed in EPA's Engine Switching Fact Sheet, dated March 13, 1991, and EPA's Addendum to Mobile Source Enforcement Memorandum 1A, dated September 4, 1997.

10.2 Vehicles subject to an emissions inspection, as referenced in Section 6.0 of this Regulation, that do not meet the requirements of Section 10.1 shall be deemed as tampered and are not eligible for a Waiver, unless they are restored to the original engine and emission control configuration.

11.0 SPECIFICATIONS FOR CERTIFIED TESTING EQUIPMENT

11.1 Approval of Certified Testing Equipment

11.1.1 Certified Testing Equipment shall meet the specifications as detailed in Appendix E.

11.1.2 It shall be illegal for any person to modify the hardware or software of Certified Testing Equipment without approval by the Department and/or Contractor.

11.1.3 It shall be illegal for any person to gain access to any Department or Contractor controlled portions of Certified Testing Equipment without approval by the Department and/or Contractor.

12.0 QUALITY ASSURANCE

12.1 A quarterly inspection shall be made by a representative of the Department to verify compliance with this Regulation for each I/M Program Station. During the time of the inspection by the Department, the Department's representative shall have exclusive access to the Certified Testing Equipment. Inspections may be performed utilizing technology integrated into the Certified Testing Equipment.

12.2 An annual covert inspection and audit shall be made by a representative of the Department to verify compliance with this Regulation for each I/M Program Station.

12.3 The Department may increase the frequency of inspections for I/M Program Stations and/or Certified Emissions Inspectors if the Department receives information of a violation of this Regulation.

12.4 The Department shall regularly monitor I/M Program Stations and/or Certified Emissions Inspectors through inspection records and/or technology integrated into the Certified Testing Equipment.

13.0 DISCIPLINARY PENALTIES AND RIGHT TO APPEAL

13.1 When the Department, or its representative(s), receives information of a violation of any regulation contained herein which may result in a permit denial, revocation, or suspension, the Department shall notify the affected entity, in writing, informing the entity of the violation and penalties to be enforced. The affected entity may request a hearing within ten calendar days of the Department giving notice of the potential permit denial, revocation, or suspension. Only a written request for a hearing shall be honored by the Department. No appeal may be made on a formal warning.

13.1.1 In considering the appropriate administrative action to be taken as indicated in Appendix C, the Director shall consider the following:

13.1.1.1 whether the violation was unintentional or careless;

13.1.1.2 the frequency of the violation or violations;

13.1.1.3 the inspection and covert inspection history of the I/M Program Station and the Certified Emissions Inspector;

13.1.1.4 whether the fault lies with the I/M Program Station or the Certified Emissions Inspector.

13.1.2 After consideration of the factors in Section 13.1.1 the Director may take appropriate administrative action as indicated in Appendix C against either the I/M Program Station, the Certified Emissions Inspector, or both.

13.2 Appeals Hearing Procedure:

13.2.1 An appeals hearing shall be held at the request of the affected entity in order to determine the accuracy of information obtained by the Department and whether there are mitigating factors which would justify a reduction of the imposed penalties.

13.2.2 The requesting party may bring to the hearing any witnesses and any evidence believed to be pertinent to the disciplinary action.

13.2.3 The appeal shall be heard by the Vehicle Inspection and Maintenance Appeal Board, hereafter I/M Board, consisting of at least three persons, who are not employees of Bear River Health Department, appointed by the Board. The I/M Board shall have the discretion to determine which witnesses shall be heard and what evidence is relevant.

13.2.4 Violations determined to be intentional or flagrant shall result in the maximum enforcement of the penalty schedule pursuant to Appendix C.

13.2.5 In considering whether to reduce a penalty indicated by Appendix C, the I/M Board and the Department shall consider the following:

13.2.5.1 whether the violation was unintentional or careless;

13.2.5.2 the frequency of the violation or violations;

13.2.5.3 the inspection and covert inspection history of the I/M Program Station and the Certified Emissions Inspector;

13.2.5.4 whether the fault lies with the I/M Program Station, the Certified Emissions Inspector, or both.

13.3 Written notice of the final determination of the I/M Board, including the I/M Board's finding under Section 14.2.5, shall be made within ten calendar days after the conclusion of the appeals hearing.

14.0 PENALTY

14.1 Any person who is found guilty of violating any of the provisions of this Regulation, either by failing to do those acts required herein or by doing a prohibited act, shall be guilty of a class B misdemeanor pursuant to Section 26A-1-123, Utah Code Annotated, 1953, as amended. If a person is found guilty of a subsequent similar violation within two years, he shall be guilty of a class A misdemeanor pursuant to Section 26A-1-123, Utah Code Annotated, 1953, as amended.

14.2 Each day such violation is committed or permitted to continue shall constitute a separate violation.

14.3 The Cache County Attorney's Office may initiate legal action, civil or criminal, requested by the Department to abate any condition that exists in violation of this Regulation.

14.4 In addition to other penalties imposed by a court of competent jurisdictions, any person(s) found guilty of violating any of this Regulation shall be liable for all expenses incurred by the Department.

14.5 A Penalty Schedule for permit warning, suspension, or revocation is adopted as Appendix C and may be amended by the Board as the Board deems necessary to accomplish the purposes of this Regulation.

14.6 The Department shall request that the Utah Division of Motor Vehicles suspend or revoke a registered vehicle's registration if the vehicle is unable to meet emissions standards or if the vehicle has not complied with the required emission testing requirements pursuant to Section 41-1a-110(6), Utah Code Annotated, 1953, as amended.

15.0 SEVERABILITY

If any provision, clause, sentence, or paragraph of this Regulation or the application thereof to any person or circumstances shall be held to be invalid, such invalidity shall not affect the other provisions or applications of this Regulation. The valid part of any clause, sentence, or paragraph of this Regulation shall be given independence from the invalid provisions or application and to this end the provisions of this Regulation are hereby declared to be severable.

16.0 EFFECTIVE DATE

This Regulation shall become effective on January 1, 2021 as adopted by the Bear River Board of Health.

Approved and Adopted this 10th day of April, 2019.

James Swink, Chair
Bear River Board of Health

Lloyd Berentzen, M.B.A.
Executive Director
Bear River Health Department

APPENDIX A – FEE SCHEDULE

Permitting of an official I/M Program Station	$250.00
Annual Renewal of I/M Program Station	$50.00
Expired I/M Program Station Renewal	$75.00
I/M Program Station Re-location	$75.00
Permitting of a Certified Emissions Inspector	$25.00
Renewal of Certified Emissions Inspector	$15.00
Expired Certified Emissions Inspector Renewal	$25.00
Official Station Sign	Cost
APC Fee for 12 month registration	$3.00
APC Fee for 6 month registration	$2.25
Emissions Inspection Fee – OBD Test	$15.00
Emissions Inspection Fee –Tampering	$20.00

APPENDIX B - RESERVED

APPENDIX C – PENALTY SCHEDULE

Violation (resets after 2 years of no similar violations unless revoked)	**1st Occurrence**	**2nd Occurrence**	**3rd Occurrence**	**4th Occurrence**
Failure to inspect or substituting a vehicle other than the vehicle on the test record – Registering a failing vehicle *(intentional pass)*	Tech: 180 day suspension and mandatory retraining	Tech: Revocation of permit for up to 5 years		
	Station: 180 day suspension	Station: 270 day suspension	Station: Revocation of inspection station permit for up to 5 years	
Passing a failing vehicle or recording pass for tampering on a tampered vehicle *(gross negligence)*	Tech: 30 day suspension and mandatory retraining	Tech: 60 day suspension and mandatory retraining	Tech: Revocation of permit for up to 5 years	
	Station: 15 day suspension	Station: 30 day suspension	Station: 60 day suspension	Station: Revocation of permit for up to 5 years
Falsifying an inspection record or emissions certificate or Failing a passing vehicle *(intentional)*	Tech: 180 day suspension and mandatory retraining	Tech: Revocation of permit for up to 5 years		
	Station: 180 day suspension	Station: 270 day suspension	Station: Revocation of inspection station permit for up to 5 years	
Non-certified person performing test – Using another inspector's access *(gross negligence table)*	Tech: 60 day suspension	Tech: 180 day suspension	Tech: Revocation of permit for up to 5 years	
	Station: 60 day suspension	Station: 180 day suspension	Station: Revocation of inspection station permit for up to 5 years	
Inaccurate or incomplete data entry *(incompetence)*	Tech: Formal warning and mandatory retraining	Tech: 30 day suspension and mandatory retraining	Tech: 90 day suspension and mandatory retraining	Tech: Revocation of permit for up to 5 years
	Station: Formal warning	Station: 15 day suspension	Station: 45 day suspension	Station: Revocation of inspection station permit for up to 5 years
Failure to follow proper test procedures – Other regulation violations *(incompentence)*	Tech: Formal warning and mandatory retraining	Tech: 30 day suspension and mandatory retraining	Tech: 90 day suspension and mandatory retraining	Tech: Revocation of permit for up to 5 years
	Station: Formal warning	Station: 15 day suspension	Station: 45 day suspension	Station: Revocation of inspection station permit for up to 5 years

APPENDIX D – TEST PROCEDURES

OBDII Test Procedures for gasoline and non-diesel based Alternative Fuel powered vehicles

1 The Certified Emissions Inspector shall verify the following items from the vehicle and accurately record them in the Certified Testing Equipment:

- 1.1 Vehicle Identification Number (VIN)
- 1.2 Gross Vehicle Weight Rating (GVWR)
- 1.3 Model year
- 1.4 Make
- 1.5 Model
- 1.6 Fuel Type
- 1.7 Engine size
- 1.8 Number of cylinders
- 1.9 Certification standard (EPA or California)

2 The Certified Emissions Inspector shall visually examine the instrument panel to determine if the Malfunction Indicator Light (MIL) illuminates, at least briefly, when the ignition key is turned to the "key on, engine off" (KOEO) position. The visual result shall be accurately recorded in the Certified Testing Equipment.

3 The Certified Emissions Inspector shall locate the Diagnostic Link Connector (DLC) on the vehicle being tested. The vehicle should be connected to the Certified Testing Equipment when prompted.

- 3.1 If the DLC is missing, has been tampered with, or is otherwise inoperable, the vehicle fails the test and shall be repaired.

- 3.2 If the DLC is inaccessible, the problem must be remedied before the test can continue.

4 When prompted by the Certified Testing Equipment the Certified Emissions Inspector should start the engine so the vehicle is in the "key on, engine running" (KOER) condition and follow the screen prompts until the test is complete.

5 For 1996-2000 model year vehicles two (2) supported readiness monitors are allowed to be "not ready". For 2001 and newer vehicles one (1) supported readiness monitor is allowed to be "not ready". If the "not ready" status exceeds these numbers the vehicle must be driven additional miles or have appropriate repairs made.

- 5.1 A vehicle that fails the initial inspection for a catalyst related fault (i.e., P0420-P0439) must have the catalyst monitor set to "ready" upon re-inspection.

6 If the MIL is commanded on while the engine is running, regardless of the presence of Diagnostic Trouble Codes (DTC), the vehicle will fail the test and will require repairs.

7 Certain vehicles have been determined to be OBDII deficient. The Certified Testing Equipment software will maintain a list of these vehicles and perform a modified OBDII test.

8 A vehicle must meet the requirements of Section 41-6a-1626, Utah Code Annotated 1953, as amended, regarding visible emissions in order to qualify for a Certificate of Compliance.

9 Certain vehicles will be flagged by the testing software during the inspection and may be recalled to the I/M Technical Center for a Compliance Assurance Inspection. Vehicles will be flagged for the following items:

9.1 Mismatch between entered VIN and OBD VIN;

9.2 Any of the following readiness monitors being unsupported: Misfire, fuel system, component, catalyst, and/or oxygen sensor;

9.3 A change in supported readiness monitors since the last inspection;

9.4 A change in communication protocol since the last inspection;

9.5 A change in OBD VIN since the last inspection;

9.6 The presence of an OBD VIN in a vehicle that does not support OBD VINs;

9.7 The absence of an OBD VIN in a vehicle that supports OBD VINs; or

9.8 A change in PID count since the last inspection.

10 Certain vehicles might not communicate with the Certified Testing Equipment. These vehicles will be referred to the I/M Technical Center for a Referee Inspection.

11 A vehicle owner/operator that challenges the results of an official emissions inspection may request a Referee Inspection at the I/M Technical Center.

Diesel and diesel based Alternative Fuel Powered Vehicles Test Procedures

All diesel powered vehicles 2007 and newer, with a gross vehicle weight rating less than 14,001 pounds, shall be tested as follows:

1 The Certified Emissions Inspector shall verify the following items from the vehicle and accurately record them in the Certified Testing Equipment:

- 1.1 Vehicle Identification Number (VIN)
- 1.2 Gross Vehicle Weight Rating (GVWR)
- 1.3 Model year
- 1.4 Make
- 1.5 Model
- 1.6 Fuel Type
- 1.7 Engine size
- 1.8 Number of cylinders
- 1.9 Certification standard (EPA or California)

2 The Certified Emissions Inspector shall visually examine the instrument panel to determine if the Malfunction Indicator Light (MIL) illuminates, at least briefly, when the ignition key is turned to the "key on, engine off" (KOEO) position. The visual result shall be accurately recorded in the Certified Testing Equipment.

3 The Certified Emissions Inspector shall locate the Diagnostic Link Connector (DLC) on the vehicle being tested. The vehicle should be connected to the Certified Testing Equipment when prompted.

- 3.1 If the DLC is missing, has been tampered with, or is otherwise inoperable, the vehicle fails the test and shall be repaired.

- 3.2 If the DLC is inaccessible, the problem must be remedied before the test can continue.

4 When prompted by the Certified Testing Equipment the Certified Emissions Inspector should start the engine so the vehicle is in the "key on, engine running" (KOER) condition and follow the screen prompts until the test is complete.

5 Two supported readiness monitors are allowed to be "not ready". If the "not ready" status exceeds these numbers the vehicle must be driven additional miles or have appropriate repairs made.

- 5.1 A vehicle that fails the initial inspection for a catalyst related fault (i.e., P0420-P0439) must have the catalyst monitor set to "ready" upon re-inspection.

6 If the MIL is commanded on while the engine is running, regardless of the presence of Diagnostic Trouble Codes (DTC), the vehicle will fail the test and will require repairs.

7 Certain vehicles have been determined to be OBDII deficient. The Certified Testing Equipment software will maintain a list of these vehicles and perform a modified OBDII test.

8 A vehicle must meet the requirements of Section 41-6a-1626, Utah Code Annotated 1953, as amended, regarding visible emissions in order to qualify for a Certificate of Compliance.

9 Certain vehicles will be flagged by the testing software during the inspection and may be recalled to the I/M Technical Center for a Compliance Assurance Inspection. Vehicles will be flagged for the following items:

9.1 Mismatch between entered VIN and OBD VIN;

9.2 Any of the following readiness monitors being unsupported: Misfire, fuel system, component, NMHC, and/or NOx/SCR;

9.3 A change in supported readiness monitors since the last inspection;

9.4 A change in communication protocol since the last inspection;

9.5 A change in OBD VIN since the last inspection;

9.6 The absence of an OBD VIN; or

9.7 A change in PID count since the last inspection.

10 Diesel powered vehicles shall be subject to a visual anti-tampering inspection. The air pollution control devices identified in the Vehicle Emissions Control Information (VECI) label shall be in place and apparently operable on the vehicle. If the decal is missing, reference material may be used to identify the air pollution control devices required for the vehicle.

11 Certain vehicles might not communicate with the Certified Testing Equipment. These vehicles will be referred to the I/M Technical Center for a Referee Inspection.

12 A vehicle owner/operator that challenges the results of an official emissions inspection may request a Referee Inspection at the I/M Technical Center.

All diesel powered vehicles 1998-2006, with a gross vehicle weight rating less than 14,001 pounds, shall be tested as follows:

1 The Certified Emissions Inspector shall verify the following items from the vehicle and accurately record them in the Certified Testing Equipment:

1.1 Vehicle Identification Number (VIN)
1.2 Gross Vehicle Weight Rating (GVWR)
1.3 Model year
1.4 Make
1.5 Model
1.6 Fuel Type
1.7 Engine size
1.8 Number of cylinders
1.9 Certification standard (EPA or California)

2 Diesel powered vehicles shall be subject to a visual anti-tampering inspection. The air pollution control devices identified in the Vehicle Emissions Control Information (VECI) label shall be in place and apparently operable on the vehicle. If the decal is missing, reference material may be used to identify the air pollution control devices required for the vehicle.

3 A vehicle must meet the requirements of Section 41-6a-1626, Utah Code Annotated 1953, as amended, regarding visible emissions in order to qualify for a Certificate of Compliance.

4 If the OBDII System is identified on the VECI label, the procedure in Section 2 through 5 shall be followed.

4.1 An inspection of the OBDII System shall be for informational purposes only and will not determine whether a vehicle passes or fails the emission inspection.

Compliance Assurance Inspection

1 A vehicle that is referred to the I/M Technical Center for a Compliance Assurance Inspection shall be subject to an official emissions inspection. A visual anti-tampering inspection shall also be included in every Compliance Assurance Inspection. The air pollution control devices listed in the Vehicle Emissions Control Information (VECI) label shall be in place and apparently operable on the vehicle. If the VECI label is missing, reference material may be used to identify the air pollution control devices required for the vehicle.

1.1 A vehicle that has missing or tampered air pollution control devices will fail the Compliance Assurance Inspection and will not be issued a Certificate of Compliance.

1.2 A vehicle that has missing or tampered air pollution control devices and has already been issued a Certificate of Compliance will be required to replace or repair the devices. Owners/operators of vehicles that do not comply will be subject to the penalties in this Regulation.

2 The Department will use data obtained by the Utah Division of Motor Vehicles and inspection data to determine if a vehicle should be subject to a Compliance Assurance Inspection.

3 The owner/operator of a vehicle subject to a Compliance Assurance Inspection will be notified in writing of the requirement to present the vehicle for inspection.

Referee Inspection

1 Vehicles may be referred to the I/M Technical Center for a Referee Inspection. During a Referee Inspection the Department may override the normal testing criteria and issue a Certificate of Compliance for the following reasons:

1.1 The vehicle will not communicate with the Certified Testing Equipment but will communicate with other scan tools. The vehicle must meet all other testing requirements including readiness status and MIL status; or

1.2 The vehicle has met the criteria to be issued a Waiver.

2 A Referee Inspection may also be performed when an owner/operator believes the emissions inspection performed at an I/M Program Station was not done correctly.

APPENDIX E – CERTIFIED TESTING EQUIPMENT STANDARDS

1 General

This appendix contains specifications for Contractors to design Certified Testing Equipment to be used in the Cache County I/M Program.

1.1 Design Goals

Certified Testing Equipment must be designed and constructed to provide reliable and accurate service in the automotive service environment. The software must be designed for maximum operational simplicity. The software must prevent users from clearing Diagnostic Trouble Codes (DTC), changing readiness status, or performing other actions that could change the results of an official emissions test. In addition, the Certified Testing Equipment must include security measures that will prevent unauthorized modifications to the software or inspection data.

These technical specifications contain the minimum requirements for Certified Testing Equipment used to perform official emissions inspections in Cache County, UT.

1.2 Manuals

All Certified Testing Equipment sold or leased by the Contractor must be provided with a current copy of a manual that contains, at a minimum, operating instructions, maintenance instructions, and initial startup instructions. The manual may be provided in electronic format and shall be accessible from the Certified Testing Equipment.

1.3 Warranty Coverage and Extended Service Agreements

A written warranty coverage agreement, signed by an authorized representative of the Contractor and the I/M Program Station, which provides a complete description of coverage for all systems and components and all Contractor provided services listed below in Contractor Provided Services, must accompany the sale or lease of each unit of Certified Testing Equipment.

The Contractor shall provide a minimum of one-year warranty coverage on each unit of Certified Testing Equipment sold or leased. The one-year warranty coverage shall begin on the date of purchase and shall be included in the unit pricing for the Certified Testing Equipment. An extended warranty shall be made available to the I/M Program Stations that purchase or lease Certified Testing Equipment.

1.4 Contractor Provided Services

The Contractor shall provide the following services to the I/M Program Station as part of any sale, lease, or loan of Certified Testing Equipment:

- Delivery, set-up, and verification of proper functionality of the Certified Testing Equipment; and
- Training on the use and maintenance of the Certified Testing Equipment.

The Contractor shall provide the following services to the I/M Program Station during the initial one-year warranty coverage period and thereafter to any I/M Program Station that purchases an extended warranty:

- Full system support and repair as detailed in the warranty coverage agreement; and
- Appropriate service response, either on-site or remote, by a Contractor authorized repair technician within one business day (Saturday shall be considered a business day), excluding Sundays, and national/state holidays (New Year's Day, Human Rights Day, President's Day, Memorial Day, Independence Day, Pioneer Day, Labor Day, Veteran's Day, Thanksgiving, and Christmas), of a request from the I/M Program Station. All system repairs, component replacements, and/or Certified Testing Equipment adjustments must be accomplished within a minimum average response time of 8 business hours after a service request has been initiated. If the completion of this work is not possible within this time period, Certified Testing Equipment of equal quality and specifications must be provided until the malfunctioning unit is properly repaired and returned to service.

1.5 Tamper Resistance

The Certified Testing Equipment operators, Department personnel, and Contractor authorized service technicians shall be prevented from changing any inspection results, programs, or data contained on the Certified Testing Equipment. The Contractor shall use appropriate software and/or hardware provisions to protect files and programs.

2 – Hardware/Software Requirements

2.1 Accessing the OBD System

The Certified Testing Equipment must include hardware and software necessary to access the on-board computer systems of vehicles subject to OBD inspections. This includes the following:

- 1996 and newer gasoline and non-diesel based alternative fuel vehicles with a gross vehicle weight rating of 8,500 pounds or less
- 2008 and newer gasoline and non-diesel based alternative fuel vehicles with a gross vehicle weight rating of 14,000 pounds or less
- 2007 and newer diesel and diesel based alternative fuel vehicles with a gross vehicle weight rating of 14,000 pounds or less

The Certified Testing Equipment shall be compliant with the recommended practices regarding OBD inspections contained in J1962, J1978, and J1979 as published by the Society of Automotive Engineers (SAE). The Certified Testing Equipment must be able to connect to the vehicle's data link connector (DLC) and access, at a minimum, the following OBD data:

- Service modes $01, $03, $06, $07, $09, $0A

The Certified Testing Equipment must be capable of communicating with all OBD vehicles that use, at a minimum, the following communications protocols:

- International Organization for Standardization (ISO) 9141
- Variable Pulse Width (VPW)
- Pulse Width Modulation (PWM)
- Keyword Protocol 2000 (KWP)
- Controller Area Network (CAN)

2.2 Barcode Scanner

The Certified Testing Equipment must include a bar code scanner capable of reading both 1D and 2D barcodes. The bar code scanner must be able to read the barcode through a windshield. The barcode scanner must be able to withstand multiple 6.5 foot (2 meter) drops to concrete and be environmentally sealed to withstand the normal operating conditions of an automotive service environment.

The bar code scanner may be a stand alone device or may be integrated into the Certified Testing Equipment.

2.3 Camera

Certified Testing Equipment shall be equipped with video capturing equipment. The video capturing equipment must capture video from each official emissions inspection.

APPENDIX F – WAIVERS FOR "NOT READY" VEHICLES

A vehicle owner may be eligible for a Waiver when their gasoline powered vehicle is "Not Ready" and the following conditions are met:

1 The vehicle is not subject to a modified OBDII test because of OBD deficiencies;

2 The vehicle has an official test performed showing a "Not Ready" status. The MIL is functioning properly and is not commanded on. No pending codes are stored in the vehicle's computer.

3 A second inspection has been performed showing the following:

- 3.1 Readiness monitors have not changed from "Not Ready" to "Ready";
- 3.2 The test dates are separated by at least 7 days and the vehicle has traveled a minimum of 200 miles;
- 3.3 The MIL is functioning properly and is not commanded on. No pending codes are stored in the vehicle's computer; and
- 3.4 A statement is included from a repair station, stating the appropriate diagnostics and manufacturer recommended drive cycles have been performed and the readiness monitors have not been set.

4 A third inspection has been performed by a second repair station showing the following:

- 4.1 Readiness monitors have not changed from "Not Ready" to "Ready";
- 4.2 The initial and third test dates are separated by at least 14 days and the vehicle has traveled a minimum of 400 miles;
- 4.3 The MIL is functioning properly and is not commanded on. No pending codes are stored in the vehicle's computer; and
- 4.4 A statement is included from a repair station, stating the appropriate diagnostics and manufacturer recommended drive cycles have been performed and the readiness monitors have not been set.

5 At least one of the statements must come from the vehicle manufacturer's dealership repair station. This statement must indicate that the appropriate drive cycles and diagnostics have been performed and the vehicle will not reach a "Ready" status. The dealership must also document that the vehicle's computer is up to date and functioning properly. The computer must be updated if required or recommended by the manufacturer. If the computer is updated the vehicle must complete the appropriate drive cycles following the update.

6 The cost requirements as set forth by this Regulation must be met in order to qualify for a Waiver. In order to count labor the repair station must employ individuals with current ASE L1, ASE A8, or other certifications approved by the Department.

ORDINANCE 2013-04

IMPLEMENTATION OF A VEHICLE EMISSIONS AND MAINTENANCE PROGRAM IN CACHE COUNTY

1.0 PURPOSE

The purpose of this ordinance is to reduce air pollution levels in Cache County by requiring emission inspections of on-road motor vehicles and by requiring emission related repairs and/or adjustments for those vehicles that fail to meet the prescribed standards so as to:

1.1 Protect and promote the public health, safety, and welfare;

1.2 Improve air quality;

1.3 Comply with the federal regulations contained in 40 CFR part 51 subpart S;

1.4 Comply with the law enacted by the Legislature of the State of Utah, Section 41-6a-1642 Utah Code Annotated, 1953, as amended.

2.0 POWERS AND DUTIES

2.1 The Cache County Council (hereafter, "Council") has authority to implement a vehicle inspection and maintenance program under Section 41-6a-1642, Utah Code Annotated, 1953, as amended.

2.2 The Council is presently required by the EPA and the State of Utah to implement a vehicle emission inspection and maintenance program.

2.3 The Council hereby delegates its authority as an administrative body under Section 41-6a-1642, Utah Code Annotated, 1953, as amended, to the Bear River District Board of Health (hereafter "Board"), to address all issues pertaining to the adoption and administration of the vehicle emission inspection and maintenance program.

2.4 The Council authorizes and directs the Board to adopt and promulgate rules and regulations to ensure compliance with EPA and State Implementation Plan requirements with respect to an emission inspection and maintenance program.

3.0 GENERAL PROVISIONS

3.1 The Board, in conjunction with its staff, will administer and enforce this ordinance.

3.2 The Board shall adopt vehicle emission and inspection rules and regulations which meet EPA and State Implementation Plan requirements.

3.3 The Council shall approve the initial Rules and Regulations established by the Board and all changes in Rules and Regulations.

4.0 GUIDELINES TO BE FOLLOWED BY THE BEAR RIVER BOARD OF HEALTH IN IMPLEMENTING A VEHICLE INSPECTION AND MAINTENANCE PROGRAM IN CACHE COUNTY

4.1 Vehicles registered in Cache County, that are not exempt from inspection requirements, will be inspected on the following schedule:

4.1.1 All gasoline and non-diesel based Alternative Fuel powered vehicles, including Bi-Fuel vehicles, model year 1996 and newer, with a GVWR 8,500 lbs or less will be subject to inspection. All gasoline and non-diesel based Alternative Fuel powered vehicles, including Bi-Fuel vehicles, model year 2008 and newer, with a GVWR greater than 8,500 lbs and less than 14,001 lbs will be subject to inspection.

4.1.2 All diesel and diesel based Alternative Fuel powered vehicles model year 1998 and newer, with a GVWR less than 14,001 lbs will be subject to inspection.

4.1.3 No emissions inspection will be required for any vehicle that is less than six years old on January 1 based on the age of the vehicle as determined by the model year identified by the manufacture.

4.1.4 Emissions inspections will be required in odd-numbered years for a vehicle with an odd-numbered model year. Emissions inspections will be required in even-numbered years for a vehicle with an even-numbered model year.

4.2 A maximum fee for inspection shall be set by the Board and approved by the Council. Part of this fee will be retained by the entity which performs the test and part may be remitted to the Board as reimbursement for administering the program. The intent of the Council is that this fee be as low as possible, while still maintaining the financial viability of the program.

4.3 If a vehicle fails the emissions inspection, a waiver may be granted that will allow the vehicle to be registered that year. In order to qualify for a waiver, the vehicle owner/operator must spend a minimum of $200.00 on emissions related repairs and meet any other requirements established by the Board. A waiver will be issued once during the lifetime of the vehicle. Any changes to the minimum required repair expenditure to qualify for the waiver shall be approved by the Council.

4.4 Emission inspections in Cache County will be conducted by private firms, or by utilizing remote OBD technology. The Board shall establish criteria to ensure that testing is performed in accordance with state and federal requirements.

4.5 To fund the administration of the emissions inspection and maintenance program and other air quality improvement programs, the Council authorizes an Air Pollution Control fee to be assessed upon every motorized vehicle registered in Cache County at the time of registration as provide by Section 41-1a-1223, Utah Code Annotated, 1953, amended.

4.5.1 The fee is set at $3.00 for each vehicle registration within the County under section 41-1a-215, Utah Code Annotated, 1953, as amended and at $2.25 for each vehicle registration within the county for a six month registration period under Section 41-1a-215.5, Utah Code, 1953, as amended.

4.5.2 Motor vehicles that are exempt from the registration fee, and commercial vehicles with an apportioned registration shall be exempt from this fee as per Section 41-1a-1223, Utah Code Annotated, 1953 as amended.

4.5.3 The fee shall be assessed beginning January 1, 2014.

5.0 REVIEW OF NEED FOR PROGRAM

The Council shall review the vehicle emissions and maintenance program at least every five years to evaluate the continuing need for the program.

6.0 EFFECTIVE DATE

These changes will take effect on January 1, 2021.

This ordinance takes effect on March 27, 2013. Following its passage, but prior to the effective date, a copy of the Ordinance shall be deposited with the County Clerk and a short summary of the ordinance shall be published in a newspaper of general circulation within the County as required by law.

ITEM 6

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-079-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Mat Carlile, Environmental Planning Consultant

DATE: August 16, 2019

SUBJECT: FINAL ADOPTION: Amend R307-110-31. Section X, Vehicle Inspection and Maintenance Program, Part A, General Requirements and Applicability; and R307-110-36. Section X, Vehicle Inspection and Maintenance Program, Part F, Cache County.

When sections of the State Implementation Plan (SIP) are amended by the Board, those sections must be incorporated into the Air Quality Rules. On June 5, 2019, the Board proposed amendments to R307-110-31 and R307-110-36 to incorporate into its rule changes made to Section X, Vehicle Inspection and Maintenance Program, Parts A and F.

A public comment period was held from July 1 to July 31, 2019. No comments were received, and no hearing was requested.

Recommendation: Staff recommends that the Board adopt R307-110-31 and R307-110-36 as proposed.

Appendix 1: Regulatory Impact Summary Table*

Fiscal Costs	**FY 2020**	**FY 2021**	**FY 2022**
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Person	$0	$0	$0
Total Fiscal Costs:	**$0**	**$0**	**$0**
Fiscal Benefits			
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Persons	$0	$0	$0
Total Fiscal Benefits:	**$0**	**$0**	**$0**
Net Fiscal Benefits:	**$0**	**$0**	**$0**

***This table only includes fiscal impacts that could be measured. If there are inestimable fiscal impacts, they will not be included in this table. Inestimable impacts for State Government, Local Government, Small Businesses and Other Persons are described in the narrative. Inestimable impacts for Non-Small Businesses are described in Appendix 2.**

Appendix 2: Regulatory Impact to Non-Small Businesses

This rule change is not expected to have any fiscal impacts on non-small businesses revenues or expenditures, because each county implements their own Inspection and Maintenance programs. This rule only incorporates those existing plans into the State Implementation Plan.

The Executive Director of the Department of Environmental Quality, Alan Matheson, has reviewed and approved this fiscal analysis.

****"Non-small business" means a business employing 50 or more persons; "small business" means a business employing fewer than 50 persons.**

R307. Environmental Quality, Air Quality.
R307-110. General Requirements: State Implementation Plan.

R307-110-31. Section X, Vehicle Inspection and Maintenance Program, Part A, General Requirements and Applicability.

The Utah State Implementation Plan, Section X, Vehicle Inspection and Maintenance Program, Part A, General Requirements and Applicability, as most recently amended by the Utah Air Quality Board on September 4, 2019, pursuant to Section 19-2-104, is hereby incorporated by reference and made a part of these rules.

KEY: air pollution, PM10, PM2.5, ozone
Date of Enactment or Last Substantive Amendment: 2019
Notice of Continuation: January 27, 2017
Authorizing, and Implemented or Interpreted Law: 19-2-104

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Fiscal Costs	**FY 2020**	**FY 2021**	**FY 2022**
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Person	$0	$0	$0
Total Fiscal Costs:	**$0**	**$0**	**$0**
Fiscal Benefits			
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Persons	$0	$0	$0
Total Fiscal Benefits:	**$0**	**$0**	**$0**
Net Fiscal Benefits:	**$0**	**$0**	**$0**

***This table only includes fiscal impacts that could be measured. If there are inestimable fiscal impacts, they will not be included in this table. Inestimable impacts for State Government, Local Government, Small Businesses and Other Persons are described in the narrative. Inestimable impacts for Non-Small Businesses are described in Appendix 2.**

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R307. Environmental Quality, Air Quality.
R307-110. General Requirements: State Implementation Plan.

R307-110-36. Section X, Vehicle Inspection and Maintenance Program, Part F, Cache County.
The Utah State Implementation Plan, Section X, Vehicle Inspection and Maintenance Program, Part F, Cache County, as most recently adopted by the Utah Air Quality Board on September 4, 2019, pursuant to Section 19-2-104, is hereby incorporated by reference and made a part of these rules.

KEY: air pollution, PM10, PM2.5, ozone
Date of Enactment or Last Substantive Amendment: 2019
Notice of Continuation: January 27, 2017
Authorizing, and Implemented or Interpreted Law: 19-2-104

ITEM 7

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-089-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Becky Close, Environmental Scientist

DATE: August 22, 2019

SUBJECT: PROPOSE FOR PUBLIC COMMENT: SIP Subsection IX.A.36: PM2.5 Maintenance Provisions for Salt Lake City, UT.

On January 2, 2019, the Utah Air Quality Board approved Utah State Implementation Plan (SIP) Subsection IX.A.31: *Control Measures for Area and Point Sources, Fine Particulate Matter, Serious Area $PM_{2.5}$ for the Salt Lake City, UT Nonattainment Area* (Serious SIP). The Serious SIP includes all necessary elements to support the demonstration, control strategy, and implementation of the attainment plan. The Serious SIP was submitted to the Environmental Protection Agency (EPA) on February 15, 2019.

Under the EPA's Clean Data Policy, EPA proposed a clean data determination for the Salt Lake City Nonattainment Area (SLC NAA) on June 5, 2019. The clean data determination shows that the SLC NAA attained the 2006 24-hr $PM_{2.5}$ national ambient air quality standard (NAAQS) based on validated monitored data from 2016 to 2018, prior to the attainment deadline of December 31, 2019. Final EPA approval of the clean data determination is expected by the time this SIP subsection is proposed for final adoption by the Board.

A finding that the area has attained the standard does not mean the area is automatically reclassified to attainment status. For that to happen, EPA must take action to redesignate an area from nonattainment back to attainment. The Clean Air Act (CAA) outlines five requirements that a nonattainment area must satisfy for redesignation to occur, and this proposed SIP addresses those requirements:

1. Attainment of the NAAQS
2. A fully approved Attainment SIP

3. A demonstration that improvements in air quality are due to permanent and enforceable emissions reductions
4. A demonstration that the State has met requirements applicable to the area under CAA Section 110 and Part D
5. A fully approved maintenance plan

Requirements 1 through 4 are addressed in the first section of this SIP as part of the documentation for the redesignation request. The maintenance plan is also included in this SIP package and includes a modeling demonstration that the SLC NAA continues to attain the NAAQS out to 2035, with an intermediate year check in of 2026. As noted in EPA guidance, the EPA approval action on SIP elements and the redesignation request may occur simultaneously. Therefore, some serious SIP elements may still be pending approval and will likely be approved by EPA concurrently with the redesignation to attainment status.

Recommendation: Staff recommends that the Board propose SIP Subsection IX.A.36: $PM_{2.5}$ Maintenance Provisions for Salt Lake City, UT, for a 30-day public comment period.

UTAH STATE IMPLEMENTATION PLAN

$PM_{2.5}$ Maintenance Provisions for the Salt Lake City, UT Nonattainment Area

SECTION IX.A.36

UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
AIR
QUALITY

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List of Acronyms and Abbreviations

BACM	Best Available Control Measure
BACT	Best Available Control Technology
CAA	Clean Air Act
CDD	Clean Data Determination
CFR	Code of Federal Regulations
CAMx	Comprehensive Air Quality Model with Extensions
DAQ	Utah Division of Air Quality (also UDAQ)
EPA	Environmental Protection Agency
FR	Federal Register
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
MVEB	Motor Vehicle Emissions Budget
$\mu g/m^3$	Micrograms Per Cubic Meter
Micron	One Millionth of a Meter
NAAQS	National Ambient Air Quality Standards
NH_3	Ammonia
NO_x	Nitrogen Oxides
NNSR	Nonattainment New Source Review
PM	Particulate Matter
PM_{10}	Particulate Matter Smaller Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Smaller Than 2.5 Microns in Diameter
R-307	Utah Administrative Code Air Quality Rules
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SIP	State Implementation Plan
SLC NAA	Salt Lake City Nonattainment Area
SMAT	Software for Model Attainment Test
SMOKE	Sparse Matrix Operator Kernal Emissions
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
TPY	Tons Per Year
TSD	Technical Support Document
UAC	Utah Administrative Code
UT	Utah
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compounds
WRF	Weather Research and Forecasting

Section IX.A.36
$PM_{2.5}$ Maintenance Provisions the for SLC, UT Nonattainment Area

IX.A.36.a Introduction

The Salt Lake City Nonattainment Area (SLC NAA) has attained the 2006 $PM_{2.5}$ 24-hour National Ambient Air Quality Standard (NAAQS). As a result, this Section has been added to the State Implementation Plan (SIP) to demonstrate that the SLC NAA is eligible for redesignation to attainment. Under Section 107(d)(3)(E) of the Clean Air Act (CAA or the Act), a nonattainment area is eligible for redesignation when the area has met the following requirements: (1) the area has attained the national ambient air quality standard, (2) the area has an Environmental Protection Agency (EPA) approved attainment SIP, (3) the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, (4) the State has met the SIP requirements of Section 110 and Part D of the Act, and (5) the area has an EPA approved Maintenance Plan.

As demonstrated in Subsection IX.A.36.b, the SLC NAA has satisfied the redesignation requirements of Section 107 and is eligible for redesignation pending the EPA's approval of the SLC NAA Maintenance Plan. The maintenance plan is included in Subsection IX.A.36.c and was written in compliance with Section 175A of the Act. The maintenance plan demonstrates that the SLC NAA will continue to maintain the 24-hour $PM_{2.5}$ NAAQS through at least the year 2035. The maintenance plan also includes contingency measures to assure that the State will promptly correct any violation of the standard that may occur after redesignation. Upon the EPA's approval of the maintenance plan, the State is requesting that the SLC NAA be redesignated to attainment for the 2006 $PM_{2.5}$ 24-hour NAAQS.[1]

a) Background

In October of 2006, EPA revised the 1997 NAAQS for $PM_{2.5}$. While the annual standard remained unchanged at 15 µg /m^3 until 2012, the 24-hr standard was lowered from 65 µg /m^3 to 35 µg /m^3. The Utah Division of Air Quality (UDAQ) has monitored $PM_{2.5}$ since 2000 and found that all areas have complied with the 1997 standards. Since the promulgation of the 2006 standard, all or parts of seven Utah counties have recorded monitoring data that was not in compliance with the new 24-hr standard. In 2012, EPA lowered the annual standard to 12 µg /m^3, and all areas of the state meet this new standard.

On November 13, 2009, EPA designated the SLC NAA as nonattainment for the 2006 24-hour $PM_{2.5}$ NAAQS under the Act's general provisions for nonattainment areas. On January 4, 2013, the D.C. Circuit Court of Appeals issued a decision holding that the specific provisions for PM_{10} nonattainment areas, which are found in Part D, Subpart 4 of the Act, also apply to $PM_{2.5}$ nonattainment areas. These provisions require EPA to classify a PM nonattainment area as "moderate" at the time it is designated nonattainment. If the area cannot attain the NAAQS by the attainment date, then EPA is required to

[1] Concurrent with the State's submittal of SIP Section IX.A.36 to the EPA, Governor Gary Herbert will submit a letter to EPA requesting that EPA approve the maintenance plan and redesignate the SLC NAA to attainment.

reclassify the area as "serious." On June 2, 2014, the EPA classified the SLC NAA as a moderate nonattainment area with an attainment date of December 31, 2015.

The Act requires areas failing to meet the federal ambient $PM_{2.5}$ standard to develop a SIP with sufficient control requirements to expeditiously attain and maintain the standard. On December 22, 2014, UDAQ submitted a moderate area nonattainment SIP for the SLC NAA.[2] The modeled attainment demonstration underlying the moderate SIP assessed the likelihood of attainment by the applicable attainment date of December 31, 2015, and concluded that it would be impracticable to do so.

After reaching the statutory attainment date, the EPA was compelled to determine whether the area had or had not achieved compliance with the standard by evaluating the prior three years of quality assured data. On May 10, 2017, EPA determined that the SLC NAA did not reach attainment of the 2006 24-hour standard by the attainment date (89 FR 21711). EPA subsequently reclassified the SLC NAA from a moderate $PM_{2.5}$ nonattainment area to a serious $PM_{2.5}$ nonattainment area on June 9, 2017.

Under Subpart 4 of the Act, serious PM nonattainment areas require, in addition to the provisions submitted to meet the moderate area planning requirements, the submittal of a SIP revision that: 1) provides for attainment of the applicable NAAQS no later than the end of the 10th calendar year after the area's designation as nonattainment (December 31, 2019, for the SLC NAA), and 2) includes provisions to assure that the best available control measures (BACM) for the control of $PM_{2.5}$ and its precursors shall be implemented no later than four years after the date the area is re-classified as a serious area (June 9, 2021, for the SLC NAA). To fulfill the Subpart 4 requirements, Utah submitted a serious SIP to EPA, including a BACM analysis, on February 15, 2019, that demonstrates attainment of the $PM_{2.5}$ NAAQS by December 31, 2019. EPA SIP approval is discussed in more detail in IX.A.36.b(2).

The statutory attainment date for the SLC NAA is December 31, 2019. Under the 24-hour $PM_{2.5}$ NAAQS, compliance is determined by the average of three years of 98th percentile values. On June 5, 2019 (84 FR 26053), the EPA published a proposed rule in the Federal Register based on the validated data from 2016-2018, that the SLC NAA attained the 2006 primary and secondary 24-hour $PM_{2.5}$ NAAQS prior to the 2019 attainment date. The purpose of this SIP submittal is to demonstrate that the SLC NAA is eligible for redesignation to attainment (IX.A.36.b) and document a ten-year maintenance plan (IX.A.36.c).

IX.A.36.b Redesignation Requirements

Section 107(d)(3)(E) of the Act outlines five requirements that a nonattainment area must satisfy before an area may be eligible for redesignation from nonattainment to attainment. Table IX.A.36.1 identifies the redesignation requirements as they are stated in Section 107(d)(3)(E) of the Act. Each element will be addressed in turn, with the central element being the maintenance plan found in Subsection IX.A.36.c below.

[2] UDAQ. December 3, 2014. Utah State Implementation Plan. Control Measures for Area and Point Sources, Fine Particulate Matter, $PM_{2.5}$ SIP for the Salt Lake City, UT Nonattainment Area. Section IX. Part A.21. https://deq.utah.gov/legacy/laws-and-rules/air-quality/sip/docs/2014/12Dec/SIP%20IX.A.21_SLC_FINAL_Adopted%2012-3-14.pdf

Category	Requirement	Reference	Addressed in Section
Attainment of Standard	Three consecutive years of $PM_{2.5}$ monitoring data must show that violations of the standard are no longer occurring	CAA §107(d)(3)(E)(i)	IX.A.36.b(1)
Approved SIP	The attainment SIP for the area must be fully approved	CAA §107(d)(3)(E)(ii)	IX.A.36.b(2)
Permanent and Enforceable Emissions Reductions	The State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable	CAA §107(d)(3)(E)(iii), Calcagni memo (Sect 3, para 2)	IX.A.36.b(3)
Section 110 and Part D requirements	The State must verify that the area has met all requirements applicable to the area under section 110 and Part D	CAA: §107(d)(3)(E)(v), §110(a)(2), Sec 171	IX.A.36.b(4)
Maintenance Plan	The Administrator has fully approved the Maintenance Plan for the area as meeting the requirements of CAA §175A	CAA: §107(d)(3)(E)(iv)	IX.A.36.b(5) and IX.A.36.c

Table IX.A.36. 1 Prerequisites to Redesignation in the Federal Clean Air Act

(1) The Area Has Attained the $PM_{2.5}$ NAAQS

CAA 107(d)(3)(E)(i) – *The Administrator determines that the area has attained the national ambient air quality standard*. To satisfy this requirement, the State must show that the area is attaining the applicable NAAQS. According to EPA's guidance[3] concerning area redesignations, there are generally two components involved in making this demonstration. The first relies upon ambient air quality data which should be representative of the area of highest concentration and should be collected and quality assured in accordance with 40 CFR 58. The second component relies upon supplemental air quality modeling. Each component will be addressed in turn.

a) Ambient Air Quality Data (Monitoring) and Utah's Monitoring Network

The NAAQS for $PM_{2.5}$ are listed in 40 CFR 50.13. The 2006 24-hour NAAQS is 35 micrograms per cubic meter ($\mu g/m^3$) for a 24-hour period and is met when the 98th percentile 24-hr concentration is less than or equal to 35 $\mu g/m^3$. Each year's 98th percentile is the daily value beneath which 98% of all daily values would fall. The procedure for evaluating $PM_{2.5}$ data with respect to the NAAQS is specified in Appendix N of 40 CFR Part 50. Generally speaking, the 24-hr $PM_{2.5}$ standard is met when a three-year average of 98th percentile values is less than or equal to 35 $\mu g/m^3$.

$PM_{2.5}$ has been monitored in Utah since 2000, following the promulgation of the 1997 $PM_{2.5}$ NAAQS. UDAQ's monitors are appropriately located to assess concentration, trends, and changes in $PM_{2.5}$

[3] John Calcagni. September 4, 1992. EPA Memorandum "Procedures for Processing Requests to Redesignate Areas to Attainment."

concentrations. During Utah's wintertime temperature inversions, daily sampling and real time monitoring are necessary for both public notification and to provide data for the air quality models.

The UDAQ Air Monitoring Section maintains an ambient air monitoring network in Utah in accordance with 40 CFR 58 that collects both air quality and meteorological data. Figure IX.A.36.1 on the following page shows the location of sites along the Wasatch Front and in the Cache Valley that collect $PM_{2.5}$ data. The ambient air quality monitoring network along Utah's Wasatch Front and in the Cache Valley is routinely audited by the EPA, and meets the agency's requirements for air monitoring networks.

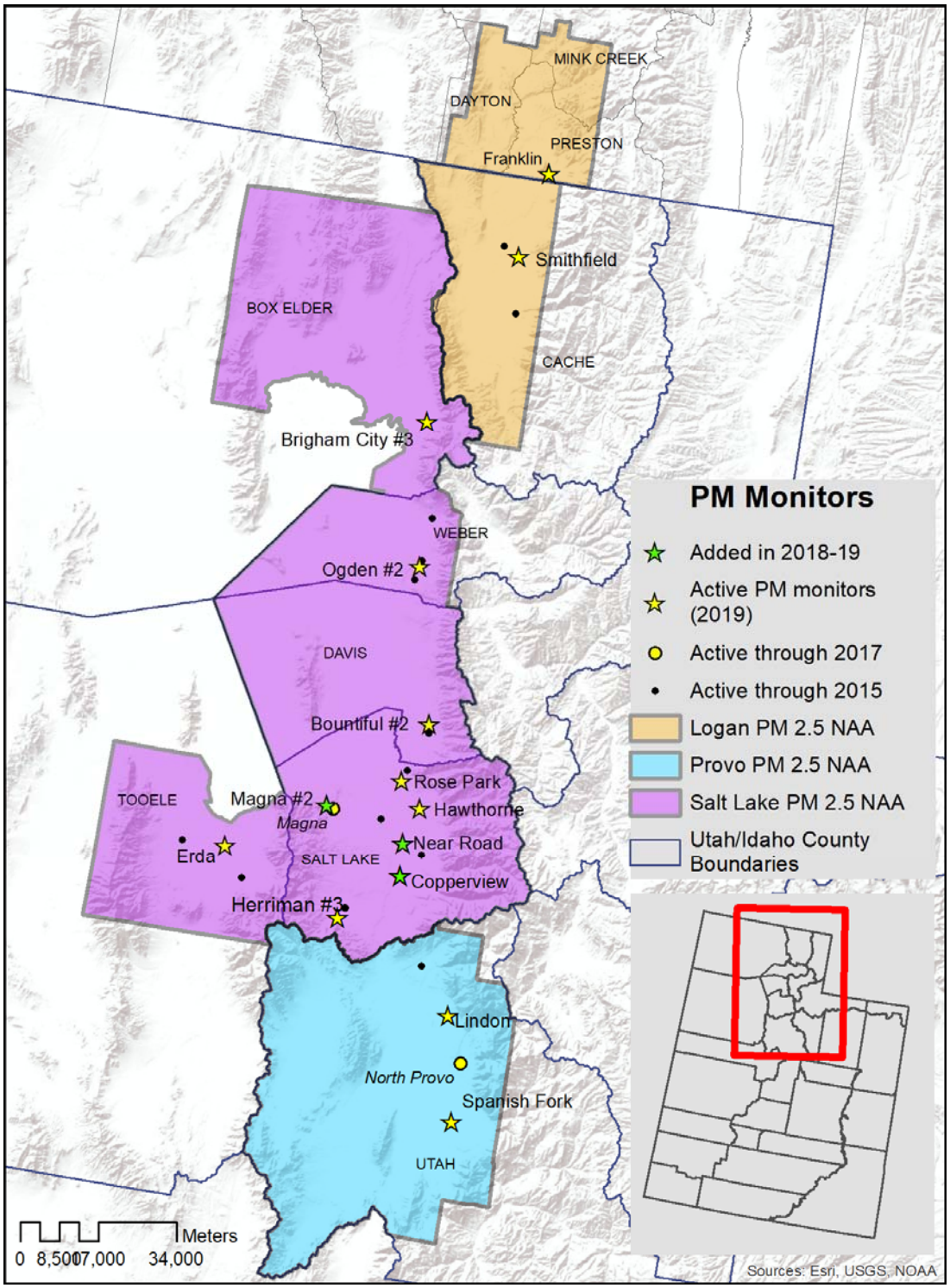

Figure IX.A.36. 1 Utah's $PM_{2.5}$ Monitoring Network

Data may be flagged when circumstances indicate that it would represent an event in the data set and not be indicative of the entire airshed or the efforts to reasonably mitigate air pollution within. 40 CFR 50.14,

Treatment of air quality monitoring data influenced by exceptional events, anticipates this, and says that a State may request EPA to exclude data showing exceedances or violations of any national ambient air quality standard that are directly due to an exceptional event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, from use in determinations. The protocol for data handling dictates that flagging is initiated by the state or local agency, and then the EPA either concurs or indicates that it has not concurred.

Table IX.A.36.2 below shows the 98th percentile values in µg /m^3 for 2016, 2017, and 2018 as well as the three-year average of these values. The validated data in Table IX.A.36.2 excludes values at the Rose Park monitor from a firework event on July 4, 2017, and a wildfire exceptional event on September 6, 2017. On May 28, 2019, UDAQ received notice[4,5] that EPA concurred with the State's flag on both exceptional events. The three-year average, or design value from 2016-2018 was used by EPA in their proposed action of determination of attainment for the SLC NAA (84 FR 26053).

	2016	2017	2018	3 year average
Brigham City	35.0	36.2	26.2	32.4
Ogden 2	39.0	27.1	24.6	30.2
Bountiful	24.7	35.2	25.7	28.5
Hawthorne	38.4	35.7	26.2	33.4
Rose Park	43.2	32.4	29.2	34.9*
Herriman 3	24.9	28.2	29.0	27.3
Erda	25.1	20.9	30.6	25.5

Table IX.A.36. 2 Monitored Ambient 24-hr $PM_{2.5}$ Data

*data excludes values from exceptional events that received EPA concurrence

b) Modeling Element

EPA guidance[6] concerning redesignation requests and maintenance plans discusses the requirement that the area has attained the standard and notes that air quality modeling may be necessary to determine the representativeness of the monitored data. Areas that were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. The SLC NAA was not designated based on modeling; therefore, additional modeling is not necessary to determine the representativeness of the monitored data. The SLC NAA clean data determination was made based on validated ambient monitored values. Consequently, modeling is not necessary to show attainment. However, modeling was conducted for the purpose of this maintenance demonstration to show continued compliance with the $PM_{2.5}$ NAAQS through the year 2035 (see section IX.A.36.c).

[4] EPA letter to UDAQ. Ref: 8ARD-PM. Concurrence on Exceptional Event Claim for July 4, 2017 $PM_{2.5}$ Data
[5] EPA letter to UDAQ. Ref: 8ARD-PM. Concurrence on Exceptional Event Claim for September 6, 2017 $PM_{2.5}$ Data
[6] Calcagni (n 3)

c) EPA Acknowledgement

The data presented in the preceding paragraphs demonstrates that the SLC NAA is attaining the 24-hr $PM_{2.5}$ NAAQS. On June 5, 2019, EPA published notice in the Federal Register (84 FR 26053) that pursuant to CAA section 199(b)(2), "the EPA is proposing to make a clean data determination for the 2006 24-hr fine particulate matter ($PM_{2.5}$) Salt Lake City, UT nonattainment area." This determination was based on quality-assured, quality-controlled, and validated ambient air monitoring data for 2016-2018.

(2) Fully Approved Attainment Plan for $PM_{2.5}$

CAA 107(d)(3)(E)(ii) - The Administrator has fully approved the applicable implementation plan for the area under section 110(k).

On February 15, 2019, Utah submitted a serious SIP[7] for the SLC NAA that demonstrated attainment of the $PM_{2.5}$ NAAQS by the attainment date, December 31, 2019.

Areas designated as nonattainment that attain the standard prior to the SIP submittal deadline, or prior to an area's approved attainment date, are eligible for reduced regulatory requirements as described in EPA's "Clean Data Policy."[8] Under the Clean Data Policy, the EPA issued a proposed clean data determination on June 5, 2019 (84 FR 26053) for the SLC NAA. The approval status of both the moderate and serious SLC SIPs is dependent on the clean data determination requirements as detailed in 40 CFR 51.1015. For a serious $PM_{2.5}$ nonattainment area, a clean data determination suspends the requirements for the state to submit an attainment demonstration, reasonable further progress (RFP) plans, quantitative milestones, and contingency measures until such time as: (1) the area is redesignated to attainment, after which such requirements are permanently discharged; or (2) the EPA determines that the area has re-violated the $PM_{2.5}$ NAAQS, at which time the state shall submit such attainment plan elements for the serious nonattainment area by a future date to be determined by the EPA. Table IX.A.36.3 details the EPA SIP approval status.

Additionally, EPA guidance[9] states that approval action on SIP elements and the redesignation request may occur simultaneously. Requirements listed in Table IX.A.36.3 that show pending approval may fall into this category.

Requirement	EPA Action & Date	FR Citation
Base Year and Projection Year Emission Inventories	Pending Approval	--
Modeled Attainment Demonstration	Pending Approval	--
BACT	Pending Approval	--

[7] UDAQ. January 5, 2019. Utah State Implementation Plan. Control Measures for Area and Point Sources, Fine Particulate Matter, Serious Area $PM_{2.5}$ SIP for the Salt Lake City, UT Nonattainment Area. Section IX. Part A.31. https://documents.deq.utah.gov/air-quality/pm25-serious-sip/part-a/DAQ-2019-005386.pdf

[8] Steve Page, Director, EPA Office of Air Quality Policy Planning and Standard. December 14, 2004. EPA Memorandum to Air Division Directors, "Clean Data Policy for the Fine Particle National Ambient Air Quality Standards."

[9] Calcagni (n 3)

On-Road Mobile BACM	Pending Approval	--
Non-Road Mobile BACM	Pending Approval	--
Area Source BACM	Pending Approval	--
MVEB	Clean Data Determination Pending Final Approval	84 FR 26053
Nonattainment New Source Review (R307-403)	Approved on 7/25/2019	84 FR 35832
Reasonable Further Progress	Clean Data Determination Pending Final Approval	84 FR 26053
Quantitative Milestones	Clean Data Determination Pending Final Approval	84 FR 26053
Contingency Measures	Clean Data Determination Pending Final Approval	84 FR 26053

Table IX.A.36. 3 SLC, UT Serious SIP Approval Status

The SIP elements still required under the clean data policy[10] include emission inventories, NNSR requirements, and BACM/BACT. The EPA approved R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas on July 25, 2019 (84 FR 35832), which covers the NNSR requirement for the $PM_{2.5}$ attainment plans. The State has submitted the emission inventories, and BACM/BACT elements to the EPA, including the R307-300 series amendments and the point source BACT emission limitation and operating practices (Utah SIP Section IX.H). These SIP elements are still pending EPA approval.

While many of the moderate and serious SIP elements are suspended under the clean data determination, many of the moderate SIP elements have been approved. As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control $PM_{2.5}$ and $PM_{2.5}$ precursors. On February 25, 2016 (81 FR 9343) and October 19, 2016 (81 FR 71988), the EPA approved area source rule revisions and reasonably available control measures (RACM) analyses (where appropriate) for the majority of the R307-300 series. See Table IX.A.36.4 for details on rules, approval dates, and implementation schedules. For the SLC NAA, the BACM analysis resulted in revisions to 13 different area source rules which affect surface coating, graphic arts, and aerospace manufacture and rework facilities.

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-302 Solid Fuel Burning Devices [1] EPA conditionally approved* October 19, 2016 (81 FR 71988).	February 1, 2017
R307-303 Commercial Cooking [1] EPA approved February 25, 2016 (81 FR 9343).	December 15, 2015

[10] Environmental Protection Agency. August 24, 2016. Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements; Final Rule. 82 FR 58128.

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-304 Solvent Cleaning [1]	December 6, 2017
R307-307 Road Salting and Sanding EPA approved February 25, 2016 (81 FR 9343).	January 1, 2014
R307-309 Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust [1] EPA proposed for approval September 14, 2017 (82 FR 43205).	Salt Lake County, Utah County, and the City of Ogden – January 1, 2013. Remaining NAAs – April 1, 2013. Amended August 4, 2017
R307-312 Aggregate Processing Operations for $PM_{2.5}$ Nonattainment Areas. EPA approved October 19, 2016 (81 FR 71988).	February 4, 2016
R307-335 Degreasing and Solvent Cleaning Operations [1] EPA approved February 25, 2016 (81 FR 9343).	All sources within Salt Lake and Davis Counties R307-335-3 through R307-335-6 – January 1, 2013. All other sources defined in R307-335-2 – September 1, 2013. All sources within Box Elder, Cache, Utah, Weber, and Tooele Counties R307-335-7 – August 1, 2014 Amended October 29, 2017, by removing sections 6 & 7 to for rule R307-304
R307-342 Adhesives & Sealants [1] EPA approved February 25, 2016 (81 FR 9343).	December 1, 2014
R307-343 Emissions Standards for Wood Furniture Manufacturing Operations [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – September 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-344 Paper, Film & Foil Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-345 Fabric & Vinyl Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2011. Amended December 6, 2017
R307-346 Metal Furniture Surface Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-347 Large Appliance Surface Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-348 Magnet Wire Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-349 Flat Wood Panel Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-350 Miscellaneous Metal Parts and Products Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – September 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-351 Graphic Arts [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-352 Metal Containers, Closure, and Coil Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-353 Plastic Parts Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-354 Automotive Refinishing Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-355 Control of Emissions from Aerospace Manufacture and Rework Facilities [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended March 8, 2018
R307-356 Appliance Pilot Light [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2013
R307-357 Consumer Products [1] EPA approved February 25, 2016 (81 FR 9343)	May 8, 2014
R307-361 Architectural Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	October 31, 2013

Table IX.A.36. 4 Area Source Rules Implementation Schedule and EPA Approval Status

[1] control measure implementation schedule and confirmation that measures have been implemented

[2] control measure implementation schedule and review if any new sources located in the NAA

*UDAQ submitted the committed revisions on February 1, 2017, within the one-year conditional approval window

The clean data determination has suspended all other elements of the SLC NAA $PM_{2.5}$ attainment plan, including reasonable further progress (RFP) plans, quantitative milestones, and contingency measures at this time. Considering the suspended SIP elements through the clean data policy and the approval or expected approval of required elements, Utah has met requirement 107(d)(3)(E)(ii) for the SLC NAA.

(3) Improvements in Air Quality Due to Permanent and Enforceable Reductions in Emissions

CAA 107(d)(3)(E)(iii) - *The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and*

enforceable reductions. Speaking further on the issue, EPA guidance[11] reads that the State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. In the following sections, both the improvement in air quality and the emission reductions themselves will be discussed.

a) Improvement in Air Quality

The improvement in air quality with respect to $PM_{2.5}$ can be shown in a number of ways. Improvement, in this case, is relative to the various control strategies that affected the airshed. For the SLC NAA, these control strategies were implemented as the result of both the moderate SIP and the serious SIP, submitted to EPA in December 2014 and February 2019, respectively. The various control measure effective dates are detailed in Tables IX.A.36.4 and IX.A.36.6.

An assessment of the ambient air quality data collected at monitors in the NAA from the year monitoring began to 2018 (the last year of validated data) shows an observable decrease in monitored $PM_{2.5}$ (see Figures IX.A.36.2 and IX.A.36.3). The SLC NAA is designated nonattainment only for the 24-hour health standard, not for the annual standard. However, it is useful to observe both the 98th percentile average of 24-hr data as well as the annual arithmetic mean to understand trends. Ambient concentrations in excess of the 24-hr standard are typically only incurred during winter months when cold-pool conditions drive and trap secondary $PM_{2.5}$. The actual cold-pool temperature inversions vary in strength and duration from year to year, and the $PM_{2.5}$ concentrations measured during those times reflect this variability far more than they reflect gradual changes in the emissions of direct $PM_{2.5}$ and $PM_{2.5}$ precursors. This variability is apparent in Figure IX.A.36.3. Despite the variability, if a line is fit through the 24-hr data, the trend is noticeably downward and indicates an improvement of approximately one µg /m^3 per year.

This episodic variability is reduced by looking at annual mean values of $PM_{2.5}$ concentrations shown in Figure IX.A.36.2. The data is still skewed more by winter data than summer data. It includes all of the high values identified as the 98th percentiles, as well as the values ranked even higher. Still, the trend is downward. Fitting a line through the data collected at the Hawthorne site (chosen because it has recorded, validated data since 2000 and consistently records the 2nd highest values after Rose Park) reveals a trend that noticeably decreases and indicates an improvement of approximately 4.3 µg /m^3 over the 18-year span.

Improvements must be considered in light of the attainment date as well as the date by which all controls must be implemented. For the SLC NAA, the attainment date is December 31, 2019; however, 40 CFR 51.1011 establishes that control measures must be implemented no later than the beginning of the year containing the applicable attainment date. Thus, for purposes of reasonable further progress and SIP credit, the deadline for control measure implementation is January 1, 2019. Any control measures implemented beyond such date are instead regarded as additional feasible measures (that other than timing, meet the definition of BACM). Thus, by the end of 2018, the control measure emission reduction will be reflected in the ambient data, while the additional feasible measures reduction will be reflected as late as June 9, 2021 (four years after the date that the SLC NAA was redesignated as serious). The

[11] Calcagni (n 3)

requirement to ensure BACM/BACT is in addition to the requirements from the moderate Area SIP, which included RACM and RACT.

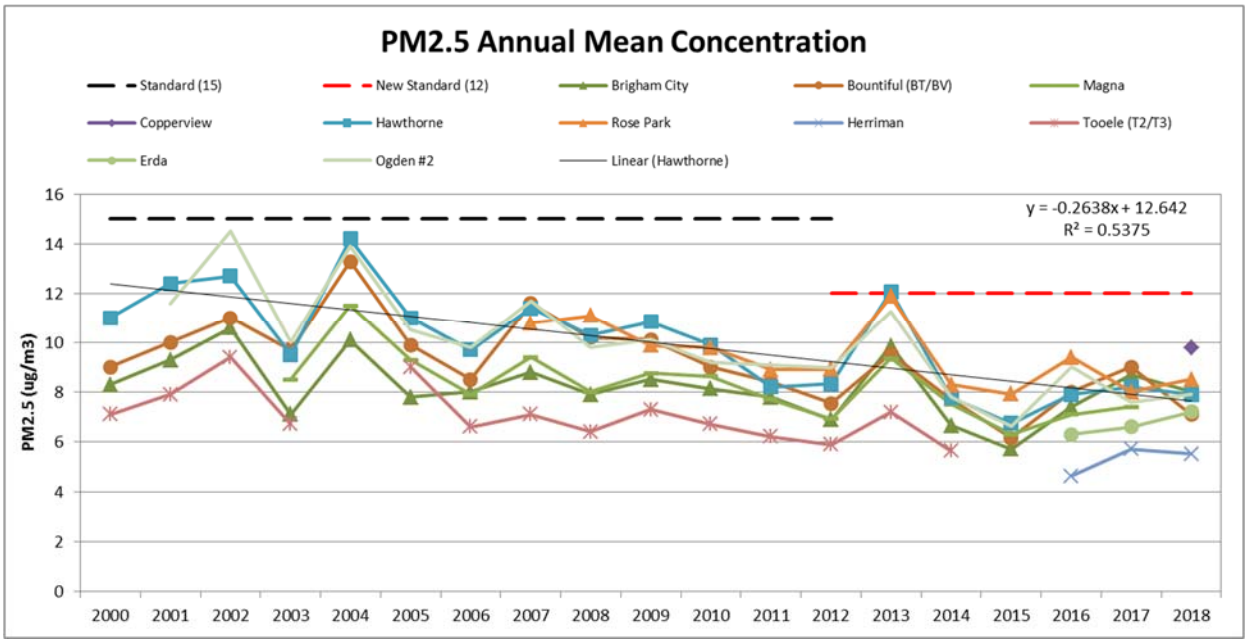

Figure IX.A.36. 2 SLC NAA $PM_{2.5}$ Annual Mean Concentration

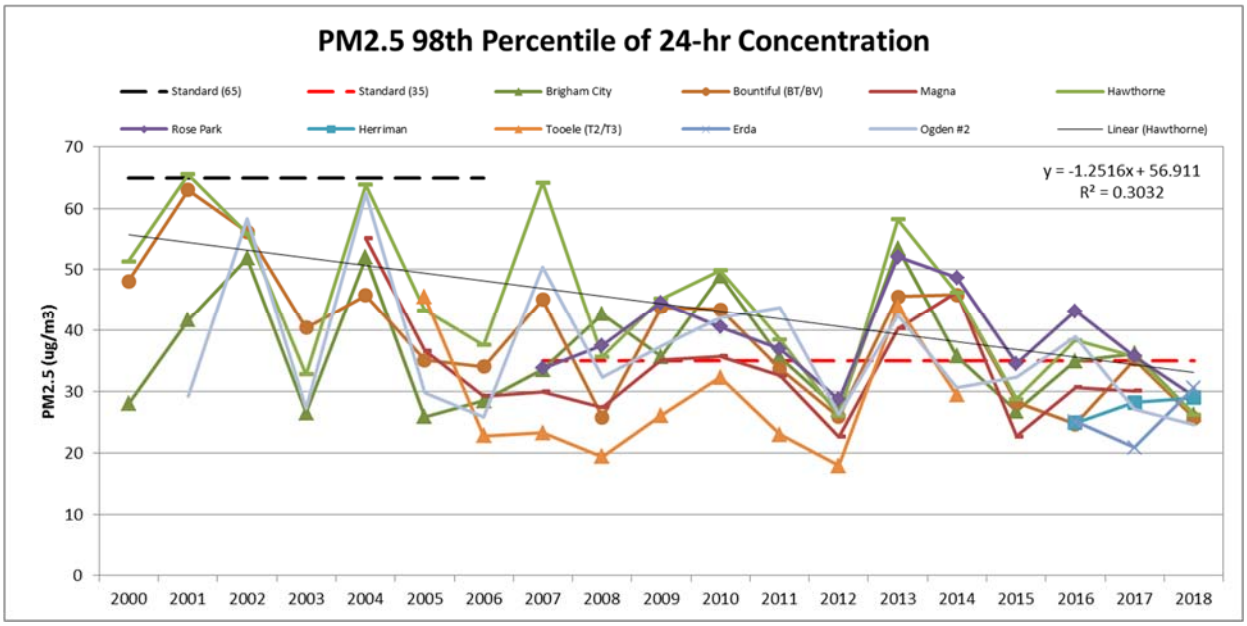

Figure IX.A.36. 3 SLC NAA $PM_{2.5}$ 98th Percentile of 24-hr Concentration

i. Reduction in Emissions

As stated above, EPA guidance[12] says that the State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable. In making this showing, the State should estimate the percent reduction (from the year that was used to determine the design value) achieved by Federal measures such as motor vehicle control, as well as by control measures that have been adopted and implemented by the State.

As mentioned, the ambient air quality data presented in Subsection IX.A.36.b(3)(a) includes values prior to the nonattainment designation through 2018 to illustrate the lasting effect of the implemented control strategies. In discussing the effect of the controls, as well as the control measures themselves, however, it is important to keep in mind the time necessary for their implementation.

The moderate nonattainment SIP for the SLC NAA included a statutory date for the implementation of RACM/RACT of December 31, 2014. Thus, 2015 marked the first year in which RACM/RACT was reflected in the emissions inventories for the SLC NAA. Section 189(c) of the CAA identifies, as a required plan element, quantitative milestones which are to be achieved every three years, and which demonstrate reasonable further progress (RFP) toward attainment of the standard by the applicable date. As defined in CAA Section 171(1), the term reasonable further progress means "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." Hence, the milestone report must demonstrate that the control strategy is achieving reasonable progress toward attainment.

[12] Ibid

The RACM prescribed by the moderate nonattainment SIP and the subsequent implementation by the State is discussed in more detail in a milestone report submitted for the SLC NAA to EPA on March 23, 2018, within the 90 day post-milestone date required by CAA 189(c)(2) and 51.1013(b). On October 24, 2018, EPA sent Governor Gary Herbert a letter stating "The Environmental Protection Agency has determined that the 2017 Quantitative Milestone Reports are adequate. The basis for this determination is set forth in the enclosures. This determination is based on the EPA's review of information contained in the Moderate Area Plans and additional information provided in the 2017 Quantitative Milestone Reports." This approval letter is included in the TSD for this SIP submittal. Much of the downward trend in the ambient data as seen in Figures IX.A.36.2 and IX.A.36.3 is attributable to the controls implemented through the moderate SIP.

40 CFR 51.1011 establishes that control measures must be implemented no later than the beginning of the year containing the applicable attainment date, January 1, 2019, for the SLC NAA. Any control measures implemented beyond such date are instead regarded as additional feasible measures. Implementation schedules for point source control measures are included in Table IX.A.36.5. Emission reductions leading to lower ambient values can be observed in Figures IX.A.36.2 and IX.A.36.3, with further improvements expected beyond 2019 as a result of the more stringent BACM/BACT requirements.

Included in the serious SIP for the SLC NAA are additional BACT emission limits for eight stationary point sources. The changes in these requirements are reflected in Section IX, Part H (Emission Limits and Operating Practices) of the SIP.

Company	RACT Equipment Update(s)	BACT Requirement(s)	Implementation Schedule	Quantify Reduction (tons/yr)	Compliance Mechanism
ATK Launch Systems Inc.	Two (2) 25 MMBTU/hr Natural Gas Boilers	Ultra Low Nox Burners	31-Dec-24	NOx ~ 10.44 tons/yr	AO Issuance
Big West Oil Company	Hydrocarbon Flares	Limited routine flaring between Oct 1st and March 31st.	Date of SIP Approval	N/A	AO Issuance
	Carbon Canisters/Fire Pumps	Miscellaneous Carbon Canister and Fire Pump Changes	31-Dec-19	VOC ~ 15.4 tons/yr	AO Issuance
Chemical Lime Company	Lime Kiln	Selective Non-catalytic Reduction	Upon Source Start-up	N/A	AO Issuance
		New Baghouse	Upon Source Start-up	N/A	AO Issuance
Chevron Products Co.	Boilers/Compressor Drivers	Replacement of 4 Compressor Drivers	31-Dec-19	N/A	AO Issuance
	Tier 3 Fuels	Removal of Boilers 1, 2, & 4; Replacement with Boiler 7	31-Dec-19	N/A	AO Issuance
Compass Minerals	Boilers #1 & #2 - Required Nox Limitations	Ultra low Nox burners/Upgrades to Baghouses	31-Dec-19	NOx ~ 10 tons/yr	AO Issuance
	PM2.5 Filterable and Condensable emission				
	limits required for 14 emission points				
Hexel Corporation	Carbon Fiber Lines	Addition of Filter Boxes on Lines 13 & 14	31-Dec-19	PM 2.5 ~ 20 tons/yr	AO Issuance
		De-NOx Water Direct Fired Thermal Oxidizer on Lines 13, 14, 15 & 16	31-Dec-24	NOx ~ 75 tons/yr	AO Issuance
		Low-Nox Burners w/fuel gas re-circulation on Lines 3, 4, & 7	31-Dec-24	NOx ~ 25.5 tons/yr	AO Issuance
Hill Air Force Base	Painting and De-painting	VOC emission limitation for painting activities.	31-Dec-24	PM2.5 ~ 11.8 tons/yr	AO Issuance
	Boilers	Requirement that no boilers manufactured after January 1, 1989		NOx ~ 434.38 tons/yr	
		over 30 MMBtu/hr be operated.		VOC ~ 8.53 tons/yr	
Holly Corporation	Wet Gas Scrubber & Boiler	Installation of Wet Gas Scrubber and Boiler Replacement	N/A	N/A	N/A
Kennecott Utah Copper					
Mine	Mine	Mileage limitation and Required lower emission rate for in-pit crusher	Date of SIP Approval	PM2.5 ~ 4.33 tons/yr	AO Issuance
Power Plant	Power Plant upgrades	Unit #4: Installation of SCR and Overfired Air;	1-Jan-19	NOx ~ 1,268.8 tons/yr (8760 hrs of operation)	AO Issuance
		Unit #4: Lower ppm and lb/hr testing requirement.		NOx ~ 302.43 tons/yr (2088 hrs of operation)	AO Issuance
Smelter & Refinery	Smelter & Refinery upgrades	Replacement of one (1) 82 MMBtu/hr Tankhouse Boiler	1-Dec-20	NOx ~ 35.04 tons/yr (8760 hrs of operation)	AO Issuance
Nucor Steel Mills	No Changes	No BACT Changes	N/A	N/A	N/A
Pacificorp Energy					
Gadsby Power Plant	No Changes	No BACT Changes	N/A	N/A	N/A
Proctor & Gamble	Utility Boilers	PM2.5 Filterable and Condensable Limits & Nox Limits	N/A	N/A	AO Issuance
		Workload changes at facility			
Tesoro Refining	Refinery Operations	Installation of Wet Gas Scrubber	31-Oct-19	N/A	AO DAQE-103350075-18
University of Utah	Heating Plant	Replacement of Boiler #4. Installation of Boiler #9.	31-Dec-19	NOx ~ 44.29 tons/yr	AO Issuance
		Natural Gas limitations on Boilers #1, #3, & #4.	30-Sep-19	NOx ~ 4.27 tons/yr	AO Issuance
Utah Municipal Power Agency	Power Plant	No BACT required changes	N/A	N/A	N/A
Vulcraft	Steel Fabrication	No BACT required changes	N/A	N/A	N/A

Table IX.A.36. 5 Point Source Emission Control Measure Implementation Schedule and Compliance Mechanism

As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control $PM_{2.5}$ and $PM_{2.5}$ precursors. For the serious SIP area source BACM review, each of UDAQ's existing area source rules were re-evaluated to ensure that all appropriate source categories were addressed in rulemaking and that the level of control required is consistent with BACM. For newly identified controls or enhancement of existing controls, an evaluation was made to determine technological and economic feasibility. The BACM review resulted in revisions to 13 different area source rules which affect surface coating (for a variety of different surfaces), graphic arts, and aerospace manufacture & rework facilities. The rules and amendments are listed in Table IX.A.36.4. Table IX.A.36.6 shows the effectiveness of the area source rules within the SLC NAA.

SLC NAA	Emissions Reduced in Pounds Per Day (lb/day)									
Area Source Rule Name	2016 Base Year					2017 Milestone Year				
	NOx	VOC	NH3	SO2	PM2.5	NOx	VOC	NH3	SO2	PM2.5
R307-342 adhesive/sealants	0.0	869.9	0.0	0.0	0.0	0.0	1,176.6	0.0	0.0	0.0
R307-355 aerospace manufacture & rework										
R307-312 aggregate processing	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	5.6
R307-347 appliance surface coating										
R307-354 automotive refinishing	0.0	344.2	0.0	0.0	0.0	0.0	698.1	0.0	0.0	0.0
R307-352 metal container, closure & coil coating										
R307-303 commercial cooking	0.0	51.3	0.0	0.0	0.0	0.0	52.0	0.0	0.0	0.0
R307-357 consumer products	0.0	4,372.5	0.0	0.0	0.0	0.0	4,435.4	0.0	0.0	0.0
R307-335 degreasing & solvent cleaning										
R307-345 fabric & vinyl coatings										
R307-349 flat wood panel coatings										
R307-309 fugitive dust	0.0	0.0	0.0	0.0	1,442.4	0.0	0.0	0.0	0.0	1,455.7
R307-351 graphic arts										
R307-208 outdoor wood boilers	5.8	188.2	4.8	5.8	178.6	5.6	187.4	4.6	5.6	178.4
R307-221 landfill controls	0.0	276.5	0.0	0.0	0.0	0.0	281.9	0.0	0.0	0.0
R307-348 magnet wire coatings										
R307-346 metal furniture surface coating										
R307-350 misc metal parts & product coating										
R307-361 architectural coating	0.0	6,089.7	0.0	0.0	0.0	0.0	6,177.3	0.0	0.0	0.0
R307-344 paper/film/foil coating										
R307-356 appliance pilot light	3,383.8	198.0	0.0	21.6	15.5	4,511.6	264.0	0.0	28.8	20.6
R307-353 plastic parts coating										
R307-302 residential wood burning ban	1,344.8	10,436.3	389.1	133.9	9,046.5	1,339.2	10,406.0	386.3	133.3	9,019.9
R307-230 water heaters										
R307-343 wood furniture manufacturing										
Total Area Source Emissions Reduced	**4,734.4**	**22,826.6**	**393.9**	**161.3**	**10,688.6**	**5,856.4**	**23,678.5**	**390.9**	**167.7**	**10,680.2**

SLC NAA	Emissions Reduced in Pounds Per Day (lb/day)									
Area Source Rule Name	2019 Attainment Year					2020 Milestone Year				
	NOx	VOC	NH3	SO2	PM2.5	NOx	VOC	NH3	SO2	PM2.5
R307-342 adhesive/sealants	0.0	1,513.1	0.0	0.0	0.0	0.0	1,533.7	0.0	0.0	0.0
R307-355 aerospace manufacture & rework	0.0	28.7	0.0	0.0	0.0	0.0	43.1	0.0	0.0	0.0
R307-312 aggregate processing	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	5.6
R307-347 appliance surface coating	0.0	0.5	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0
R307-354 automotive refinishing	0.0	1,436.0	0.0	0.0	0.0	0.0	1,817.8	0.0	0.0	0.0
R307-352 metal container, closure & coil coating	0.0	83.6	0.0	0.0	0.0	0.0	125.0	0.0	0.0	0.0
R307-303 commercial cooking	0.0	53.6	0.0	0.0	0.0	0.0	54.3	0.0	0.0	0.0
R307-357 consumer products	0.0	4,559.9	0.0	0.0	0.0	0.0	4,625.3	0.0	0.0	0.0
R307-335 degreasing & solvent cleaning	0.0	1,014.9	0.0	0.0	0.0	0.0	1,527.9	0.0	0.0	0.0
R307-345 fabric & vinyl coatings	0.0	362.0	0.0	0.0	0.0	0.0	443.0	0.0	0.0	0.0
R307-349 flat wood panel coatings	0.0	11.4	0.0	0.0	0.0	0.0	17.1	0.0	0.0	0.0
R307-309 fugitive dust	0.0	0.0	0.0	0.0	1,484.0	0.0	0.0	0.0	0.0	1,497.1
R307-351 graphic arts	0.0	995.5	0.0	0.0	0.0	0.0	1,062.4	0.0	0.0	0.0
R307-208 outdoor wood boilers	5.8	186.6	4.8	5.8	177.0	5.8	186.0	4.8	5.8	176.6
R307-221 landfill controls	0.0	293.8	0.0	0.0	0.0	0.0	299.4	0.0	0.0	0.0
R307-348 magnet wire coatings	0.0	22.0	0.0	0.0	0.0	0.0	22.2	0.0	0.0	0.0
R307-346 metal furniture surface coating	0.0	167.1	0.0	0.0	0.0	0.0	249.5	0.0	0.0	0.0
R307-350 misc metal parts & product coating	0.0	273.8	0.0	0.0	0.0	0.0	411.4	0.0	0.0	0.0
R307-361 architectural coating	0.0	6,344.1	0.0	0.0	0.0	0.0	6,441.8	0.0	0.0	0.0
R307-344 paper/film/foil coating	0.0	97.9	0.0	0.0	0.0	0.0	147.6	0.0	0.0	0.0
R307-356 appliance pilot light	5,834.7	396.4	0.0	43.2	31.0	4,926.2	361.8	0.0	39.5	28.3
R307-353 plastic parts coating	0.0	189.3	0.0	0.0	0.0	0.0	222.4	0.0	0.0	0.0
R307-302 residential wood burning ban	1,332.3	10,343.1	385.7	132.0	8,964.8	1,327.6	10,311.5	384.5	131.7	8,939.5
R307-230 water heaters	1,396.8	0.0	0.0	0.0	0.0	1,632.5	0.0	0.0	0.0	0.0
R307-343 wood furniture manufacturing	0.0	604.1	0.0	0.0	0.0	0.0	910.9	0.0	0.0	0.0
Total Area Source Emissions Reduced	**8,569.5**	**28,977.4**	**390.5**	**181.0**	**10,662.3**	**7,892.1**	**30,814.8**	**389.3**	**177.0**	**10,647.1**

Table IX.A.36. 6 Area Source Rule Emissions Reduction in SLC NAA

In reality, the NAAs should expect to see continued improvement in the next five to ten years as a result of the phase-in period of a number of the area source rules and some additional feasible measures installed at point sources. For example, the gas-fired water heater rule R307-230 requires that only ultra-low NOx gas-fired water heaters be sold or installed after July 1, 2018, but it takes years for water heater turnover to occur. In addition, the 13 rules that were revised during the serious SIP BACM review were implemented at the state level in 2018 and have a five-year phase-in period, resulting in full emission reduction by 2023. Therefore, additional emissions reductions will be seen. These phase-in periods were considered in the inventories used for modeling in this SIP.

Existing controls not implemented through the SIP process also affect the emission rates from non-stationary source categories. The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that produce $PM_{2.5}$. Tier 1 and 2 standards were implemented by 1997 and 2008 respectively. Tier 3 vehicle/engine standards were initiated with new vehicles coming to market in 2017 (25% of new sales) with full phase in by 2021 (100% of new sales). For gasoline, the five Wasatch Front refineries and the Sinclair refinery in Wyoming that also supplies

gasoline to the Wasatch Front market, are considered small refineries by EPA's rule. As such, these refineries have a tier 3 delayed implementation date of January 1, 2020 to produce a tier 3 (10 ppm sulfur) gasoline product or produce a gasoline product (greater than 10 ppm sulfur) with compensating sulfur credits. Similarly, the Heavy-Duty Engine and Vehicle Standards took effect in 2007 and were fully phased in by 2010. Air quality benefits, particularly those stemming from the light-duty and heavy-duty vehicle standards, continue to be realized as older, higher-polluting vehicles are replaced by newer, cleaner vehicles.

To supplement the federal motor vehicle control program, Inspection and Maintenance Programs were implemented in Salt Lake, Davis, and Weber Counties. These programs have been effective in identifying vehicles that no longer meet the emission specifications for their respective makes and models and in ensuring that those vehicles are repaired in a timely manner.

Emissions from non-road mobile emission sources also benefit from several significant regulatory programs enacted at the federal level. This category of emitters includes airplanes, locomotives, hand-held engines, and larger portable engines such as generators and construction equipment. The effectiveness of these controls has been incorporated into the "NONROAD" model UDAQ uses to compile the inventory information for this source category.

SLC NAA *Emissions by Year	Base Yr.	Projection Years with Growth & Controls			
	2016	2017	2019	2020	**RFP
$PM_{2.5}$	**15.4**	**15.8**	**16.1**	**16.0**	**0.2**
NOx	103.6	100.2	94.9	87.9	-2.9
SO2	5.6	5.6	4.9	4.9	-0.2
VOC	91.7	91.5	86.8	83.5	-1.6
NH3	16.0	16.0	16.0	15.9	0.0
$PM_{2.5}$ Precursors	**216.9**	**213.2**	**202.6**	**192.2**	**-4.8**
Total	**232.3**	**229.0**	**218.7**	**208.2**	**-4.5**

*Emissions are reported in tons per average-episode-day

**Emission change per year, (ton/day) averaged from Base Year (2016) through Attainment Year (2019)

Table IX.A.36. 7 Emission Reductions in SLC NAA from all Controls in Serious SIP

The cumulative effect of all permanent and enforceable emission reductions is represented in Table IX.A.36.7. The emissions reductions resulting from federal programs and the RACM/RACT plus BACM/BACT controls incorporated into the Utah SIP and promulgated at the State level, result in emission reductions that are consistent with the notion of permanent and enforceable improvements in air quality. Taken together with the trends in ambient air quality illustrated in the preceding paragraph, along with the continued implementation of the nonattainment SIP for the SLC NAA, they provide a reliable indication that these improvements in air quality reflect the application of permanent steps to improve the air quality in the region.

(4) State has Met Requirements of Section 110 and Part D

CAA 107(d)(3)(E)(v) - The State containing such area has met all requirements applicable to the area under section 110 and part D. Section 110 of the Act deals with the broad scope of state implementation plans and the capacity of the respective state agency to effectively administer such a plan. Part D deals specifically with plan requirements for nonattainment areas, including those requirements that are specific to $PM_{2.5}$.

a) Section 110

The State has met all requirements applicable to the SLC NAA under Section 110 of the Act. Section 110(a)(2) contains the general requirements or infrastructure elements necessary for EPA approval of the SIP. On September 21, 2010, the State submitted an Infrastructure SIP to EPA demonstrating compliance with the requirements of Section 110 that are applicable to the 2006 $PM_{2.5}$ NAAQS. EPA approved the State's Infrastructure SIP on November 25, 2013 (78 FR 63883) for all Section 110 requirements that are applicable to redesignation.

b) Part D Subpart 1 and 4

Part D of the Act addresses "Plan Requirements for Nonattainment Areas." Subparts 1 and 4 of Part D contain planning elements that must be included in the SIP. This includes the requirement to submit an attainment demonstration, reasonable further progress plans, quantitative milestones and milestone reports, a motor vehicle emission budget for the attainment year for the purposes of transportation conformity, and contingency measures for the area. However, upon EPA's issuance of a final clean data determination demonstrating that the SLC NAA has attained the standard, these requirements are suspended (40 C.F.R. § 51.1015(b) and 84 FR 26054).

The remaining Part D requirements that are relevant to redesignation are requirements that are independent of helping the area achieve attainment. This includes the requirement to have a nonattainment new source review ("NNSR") program, emissions inventory submission, and implementation of BACM/BACT. The State has satisfied these remaining requirements. Utah's NNSR program can be found in Utah Administrative Rule R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas. EPA fully approved the current version of the NNSR program on July 25, 2019 (84 FR 35832). The BACM/BACT requirements and the emissions inventory were included in the serious SIP for the SLC NAA that the State submitted to the EPA on February 15, 2019. Upon EPA's approval of these elements prior to or concurrently with EPA's action on the maintenance plan/redesignation request, Utah will have complied with all applicable Part D requirements.

(5) Maintenance Plan for $PM_{2.5}$ Areas

As stated in the Act, an area may not be redesignated to attainment without first submitting and receiving EPA approval of a maintenance plan. The maintenance plan is a quantitative showing that the area will continue to attain the NAAQS for an additional 10 years (from EPA approval), accompanied by sufficient assurance that the terms of the numeric demonstration will be administered by the State and by the EPA in an oversight capacity. The maintenance plan is the central criterion for redesignation. It is contained in the following subsection.

IX.A.36.c Maintenance Plan

CAA 107(d)(3)(E)(iv) - The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A. An approved maintenance plan is one of several criteria necessary for area redesignation as outlined in Section 107(d)(3)(E) of the Act. The maintenance plan itself, as described in Section 175A of the Act and further addressed in EPA guidance[13] has its own list of required elements. The following table is presented to summarize these requirements. Each will then be addressed in turn.

Category	Requirement	Reference	Addressed in Section
Maintenance demonstration	Provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation.	CAA: 175A(a)	IX.A.36.c (1)
Revise in 8 Years	The State must submit an additional revision to the plan, 8 years after redesignation, showing an additional 10 years of maintenance.	CAA: 175A(b)	IX.A.36.c (6)
Continued Implementation of Nonattainment Area Control Strategy	The Clean Air Act requires continued implementation of the NAA control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions.	CAA: 175A(c), 110(l), Calcagni memo	IX.A.36.c (5)
Contingency Measures	Areas seeking redesignation from nonattainment to attainment are required to develop contingency measures that include State commitments to implement additional control measures in response to future violations of the NAAQS.	CAA: Sec 175A(d)	IX.A.36.c (8)
Verification of Continued Maintenance	The maintenance plan must indicate how the State will track the progress of the maintenance plan.	Calcagni memo	IX.A.36.c (7)

Table IX.A.36. 8 CAA Maintenance Plan Requirements

(1) Demonstration of Maintenance - Modeling Analysis

CAA 175A(a) - Each State which submits a request under section 107(d) for redesignation of a nonattainment area as an area which has attained the NAAQS shall also submit a revision of the applicable implementation plan to provide for maintenance of the NAAQS for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be required to ensure such maintenance. The maintenance demonstration is discussed in EPA guidance[14] as one of the core provisions that should be considered by states for inclusion in a maintenance plan.

According to the EPA guidance, a State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory (discussed below) or by modeling to show that the future mix of sources and

[13] Ibid
[14] Ibid

emission rates will not cause a violation of the NAAQS. Utah has elected to make its demonstration based on air quality modeling.

(a) Introduction

The following chapter presents an analysis using observational datasets to detail the chemical regimes of Utah's NAAs. Prior to the develop of this maintenance plan, UDAQ conducted a technical analysis to support the development of the serious SIP for the SLC NAA. The analysis included preparation of emissions inventories and meteorological data, and the evaluation and application of a regional photochemical model. Part of this process included episode selection to determine the episode that most accurately replicates the photochemical formation of ambient $PM_{2.5}$ during a persistent cold air pool episode in the airshed. For this maintenance plan, UDAQ is using the same episode that was used for the serious SIP modeling.

(b) Photochemical Modeling

UDAQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 6.30 for air quality modeling. CAMx v6.30 is a state-of-the-art air quality model that includes State of Utah funded enhancements for wintertime modeling. These enhancements include snow chemistry, topographical and surface albedo refinements. CAMx is an EPA approved model for use in SIP modeling. Its configuration for use in this SIP, with respect to model options and model adjustments, is discussed in the Technical Support Document.

i. Emissions Preparation

The emissions processing model used in conjunction with CAMx is the Sparse Matrix Operator Kernel Emissions Modeling System (SMOKE) version 3.6.5[15]. SMOKE prepares the annual emissions inventory for use in the air quality model. There are three aspects to the preparation of an annual emissions inventory for air quality modeling:

- Temporal: Convert emissions from annual to daily, weekly and hourly values.
- Spatial: Convert emissions from a county-wide average to gridded emissions.
- Speciation: Decompose $PM_{2.5}$ and VOC emissions estimates into individual subspecies using the latest Carbon Bond 6 speciation profiles.

The process of breaking down emissions for the air quality model was done with sets of activity profiles and associated cross reference files. These are created for point or large industrial source emissions, smaller area sources, and mobile sources. Direct $PM_{2.5}$ and $PM_{2.5}$ precursor estimates were modified via temporal profiles to reflect wintertime conditions.

Activity profiles and their associated cross reference files from the EPA's 2011v6[16] modeling platform were used. For stationary non-point and mobile sources, spatial surrogates from the EPA Clearinghouse

[15] https://www.cmascenter.org/smoke/
[16] https://www.epa.gov/air-emissions-modeling/2011-version-6-air-emissions-modeling-platforms

for Inventories and Emissions Factors (CHIEF[17]) were used to distribute emissions in space across the modeling domain. Emissions from large industrial sources (point sources) were placed at the location of the source itself. Where reliable local information was available (population density, traffic demand modeling, residential heating), profiles and surrogates were modified or developed to reflect that information.

ii. Photochemical Modeling Domains and Grid Resolution

The UDAQ CAMx v6.30 modeling framework consists of two spatial domains: a high-resolution 1.33 km domain nested inside of a coarser 4 km domain (see Figure IX.A.36.4). This configuration allows one to efficiently integrate regional effects with local impacts within the SLC NAA. Vertical resolution in the model consists of 41 layers extending to the top of the atmosphere.

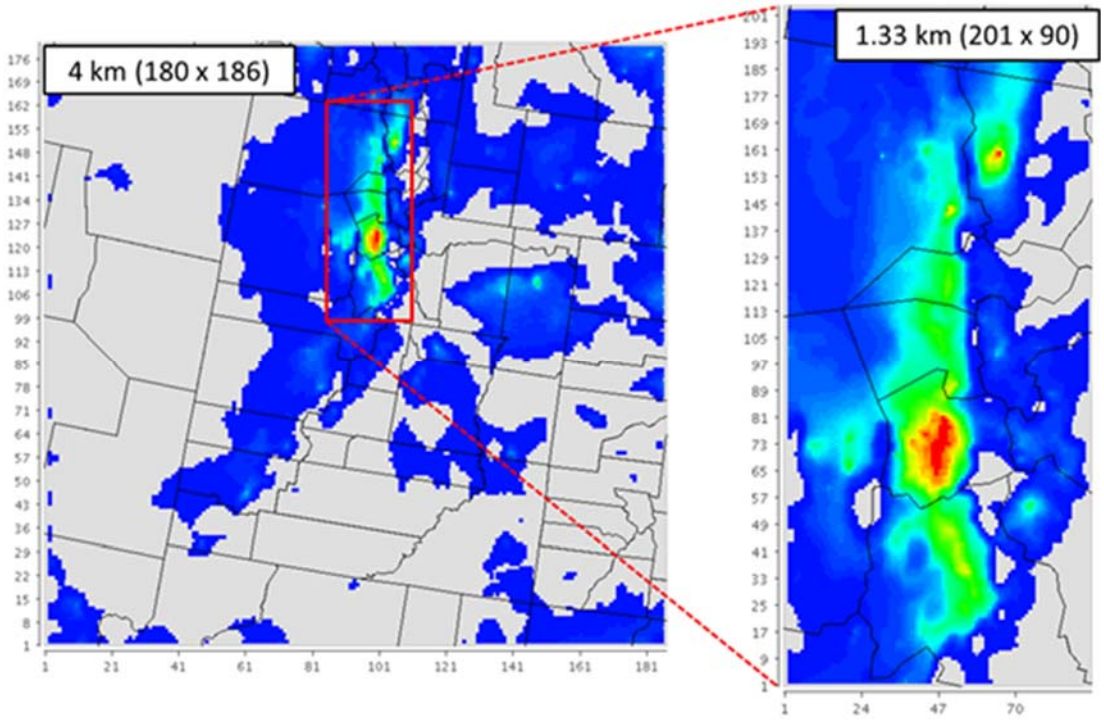

Figure IX.A.36. 4 CAMx Photochemical Modeling Domains in Two-Way Nested Configuration

The UDAQ 4 km coarse domain covers the entire state of Utah, a significant portion of Eastern Nevada (including Las Vegas), as well as smaller portions of Idaho, Wyoming, Colorado, and Arizona. The fine 1.33 km domain covers all of Utah's three $PM_{2.5}$ nonattainment areas, including the SLC NAA. Throughout this document, we will refer to the fine 1.33 km domain as the "modeling domain" when the coarse domain is not specified.

[17] https://www.epa.gov/chief

iii. Meteorological Data

Meteorological modeling was carried out by the University of Utah (University) with financial support from UDAQ.

Meteorological inputs were derived using the Weather Research and Forecasting[18] (WRF) Advanced Research WRF (WRF-ARW) model to prepare meteorological datasets for our use with the photochemical model. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

Model performance of WRF was assessed against observations at sites maintained by the University. WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8-degree temperature increase over 100 vertical meters). A summary of the performance evaluation results for WRF is included in the TSD.

iv. Episode Selection

Part of the modeling exercise involves a test to see whether the model can successfully replicate the $PM_{2.5}$ mass and composition that was observed during prior episode(s) of elevated $PM_{2.5}$ concentration. The selection of an appropriate episode, or episodes, for use in this exercise requires some forethought and should determine the meteorological episode that helps produce the best air quality modeling performance.

EPA Guidance[19] identifies some selection criteria that should be considered for SIP modeling, including:

- Select episodes that represent a variety of meteorological conditions that lead to elevated $PM_{2.5}$.
- Select episodes during which observed concentrations are close to the baseline design value.
- Select episodes that have extensive air quality data bases.
- Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

After careful consideration, the following meteorological episodes were selected as candidates for Utah's SIP modeling:

- January 1-10, 2011
- December 7-19, 2013
- February 1-16, 2016

[18] https://www.mmm.ucar.edu/weather-research-and-forecasting-model

[19] Environmental Protection Agency. April 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze.

In addition to the criteria identified in the modeling guidance, each of these candidate episodes may be characterized as having the following atmospheric conditions:

- Nearly non-existent surface winds
- Light to moderate winds aloft (wind speeds at mountaintop < 10-15 m/s)
- Simple cloud structure in the lower troposphere (e.g., consisting of only one or no cloud layer)
- Singular 24-hour $PM_{2.5}$ peaks suggesting the absence of weak intermittent storms during the episode

Previous work conducted by the University of Utah and UDAQ showed the four conditions listed above improve the likelihood for successfully simulating wintertime persistent cold air pools in the WRF model[20]. A comprehensive discussion of the meteorological model performance for all three episodes can be found in the meteorological modeling TSD[21].

a) Model Adjustments and Settings

In order to better simulate Utah's winter-time inversion episodes six different adjustments were made to CAMx input data:

1. Increased vertical diffusion rates (Kvpatch)
2. Lowered residential wood smoke emissions to reflect burn ban compliance during forecasted high $PM_{2.5}$ days (burn ban)
3. Ozone deposition velocity set to zero and increased urban area surface albedo (snow chemistry)
4. Cloud water content reduced during certain days (cloud adjustment)
5. Ammonia injection to account for missing ammonia sources in UDAQ's inventory. This is defined as artificially adding non-inventoried ammonia emissions to the inventoried emissions that are input into CAMx.
6. Reduced the dry deposition rate of ammonia by setting ammonia Rscale to 1. Rscale is a parameter in CAMx that reflects surface resistance.
7. Applied a 93% reduction to paved road dust emissions.

Depending on the episode, different adjustments were applied. All adjustments were applied to the January 2011 episode while select adjustments were applied to the other two episodes.

Kvpatch improved overall model performance by enhancing vertical mixing over urban areas. Snow chemistry modifications, which included reducing ozone deposition velocity and increasing surface albedo over urban areas, helped improve the model performance by better representing secondary ammonium nitrate formation during winter-time inversion episodes in Utah.

[20] https://www.mmm.ucar.edu/weather-research-and-forecasting-model
[21] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

Cloud adjustments were only applied to the January 2011 episode, which was characterized by cloud cover on January 6-8 over the Salt Lake and Utah valleys. This cloud cover led to a high bias in sulfate due to the effect of ammonia on the gas-to-particle partitioning of sulfate in clouds. Application of the cloud adjustment scheme helped reduce this bias.

Rscale modification and burn ban adjustments were also only applied to the January 2011 episode. The burn ban adjustments reflect the compliance rate with the state's two-stage policy ban on wood-burning.

A 93% reduction in paved road dust emissions was only applied to the January 2011 emissions. This adjustment helped improve the model performance for crustal material.

b) Episodic Model Performance

Shown below for each of three episodes are the CAMx performance results for total 24-hour $PM_{2.5}$ mass and $PM_{2.5}$ chemical species, including nitrate (NO_3), sulfate (SO_4), ammonium (NH_4), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass).

January 1-10, 2011

A comparison of 24-hr modeled and observed $PM_{2.5}$ during January 1-10, 2011, at the Hawthorne monitoring station in the SLC NAA showed that overall the model captures the temporal variation in $PM_{2.5}$ well (Figure IX.A.36.5). The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. An overestimation in $PM_{2.5}$ is observed on January 3rd, which is most likely related to the meteorological model performance on this day. Thin mid-level clouds, which were observed on January 3-4, were not simulated in the WRF model, leading to an increasingly stable low-level boundary layer, limiting the mixing of pollutants[22]. To help reduce this bias, Kvpatch was applied. The underestimation in $PM_{2.5}$ on January 5, 2011, at the Hawthorne station is also related to the meteorological model performance on this day, where the WRF model overestimated the wind shear near the mixing height[23].

[22] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf
[23] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

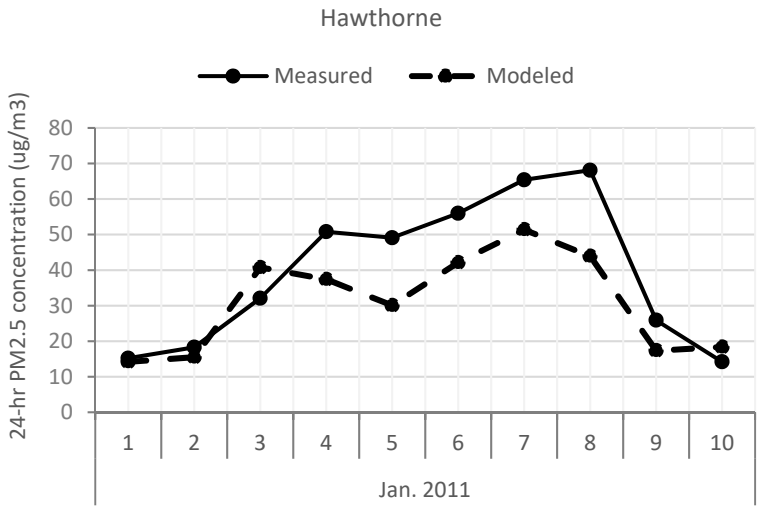

Figure IX.A.36. 5 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During January 1-10 2011 at Hawthorne Monitoring Station in SLC NAA

The model performance for $PM_{2.5}$ chemical species was also good for this episode. The chemical composition of modeled $PM_{2.5}$ on January 7, which corresponds to a $PM_{2.5}$ exceedance day, is similar to that of measured $PM_{2.5}$ with modeled secondary species, nitrate, ammonium and sulfate, accounting for over 50% of $PM_{2.5}$ mass, in agreement with measurements (IX.A.36.6). Ammonia injection helped improve the model performance for these species. The model also performed well for organic carbon (OC) while it overestimated crustal material and elemental carbon (EC), possibly due to an overprediction in their source emissions. While a 93% reduction in paved road dust emissions was applied, it is possible that further reduction was needed.

Overall, the model simulated well the timing of the capping inversion during this January episode. $PM_{2.5}$ chemical species, particularly nitrate, are also well simulated in the model, suggesting that this episode is suitable for modeling.

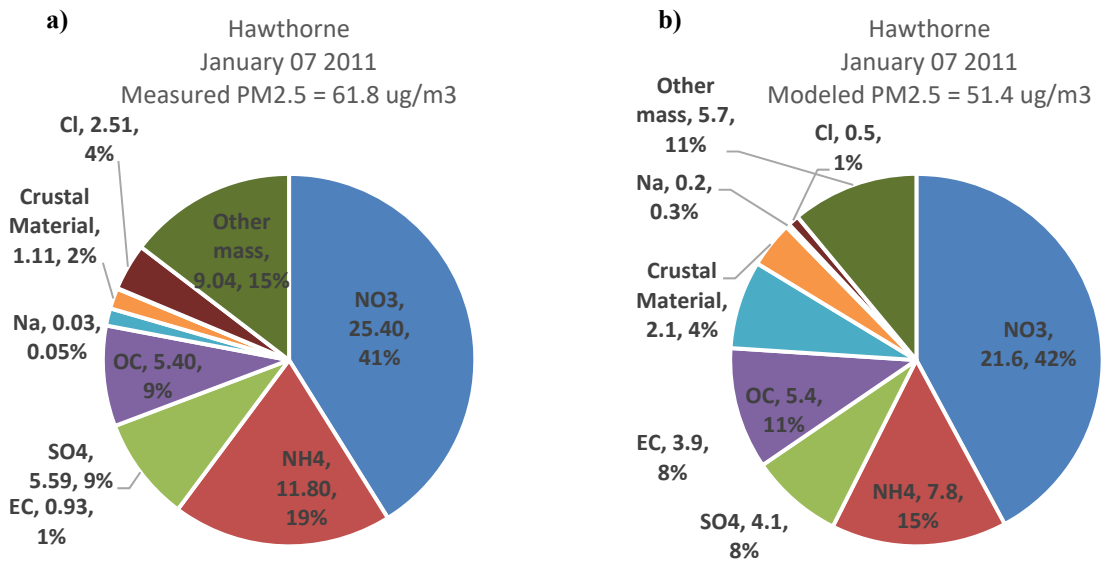

Figure IX.A.36. 6 a) Measured and b) Modeled Species Contribution (in ug/m^3 and %) to $PM_{2.5}$ at Hawthorne Monitoring Station in the SLC NAA on a Typical 24-hr $PM_{2.5}$ Exceedance Day

December 7-19, 2013

A comparison of modeled and measured 24-hr $PM_{2.5}$ at Hawthorne during the December 7-19, 2013, episode showed that the model did not represent well the temporal variation in $PM_{2.5}$ and the capping inversion (Figure IX.A.36.7). While observations show peak $PM_{2.5}$ concentrations during December 14-15, CAMx is simulating a drop in $PM_{2.5}$ levels. This can be attributed to the WRF model not properly capturing the cold overnight low temperatures that were observed on these days[24].

[24] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf.

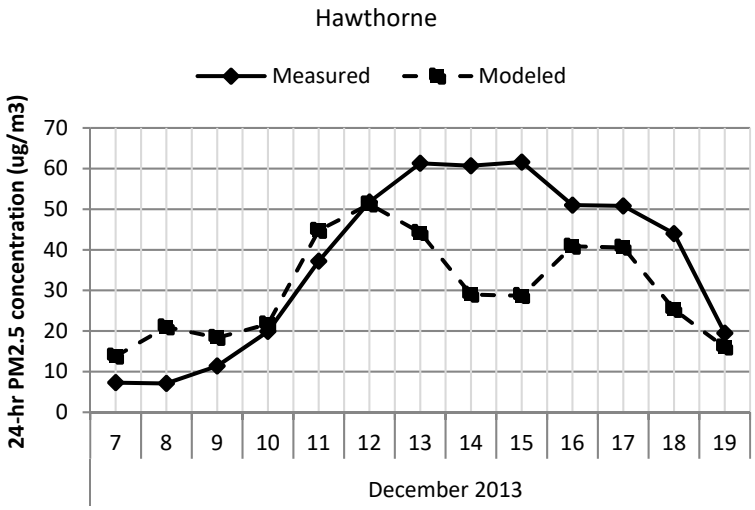

Figure IX.A.36. 7 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During December 7-19, 2013, at Hawthorne Monitoring Station in the SLC NAA

To further evaluate the model performance, modeled and measured $PM_{2.5}$ chemical species on December 15, which corresponds to a $PM_{2.5}$ exceedance day with available speciation measurements, were compared for Hawthorne (Figure IX.A.36.8). Nitrate and ammonium are both underpredicted in the model, which can be partly related to the meteorological model performance, where WRF overpredicted surface temperatures, leading to increased mixing. Moreover, similarly to the model performance for the January 2011 episode, crustal material is overpredicted in the model. An adjustment to paved road dust emissions was not applied for the December 2013 simulations. Chloride (Cl) was also underestimated in the model while the performance for sulfate and OC was acceptable.

Given that the strength of the capping inversion and timing of the $PM_{2.5}$ peaks were not well simulated, using the December 2013 episode for the modeling demonstration is not desirable.

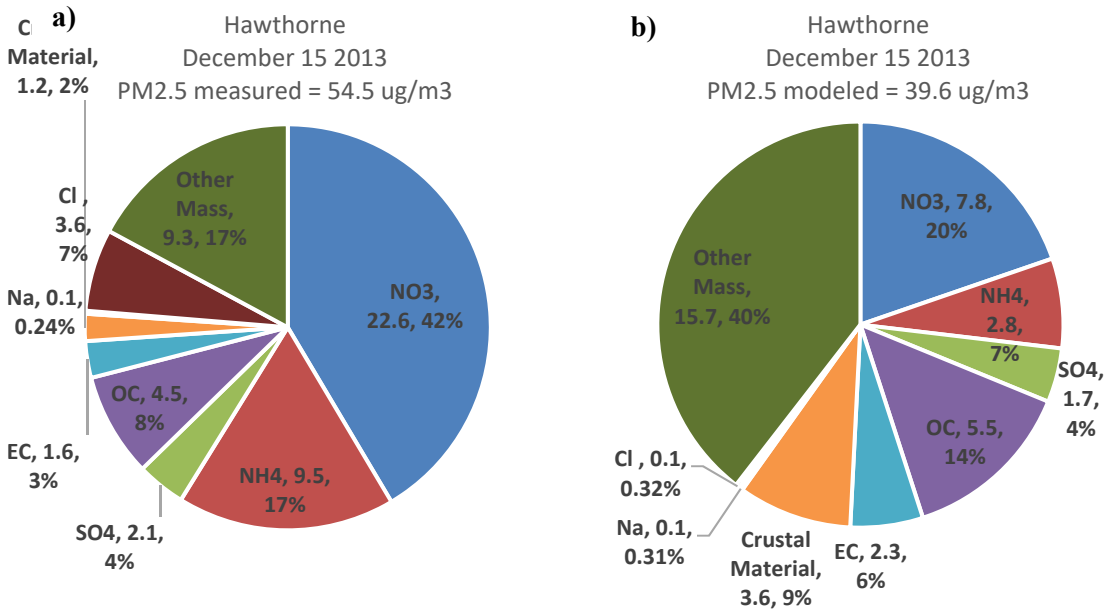

Figure IX.A.36. 8 a) Measured and b) Modeled Chemical Composition of 24-hr $PM_{2.5}$ in ug/m^3 and % of $PM_{2.5}$ at Hawthorne Monitoring Station in SLC NAA on December 15, 2013

February 1-16, 2016

A comparison of modeled and measured 24-hr $PM_{2.5}$ at Hawthorne monitoring station (Figure IX.A.36.9) shows that $PM_{2.5}$ concentrations are generally biased low in the model and $PM_{2.5}$ drops off prematurely in the model. This can be related to the meteorological model performance, where the mixing height was overestimated due to performance issues related to clouds and fog formation. While fog and low clouds were observed during February 9-15, WRF was unable to properly capture the timing of the fog and clouds formation[25].

[25] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf.

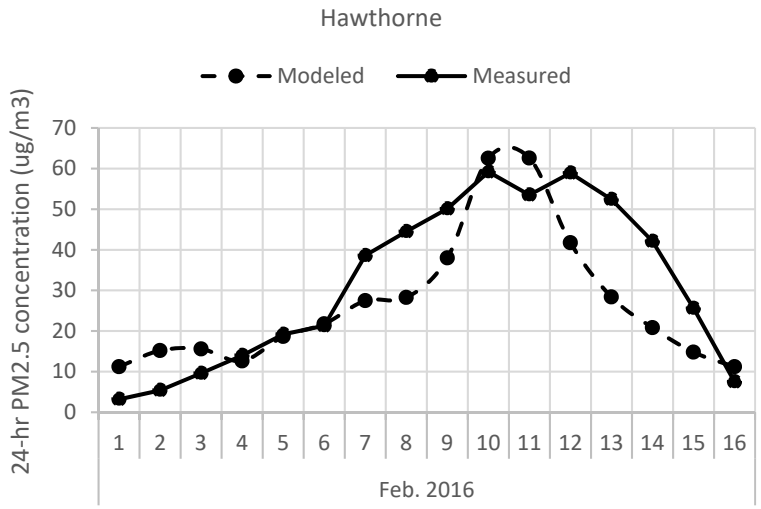

Figure IX.A.36. 9 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During February 1-16, 2016, at Hawthorne Monitoring Station in the SLC NAA

To further evaluate the model performance, modeled and measured $PM_{2.5}$ chemical species on February 12, which corresponds to a $PM_{2.5}$ exceedance day, were compared for Bountiful monitoring station (Figure IX.A.36.10). Complete speciation measurements were not available for Hawthorne. As can be seen, nitrate, ammonium and sulfate were underpredicted in the model. Moreover, similarly to the model performance for the two other episodes, EC and crustal material were overestimated in the model.

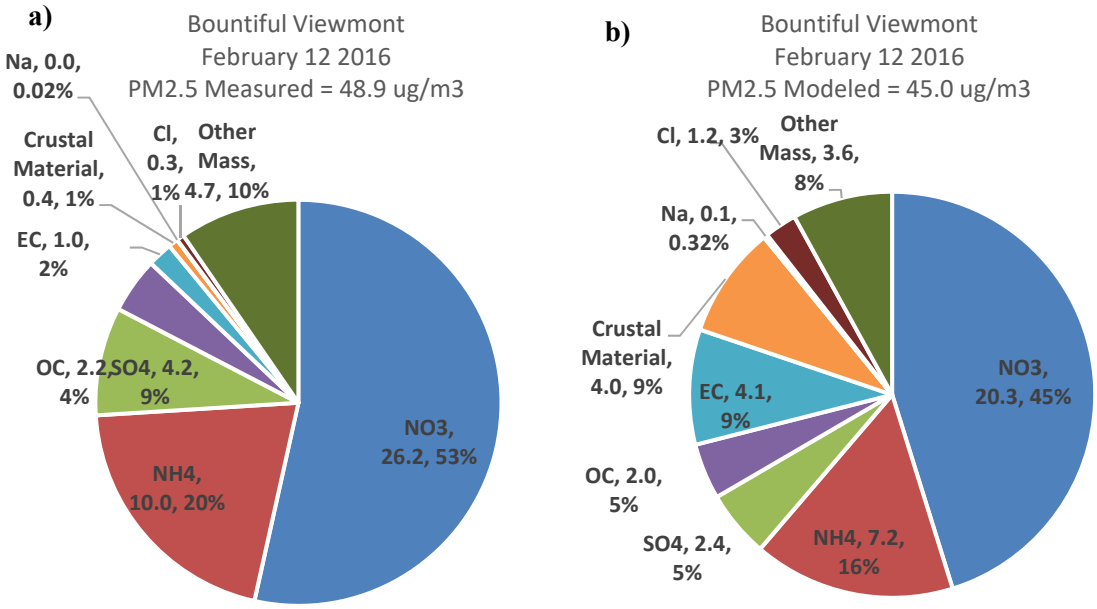

Figure IX.A.36. 10 a) Measured and b) Modeled Chemical Composition of 24-hour $PM_{2.5}$ in $\mu g/m^3$ and % of $PM_{2.5}$ at Bountiful monitoring Station on February 12, 2016

Given that the model is not able to sustain the observed $PM_{2.5}$ peaks, this episode is less suitable for modeling compared to the 2011 episode.

Conclusion

Examining the $PM_{2.5}$ model performance for all three episodes, it is clear that CAMx performed best when using the January 2011 WRF output, which was specifically calibrated to the meteorological conditions experienced during January 2011, a period that coincided with an exhaustive field campaign focused on the Salt Lake Valley (Persistent Cold Air Pool Study (PCAPS)[26]. The superior model performance for the January 2011 episode was further confirmed by a linear regression analysis that showed that modeled and measured $PM_{2.5}$ at Hawthorne monitoring station were more strongly correlated during the January 2011 episode ($R^2 = 0.80$) compared to the other episodes ($R^2 = 0.54$ and 0.69) (Figure IX.A.36.11).

Given that the January 2011 WRF data produced superior model performance when compared with the other two episodes, UDAQ selected the January 2011 episode to conduct its modeled maintenance demonstration work. A more thorough discussion is provided in the TSD.

[26] http://www.pcaps.utah.edu/

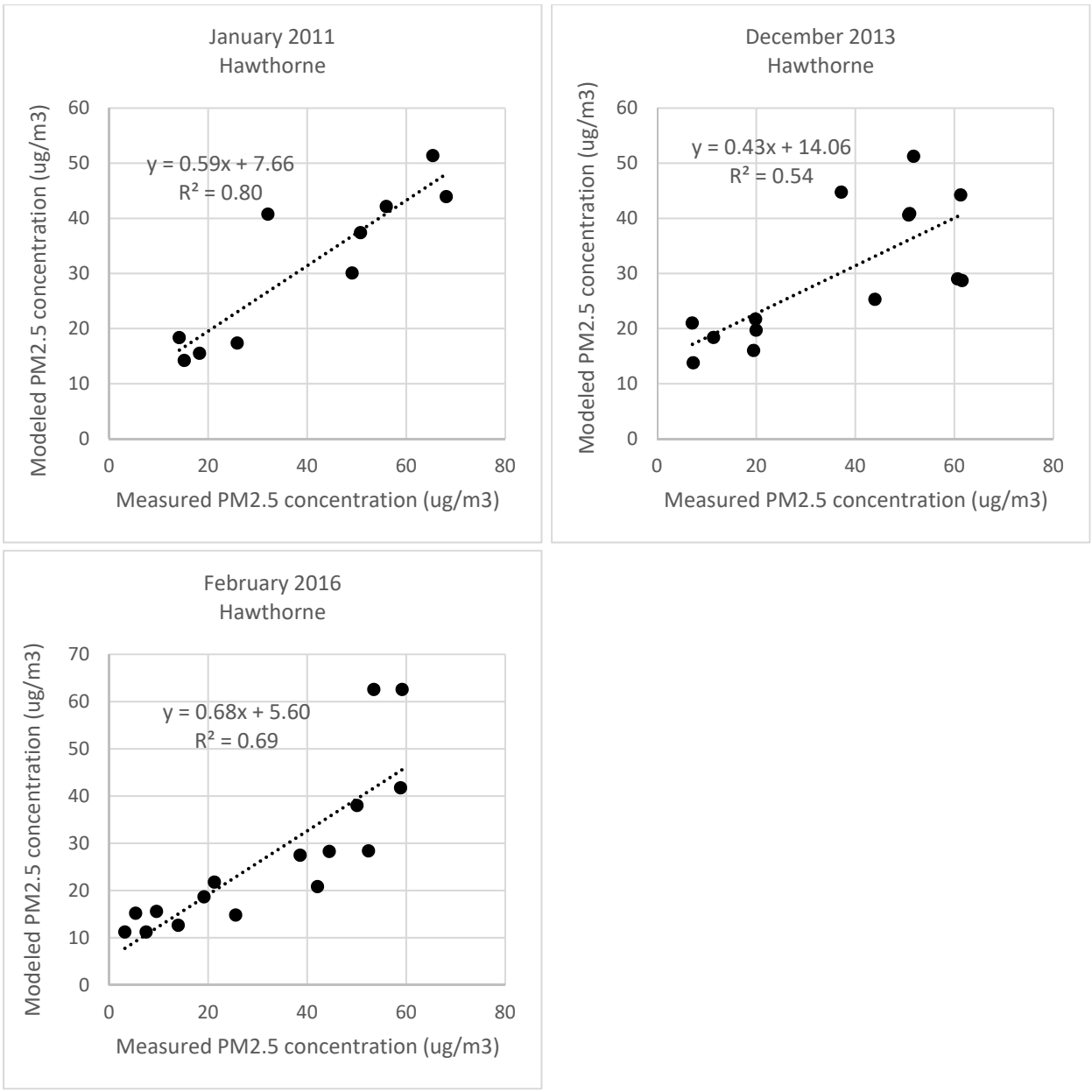

Figure IX.A.36. 11 Modeled versus measured 24-hr $PM_{2.5}$ at Hawthorne monitoring station for each of the three modeling episodes: January 2011, December 2013, and February 2016. Dots represent each individual day of the modeling episode. Linear regression fits (dashed line) and equation are shown for each episode.

c) Photochemical Model Performance Evaluation

Introduction

To assess how accurately the photochemical model predicts observed concentrations and to demonstrate that the model can reliably predict the change in pollution levels in response to changes in emissions, a model performance evaluation was conducted. This model performance evaluation also provides support

for the model modifications and settings that were applied (ammonia injection, increase of surface resistance to ammonia, zeroing-out of ozone deposition velocity, reduction of cloud-water content, snow albedo enhancement, vertical diffusion modifications and paved road dust emissions adjustment) to more accurately reproduce winter-time inversion episodes. A detailed explanation of these model modifications is provided in the TSD.

Available ambient monitoring data were used for this photochemical model performance evaluation. Data included 24-hr total $PM_{2.5}$ and 24-hr chemically-speciated $PM_{2.5}$ measurements collected at the Hawthorne monitoring station in the SLC NAA. Ammonia measurements collected during special field studies were also used for this performance evaluation. The evaluation was based on the December 31-January 10, 2011, episode and the 2011 emissions inventory was used as input data for the model simulations. The evaluation focused on days with $PM_{2.5}$ concentration exceeding the NAAQS (> 35 $\mu g/m^3$). Results for December 31, which is a model spin-up day, are excluded from this evaluation.

A more detailed model performance evaluation that examines the model performance for gaseous species is provided in the TSD. More details on the model performance at various sites within the SLC NAA are also included in the TSD.

Daily $PM_{2.5}$ Concentrations

A comparison of 24-hr modeled and observed $PM_{2.5}$ during January 1-10, 2011, at the Hawthorne monitoring station in the SLC NAA showed that the model overall captures the temporal variation in $PM_{2.5}$ well (Figure IX.A.36.12). The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. Moreover, with the exception of January 3 and 5, the bias between measured and modeled $PM_{2.5}$ is overall relatively small, particularly on $PM_{2.5}$ exceedance days. The biases observed on January 3 and 5 are largely related to the meteorological model performance on these days, as aforementioned.

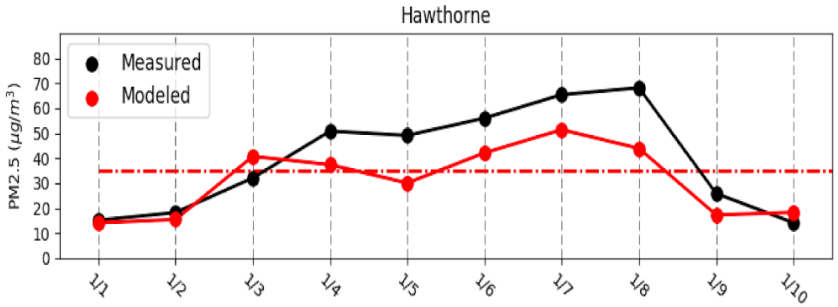

Figure IX.A.36. 12 Ten-day Time Series of Observed (black) and Modeled (red) 24-hr Average $PM_{2.5}$ Concentrations During January 1-10, 2011, at Hawthorne Monitoring Station in the SLC NAA. Dashed Red Line is NAAQS for 24-hr $PM_{2.5}$

$PM_{2.5}$ Chemical Speciation

To further investigate the model performance, measured and modeled $PM_{2.5}$ chemical species were compared at the Hawthorne monitoring site, which is part of EPA's Chemical Speciation Network (CSN). Figure IX.A.36.13 shows a comparison of the bulk chemical composition of measured and modeled $PM_{2.5}$ at Hawthorne on January 7, 2011, which corresponds to the only $PM_{2.5}$ exceedance day when measurement data are available. Chemical species, including nitrate (NO_3), sulfate (SO_4), ammonium (NH_4), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass), were considered in this analysis. The model performance evaluation for non-$PM_{2.5}$ exceedance days is provided in the TSD.

The model performance for particulate nitrate, which is the major component of $PM_{2.5}$, was good, with both modeled and measured NO_3 accounting for similar contributions to $PM_{2.5}$ filter mass. Modeled and observed NO_3 concentrations were also comparable, with modeled concentration being biased low by about 15%. The model performance for particulate SO_4 was also reasonably good, with SO_4 being biased low in the model by about 27%. Similarly, to its performance for NO_3 and SO_4, the model was also biased low for NH_4 by about 34%. This underprediction in particulate NH_4 can be attributed to an underestimation in modeled HCl (more details are provided in the TSD). The model performance for OC was good for January 7, with modeled and observed concentrations being quite comparable. The model, on the other hand, overestimated EC and CM. The overprediction in these species on days when the simulated atmospheric mixing was particularly strong, suggests that this overestimation is potentially related to an overestimation in their source emissions.

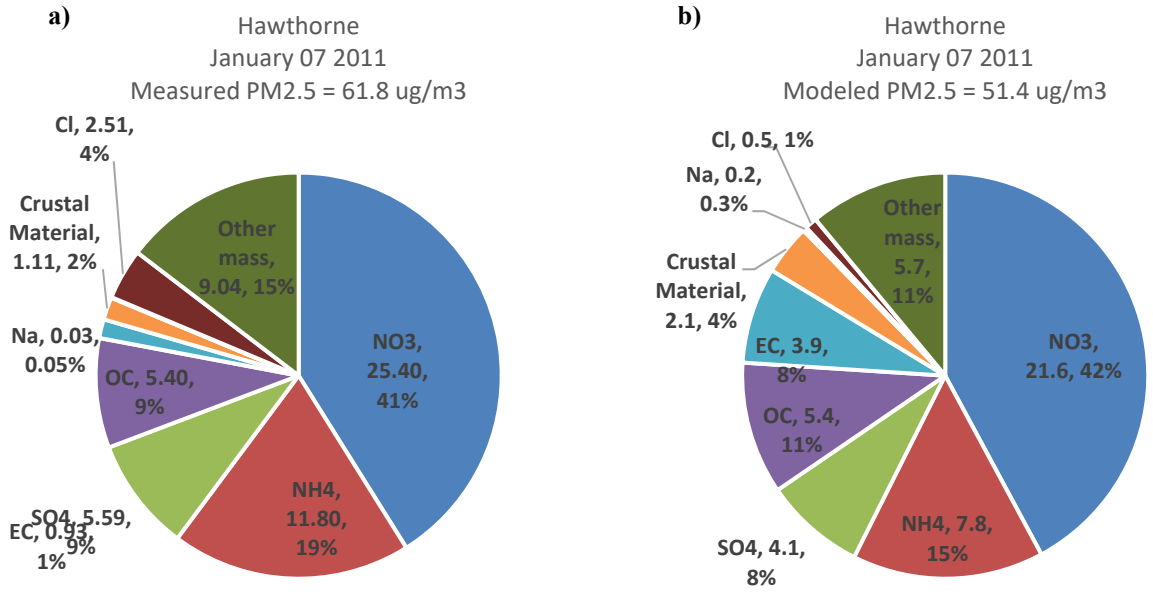

Figure IX.A.36. 13 a) Measured and b) Modeled Species Contribution (in ug/m^3 and %) to $PM_{2.5}$ at Hawthorne Monitoring Station in the SLC NAA during a typical 24-hr $PM_{2.5}$ exceedance day

The model performance was also evaluated for ammonia (NH_3), which is an important precursor to the formation of ammonium nitrate, ammonium sulfate, and ammonium chloride, all of which are important $PM_{2.5}$ species accounting for over 50% of the $PM_{2.5}$ mass during winter-time inversion events.

Hourly modeled NH_3 (Figure IX.A.36.14) was compared to hourly NH_3 measurements (Figure IX.A.36.15) conducted at the Neil Armstrong Academy, located in West Valley City in the SLC NAA, during a special field study in winter 2016. Measurements from 2016 were considered since measurements of NH_3 were not available during 2011. Hourly measurements were also only available at the Neil Armstrong Academy. However, while these 2016 field study measurements cannot be directly compared to day-specific 2011 model simulations, the measurements are qualitatively useful to assess if the model predicts similar levels of NH_3 during strong inversion conditions.

Modeled NH_3 at Hawthorne and the Neil Armstrong Academy is well within the range observed in 2016. It also displays a similar behavior to measured NH_3, with the concentration dropping during peak $PM_{2.5}$ events.

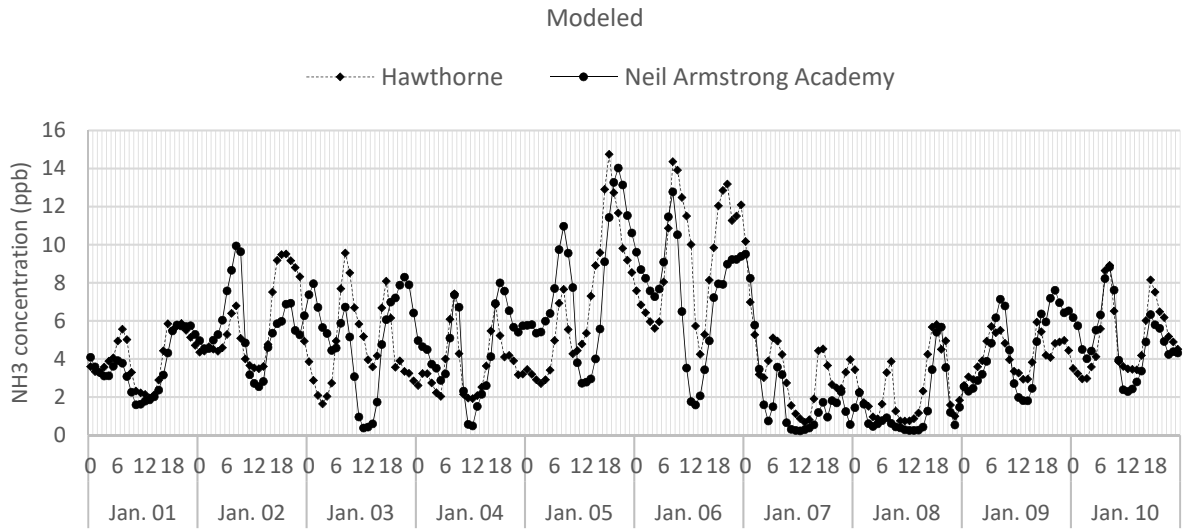

Figure IX.A.36. 14 Hourly Time Series of Modeled Ammonia (ppb) at Hawthorne and Neil Armstrong Academy during January 1 – 10, 2011

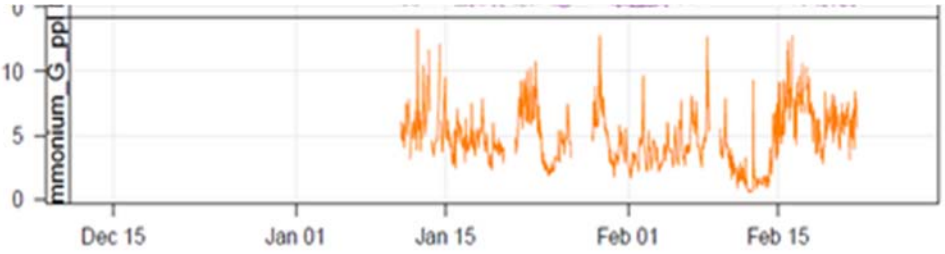

Figure IX.A.36. 15 Hourly Measured Ammonia on y-axis (ppb) at Neil Armstrong Academy in the SLC NAA during January – February 2016. Note that ammonia drops during the PCAP of February 7-14, 2016.

Summary of Model Performance

The model performance replicating the buildup and clear out of $PM_{2.5}$ is good overall. The model captures the temporal variation in $PM_{2.5}$ well. The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. The model also predicts reasonably well $PM_{2.5}$ concentration on peak days. It also overall replicates well the composition of $PM_{2.5}$ on exceedance days, with good model performance for secondary nitrate and ammonium which account for over 50% of $PM_{2.5}$ mass. Simulated ammonia concentrations are also within the range of those observed, further indicating that the model overall performs well.

Several observations should be noted on the implications of these model performance findings on the attainment modeling presented in the following section. First, it has been demonstrated that model performance overall is good and, thus, the model can be used for air quality planning purposes. Second, consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA suggests that this approach "should reduce some of the uncertainty attendant with using absolute model predictions alone."

d) Modeled Attainment Test

Introduction

With acceptable performance, the model can be utilized to make future-year attainment projections. For any given (future) year, an attainment projection is made by calculating a concentration termed the Future Design Value (FDV). This value is calculated for each monitor included in the analysis, and then compared to the NAAQS (35 $\mu g/m^3$). If the FDV at every monitor located within a NAA is less than the NAAQS, this demonstrates attainment for that area in that future year.

A maintenance plan must demonstrate continued attainment of the NAAQS for a span of ten years. This span is measured from the time EPA approves the plan, a date which is somewhat uncertain during plan development. To be conservative, attainment projections were made for 2035. An assessment was also made for 2026 as a "spot-check" against emission trends within the ten-year span.

$PM_{2.5}$ Baseline Design Values

For any monitor, the FDV is greatly influenced by existing air quality at that location. This can be quantified and expressed as a Baseline Design Value (BDV). The BDV is consistent with the form of the 24-hour $PM_{2.5}$ NAAQS, which is the 98th percentile value averaged over a three-year period. Quantification of the BDV for each monitor is included in the TSD, and is consistent with EPA guidance.

Relative Response Factors

In making future-year predictions, the output from the CAMx model is not considered to be an absolute answer. Rather, the model is used in a relative sense. In doing so, a comparison is made using the predicted concentrations for both the year in question and a pre-selected baseline year, which for this plan is 2017. This comparison results in a Relative Response Factor (RRF).

The UDAQ used the Software for Model Attainment Test - Community Edition (SMAT-CE) v. 1.01 utility from EPA[27] to perform the modeled attainment test for daily $PM_{2.5}$. SMAT is designed to interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to the FRM monitors. It also calculates the relative response factor (RRF) for grid cells near each monitor and uses these to calculate a future year design value for these grid cells. A grid of 3-by-3 (9) cells surrounding the monitors was used as the boundary for RRF calculations.

The State of Utah operates three Chemical Speciation Network (CSN) monitors: Hawthorne, Bountiful, and Lindon. Hawthorne is located in Salt Lake County, the Bountiful monitor is in Davis to the north, and the Lindon monitor is located in Utah County to the south. Of the three, Hawthorne samples one out of three days, while the other two sample one in six days.

This mismatch in sampling frequency lead, initially, to interpolated speciation profiles that were unexpectedly non-uniform across the Salt Lake Valley. To create more realistic speciation profiles, the CSN data collected at the Hawthorne monitor were applied to all of the FRM sites in the SLC NAA. UDAQ believes this is a reasonable assumption that is supported by recently conducted special studies. Further discussion may be found in the TSD.

For each monitor, the FDV is calculated by multiplying the BDV by the relative response factor: **FDV = RRF * BDV**. These FDV's are compared to the NAAQS in order to determine whether attainment is predicted at that location or not. The results for each of the monitors are shown below in Table IX.A.36.9.

For all projected years and monitors, no FDV exceeds the NAAQS. Therefore, continued attainment is demonstrated for the SLC NAA.

[27] https://www.epa.gov/scram/photochemical-modeling-tools

Monitor Location	2016-2018 BDV	2026 FDV	2035 FDV*
Brigham City	32.4	27.5	27.5
Bountiful	28.5	28.1	28.2
Hawthorne	33.4	31.8	32.1
Rose Park	34.9	33.5	33.6
Ogden	30.2	28.8	28.9
Erda**	25.5	23.0	23.1**

Table IX.A.36. 9 Baseline and Future Design Values (ug/m^3) at Monitors in SLC NAA

*These values include additional emissions added to the WFRC MVEB from the safety margin

**Erda site uses 2016 speciation data instead of 2011 like the other SLC NAA monitors because Erda was a new site starting in 2016

(2) Attainment Inventory

The attainment inventory is discussed in EPA guidance[28] as another one of the core provisions that should be considered by states for inclusion in a maintenance plan. According to the guidance, the stated purpose of the attainment inventory is to establish the level of emissions during the time periods associated with monitoring data showing attainment.

In cases such as this, where a maintenance demonstration is founded on a modeling analysis that is used in a relative sense, the modeled baseline inventory is used for comparison with every projection year model run. For this analysis, the State compiled a baseyear inventory for the year 2017. This year falls within the span of data representing current attainment of the $PM_{2.5}$ NAAQS. The guidance discusses the projection inventories as well, and notes that they should consider future growth, including population and industry, should be consistent with the baseyear inventory, and should document data inputs and assumptions. Any assumptions concerning emission rates must reflect permanent, enforceable measures.

Utah compiled projection inventories for use in the quantitative modeling demonstration. The years selected for projection include 2026 and 2035. The emissions contained in the inventories include sources located within the modeling domain encompassing all three $PM_{2.5}$ nonattainment areas, as well as a bordering region. See Figure IX.A.36.3.

Since this bordering region is so large, the State identified a “core area” within this domain wherein a higher degree of accuracy is important. Within this core area (which includes Weber, Davis, Salt Lake, Utah, Box Elder, Tooele, Cache, and Franklin, ID counties), SIP-specific inventories were prepared to include seasonal adjustments and forecasting to represent each of the projection years. In the bordering regions away from this core, the State used the most current (2014) National Emissions Inventory from EPA for the analysis.

There are four general categories of sources included in these inventories: point sources, area sources, on-road mobile sources, and non-road mobile sources. For each of these source categories, the pollutants that were inventoried includes: $PM_{2.5}$, SO_2, NO_X, VOC, and NH_3. The unit of measure for point and area

[28] Calcagni (n 3)

sources is the traditional tons per year. Mobile source emissions are reported in terms of tons per day. The pre-processing model, SMOKE, converts all emissions to daily, weekly, and hourly values.

Area source emissions were projected to 2017 from the 2014 triannual inventory. Growth data from appropriate data sources, including information from the Governor's Office of Management and Budget, was used to project inventories to 2026 and 2035. Point source emissions are represented as the actual emissions from the 2017 triannual emissions inventory. Point sources were grown to 2026 and 2035 on a case-by-case basis for the projection inventories.

On-road mobile source emissions were calculated for each year using MOVES2014b in conjunction with the appropriate estimates for vehicle miles traveled (VMT). VMT estimates for the urban counties were provided by the local metropolitan planning organizations (MPOs), including the Wasatch Front Regional Council, the Mountainland Association of Governments, and the Cache Metropolitan Planning Organization, and are based on their travel demand modeling for 2017, 2026, and 2035. Non-road mobile source emissions were calculated for each year using MOVES2014b. Growth data from appropriate data sources was used to project to 2026 and 2035. The Technical Support Documentation accompanying this SIP includes the Inventory Preparation Plan that details the growth factors used for each emissions source.

Source category emission inventories are expected to look quite different between 2017 and 2035. Population is expected to steadily increase between the 18-year span. On-road mobile emissions dominate the 2017 inventory; however, in 2035 area source emissions dominate the inventory. This is due to the tier 3 federal fuel standards and phase-in of newer cars driving on-road emission reductions. Area source emissions are relatively stable from 2017 to 2026 to 2035, besides a decrease in NOx from 2017 to 2026 due to the phase-in of area source rules.

Since this SIP subsection takes the form of a maintenance plan, it must demonstrate that the area will continue to attain the $PM_{2.5}$ NAAQS throughout a period of ten years from the date of EPA approval. It is also necessary to "spot check" this ten-year interval. Hence, projection inventories were prepared for 2026 and 2035. Table IX.A.36.10 below summarizes these inventories. As described, it represents point, area, on-road mobile, and non-road mobile sources in the modeling domain and includes $PM_{2.5}$, as well as the precursors SO_2, NO_X, VOC, and NH_3 as defined in 40 CFR Parts 50, 51, and 93.

More detail concerning any element of the inventory can be found in the appropriate section of the TSD. More detail about the general construction of the inventory can be found in the Inventory Preparation Plan.

Emissions (tons/day)	Sector	$PM_{2.5}$ Filterable	$PM_{2.5}$ Condensable	$PM_{2.5}$ Total	NOx	VOC	NH3	SO2
2017	Area Sources	5.02	1.11	6.13	13.55	45.98	14.21	0.21
	Mobile Sources	–	–	2.28	44.21	30.12	1.28	0.31
	NonRoad Sources	–	–	0.96	18.12	8.89	0.02	0.35
	Point Sources	2.97	0.97	3.94	17.01	6.52	0.34	3.78
	Total			**13.31**	**92.89**	**91.51**	**15.85**	**4.65**
2026	Area Sources	5.19	1.15	6.34	8.54	43.99	14.19	0.2
	Mobile Sources	–	–	1.34	19.63	15.96	1.09	0.16
	NonRoad Sources	–	–	0.72	14.64	8.85	0.02	0.44
	Point Sources	4.19	1.38	5.57	22.61	7.26	0.48	3.5
	Total			**13.97**	**65.42**	**76.06**	**15.78**	**4.3**
2035	Area Sources	5.37	1.19	6.56	8.69	47.17	14.21	0.2
	Mobile Sources	–	–	1.39	18.91	19.37	1.19	0.15
	NonRoad Sources	–	–	0.67	13.32	9.7	0.03	0.51
	Point Sources	4.19	1.38	5.57	22.62	7.26	0.48	3.5
	Total			**14.15**	**62.21**	**83.06**	**15.91**	**4.36**

Table IX.A.36. 10 Emissions Inventories in Tons per Average Episode Day by Year and Source Category

(3) Additional Controls for Future Years

Since the emission limitations discussed in subsection IX.A.36.b(3) are federally enforceable and, as demonstrated in IX.A.36.c(1) above, are sufficient to ensure continued attainment of the $PM_{2.5}$ NAAQS, there is no need to require any additional control measures to maintain the $PM_{2.5}$ NAAQS.

(4) Mobile Source Budget for Purposes of Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the Act requires regional transportation plans and programs to show that "…emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan…" EPA's transportation conformity regulation (40 CFR 93, Subpart A, last amended at 77 FR 14979, March 14 2012) also requires that motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be established for any years deemed appropriate (see 40 CFR 93.118(b)(2)(i)).

For an MPO's Regional Transportation Plan, analysis years that are after the last year of the maintenance plan (in this case 2035), a conformity determination must show that emissions are less than or equal to the maintenance plan's motor vehicle emissions budget(s) for the last year of the implementation plan.

a) Mobile Source $PM_{2.5}$ Emissions Budgets

In this maintenance plan, Utah is establishing transportation conformity motor vehicle emission budgets (MVEB) for direct $PM_{2.5}$, NO_X, and VOC for 2035. The MVEBs are established for tons per average winter weekday for NO_x and VOC, and for direct $PM_{2.5}$ (primary exhaust $PM_{2.5}$ + brake and tire wear).

(i) Direct $PM_{2.5}$, NO_x, and VOC

Direct (or "primary") $PM_{2.5}$ refers to $PM_{2.5}$ that is not formed via atmospheric chemistry. Rather, direct $PM_{2.5}$ is emitted straight from a mobile or stationary source. With regard to the emission budget presented herein, direct $PM_{2.5}$ includes road dust, brake wear, and tire wear as well as $PM_{2.5}$ from exhaust. Through atmospheric chemistry, NO_X and VOC emissions can substantially contribute to secondary $PM_{2.5}$ formation. For this reason, NO_X and VOC are considered $PM_{2.5}$ precursors and are the only $PM_{2.5}$ precursors emitted at a significant level by on-road mobile, and therefore included in the MVEBs.

EPA's conformity regulation (40 CFR 93.124(a)) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. These additional emissions that can be allocated to the applicable MVEB are considered the "safety margin." As defined in 40 CFR 93.101, the safety margin represents the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for demonstrating maintenance. The implementation plan can then allocate some or all of this "safety margin" to the applicable MVEBs for transportation conformity purposes.

As presented in the TSD for on-road mobile sources, the estimated on-road mobile source emissions of direct $PM_{2.5}$, NOx, and VOC in 2035 for the SLC NAA, are listed in the first row (original MVEB) in Table IX.A.36.11. These mobile source emissions were included in the maintenance demonstration in Subsection IX.A.36.c.(1) which estimates a maximum $PM_{2.5}$ concentration of 33.2 $\mu g/m^3$ in 2035 within the SLC NAA portion of the modeling domain. These emissions numbers are considered the MVEB for the maintenance plan prior to the application of any amount of safety margin.

The safety margin for the SLC NAA portion of the domain equates to 1.8 $\mu g/m^3$ (the 2006 24-hr $PM_{2.5}$ standard of 35.0 $\mu g/m^3$ minus the initial 2035 FDV of 33.2 $\mu g/m^3$). To evaluate the portion of safety margin that could be allocated to the MVEBs, modeling was re-run for 2035 using the same emission projections for point, area and non-road mobile sources with additional emissions attributed to the on-road mobile source (see 2nd row of Table IX.A.36.11, Additional Tons Per Day from Safety Margin). The revised maintenance demonstration for 2035 still shows maintenance of the $PM_{2.5}$ standard. It estimates a maximum $PM_{2.5}$ concentration of 33.6 $\mu g/m^3$ in 2035 within the SLC NAA portion of the modeling domain, allocating .4 µg of the safety margin to on-road mobile emissions for the WFRC MVEB. The final 2035 MVEB for WFRC is listed in the last row of Table IX.A.36.11. The final WFRC MVEB is adjusted since Tooele and Box Elder counties are partially within the SLC NAA.

	Direct $PM_{2.5}$	NO_X	VOC	Design Value @ controlling monitor
Original NAA MVEB	1.04	16.33	14.07	33.2 µg/m^3
Additional Tons Per Day from Safety Margin	0.34	5.30	6.50	--
Final WFRC MVEB	1.38	21.63	20.57	33.6 µg/m^3

Table IX.A.36. 11 2035 Wasatch Front Regional Council Motor Vehicle Emissions Budget in Tons per Winter Weekday

It is important to note that the MVEBs presented in Table IX.A.36.11 are somewhat different from the on-road summary emissions inventory presented in Table IX.A.36.10.

Overall the emissions established as MVEBs are calculated using MOVES to reflect an average winter weekday. The totals presented in the summary emissions inventory (Table IX.A.36.11), however, represent an average-episode-day. The episode used to make this average (December 31, 2010 through January 10, 2011) includes seven such winter weekdays, but also includes two weekends. Emissions produced on weekdays are significantly larger than those produced on both Saturdays and Sundays. Therefore, the weighted average of daily emissions calculated for an episode-day will be less than that of a weekday.

There are also some conventions to be considered in the establishment of MVEBs. In particular, $PM_{2.5}$ in the summary emissions inventory totals includes direct exhaust, tire and brake wear, and fugitive dust. For the MVEBs, $PM_{2.5}$ includes direct exhaust, tire and brake but no fugitive dust. VOC emissions in the summary emissions inventory include refueling spillage and displacement vapor loss and are counted in the on-road mobile category. MVEBs for VOC do not include these emissions because, in this context, they are regarded as an area source.

40 CFR 93.118((b)(2)(i) also states “If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan."

Considering this, it is useful to compare the projected future design values in 2026 at all monitors in the NAA to the on-road mobile emission inventory as well as the percent of the total inventory that the on-road mobile sector comprises. As can be seen in Table IX.A.36.9, the design values throughout the SLC NAA range from 23.0 to 33.5 µg/m^3. The Rose Park monitor shows the highest value at 33.5 µg/m^3, which is still 1.5 µg/m^3 below the standard. The on-road mobile source contribution to the overall inventory is shown in Table IX.A.36.12.

Emissions tons/day	**$PM_{2.5}$**	**NO_X**	**VOC**

2026 emission inventory total	14.16	62.21	83.05
2026 on-road mobile inventory	1.35	17.58	18.93
On-road mobile % of total inventory	9.53%	28.26%	22.79%

Table IX.A.36. 12 2026 On-Road Mobile Inventory Compared to Total 2026 Emissions Inventory

Since the projected design values are well below the standard, and the on-road budget is a relatively small percentage of the total inventory, UDAQ is confident that there will not be any on-road mobile factors that will cause or contribute to a new violation of the NAAQS.

(ii) Trading Ratios for Transportation Conformity

Per section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2035, a trading mechanism is established to allow future increases in on-road direct $PM_{2.5}$ emissions to be offset by future decreases in plan precursor emissions from on-road mobile sources at appropriate ratios established by the air quality model. Future increases in on-road direct $PM_{2.5}$ emissions may be offset with future decreases in NO_x emissions from on-road mobile sources at a NO_x to $PM_{2.5}$ ratio of 5.9 to 1 and/or future decreases in VOC emissions from on-road mobile sources at a VOC to $PM_{2.5}$ ratio of 21.3 to 1. This trading mechanism will only be used if needed for conformity analyses for years after 2035. To ensure that the trading mechanism does not impact the ability to meet the NO_x or VOC budgets, the NO_x emission reductions available to supplement the direct $PM_{2.5}$ budget shall only be those remaining after the 2035 NO_x budget has been met, and the VOC emissions reductions available to supplement the direct $PM_{2.5}$ budget shall only be those remaining after the 2035 VOC budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis. The assumptions used to create the trading ratios can be found in the TSD.

(5) Nonattainment Requirements Applicable Pending Plan Approval

CAA 175A(c) - *Until such plan revision is approved and an area is redesignated as attainment, the requirements of CAA Part D, Plan Requirements for Nonattainment Areas, shall remain in force and effect.* The Act requires the continued implementation of the nonattainment area control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions. Utah will continue to implement the emissions limitations and measures from both $PM_{2.5}$ SIPs.

(6) Revise in Eight Years

CAA 175A(b) - Eight years after redesignation, the State must submit an additional plan revision which shows maintenance of the applicable NAAQS for an additional 10 years. Utah commits to submit a revised maintenance plan eight years after EPA takes final action redesignating the Salt Lake City area to attainment, as required by the Act.

(7) Verification of Continued Maintenance and Monitoring

Implicit in the requirements outlined above is the need for the State to determine whether the area is in fact maintaining the standard it has achieved. There are two complementary ways to measure this: 1) by monitoring the ambient air for $PM_{2.5}$; and 2) by inventorying emissions of $PM_{2.5}$ and its precursors from various sources.

The State will continue to maintain an ambient monitoring network for $PM_{2.5}$ in accordance with 40 CFR Part 58 and the Utah SIP. The State anticipates that the EPA will continue to review the ambient monitoring network for $PM_{2.5}$ each year, and any necessary modifications to the network will be implemented.

Additionally, the State will track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the State will perform appropriate studies to determine: 1) whether additional and/or re-sited monitors are necessary; and 2) whether mobile and stationary source emission projections are on target. The State will also continue to collect actual emissions inventory data from sources at thresholds defined in R307-150.

(8) Contingency Plan

CAA 175A(d) - Each maintenance plan shall contain contingency measures to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment. Such provisions shall include a requirement that the State will implement all control measures which were contained in the SIP prior to redesignation.

Upon redesignation, this contingency plan for the SLC NAA supersedes Subsection IX.A.31.9, Contingency Measures, which is part of the serious SLC NAA $PM_{2.5}$ attainment SIP.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

a) List of Potential Contingency Measures

Section 175(d) of the CAA requires the maintenance plan to include as potential contingency measures all of the $PM_{2.5}$ control measures contained in the attainment SIP that were relaxed or modified prior to redesignation. There were no control measures relaxed in the SLC NAA; however, below are potential contingency measure that will be evaluated. If it is determined through the triggering mechanism that additional emissions reductions are necessary, UDAQ will adopt and implement appropriate contingency measure as expeditiously as possible. The following are potential contingency measures that may be considered by UDAQ:

1. Measures to address emissions from residential wood combustion (i.e. emissions from fireplaces under the existing R307-302 rule), including re-evaluating the thresholds at which red or yellow burn days are triggered. Residential wood combustion represents 35.4% of direct $PM_{2.5}$ emissions in the 2017 county-wide inventory.
2. Measures to address fugitive dust from area sources. Fugitive dust represents accounts for 31.2% of direct $PM_{2.5}$ emissions in the 2017 county-wide inventory.
3. Additional measures to address other $PM_{2.5}$ sources identified in the emissions inventory such as on-road vehicles, non-road vehicles and engines, and industrial sources. These source categories

represent 35.8%, 13.0%, and 14.5%, respectively, of the overall 2017 baseyear emissions inventory.

In addition, UDAQ administers incentive and grant programs that reduce emissions in Utah's NAAs. The emissions reductions are not included in the quantitative maintenance demonstration; however, they are expected to contribute to the mitigation of $PM_{2.5}$ concentrations. Generally speaking, the programs target Utah nonattainment areas. The programs include approximately $25.5 million from the Volkswagen settlement and approximately $12.7 million to replace heavy-duty diesel trucks and buses that are operating under old emissions standards. Nonroad diesel upgrades will see approximately $1.3 million on the Wasatch Front. Another $3.8 million of the Volkswagen funding will go towards installing electric vehicle supply equipment in Utah. UDAQ is in the process of using approximately $9.6 million in federal funding to implement wood stove changeout programs throughout the three Utah $PM_{2.5}$ NAAs.

b) Tracking

The tracking plan for the three NAAs consists of monitoring and analyzing ambient $PM_{2.5}$ concentrations. In accordance with 40 CFR 58, the State will continue to operate and maintain an adequate $PM_{2.5}$ monitoring network in SLC, Provo, and Logan NAAs.

c) Triggering

Triggering of the contingency plan does not automatically require a revision to the SIP, nor does it mean that the area will automatically be redesignated once again to nonattainment. Instead, the State will have an appropriate timeframe to correct the potential violation with implementation of one or more adopted contingency measures. In the event that violations continue to occur, additional contingency measures will be adopted until the violations are corrected.

Upon notification of a potential violation of the $PM_{2.5}$ NAAQS, the State will develop appropriate contingency measures intended to prevent or correct a violation of the $PM_{2.5}$ standard. Information about historical exceedances of the standard, the meteorological conditions related to the recent exceedances, and the most recent estimates of growth and emissions will be reviewed. The possibility that an exceptional event occurred will also be evaluated.

Upon monitoring a potential violation of the $PM_{2.5}$ NAAQS, including exceedances flagged as exceptional events but not concurred with by EPA, the State will identify a means of corrective action within six months after a potential violation. The maintenance plan contingency measures will be chosen based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate.

The State will require implementation of such corrective action no later than one year after the violation is confirmed. Any contingency measures adopted and implemented will become part of the next revised maintenance plan submitted to the EPA for approval.

ITEM 8

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-091-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Becky Close, Environmental Scientist

DATE: August 22, 2019

SUBJECT: PROPOSE FOR PUBLIC COMMENT: SIP Subsection IX.A.27: $PM_{2.5}$ Maintenance Provisions for Provo, UT.

On December 3, 2014, the Utah Air Quality Board approved the Utah State Implementation Plan (SIP) Subsection IX.A.22: *Control Measures for Area and Point Sources, Fine Particulate Matter, $PM_{2.5}$ for the Provo Nonattainment Area* (Moderate SIP). The Moderate SIP includes all necessary elements to support the demonstration, control strategy, and implementation of the moderate area designation attainment plan. In addition to the Moderate SIP, SIP elements addressing Provo's serious designation were submitted to the Environmental Protection Agency (EPA) in February 2019.
Under the EPA's Clean Data Policy, EPA finalized a clean data determination for the Provo Nonattainment Area (Provo NAA) on April 10, 2019. The clean data determination shows that the Provo NAA attained the 2006 24-hr $PM_{2.5}$ national ambient air quality standard (NAAQS) based on validated monitored data from 2015-2017.

A finding that the area has attained the standard does not mean the area is automatically reclassified to attainment status. For that to happen, EPA must take action to redesignate an area from nonattainment back to attainment. The Clean Air Act (CAA) outlines five requirements that a nonattainment area must satisfy for redesignation to occur, and this proposed SIP addresses those requirements:

1. Attainment of the NAAQS
2. A fully approved Attainment SIP
3. A demonstration that improvements in air quality are due to permanent and enforceable emissions reductions

4. A demonstration that the State has met requirements applicable to the area under CAA Section 110 and Part D
5. A fully approved maintenance plan

Requirements 1 through 4 are addressed in the first section of this SIP as part of the documentation for the redesignation request. The maintenance plan is also included in this SIP package and includes a modeling demonstration that the Provo NAA continues to attain the NAAQS out to 2035, with an intermediate year check in of 2026. As noted in EPA guidance, the EPA approval action on SIP elements and the redesignation request may occur simultaneously. Therefore, some serious SIP elements may still be pending approval and will likely be approved by EPA concurrently with the redesignation to attainment status.

Recommendation: Staff recommends that the Board propose SIP Subsection IX.A.27: $PM_{2.5}$ Maintenance Provisions for Provo, UT, for a 30-day public comment period.

UTAH STATE IMPLEMENTATION PLAN

$PM_{2.5}$ Maintenance Provisions for the Provo, UT Nonattainment Area

SECTION IX.A.27

UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
AIR
QUALITY

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List of Acronyms and Abbreviations

BACM	Best Available Control Measure
BACT	Best Available Control Technology
CAA	Clean Air Act
CDD	Clean Data Determination
CFR	Code of Federal Regulations
CAMx	Comprehensive Air Quality Model with Extensions
DAQ	Utah Division of Air Quality (also UDAQ)
EPA	Environmental Protection Agency
FR	Federal Register
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
MVEB	Motor Vehicle Emissions Budget
$\mu g/m^3$	Micrograms Per Cubic Meter
Micron	One Millionth of a Meter
NAAQS	National Ambient Air Quality Standards
NH_3	Ammonia
NO_x	Nitrogen Oxides
NNSR	Nonattainment New Source Review
PM	Particulate Matter
PM_{10}	Particulate Matter Smaller Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Smaller Than 2.5 Microns in Diameter
R-307	Utah Administrative Code Air Quality Rules
Provo NAA	Provo Nonattainment Area
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SIP	State Implementation Plan
SMAT	Software for Model Attainment Test
SMOKE	Sparse Matrix Operator Kernal Emissions
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
TPY	Tons Per Year
TSD	Technical Support Document
UAC	Utah Administrative Code
UT	Utah
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compounds
WRF	Weather Research and Forecasting

Section IX.A.27
$PM_{2.5}$ Maintenance Provisions for the Provo, UT Nonattainment Area

IX.A.27.a Introduction

The Provo Nonattainment Area (Provo NAA) has attained the 2006 $PM_{2.5}$ 24-hour National Ambient Air Quality Standard (NAAQS). As a result, this Section has been added to the State Implementation Plan (SIP) to demonstrate that the Provo NAA is eligible for redesignation to attainment. Under Section 107(d)(3)(E) of the Clean Air Act (CAA or the Act), a nonattainment area is eligible for redesignation when the area has met the following requirements: (1) the area has attained the national ambient air quality standard, (2) the area has an Environmental Protection Agency (EPA) approved SIP, (3) the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, (4) the state has met the SIP requirements of Section 110 and Part D of the Act, and (5) the area has an EPA approved Maintenance Plan.

As demonstrated in Subsection IX.A.27.b, the Provo NAA has satisfied the redesignation requirements of Section 107 and is eligible for redesignation pending the EPA's approval of the Provo NAA Maintenance Plan. The maintenance plan is included in Subsection IX.A.27.c and was written in compliance with Section 175A of the Act. The maintenance plan demonstrates that the Provo NAA will continue to maintain the 24-hr $PM_{2.5}$ NAAQS through at least the year 2035. The maintenance plan also includes contingency measures to assure that the State will promptly correct any violation of the standard that may occur after redesignation. Upon the EPA's approval of the maintenance plan, the State is requesting that the Provo NAA be redesignated to attainment for the 2006 $PM_{2.5}$ 24-hour NAAQS.[1]

1) Background

In October of 2006, EPA revised the 1997 NAAQS for $PM_{2.5}$. While the annual standard remained unchanged at 15 µg /m^3 until 2012, the 24-hr standard was lowered from 65 µg /m^3 to 35 µg /m^3. The Utah Division of Air Quality (UDAQ) has monitored $PM_{2.5}$ since 2000 and found that all areas have complied with the 1997 standards. Since the promulgation of the 2006 standard, all or parts of seven Utah counties have recorded monitoring data that was not in compliance with the new 24-hr standard. In 2012, EPA lowered the annual standard to 12 µg /m^3, and all areas of the state meet this new standard.

On November 13, 2009, EPA designated the Provo NAA as nonattainment for the 2006 24-hour $PM_{2.5}$ NAAQS under the Act's general provisions for nonattainment areas. On January 4, 2013, the D.C. Circuit Court of Appeals issued a decision holding that the specific provisions for PM_{10} nonattainment areas, which are found in Part D, Subpart 4 of the Act, also apply to $PM_{2.5}$ nonattainment areas. These provisions require EPA to classify a PM nonattainment area as "moderate" at the time it is designated nonattainment. If the area cannot attain the NAAQS by the attainment date, then EPA is required to

[1] Concurrent with the State's submittal of SIP Section IX.A.27 to the EPA, Governor Gary Herbert will submit a letter to EPA requesting that EPA approve the maintenance plan and redesignate the Provo NAA to attainment.

reclassify the area as "serious." On June 2, 2014, the EPA classified the Provo NAA as a moderate nonattainment area with an attainment date of December 31, 2015.

The Act requires areas failing to meet the federal ambient $PM_{2.5}$ standard to develop a SIP with sufficient control requirements to expeditiously attain and maintain the standard. On December 22, 2014, UDAQ submitted a moderate area nonattainment SIP for the Provo NAA.[2] The modeled attainment demonstration underlying the moderate SIP assessed the likelihood of attainment by the applicable attainment date of December 31, 2015 and concluded that it would be impracticable to do so.

After reaching the statutory attainment date, the EPA was compelled to determine whether the area had or had not achieved compliance with the standard by evaluating the prior three years of quality assured data. On May 10, 2017, EPA determined that the Provo NAA did not reach attainment of the 2006 24-hour standard by the attainment date (89 FR 21711). EPA subsequently reclassified the Provo NAA from a moderate $PM_{2.5}$ nonattainment area to a serious $PM_{2.5}$ nonattainment area on June 9, 2017.

Under Subpart 4 of the Act, serious PM nonattainment areas require, in addition to the provisions submitted to meet the moderate area planning requirements, the submittal of a SIP revision that: 1) provides for attainment of the applicable NAAQS no later than the end of the 10th calendar year after the area's designation as nonattainment (December 31, 2019, for the Provo NAA), and 2) includes provisions to assure that the best available control measures (BACM) for the control of $PM_{2.5}$ and its precursors shall be implemented no later than four years after the date the area is re-classified as a serious area (June 9, 2021, for the Provo NAA). To fulfill the subpart 4 requirements, UDAQ submitted serious SIP elements to EPA on February 4, 2019, including BACM analysis. SIP approval is discussed in more detail in IX.A.27.b(2).

The statutory attainment date for the Provo NAA is December 31, 2019. Under the 24-hour $PM_{2.5}$ NAAQS, compliance is determined by the average of three years of 98th percentile values. On April 10, 2019 (84 FR 14267), the EPA published a final determination that based on the validated data from 2015-2017, the Provo, UT nonattainment area attained the 2006 primary and secondary 24-hour $PM_{2.5}$ NAAQS. The purpose of this SIP submittal is to demonstrate that the Provo NAA is eligible for redesignation to attainment (IX.A.27.b) and document a ten-year maintenance plan (IX.A.27.c).

IX.A.27.b Redesignation Requirements

Section 107(d)(3)(E) of the Act outlines five requirements that a nonattainment area must satisfy before an area may be eligible for redesignation from nonattainment to attainment status. Table IX.A.27.1 identifies the redesignation requirements as they are stated in Section 107(d)(3)(E) of the Act. Each element will be addressed in turn, with the central element being the maintenance plan found in Subsection IX.A.27.c below.

[2] UDAQ. December 3, 2014. Utah State Implementation Plan. Control Measures for Area and Point Sources, Fine Particulate Matter, $PM_{2.5}$ SIP for the Provo, UT Nonattainment Area. Section IX. Part A.22. https://deq.utah.gov/legacy/laws-and-rules/air-quality/sip/docs/2014/12Dec/SIP%20IX.A.22_PROVO_FINAL_Adopted%2012-3-14.pdfd%2012-3-14.pdf

Category	Requirement	Reference	Addressed in Section
Attainment of Standard	Three consecutive years of $PM_{2.5}$ monitoring data must show that violations of the standard are no longer occurring	CAA §107(d)(3)(E)(i)	IX.A.27.b(1)
Approved SIP	The attainment SIP for the area must be fully approved	CAA §107(d)(3)(E)(ii)	IX.A.27.b(2)
Permanent and Enforceable Emissions Reductions	The State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable	CAA §107(d)(3)(E)(iii), Calcagni memo (Sect 3, para 2)	IX.A.27.b(3)
Section 110 and Part D requirements	The State must verify that the area has met all requirements applicable to the area under section 110 and Part D	CAA: §107(d)(3)(E)(v), §110(a)(2), Sec 171	IX.A.27.b(4)
Maintenance Plan	The Administrator has fully approved the Maintenance Plan for the area as meeting the requirements of CAA §175A	CAA: §107(d)(3)(E)(iv)	IX.A.27.b(5) and IX.A.27.c

Table IX.A.27. 1 Prerequisites to Redesignation in the Federal Clean Air Act

(1) The Area Has Attained the $PM_{2.5}$ NAAQS

CAA 107(d)(3)(E)(i) – *The Administrator determines that the area has attained the national ambient air quality standard*. To satisfy this requirement, the State must show that the area is attaining the applicable NAAQS. According to EPA's guidance[3] concerning area redesignations, there are generally two components involved in making this demonstration. The first relies upon ambient air quality data which should be representative of the area of highest concentration and should be collected and quality assured in accordance with 40 CFR 58. The second component relies upon supplemental air quality modeling. Each component will be addressed in turn.

a) Ambient Air Quality Data (Monitoring) and Utah's Monitoring Network

The NAAQS for $PM_{2.5}$ are listed in 40 CFR 50.13. The 2006 24-hour NAAQS is 35 micrograms per cubic meter ($\mu g/m^3$) for a 24-hour period and is met when the 98th percentile 24-hr concentration is less than or equal to 35 $\mu g/m^3$. Each year's 98th percentile is the daily value beneath which 98% of all daily values would fall. The procedure for evaluating $PM_{2.5}$ data with respect to the NAAQS is specified in Appendix N of 40 CFR Part 50. Generally speaking, the 24-hr $PM_{2.5}$ standard is met when a three-year average of 98th percentile values is less than or equal to 35 $\mu g/m^3$.

$PM_{2.5}$ has been monitored in Utah since 2000, following the promulgation of the 1997 $PM_{2.5}$ NAAQS. UDAQ's monitors are appropriately located to assess concentration, trends, and changes in $PM_{2.5}$ concentrations. During Utah's wintertime temperature inversions, daily sampling and real time monitoring are necessary for both public notification and to provide data for the air quality models.

The UDAQ Air Monitoring Section maintains an ambient air monitoring network in Utah in accordance with 40 CFR 58 that collects both air quality and meteorological data. Figure IX.A.27.1 on the following

[3] John Calcagni. September 4, 1992. EPA Memorandum "Procedures for Processing Requests to Redesignate Areas to Attainment."

page shows the location of sites along the Wasatch Front and in the Cache Valley that collect $PM_{2.5}$ data. The ambient air quality monitoring network along Utah's Wasatch Front and in the Cache Valley is routinely audited by the EPA, and meets the agency's requirements for air monitoring networks.

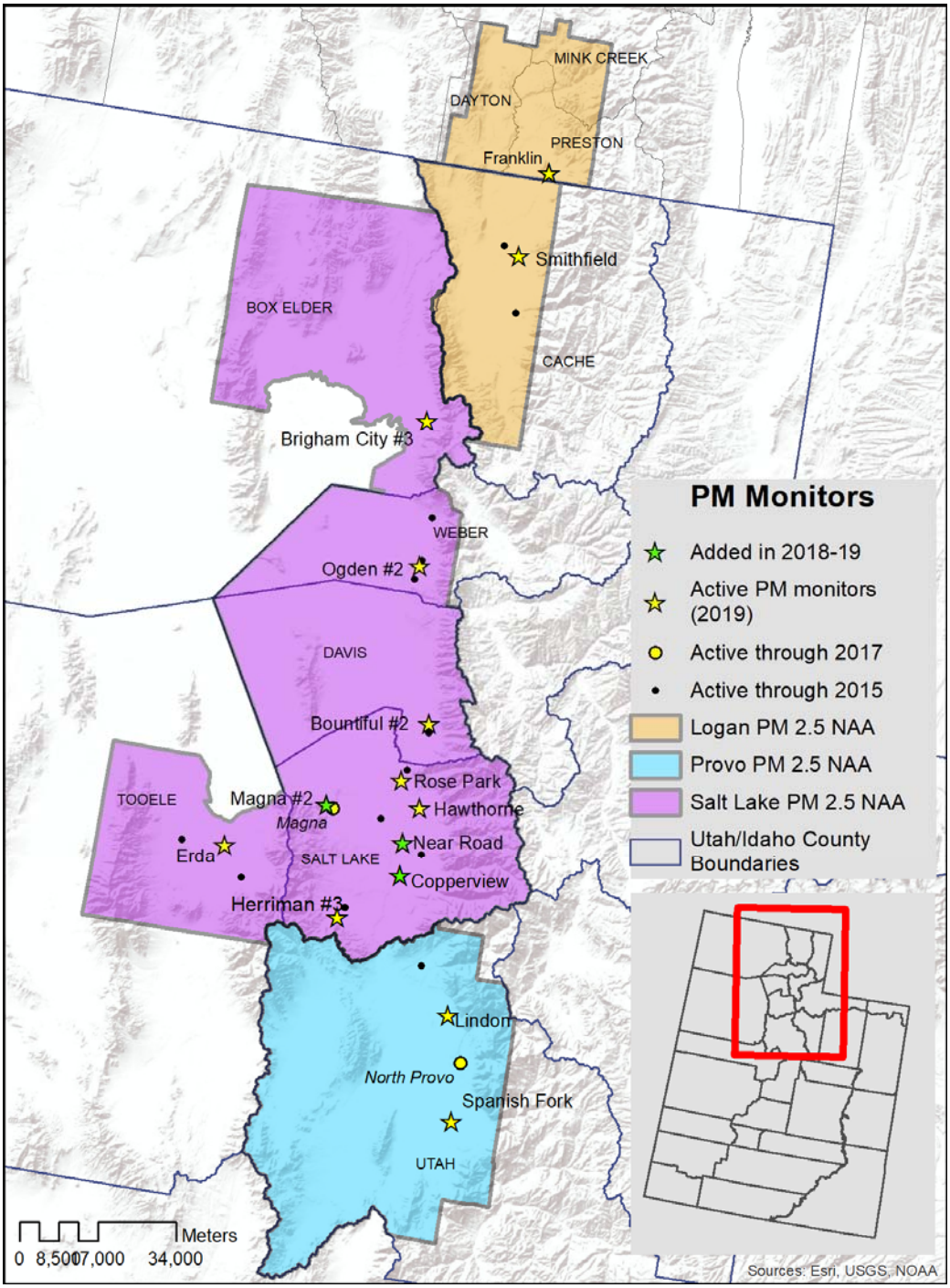

Figure IX.A.27. 1 Utah's $PM_{2.5}$ Air Monitoring Network

Table IX.A.27.2 below shows the 98th percentile values in µg /m3 for 2015, 2016, and 2017 as well as the three-year average of these values. The three-year average, or design value from 2015-2017 was used by EPA in their final clean data determination for the Provo NAA (84 FR 14267).

Location	2015	2016	2017	3-Year Average of 98th percentiles
North Provo	25.0	36.6	21.9	27.8
Lindon	27.3	36.3	28.9	30.8
Spanish Fork	28.1	29.2	27.6	28.3

Table IX.A.27. 2 Monitored Ambient 24-hr $PM_{2.5}$ Data

i. Modeling Element

EPA guidance[4] concerning redesignation requests and maintenance plans discusses the requirement that the area has attained the standard and notes that air quality modeling may be necessary to determine the representativeness of the monitored data. Areas that were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. The Provo NAA was not designated based on modeling; therefore, additional modeling is not necessary to determine the representativeness of the monitored data. The Provo NAA clean data determination was made based on validated ambient monitored values. Consequently, modeling is not necessary to show attainment. However, modeling was conducted for the purpose of this maintenance demonstration to show continued compliance with the $PM_{2.5}$ NAAQS through the year 2035 (see section IX.A.27.c).

ii. EPA Acknowledgement

The data presented in the preceding paragraphs demonstrates that the Provo NAA is attaining the 24-hr $PM_{2.5}$ NAAQS. On April 10, 2019, EPA published notice in the Federal Register (84 FR 14267) that pursuant to CAA section 199(b)(2), "the EPA is finalizing a clean data determination (CDD) for the 2006 24-hour fine particulate matter ($PM_{2.5}$) Provo, Utah (UT) nonattainment area (NAA)." This determination was based on quality-assured, quality-controlled and validated ambient air monitoring data for 2015-2017.

b) Fully Approved Attainment Plan for $PM_{2.5}$

CAA 107(d)(3)(E)(ii) - The Administrator has fully approved the applicable implementation plan for the area under section 110(k).

Areas designated as nonattainment that attain the standard prior to the SIP submittal deadline, or prior to an area's approved attainment date, are eligible for reduced regulatory requirements as described in EPA's "Clean Data Policy."[5] Under the Clean Data Policy, the EPA issued a clean data determination on April 10, 2019 (84 FR 14267) for the Provo NAA. The approval status of both the moderate and serious Provo SIPs is dependent on the clean data determination requirements as detailed in 81 CFR 51.1015. For

[4] Ibid

[5] Steve Page, Director, EPA Office of Air Quality Policy Planning and Standard. December 14, 2004. EPA Memorandum to Air Division Directors, "Clean Data Policy for the Fine Particle National Ambient Air Quality Standards."

a serious $PM_{2.5}$ nonattainment area, a clean data determination suspends the requirements for the state to submit an attainment demonstration, reasonable further progress (RFP) plans, quantitative milestones, and contingency measures until such time as: (1) the area is redesignated to attainment, after which such requirements are permanently discharged; or (2) the EPA determines that the area has re-violated the $PM_{2.5}$ NAAQS, at which time the state shall submit such attainment plan elements for the serious nonattainment area by a future date to be determined by the EPA. Table IX.A.27.3 details the EPA SIP approval status.

On February 4, 2019, Utah submitted the required serious SIP elements for the Provo NAA. Additionally, EPA guidance[6] states that approval action on SIP elements and the redesignation request may occur simultaneously. Requirements listed in Table IX.A.27.3 that show pending approval may fall into this category.

Requirement	EPA Action & Date	FR Citation
Base Year and Projection Year Emission Inventories	Approval Pending	--
Modeled Attainment Demonstration	Clean Data Determination 4/10/2019	84 FR 14267
BACT	Approval Pending	--
On-Road Mobile BACM	Approval Pending	--
Non-Road Mobile BACM	Approval Pending	--
Area Source BACM	See Table IX.A.27.4	--
MVEB	Clean Data Determination 4/10/2019	84 FR 14267
Nonattainment New Source Review (R307-403)	Approved on 7/25/2019	84 FR 35832
Reasonable Further Progress	Clean Data Determination 4/10/2019	84 FR 14267
Quantitative Milestones	Clean Data Determination 4/10/2019	84 FR 14267
Contingency Measures	Clean Data Determination 4/10/2019	84 FR 14267

Table IX.A.27. 3 Provo, UT Serious SIP Approval Status

The SIP elements still required under the clean data policy[7] include emission inventories, NNSR requirements, and BACM/BACT. The EPA approved R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas on July 25, 2019 (84 FR 35832), which covers the NNSR requirement for the $PM_{2.5}$ attainment plans. The State has submitted the emission inventories, and BACM/BACT elements to the EPA, including the R307-300 series amendments and the point source

[6] Calcagni (n 3)
[7] Environmental Protection Agency. August 24, 2016. Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements; Final Rule. 82 FR 58128.

BACT emission limitation and operating practices (Utah SIP Section IX.H). These SIP elements are still pending EPA approval.

While many of the moderate and serious SIP elements are suspended under the clean data determination, many of the moderate SIP element have been approved. As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control $PM_{2.5}$ and $PM_{2.5}$ precursors. On February 25, 2016 (81 FR 9343), and October 19, 2016 (81 FR 71988), the EPA approved area source rule revisions and reasonably available control measure (RACM) analyses (where appropriate) for the majority of the R307-300 series. See Table IX.A.27.4 for details on rules, approval dates, and implementation schedules. For the SLC and Provo NAAs, the BACM analysis resulted in revisions to 13 different area source rules which affect surface coating, graphic arts, and aerospace manufacture and rework facilities.

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-302 Solid Fuel Burning Devices [1] EPA conditionally approved* October 19, 2016 (81 FR 71988).	February 1, 2017
R307-303 Commercial Cooking [1] EPA approved February 25, 2016 (81 FR 9343).	December 15, 2015
R307-304 Solvent Cleaning [1]	December 6, 2017
R307-307 Road Salting and Sanding EPA approved February 25, 2016 (81 FR 9343).	January 1, 2014
R307-309 Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust [1] EPA proposed for approval September 14, 2017 (82 FR 43205).	Salt Lake County, Utah County, and the City of Ogden – January 1, 2013. Remaining NAAs – April 1, 2013. Amended August 4, 2017
R307-312 Aggregate Processing Operations for $PM_{2.5}$ Nonattainment Areas. EPA approved October 19, 2016 (81 FR 71988).	February 4, 2016

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-335 Degreasing and Solvent Cleaning Operations [1] EPA approved February 25, 2016 (81 FR 9343).	All sources within Salt Lake and Davis Counties R307-335-3 through R307-335-6 – January 1, 2013. All other sources defined in R307-335-2 – September 1, 2013. All sources within Box Elder, Cache, Utah, Weber, and Tooele Counties R307-335-7 – August 1, 2014 Amended October 29, 2017, by removing sections 6 & 7 to for rule R307-304
R307-342 Adhesives & Sealants [1] EPA approved February 25, 2016 (81 FR 9343).	December 1, 2014
R307-343 Emissions Standards for Wood Furniture Manufacturing Operations [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – September 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-344 Paper, Film & Foil Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-345 Fabric & Vinyl Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2011. Amended December 6, 2017
R307-346 Metal Furniture Surface Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-347 Large Appliance Surface Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-348 Magnet Wire Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-349 Flat Wood Panel Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-350 Miscellaneous Metal Parts and Products Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – September 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-351 Graphic Arts [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-352 Metal Containers, Closure, and Coil Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-353 Plastic Parts Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-354 Automotive Refinishing Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-355 Control of Emissions from Aerospace Manufacture and Rework Facilities [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended March 8, 2018
R307-356 Appliance Pilot Light [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2013

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-357 Consumer Products [1] EPA approved February 25, 2016 (81 FR 9343)	May 8, 2014
R307-361 Architectural Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	October 31, 2013

Table IX.A.27. 4 Area Source Rules Implementation Schedule and EPA Approval Status

[1] control measure implementation schedule and confirmation that measures have been implemented
[2] control measure implementation schedule and review if any new sources located in the NAA
*UDAQ submitted the committed revisions on February 1, 2017, within the one-year conditional approval window

The clean data determination has suspended all other elements of the Provo NAA $PM_{2.5}$ attainment plan, including reasonable further progress (RFP) plans, quantitative milestones, and contingency measures at this time. Considering the suspended SIP elements through the clean data policy and the approval or expected approval of required elements, Utah has met requirement 107(d)(3)(E)(ii) for the Provo NAA.

c) Improvements in Air Quality Due to Permanent and Enforceable Reductions in Emissions

CAA 107(d)(3)(E)(iii) - *The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions.* Speaking further on the issue, EPA guidance[8] reads that the State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. In the following sections, both the improvement in air quality and the emission reductions themselves will be discussed.

i. Improvement in Air Quality

The improvement in air quality with respect to $PM_{2.5}$ can be shown in a number of ways. Improvement, in this case, is relative to the various control strategies that affected the airshed. For the Provo NAA, these control strategies were implemented as the result of both the moderate SIP and the serious designation BACM/BACT requirements, submitted to EPA in December 2014 and February 2019, respectively. The various control measure effective dates are detailed in Tables IX.A.27.4 and IX.A.27.5.

An assessment of the ambient air quality data collected at monitors in the NAA from the year monitoring began to 2018 (the last year of validated data) shows an observable decrease in monitored $PM_{2.5}$ (see Figure IX.A.27.2 and Figure IX.A.27.3). The Provo NAA is designated nonattainment only for the 24-hour health standard, not for the annual standard. However, it is useful to observe both the 98th percentile average of 24-hr data as well as the annual arithmetic mean to understand trends (see Figure IX.A.27.2).

[8] Calcagni (n 3)

Ambient concentrations in excess of the 24-hr standard are typically only incurred during winter months when cold-pool conditions drive and trap secondary $PM_{2.5}$. The actual cold-pool temperature inversions vary in strength and duration from year to year, and the $PM_{2.5}$ concentrations measured during those times reflect this variability far more than they reflect gradual changes in the emissions of direct $PM_{2.5}$ and $PM_{2.5}$ precursors. This variability is apparent in Figure IX.A.27.3. Despite the variability, if a line is fit through the 24-hr data, the trend is noticeably downward and indicates an improvement of a little less than one µg /m^3 per year.

This episodic variability is reduced by looking at annual mean values of $PM_{2.5}$ concentrations shown in Figure IX.A.27.2. The data is still skewed more by winter data than summer data. It includes all of the high values identified as the 98^{th} percentiles, as well as the values ranked even higher. Still, the trend is downward. Fitting a line through the data collected at the Lindon site (chosen because the monitor consistently records the highest values in the NAA) reveals a trend that noticeably decreases and indicates an improvement of approximately 3.0 µg /m^3, over the 18-year span.

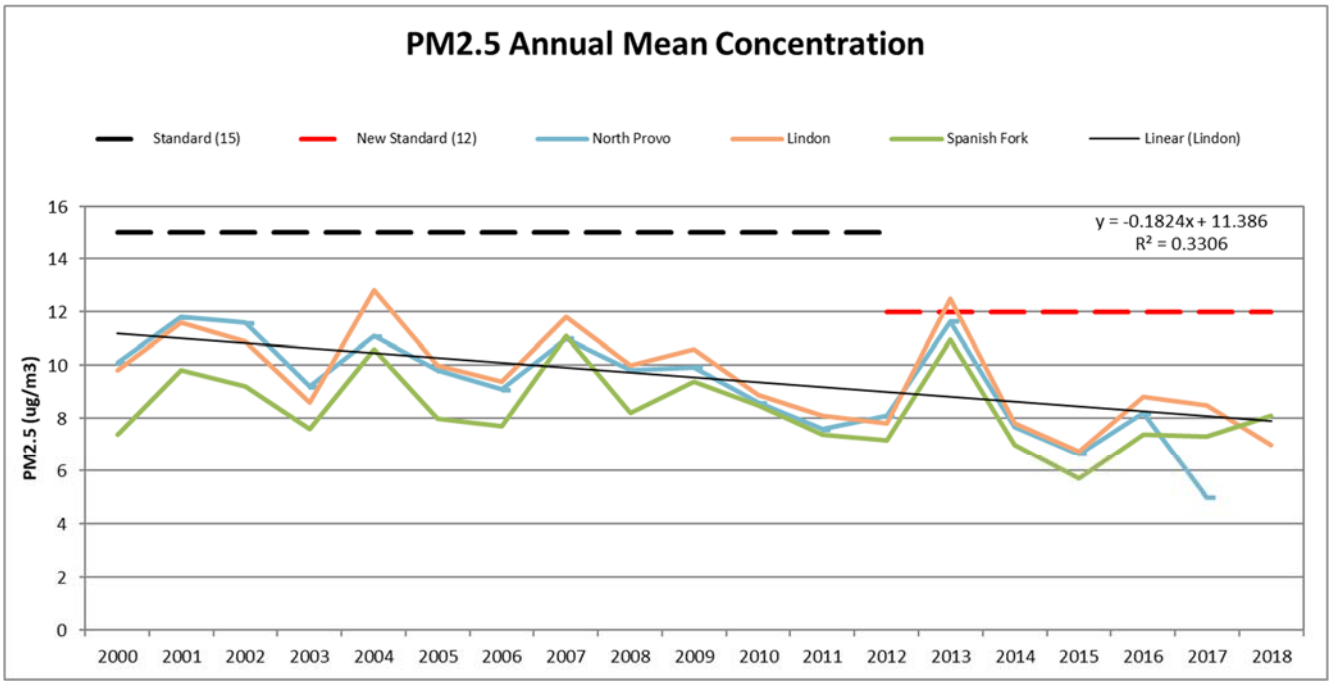

Figure IX.A.27. 2 Provo NAA $PM_{2.5}$ Annual Mean Concentration

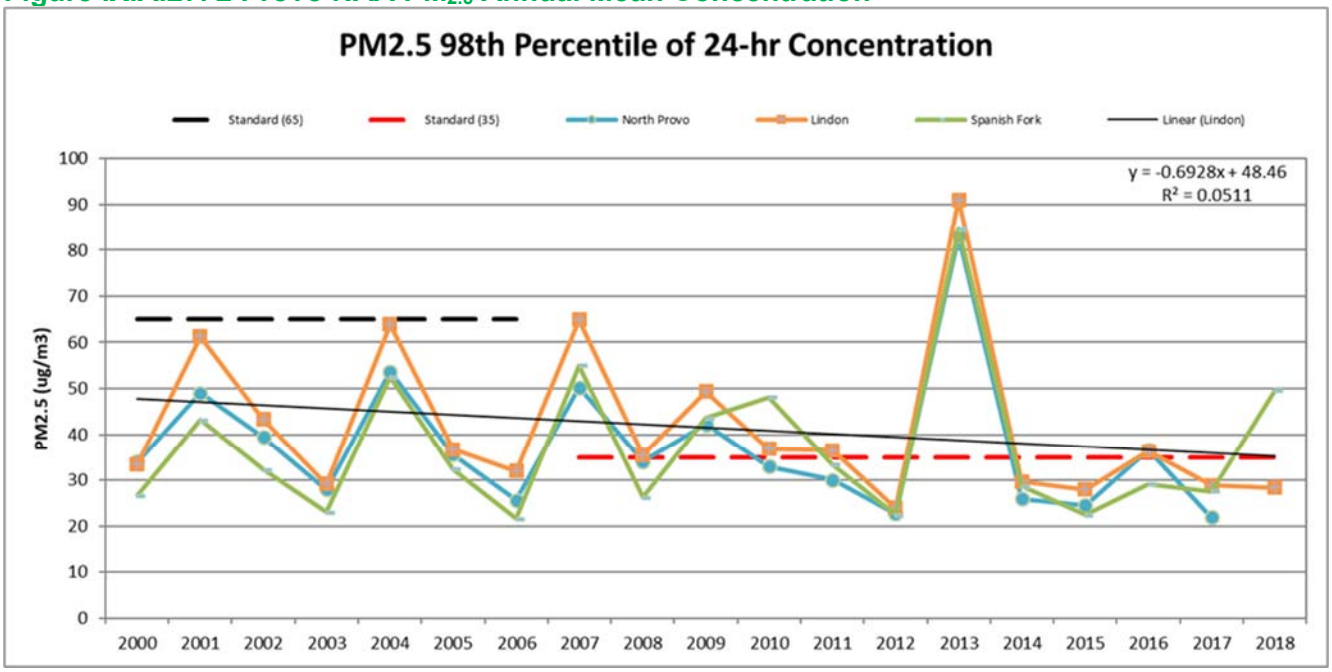

Figure IX.A.27. 3 Provo NAA $PM_{2.5}$ 98th Percentile of 24-hr Concentration

ii. Reduction in Emissions

As stated above, EPA guidance[9] says that the State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable. In making this showing, the State

[9] Ibid

should estimate the percent reduction (from the year that was used to determine the design value) achieved by Federal measures such as motor vehicle control, as well as by control measures that have been adopted and implemented by the State.

As mentioned, the ambient air quality data presented in Subsection IX.A.27.b(3)(a) includes values prior to the nonattainment designation through 2018 to illustrate the lasting effect of the implemented control strategies. In discussing the effect of the controls, as well as the control measures themselves, however, it is important to keep in mind the time necessary for their implementation.

The moderate nonattainment SIP for the Provo NAA included a statutory date for the implementation of RACM/RACT of December 31, 2014. Thus, 2015 marked the first year in which RACM/RACT was reflected in the emissions inventories for the Provo NAA. Section 189(c) of the CAA identifies, as a required plan element, quantitative milestones which are to be achieved every three years, and which demonstrate reasonable further progress (RFP) toward attainment of the standard by the applicable date. As defined in CAA Section 171(1), the term reasonable further progress means "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." Hence, the milestone report must demonstrate that the control strategy is achieving reasonable progress toward attainment.

The RACM prescribed by the moderate nonattainment SIP and the subsequent implementation by the State is discussed in more detail in a milestone report submitted for the Provo NAA to EPA on March 23, 2018, within the 90 day post-milestone date required by CAA 189(c)(2) and 51.1013(b). On October 24, 2018, EPA sent Governor Gary Herbert a letter stating "The Environmental Protection Agency has determined that the 2017 Quantitative Milestone Reports are adequate. The basis for this determination is set forth in the enclosures. This determination is based on the EPA's review of information contained in the Moderate Area Plans and additional information provided in the 2017 Quantitative Milestone Reports." This approval letter is included in the TSD for this SIP submittal. Much of the downward trend in the ambient data as seen in Figures IX.A.27.2 and IX.A.27.3 is attributable to the controls implemented through the moderate SIP.

40 CFR 51.1011 establishes that control measures must be implemented no later than the beginning of the year containing the applicable attainment date, January 1, 2019, for the Provo NAA. Any control measures implemented beyond such date are instead regarded as additional feasible measures. Implementation schedules for point source control measures are included in Table IX.A.27.5. Emission reductions leading to lower ambient values can be observed in Figures IX.A.27.2 and IX.A.27.3, with further improvements expected beyond 2019 as a result of the more stringent BACM/BACT requirements.

Company	RACT Equipment Updates	BACT Requirements	Implementation Schedule	Quantity Reduction (tons/yr)	Compliance Mechanism
PacifiCorp Lake Side	N/A (currently at RACT)	Retention of NOx limits from existing permit:	Already Implementing (use of SCR)	N/A identical to previous existing RACT	NOx CEM

		Block 1: 14.9 lb/hr Block 2: 18.1 lb/hr		controls and permit as written	
McWane Ductile	Limiting VOC emissions 118.16 tons/yr	Replaced RACT limit w/ VOCs from finishing paint line < 1 ton/day	Already implementing	N/A	Recordkeeping requirement outlined in IX.H.13.c.i.a
	Heat input limit on annealing ovens (63.29 MMBtu/hr)	Retained RACT limit as BACT	Already implementing	N/A	General requirements of IX.H.11.c

Table IX.A.27. 5 Point Source Emission Control Measure Implementation Schedule and Compliance Mechanism

As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control $PM_{2.5}$ and $PM_{2.5}$ precursors. For the serious SIP area source BACM review, each of UDAQ's existing area source rules were re-evaluated to ensure that all appropriate source categories were addressed in rulemaking and that the level of control required is consistent with BACM. For newly identified controls or enhancement of existing controls, an evaluation was made to determine technological and economic feasibility. The BACM review resulted in revisions to 13 different area source rules which affect surface coating (for a variety of different surfaces), graphic arts, and aerospace manufacture & rework facilities. The rules and amendments are listed in Table IX.A.27.4. Table IX.A.27.6 shows the effectiveness of the area source rules within Provo NAA.

2017 PROVO NAA lb/day Area Source Rule Name	NOX	VOC	NH3	SO2	PM2.5
R307-342 adhesive/sealants	0.0	393.5	0.0	0.0	0.0
R307-355 aerospace manufacture & rework	0.0	0.0	0.0	0.0	0.0
R307-312 aggregate processing	0.0	22.8	0.0	0.0	0.0
R307-347 appliance surface coating	0.0	0.0	0.0	0.0	0.0
R307-354 automotive refinishing	0.0	154.6	0.0	0.0	0.0
R307-352 metal container, closure, & coil coating	0.0	0.0	0.0	0.0	0.0
R307-303 commercial cooking	0.0	282.4	0.0	0.0	0.0
R307-357 consumer products	0.0	1478.3	0.0	0.0	0.0
R307-335 degreasing & solvent cleaning	0.0	0.0	0.0	0.0	0.0
R307-349 flat wood panel coatings	0.0	0.0	0.0	0.0	0.0
R307-309 fugitive dust	0.0	0.0	0.0	0.0	916.3
R307-351 graphic arts	0.0	0.0	0.0	0.0	0.0
R307-208 outdoor wood boilers	3.4	111.4	2.8	3.4	105.8
R307-221 landfill controls	0.0	63.2	0.0	0.0	0.0
R307-348 magnet wire coatings	0.0	0.0	0.0	0.0	0.0
R307-346 metal furniture surface coating	0.0	0.0	0.0	0.0	0.0
R307-350 misc metal parts & product coating	0.0	0.0	0.0	0.0	0.0
R307-361 architectural coating	0.0	2178.6	0.0	0.0	0.0
R307-344 paper/film/foil coating	0.0	0.0	0.0	0.0	0.0
R307-356 appliance pilot light	494.3	28.9	0.0	3.2	2.3
R307-353 plastic parts coating	0.0	0.0	0.0	0.0	0.0
R307-302 residential wood burning ban	321.7	2659.7	100.0	38.0	2330.4
R307-230 water heaters	0.0	0.0	0.0	0.0	0.0
R307-343 wood furniture manufacturing	0.0	0.0	0.0	0.0	0.0
Total emissions reduced lb/day	**819.4**	**7373.5**	**102.8**	**44.6**	**3354.8**

2026 PROVO NAA lb/day Area Source Rule Name	NOX	VOC	NH3	SO2	PM2.5
R307-342 adhesive/sealants	0.00	608.95	0.00	0.00	0.00
R307-355 aerospace manufacture & rework	0.00	0.22	0.00	0.00	0.00
R307-312 aggregate processing	0.00	23.49	0.00	0.00	0.00
R307-347 appliance surface coating	0.00	48.12	0.00	0.00	0.00
R307-354 automotive refinishing	0.00	479.11	0.00	0.00	0.00
R307-352 metal container, closure, & coil coating	0.00	0.00	0.00	0.00	0.00
R307-303 commercial cooking	0.00	18.23	0.00	0.00	0.00
R307-357 consumer products	0.00	1829.57	0.00	0.00	0.00
R307-335 degreasing & solvent cleaning	0.00	483.36	0.00	0.00	0.00
R307-349 flat wood panel coatings	0.00	16.68	0.00	0.00	0.00
R307-309 fugitive dust	0.00	0.00	0.00	0.00	1118.72
R307-351 graphic arts	0.00	315.66	0.00	0.00	0.00
R307-208 outdoor wood boilers	3.20	108.40	2.80	3.20	103.00
R307-221 landfill controls	0.00	78.17	0.00	0.00	0.00
R307-348 magnet wire coatings	0.00	0.31	0.00	0.00	0.00
R307-346 metal furniture surface coating	0.00	99.92	0.00	0.00	0.00
R307-350 misc metal parts & product coating	0.00	64.83	0.00	0.00	0.00
R307-361 architectural coating	0.00	2696.22	0.00	0.00	0.00
R307-344 paper/film/foil coating	0.00	350.49	0.00	0.00	0.00
R307-356 appliance pilot light	2992.74	139.35	0.00	15.20	10.89
R307-353 plastic parts coating	0.00	125.97	0.00	0.00	0.00
R307-302 residential wood burning ban	312.68	2589.01	98.03	36.62	2268.45
R307-230 water heaters	2620.83	0.00	0.00	0.00	0.00
R307-343 wood furniture manufacturing	0.00	408.39	0.00	0.00	0.00
Total emissions reduced lb/day	**5929.4**	**10484.4**	**100.8**	**55.0**	**3501.1**

Table IX.A.27. 6 Area Source Rule Emissions Reduction in Provo NAA

In reality, the NAAs should expect to see continued improvement in the next five to ten years as a result of the phase-in period of a number of the area source rules and some additional feasible measures installed at point sources. For example, the gas-fired water heater rule R307-230 requires that only ultra-low NOx gas-fired water heaters to be sold or installed after July 1, 2018, but it takes years for water heater turnover to occur. In addition, the 13 rules that were revised during the serious SIP BACM review were implemented at the state level in 2018 and have a five-year phase-in period, resulting in full emission reduction by 2023. Therefore, additional emissions reductions will be seen. These phase-in periods were considered in the inventories used for modeling in this SIP.

Existing controls not implemented through the SIP process also affect the emission rates from non-stationary source categories. The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that produce $PM_{2.5}$. Tier 1 and 2 standards were implemented by 1997 and 2008 respectively. Tier 3 vehicle/engine standards were initiated with new vehicles coming to market in 2017 (25% of new sales) with full phase in by 2021 (100% of new sales). For gasoline, the five Wasatch Front refineries and the Sinclair refinery in Wyoming that also supplies gasoline to the Wasatch Front market, are considered small refineries by EPA's rule. As such, these

refineries have a tier 3 delayed implementation date of January 1, 2020 to produce a tier 3 (10 ppm sulfur) gasoline product or produce a gasoline product (greater than 10 ppm sulfur) with compensating sulfur credits. Similarly, the Heavy-Duty Engine and Vehicle Standards took effect in 2007 and were fully phased in by 2010. Air quality benefits, particularly those stemming from the light-duty and heavy-duty vehicle standards, continue to be realized as older, higher-polluting vehicles are replaced by newer, cleaner vehicles.

To supplement the federal motor vehicle control program, an Inspection and Maintenance Program was implemented in Utah County. This program has been effective in identifying vehicles that no longer meet the emission specifications for their respective makes and models and in ensuring that those vehicles are repaired in a timely manner.

Emissions from non-road mobile emission sources also benefit from several significant regulatory programs enacted at the federal level. This category of emitters includes airplanes, locomotives, hand-held engines, and larger portable engines such as generators and construction equipment. The effectiveness of these controls has been incorporated into the "NONROAD" model UDAQ uses to compile the inventory information for this source category.

The emissions reductions resulting from federal programs and the RACM/RACT plus BACM/BACT controls incorporated into the Utah SIP or promulgated at the State level, result in emissions reductions that are consistent with the notion of permanent and enforceable improvements in air quality. Taken together with the trends in ambient air quality illustrated in the previous paragraph, along with the continued implementation of the nonattainment SIP elements for the Provo NAA, they provide a reliable indication that these improvements in air quality reflect the application of permanent steps to improve the air quality in the region.

d) State has Met Requirements of Section 110 and Part D

CAA 107(d)(3)(E)(v) - The State containing such area has met all requirements applicable to the area under section 110 and part D. Section 110 of the Act deals with the broad scope of state implementation plans and the capacity of the respective state agency to effectively administer such a plan. Part D deals specifically with plan requirements for nonattainment areas, including those requirements that are specific to $PM_{2.5}$.

i. Section 110

The State has met all requirements applicable to the Provo NAA under Section 110 of the Act. Section 110(a)(2) contains the general requirements or infrastructure elements necessary for EPA approval of the SIP. On September 21, 2010, the State submitted an Infrastructure SIP to EPA demonstrating compliance with the requirements of Section 110 that are applicable to the 2006 $PM_{2.5}$ NAAQS. EPA approved the State's Infrastructure SIP on November 25, 2013 (78 FR 63883) for all Section 110 requirements that are applicable to redesignation.

ii. Part D Subpart 1 and 4

Part D of the Act addresses "Plan Requirements for Nonattainment Areas." Subparts 1 and 4 of Part D contain planning elements that must be included in the SIP. This includes the requirement to submit an

attainment demonstration, reasonable further progress plans, quantitative milestones and milestone reports, a motor vehicle emission budget for the attainment year for the purposes of transportation conformity, and contingency measures for the area. However, upon EPA's issuance of a final clean data determination demonstrating that the Provo NAA has attained the standard, these requirements are suspended (40 C.F.R. § 51.1015(b) and 84 FR 26054).

The remaining Part D requirements that are relevant to redesignation are requirements that are independent of helping the area achieve attainment. This includes the requirement to have a nonattainment new source review ("NNSR") program, emissions inventory submission, and implementation of BACM/BACT. The State has satisfied these remaining requirements. Utah's NNSR program can be found in Utah Administrative Rule R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas. EPA fully approved the current version of the NNSR program on July 25, 2019 (84 FR 35832). The BACM/BACT requirements and the emissions inventory were included in the serious SIP element submittal for the Provo NAA that the State submitted to the EPA on February 4, 2019. Upon EPA's approval of these elements prior to or concurrently with EPA's action on the maintenance plan/redesignation request, Utah will have complied with all applicable Part D requirements.

e) Maintenance Plan for $PM_{2.5}$ Areas

As stated in the Act, an area may not be redesignated to attainment without first submitting and receiving EPA approval of a maintenance plan. The maintenance plan is a quantitative showing that the area will continue to attain the NAAQS for an additional 10 years (from EPA approval), accompanied by sufficient assurance that the terms of the numeric demonstration will be administered by the State and by the EPA in an oversight capacity. The maintenance plan is the central criterion for redesignation. It is contained in the following subsection.

IX.A.27.c Maintenance Plan

CAA 107(d)(3)(E)(iv) - The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A. An approved maintenance plan is one of several criteria necessary for area redesignation as outlined in Section 107(d)(3)(E) of the Act. The maintenance plan itself, as described in Section 175A of the Act and further addressed in EPA guidance[10] has its own list of required elements. The following table is presented to summarize these requirements. Each will then be addressed in turn.

Category	Requirement	Reference	Addressed in Section
Maintenance demonstration	Provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation.	CAA: 175A(a)	IX.A.27.c (1)
Revise in 8 Years	The State must submit an additional revision to the plan, 8 years after	CAA: 175A(b)	IX.A.27.c (6)

[10] Calcagni (n 3)

	redesignation, showing an additional 10 years of maintenance.		
Continued Implementation of Nonattainment Area Control Strategy	The Clean Air Act requires continued implementation of the NAA control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions.	CAA: 175A(c), 110(l), Calcagni memo	IX.A.27.c (5)
Contingency Measures	Areas seeking redesignation from nonattainment to attainment are required to develop contingency measures that include State commitments to implement additional control measures in response to future violations of the NAAQS.	CAA: Sec 175A(d)	IX.A.27.c (8)
Verification of Continued Maintenance	The maintenance plan must indicate how the State will track the progress of the maintenance plan.	Calcagni memo	IX.A.27.c (7)

Table IX.A.27. 7 CAA Maintenance Plan Requirements

(1) Demonstration of Maintenance - Modeling Analysis

CAA 175A(a) - Each State which submits a request under section 107(d) for redesignation of a nonattainment area as an area which has attained the NAAQS shall also submit a revision of the applicable implementation plan to provide for maintenance of the NAAQS for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be required to ensure such maintenance. The maintenance demonstration is discussed in EPA guidance[11] as one of the core provisions that should be considered by states for inclusion in a maintenance plan.

According to the EPA guidance, a State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory (discussed below) or by modeling to show that the future mix of sources and emission rates will not cause a violation of the NAAQS. Utah has elected to make its demonstration based on air quality modeling.

(a) Introduction

The following chapter presents an analysis using observational datasets to detail the chemical regimes of Utah's NAAs. Prior to the develop of this maintenance plan, UDAQ conducted a technical analysis to support the development of the serious SIP for the SLC NAA. The analysis included preparation of emissions inventories and meteorological data, and the evaluation and application of a regional photochemical model. Part of this process included episode selection to determine the episode that most accurately replicates the photochemical formation of ambient $PM_{2.5}$ during a persistent cold air pool episode in the airshed. For this maintenance plan, UDAQ is using the same episode that was used for the serious SIP modeling.

[11] Ibid

(b) Photochemical Modeling

UDAQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 6.30 for air quality modeling. CAMx v6.30 is a state-of-the-art air quality model that includes State of Utah funded enhancements for wintertime modeling. These enhancements include snow chemistry, topographical and surface albedo refinements. CAMx is an EPA approved model for use in SIP modeling. Its configuration for use in this SIP, with respect to model options and model adjustments, is discussed in the Technical Support Document.

i. Emissions Preparation

The emissions processing model used in conjunction with CAMx is the Sparse Matrix Operator Kernel Emissions Modeling System (SMOKE) version 3.6.5[12]. SMOKE prepares the annual emissions inventory for use in the air quality model. There are three aspects to the preparation of an annual emissions inventory for air quality modeling:

- Temporal: Convert emissions from annual to daily, weekly and hourly values.
- Spatial: Convert emissions from a county-wide average to gridded emissions.
- Speciation: Decompose $PM_{2.5}$ and VOC emissions estimates into individual subspecies using the latest Carbon Bond 6 speciation profiles.

The process of breaking down emissions for the air quality model was done with sets of activity profiles and associated cross reference files. These are created for point or large industrial source emissions, smaller area sources, and mobile sources. Direct $PM_{2.5}$ and $PM_{2.5}$ precursor estimates were modified via temporal profiles to reflect wintertime conditions.

Activity profiles and their associated cross reference files from the EPA's 2011v6[13] modeling platform were used. For stationary non-point and mobile sources, spatial surrogates from the EPA Clearinghouse for Inventories and Emissions Factors (CHIEF[14]) were used to distribute emissions in space across the modeling domain. Emissions from large industrial sources (point sources) were placed at the location of the source itself. Where reliable local information was available (population density, traffic demand modeling, residential heating), profiles and surrogates were modified or developed to reflect that information.

ii. Photochemical Modeling Domains and Grid Resolution

The UDAQ CAMx v6.30 modeling framework consists of two spatial domains: a high-resolution 1.33 km domain nested inside of a coarser 4 km domain (see Figure IX.A.27.4). This configuration allows one to efficiently integrate regional effects with local impacts within the Provo NAA. Vertical resolution in the model consists of 41 layers extending to the top of the atmosphere.

[12] https://www.cmascenter.org/smoke/
[13] https://www.epa.gov/air-emissions-modeling/2011-version-6-air-emissions-modeling-platforms
[14] https://www.epa.gov/chief

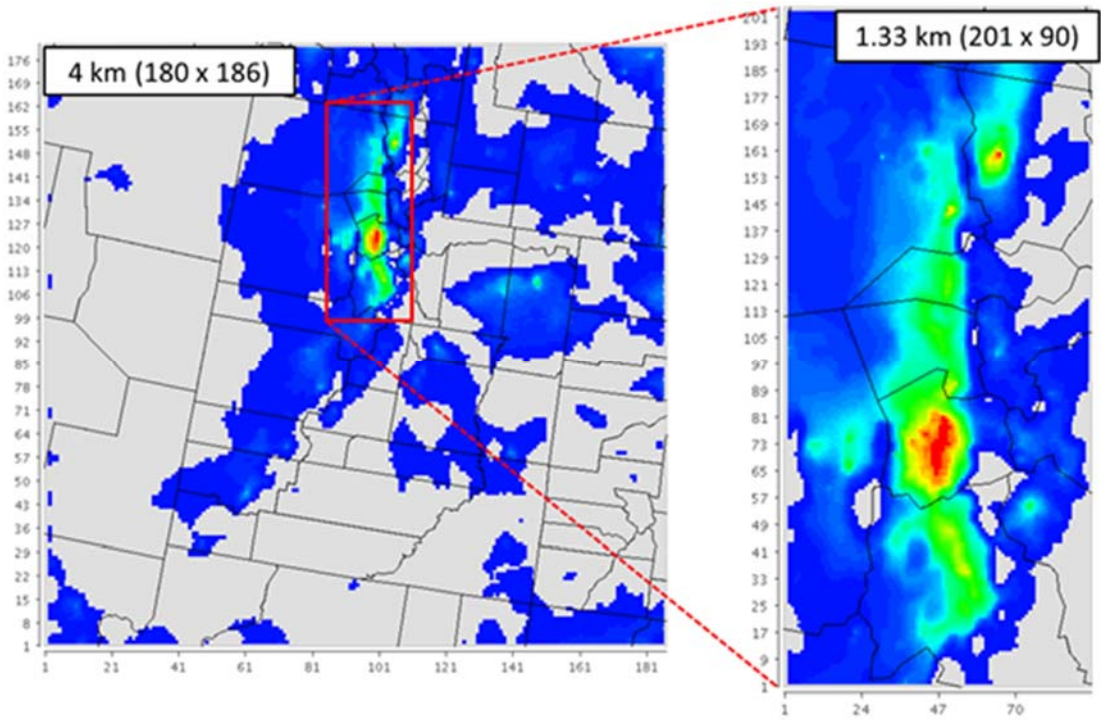

Figure IX.A.27. 4 CAMx Photochemical Modeling Domains in Two-Way Nested Configuration

The UDAQ 4 km coarse domain covers the entire state of Utah, a significant portion of Eastern Nevada (including Las Vegas), as well as smaller portions of Idaho, Wyoming, Colorado, and Arizona. The fine 1.33 km domain covers all of Utah's three $PM_{2.5}$ nonattainment areas, including the Provo NAA. Throughout this document, we will refer to the fine 1.33 km domain as the "modeling domain" when the coarse domain is not specified.

iii. Meteorological Data

Meteorological modeling was carried out by the University of Utah (University) with financial support from UDAQ.

Meteorological inputs were derived using the Weather Research and Forecasting[15] (WRF) Advanced Research WRF (WRF-ARW) model to prepare meteorological datasets for our use with the photochemical model. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary

[15] https://www.mmm.ucar.edu/weather-research-and-forecasting-model

conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

Model performance of WRF was assessed against observations at sites maintained by the University. WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8-degree temperature increase over 100 vertical meters). A summary of the performance evaluation results for WRF is included in the TSDs.

iv. Episode Selection

Part of the modeling exercise involves a test to see whether the model can successfully replicate the $PM_{2.5}$ mass and composition that was observed during prior episode(s) of elevated $PM_{2.5}$ concentration. The selection of an appropriate episode, or episodes, for use in this exercise requires some forethought and should determine the meteorological episode that helps produce the best air quality modeling performance.

EPA Guidance[16] identifies some selection criteria that should be considered for SIP modeling, including:

- Select episodes that represent a variety of meteorological conditions that lead to elevated $PM_{2.5}$.
- Select episodes during which observed concentrations are close to the baseline design value.
- Select episodes that have extensive air quality data bases.
- Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

After careful consideration, the following meteorological episodes were selected as candidates for Utah's SIP modeling:

- January 1-10, 2011
- December 7-19, 2013
- February 1-16, 2016

In addition to the criteria identified in the modeling guidance, each of these candidate episodes may be characterized as having the following atmospheric conditions:

- Nearly non-existent surface winds
- Light to moderate winds aloft (wind speeds at mountaintop < 10-15 m/s)
- Simple cloud structure in the lower troposphere (e.g., consisting of only one or no cloud layer)
- Singular 24-hour $PM_{2.5}$ peaks suggesting the absence of weak intermittent storms during the episode

[16] Environmental Protection Agency. April 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze.

Previous work conducted by the University of Utah and UDAQ showed the four conditions listed above improve the likelihood for successfully simulating wintertime persistent cold air pools in the WRF model[17]. A comprehensive discussion of the meteorological model performance for all three episodes may be found in the Technical Support Document for the meteorological modeling[18].

a) Model Adjustments and Settings

In order to better simulate Utah's winter-time inversion episodes six different adjustments were made to CAMx input data:

1. Increased vertical diffusion rates (Kvpatch).
2. Lowered residential wood smoke emissions to reflect burn ban compliance during forecasted high $PM_{2.5}$ days (burn ban).
3. Ozone deposition velocity set to zero and increased urban area surface albedo (snow chemistry)
4. Cloud water content reduced during certain days (cloud adjustment).
5. NH_3 injection to account for missing NH_3 sources in UDAQ's inventory. This is defined as artificially adding non-inventoried NH_3 emissions to the inventoried emissions that are input into CAMx.
6. Reduced the dry deposition rate of NH_3 by setting NH_3 Rscale to 1. Rscale is a parameter in CAMx that reflects surface resistance.
7. Applied a 93% reduction to paved road dust emissions.

Depending on the episode, different adjustments were applied. All adjustments were applied to the January 2011 episode while select adjustments were applied to the other two episodes.

Kvpatch improved overall model performance by enhancing vertical mixing over urban areas. Snow chemistry modifications, which included reducing ozone deposition velocity and increasing surface albedo over urban areas, helped improve the model performance by better representing secondary ammonium nitrate formation during winter-time inversion episodes in Utah.

Cloud adjustments were only applied to the January 2011 episode, which was characterized by cloud cover on January 6-8 over the Salt Lake and Utah valleys. This cloud cover led to a high bias in sulfate due to the effect of NH_3 on the gas-to-particle partitioning of sulfate in clouds. Application of the cloud adjustment scheme helped reduce this bias.

Rscale modification and burn ban adjustments were also only applied to the January 2011 episode. The burn ban adjustments reflect the compliance rate with the state's two-stage policy ban on wood-burning.

A 93% reduction in paved road dust emissions was only applied to the January 2011 emissions. This adjustment helped improve the model performance for crustal material.

[17] https://www.mmm.ucar.edu/weather-research-and-forecasting-model
[18] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

b) Episodic Model Performance

Shown below for each of three episodes are the CAMx performance results for total 24-hour $PM_{2.5}$ mass and $PM_{2.5}$ chemical species, including nitrate (NO_3), sulfate (SO_4), ammonium (NH_4), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass).

January 1-10, 2011

A comparison of 24-hr modeled and observed $PM_{2.5}$ during January 1-10, 2011 at the Lindon monitoring station in the Provo NAA showed that overall the model captures the temporal variation in $PM_{2.5}$ well (Figure IX.A.27.5). The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. Moreover, with the exception of January 3-5, the bias between measured and modeled $PM_{2.5}$ is overall relatively small, particularly on $PM_{2.5}$ exceedance days. The large bias on January 3-5 can be mainly related to the meteorological model performance on these days where jet wind speeds were overestimated in the WRF model[19].

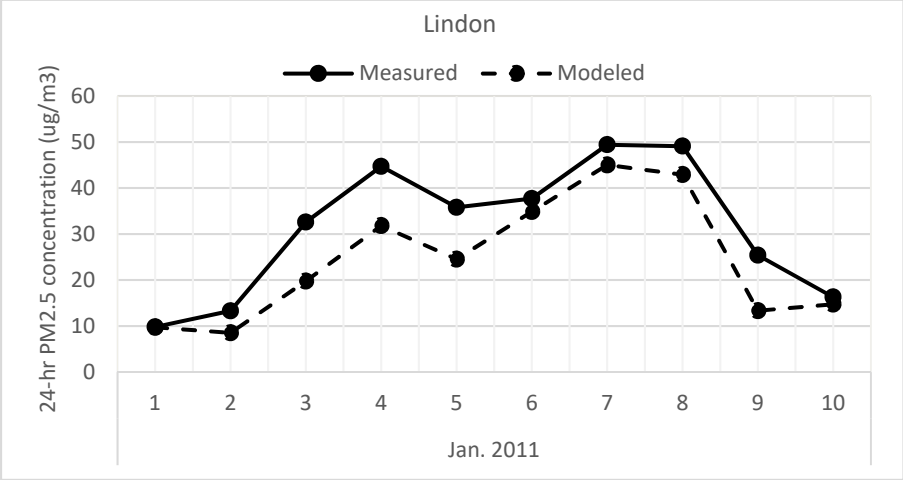

Figure IX.A.27. 5 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During January 1-10 2011 at Lindon Monitoring Station in Provo NAA

The model performance for $PM_{2.5}$ chemical species was also good for this episode as indicated by a comparison of measured and modeled $PM_{2.5}$ chemical composition at Lindon monitoring station on a $PM_{2.5}$ exceedance day (Figure IX.A.27.6). Given that measurements of $PM_{2.5}$ chemical species were not available for a $PM_{2.5}$ exceedance day during the January 1-10, 2011, modeling episode, this analysis is based on a comparison of the fraction of individual $PM_{2.5}$ chemical species in total $PM_{2.5}$ mass between 2011 model outputs and measurements from 2013. Measurements correspond to filter speciation data collected at Lindon during a typical winter-time inversion event in 2013.

[19] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

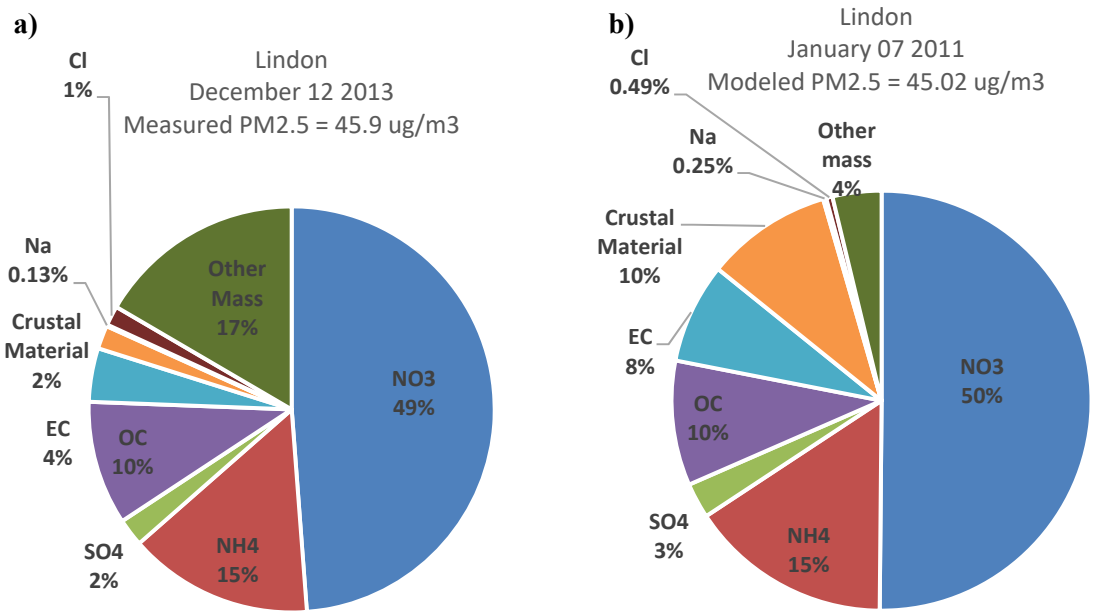

Figure IX.A.27. 6 a) Measured and b) Modeled Species Contribution (in %) to $PM_{2.5}$ at Lindon Monitoring Station in the Provo NAA on a Typical 24-hr $PM_{2.5}$ Exceedance Day

As can be seen, the chemical composition of modeled $PM_{2.5}$ is similar to that of measured $PM_{2.5}$, with modeled secondary species, NO_3, NH_3, and SO_4, accounting for over 50% of $PM_{2.5}$ mass, in agreement with measurements. The model also performed well for OC while it overestimated the percent contributions of EC and crustal material to $PM_{2.5}$. This overprediction could be related to an overestimation in source emissions. Speciation measurements specific to this episode are needed for further confirmation.

Overall, the model simulated well the timing and strength of the capping inversion during this January episode. $PM_{2.5}$ chemical species, particularly NO_3 and ammonium, are also well simulated in the model, suggesting that this episode is suitable for modeling.

December 7-19, 2013

The model performance for the December 7-19, 2013, episode was first evaluated for 24-hr $PM_{2.5}$ mass. A comparison of modeled and measured 24-hr $PM_{2.5}$ during this period showed that, while the model generally represented well the temporal variation in $PM_{2.5}$, the model simulated low $PM_{2.5}$ concentrations compared to measurements (Figure IX.A.27.7). This is likely related to a warm model temperature bias in the Utah Valley between December 10-14 due to inadequate simulation of stratus cloud formation during

December 12-14 and inadequate representation of the surface of the Utah Lake. Although frozen in reality during this December episode, the surface of the Utah lake was not represented as frozen in the model[20].

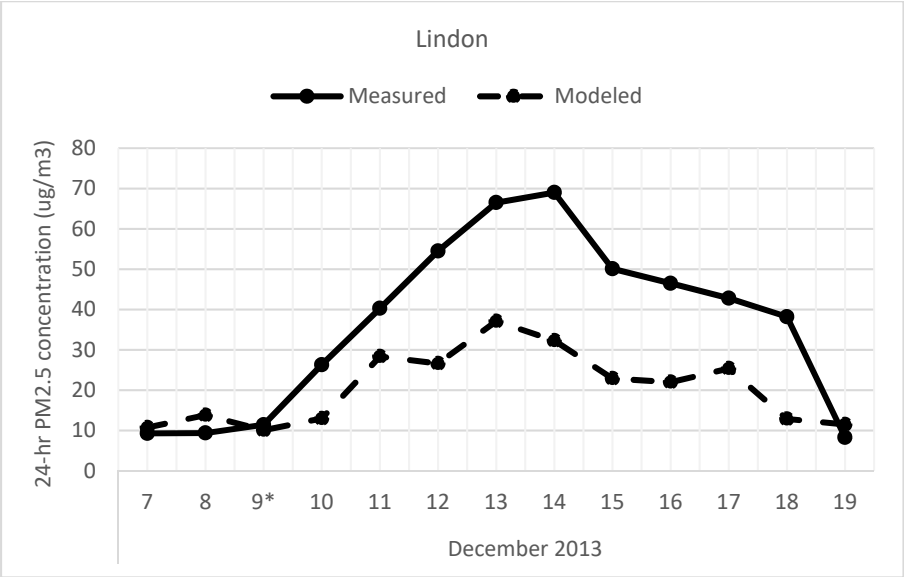

Figure IX.A.27. 7 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During December 7-19, 2013, at Lindon Monitoring Station in the Provo NAA

* Federal Reference Monitor (FRM) data is missing for this day. Reported measurement corresponds to data collected with a continuous $PM_{2.5}$ instrument.

To further evaluate the model performance during this episode, modeled and measured $PM_{2.5}$ chemical species on December 12, which corresponds to a $PM_{2.5}$ exceedance day with available speciation measurements, were compared (Figure IX.A.27.8). NO_3, ammonium, and OC are all underpredicted in the model, which is possibly related to the meteorological model performance. The WRF model overpredicted surface temperatures, leading to increased mixing and therefore reduction in concentrations. Moreover, similarly to the model performance for the January 2011 episode, crustal material is overpredicted in the model. An adjustment to paved road dust emissions was not applied for the December 2013 simulations.

Given that the strength of the capping inversion was not well simulated in the meteorological model, selection of the December 2013 episode as modeling episode for modeling demonstration is not desirable.

[20] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

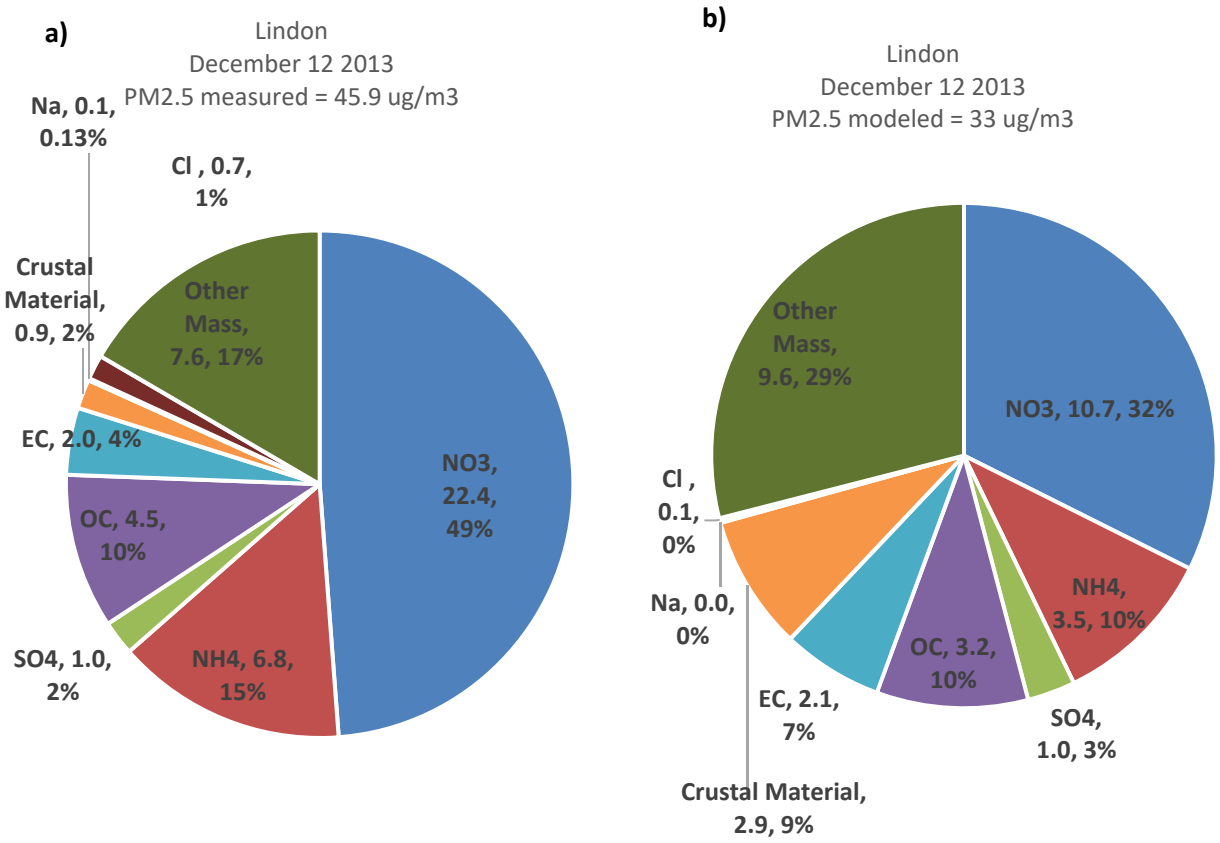

Figure IX.A.27. 8 a) Measured and b) Modeled Chemical Composition of 24-hr $PM_{2.5}$ in ug/m3 and % of $PM_{2.5}$ at Lindon Monitoring Station in Provo NAA on December 12, 2013

February 1-16, 2016

A comparison of modeled and measured 24-hr $PM_{2.5}$ at the Lindon monitoring station in the Provo NAA during February 1-16, 2016 showed that peak $PM_{2.5}$ concentrations are not well simulated in the model (Figure IX.A.27.9). The increase in $PM_{2.5}$ is not well represented in the model, with $PM_{2.5}$ concentrations building up then dropping prematurely in the model. The model also failed at capturing the observed $PM_{2.5}$ peak on February 14. These results can be attributed to the meteorological model performance. A warm modeled temperature bias in the Utah Valley due to early snow melt-out in the model as well as premature dissipation of simulated clouds likely contributed to increased mixing and early dispersion of $PM_{2.5}$ in the model[21].

[21] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

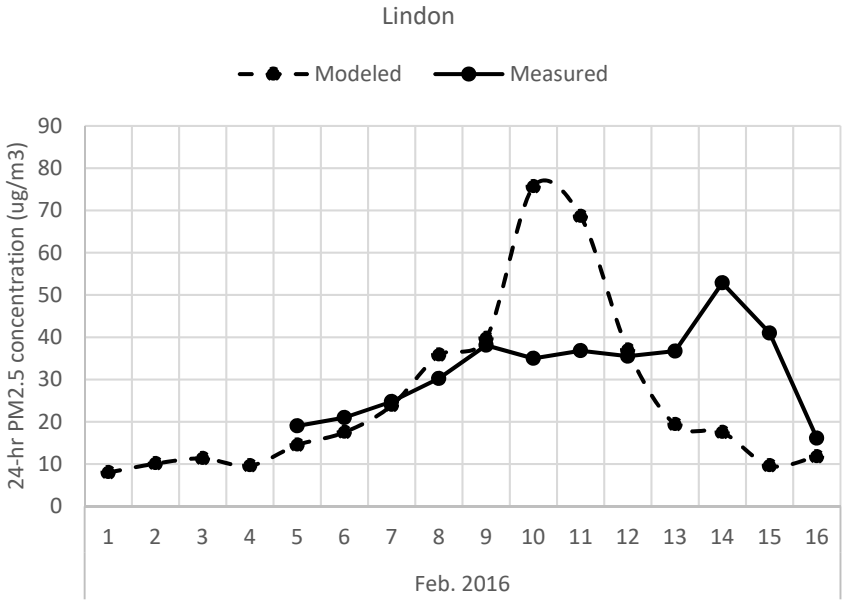

Figure IX.A.27. 9 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During February 1-16, 2016 at Lindon Monitoring Station in the Provo NAA. FRM data was missing for all episode days. Reported measurements correspond to data collected with a continuous $PM_{2.5}$ instrument.

The model performance for this episode was further assessed for $PM_{2.5}$ bulk chemical species on February 12, which corresponds to a $PM_{2.5}$ exceedance day (Figure IX.A.27.10). NO_3, a major component of $PM_{2.5}$, was underpredicted by about 25% in the model. Moreover, similarly to the model performance for the two other meteorological episodes, EC and crustal material were overestimated in the model. The model performance for all other species was overall acceptable.

Although the chemical composition of $PM_{2.5}$ on February 12 is overall well reproduced by the model, the timing in $PM_{2.5}$ peaks was generally poorly represented, suggesting that this episode not suitable for modeling.

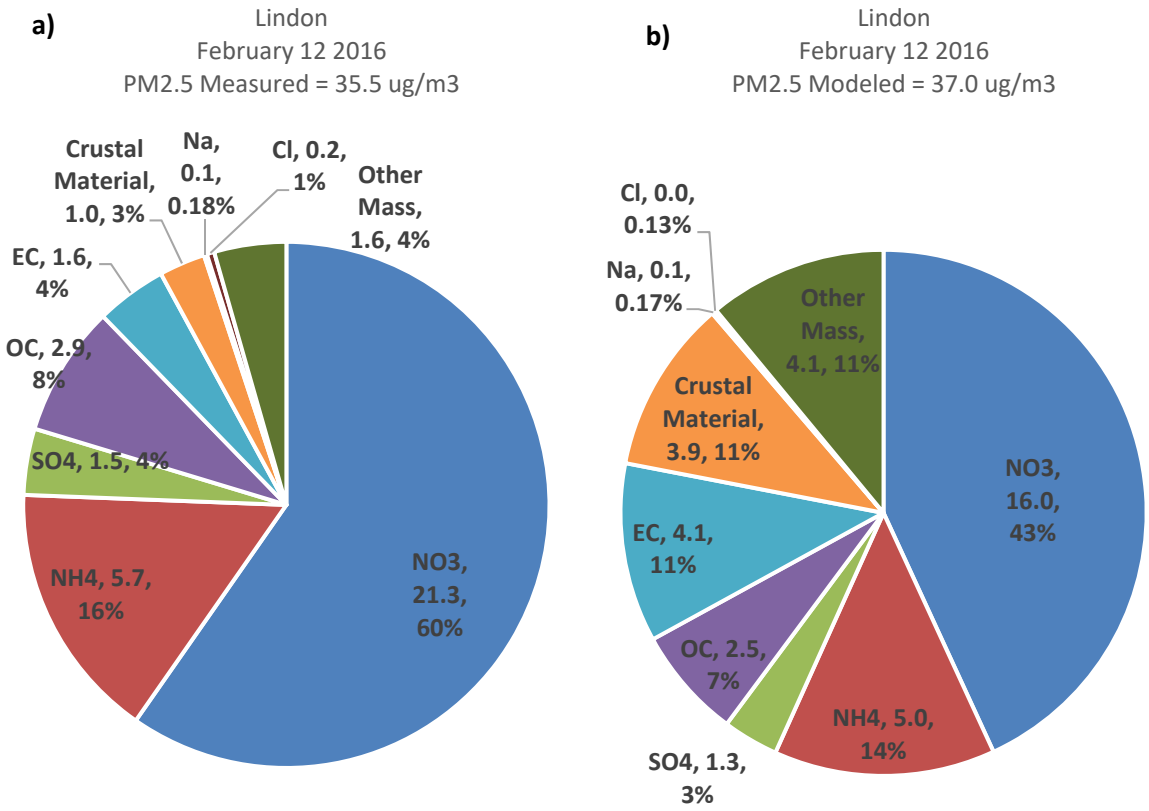

Figure IX.A.27. 10 a) Measured and b) Modeled Chemical Composition of $PM_{2.5}$ in ug/m^3 and % of $PM_{2.5}$ at Lindon in the Provo NAA on February 12, 2016

Conclusion

Examining the $PM_{2.5}$ model performance for all three episodes, it is clear that CAMx performed best when using the January 2011 WRF output, which was specifically calibrated to the meteorological conditions experienced during January 2011, a period that coincided with an exhaustive field campaign (Persistent Cold Air Pool Study (PCAPS)[22]). This was further confirmed by a linear regression analysis that showed that modeled and measured $PM_{2.5}$ at Lindon monitoring station were more strongly correlated during the January 2011 episode ($R^2 = 0.89$) compared to the other episodes ($R^2 = 0.05$ and 0.81) (Figure IX.A.27.11). They also displayed a slope that is close to unity (0.87) for the January 2011 episode, further indicating their close agreement and good model performance when using the 2011 WRF output.

[22] http://www.pcaps.utah.edu/

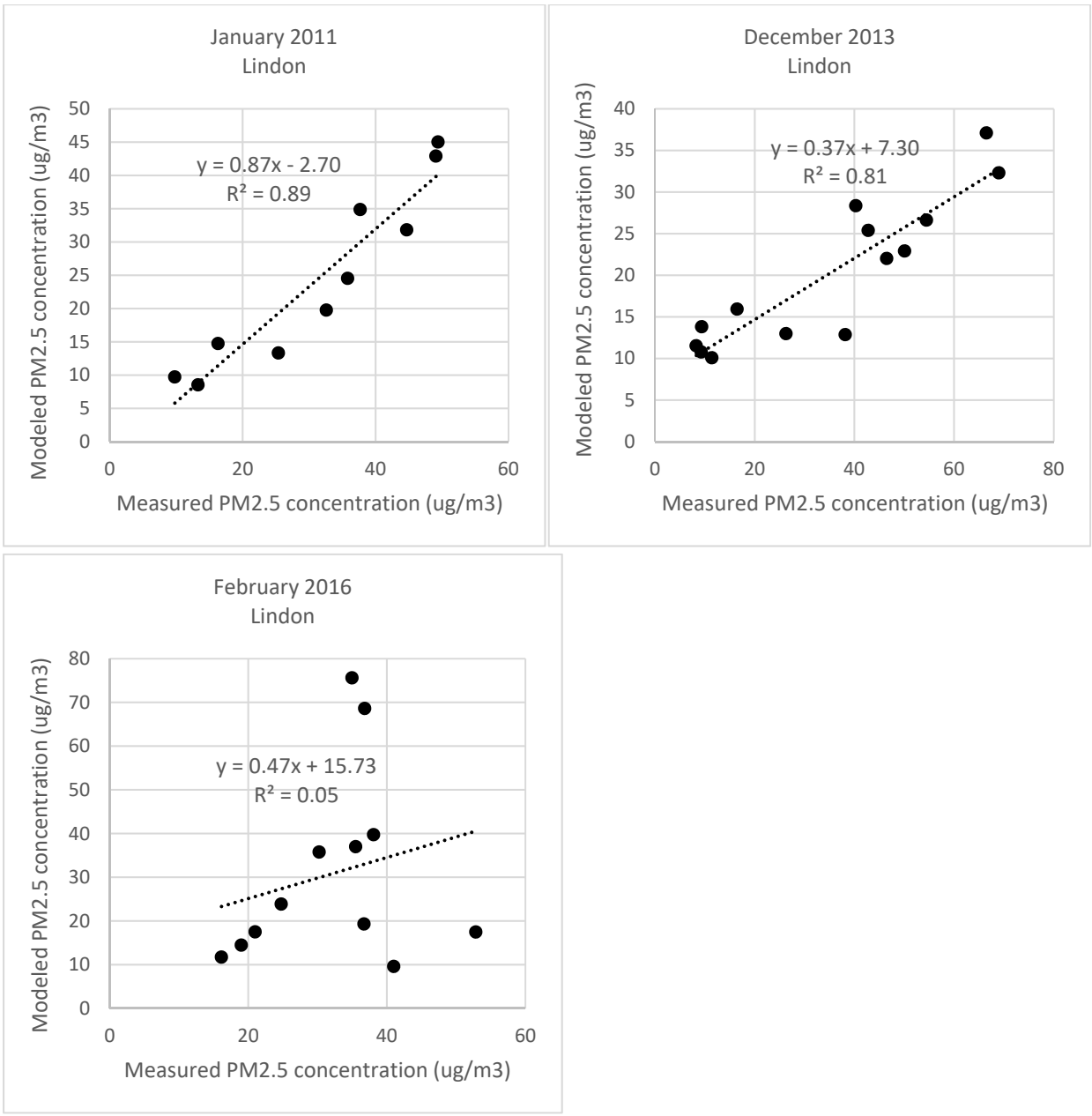

Figure IX.A.27. 11 Modeled vs. Measured 24-hr $PM_{2.5}$ at Lindon Monitoring Station for Each of the Three Modeling Episodes: January 2011, December 2013, and February 2016. Dots represent each individual day of the modeling episode. Linear regression fits (dashed line) and equation are shown for each episode.

Given that the January 2011 WRF data produced superior model performance when compared with the other two episodes, UDAQ selected the January 2011 episode to conduct its modeled maintenance demonstration work. A more thorough discussion is provided in the TSD.

(c) Photochemical Model Performance Evaluation

Introduction

To assess how accurately the photochemical model predicts observed concentrations and to demonstrate that the model can reliably predict the change in pollution levels in response to changes in emissions, a model performance evaluation was conducted. This model performance evaluation also provides support for the model modifications and settings that were applied (ammonia injection, increase of surface resistance to ammonia, zeroing-out of ozone deposition velocity, reduction of cloud-water content, snow albedo enhancement, vertical diffusion modifications and paved road dust emissions adjustment) to more accurately reproduce winter-time inversion episodes. A detailed explanation of these model modifications is provided in the TSD.

Available ambient monitoring data were used for this photochemical model performance evaluation. Data included 24-hr total $PM_{2.5}$ and 24-hr chemically-speciated $PM_{2.5}$ measurements collected at the Lindon monitoring station in the Provo NAA. The evaluation was based on the December 31-January 10, 2011, episode and the 2011 emissions inventory were used as input data for the model simulations. The evaluation focused on days with $PM_{2.5}$ concentration exceeding the NAAQS (> 35 $\mu g/m^3$). Results for December 31, which is a model spin-up day, are excluded from this evaluation.

A more detailed model performance evaluation that examines the model performance for gaseous species is provided in the TSD. More details on the model performance at various sites within the Provo NAA are also included in the TSD.

Daily $PM_{2.5}$ Concentrations

A comparison of 24-hr modeled and observed $PM_{2.5}$ during January 1-10, 2011, at the Lindon monitoring station in the Provo non-attainment area showed that the model overall captures the temporal variation in $PM_{2.5}$ well (Figure IX.A.27.12). The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. Moreover, the bias between measured and modeled $PM_{2.5}$ is overall relatively small, particularly on $PM_{2.5}$ exceedance days.

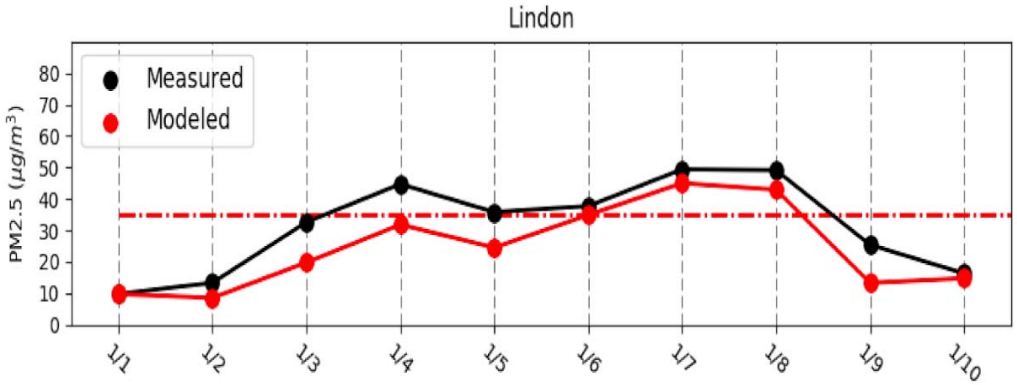

Figure IX.A.27. 12 Ten-day Time Series of Observed (black) and Modeled (red) 24-hr Average $PM_{2.5}$ Concentrations During January 1-10, 2011 at Lindon Monitoring Station in the Provo NAA. Dashed Red Line is NAAQS for 24-hr $PM_{2.5}$.

$PM_{2.5}$ Chemical Speciation

The model performance was further evaluated for $PM_{2.5}$ chemical species. Given that measurements of $PM_{2.5}$ chemical species were not available for a $PM_{2.5}$ exceedance day during the selected modeling episode, this analysis is based on a comparison of the fraction of individual PM2.5 chemical species in total $PM_{2.5}$ mass between 2011 model outputs and 2013 measurements. The latter correspond to filter speciation data collected at Lindon during a typical winter-time inversion event in 2013. While the 2013 measurements cannot be directly compared to day-specific 2011 model simulations, the measurements are useful to assess if the model predicts similar $PM_{2.5}$ chemical composition during strong inversion conditions. Although the concentration of individual PM2.5 chemical species may vary between inversion events, their relative contribution to total PM2.5 mass is expected to remain the same during typical inversion events. Chemical species, including nitrate (NO_3), sulfate (SO_4), ammonium (NH_4), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM), and other species (other mass), were considered in this analysis. The model performance evaluation for $PM_{2.5}$ species on non-$PM_{2.5}$ exceedance days is provided in the TSD.

Figures IX.A.27.13 shows the percent contribution of modeled and measured chemical species to $PM_{2.5}$ at Lindon monitoring station on a typical 24-hr $PM_{2.5}$ exceedance day. As can be seen, the chemical composition of modeled $PM_{2.5}$ is similar to that of measured $PM_{2.5}$. Modeled NO_3 accounts for about 50% of $PM_{2.5}$, in agreement with the contribution of measured NO_3 to $PM_{2.5}$ mass (about 49%). Measured and modeled sulfate and ammonium also have similar fractional contributions to $PM_{2.5}$ mass. The model performance for OC was also good. On the other hand, the model overestimated the percent contributions of EC and CM to $PM_{2.5}$. This overprediction on days when the simulated atmospheric mixing was particularly strong could be related to an overestimation in source emissions. A more thorough evaluation is limited by the lack of speciation measurements for the selected modeling episode.

a) **b)**

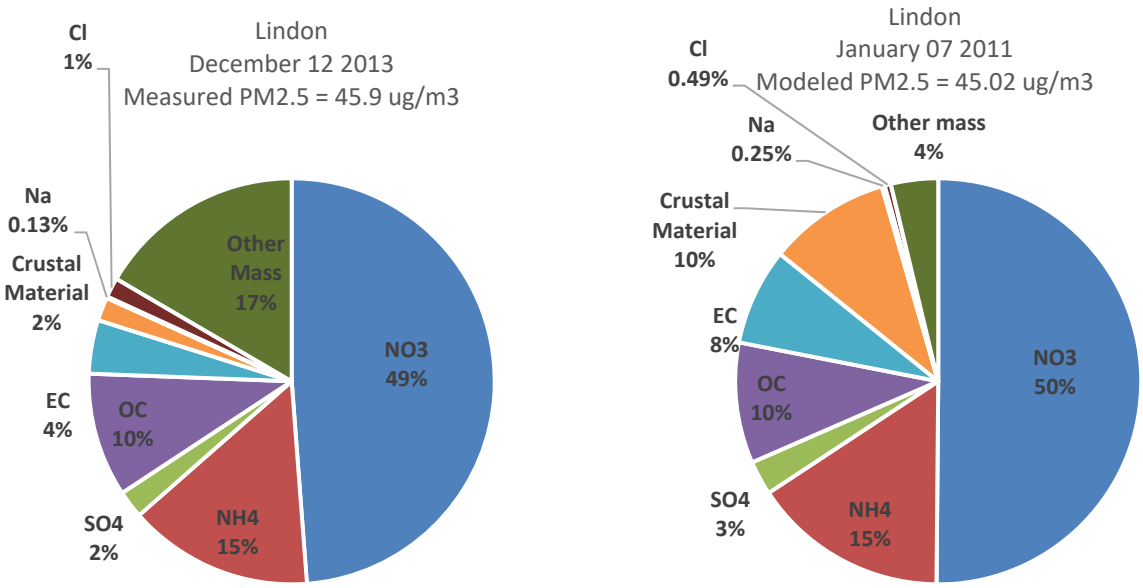

Figure IX.A.27. 13 a) Measured and b) Modeled Species Contribution (in ug/m3 and %) to $PM_{2.5}$ at Lindon Monitoring Station in the Provo NAA during a typical 24-hr $PM_{2.5}$ exceedance day

Summary of Model Performance

The model performance replicating the buildup and clear out of $PM_{2.5}$ is good overall. The model captures the temporal variation in $PM_{2.5}$ well. The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. The model also predicts reasonably well $PM_{2.5}$ concentration on peak days. It also overall replicates well the composition of $PM_{2.5}$ on exceedance days, with good model performance for secondary NO_3 and ammonium which account for over 50% of $PM_{2.5}$ mass.

Several observations should be noted on the implications of these model performance findings on the attainment modeling presented in the following section. First, it has been demonstrated that model performance overall is good and, thus, the model can be used for air quality planning purposes. Second, consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA suggests that this approach "should reduce some of the uncertainty attendant with using absolute model predictions alone."

(d) Modeled Attainment Test

Introduction

With acceptable performance, the model can be utilized to make future-year attainment projections. For any given (future) year, an attainment projection is made by calculating a concentration termed the Future Design Value (FDV). This value is calculated for each monitor included in the analysis, and then

compared to the NAAQS (35 µg/m^3). If the FDV at every monitor located within a NAA is less than the NAAQS, this demonstrates attainment for that area in that future year.

A maintenance plan must demonstrate continued attainment of the NAAQS for a span of ten years. This span is measured from the time EPA approves the plan, a date which is somewhat uncertain during plan development. To be conservative, attainment projections were made for 2035. An assessment was also made for 2026 as a "spot-check" against emission trends within the ten-year span.

$PM_{2.5}$ Baseline Design Values

For any monitor, the FDV is greatly influenced by existing air quality at that location. This can be quantified and expressed as a Baseline Design Value (BDV). The BDV is consistent with the form of the 24-hour $PM_{2.5}$ NAAQS, which is the 98th percentile value averaged over a three-year period. Quantification of the BDV for each monitor is included in the TSD, and is consistent with EPA guidance.

Several values were excluded when calculating the BDVs in the Provo NAA. EPA's "Exceptional Events Rule" allows states to exclude certain air quality data due to exceptional events such as wildfires or dust storms. In the preamble to the 2016 amendments to the rule, EPA states that "the CAA also recognizes that it may not be appropriate to use the monitoring data influenced by "exceptional" events that are collected by the ambient air quality monitoring network when making certain regulatory determinations. When "exceptional" events cause exceedances or violations of the NAAQS that subsequently affect certain regulatory decisions, the normal planning and regulatory process established by the CAA may not be appropriate."[23]

There were two large local wildfires during the summer of 2018 that affected the ambient monitored $PM_{2.5}$ values at the Spanish Fork monitor in the Provo NAA. When including the atypical data influenced by wildfires, the baseline design value is just below the NAAQS at 35.4 µg/m^3. Since the design value complies with the NAAQS, the wildfire events are not considered "exceptional events" because they did not cause exceedances or violations of the NAAQS (40 CFR 50.14). In anticipation that there would be some determinations and analyses not covered by the Exceptional Events Rules that would rely on air quality data that may have been influenced by atypical, extreme, or unrepresentative events, EPA published further guidance on the subject[24].

This guidance identifies the most common determinations and analyses not covered by the Exceptional Events Rule and clarifies for each of them whether there is a separate existing mechanism under which the exclusion, selection, or adjustment of air quality monitoring data may be appropriate. One example is certain modeling analyses under EPA's Guideline on Air Quality Models Rule, including modeling analyses used for estimating base and future year design values for ozone and $PM_{2.5}$ attainment demonstrations.

According to the Guidance, these types of modeling analyses may exclude monitoring data if the data is not representative to characterize base period concentrations which may impact a determinative value in a

[23] Treatment of Data Influenced by Exceptional Events; Final Rule, 81 Fed. Reg. 68216 (Oct. 3, 2016).
[24] EPA Memorandum. Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events. April 4, 2019.

projected time period. This could include data used to model future year design values for demonstrating attainment.

In the case of the two Utah County fires, the ambient data recorded by the Spanish Fork monitor was atypical. It did not characterize base period concentrations, and it would impact a determinative value in the projected design value. Since this data is atypical and gives an atypical projected design value, it should be excluded from the Provo NAA's modeling and maintenance demonstration.

As a result, this maintenance plan modeling uses a baseline design value that excludes the atypical data at the Spanish Fork monitor from the two fires. The baseline design value including the atypical data is 35.4 $\mu g/m^3$. The baseline design value excluding the atypical data is 28.4 $\mu g/m^3$. An extensive atypical event write-up, including back trajectory analysis using HYSPLIT, is included in the TSDs. Table IX.A.27.8 details the filtered $PM_{2.5}$ values that are excluded.

Date	Value	Wildfire Sources
8/7/2018	37.8	Coal Hollow
8/9/2018	50.8	Coal Hollow and other western state(s) fire(s)
8/10/2018	68.8	Coal Hollow and other western state(s) fire(s)
8/11/2018	49.6	Coal Hollow and other western state(s) fire(s)
8/13/2018	58.1	Coal Hollow and other western state(s) fire(s)
9/14/2018	71.5	Pole Creek and Bald Mountain
9/15/2018	42.6	Pole Creek and Bald Mountain
9/17/2018	74.5	Pole Creek and Bald Mountain
9/18/2018	57.7	Pole Creek and Bald Mountain
9/19/2018	76.3	Pole Creek and Bald Mountain
9/21/2018	39.3	Pole Creek and Bald Mountain

Table IX.A.27. 8 Atypical Event Values Excluded from Baseline Design Value at the Spanish Fork Monitor

Relative Response Factors

In making future-year predictions, the output from the CAMx model is not considered to be an absolute answer. Rather, the model is used in a relative sense. In doing so, a comparison is made using the predicted concentrations for both the year in question and a pre-selected baseline year, which for this plan is 2017. This comparison results in a Relative Response Factor (RRF).

The UDAQ used the Software for Model Attainment Test - Community Edition (SMAT-CE) v. 1.01 utility from EPA[25] to perform the modeled attainment test for daily $PM_{2.5}$. SMAT is designed to interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to the FRM monitors. It also calculates the RRF for grid cells near each monitor and uses these to calculate

[25] https://www.epa.gov/scram/photochemical-modeling-tools

a future year design value for these grid cells. A grid of 3-by-3 (9) cells surrounding the monitors was used as the boundary for relative response factor (RRF) calculations.

The State of Utah operates three Chemical Speciation Network (CSN) monitors: Hawthorne, Bountiful, and Lindon. Hawthorne is located in Salt Lake County, the Bountiful monitor is in Davis to the north, and the Lindon monitor is located in Utah County to the south. Of the three, Hawthorne samples one out of three days, while the other two sample one in six days.

This mismatch in sampling frequency lead, initially, to interpolated speciation profiles that were unexpectedly non-uniform across the Salt Lake Valley. To create more realistic speciation profiles, the CSN data collected at the Hawthorne monitor were applied to all of the FRM sites in the SLC NAA. UDAQ believes this is a reasonable assumption that is supported by recently conducted special studies. Further discussion may be found in the TSD.

For each monitor, the FDV is calculated by multiplying the BDV by the relative response factor: **FDV = RRF * BDV**. These FDV's are compared to the NAAQS in order to determine whether attainment is predicted at that location or not. The results for each of the monitors are shown below in Table IX.A.27.9. For all projected years and monitors, no FDV exceeds the NAAQS. Therefore, continued attainment is demonstrated for the Provo NAA.

Monitor Location	2016-2018 BDV	2026 FDV	2035 FDV*
Lindon	31.1	29.3	29.5
Spanish Fork	28.4**	28.4	28.4

Table IX.A.27. 9 Baseline and Future Design Values (ug/m^3) at Monitors in Provo NAA

*These values include additional emissions added to the MAG MVEB from the safety margin

**This value excludes data from atypical events discussed in the BDV section

(2) Attainment Inventory

The attainment inventory is discussed in EPA guidance[26] as another one of the core provisions that should be considered by states for inclusion in a maintenance plan. According to the guidance, the stated purpose of the attainment inventory is to establish the level of emissions during the time periods associated with monitoring data showing attainment.

In cases such as this, where a maintenance demonstration is founded on a modeling analysis that is used in a relative sense, the modeled baseline inventory is used for comparison with every projection year model run. For this analysis, the State compiled a baseyear inventory for the year 2017. This year falls within the span of data representing current attainment of the $PM_{2.5}$ NAAQS. The guidance discusses the projection inventories as well, and notes that they should consider future growth, including population and industry, should be consistent with the baseyear inventory, and should document data inputs and assumptions. Any assumptions concerning emission rates must reflect permanent, enforceable measures.

Utah compiled projection inventories for use in the quantitative modeling demonstration. The years selected for projection include 2026 and 2035. The emissions contained in the inventories include sources

[26] Calcagni (n 3)

located within the modeling domain, encompassing all three $PM_{2.5}$ nonattainment areas, as well as a bordering region. See Figure IX.A.27.4.

Since this bordering region is so large, the State identified a "core area" within this domain wherein a higher degree of accuracy is important. Within this core area (which includes Weber, Davis, Salt Lake, Utah, Box Elder, Tooele, Cache, and Franklin, ID counties), SIP-specific inventories were prepared to include seasonal adjustments and forecasting to represent each of the projection years. In the bordering regions away from this core, the State used the most current National Emissions Inventory (2014) from EPA for the analysis.

There are four general categories of emission sources included in these inventories: point sources, area sources, on-road mobile sources, and non-road mobile sources. For each of these source categories, the pollutants that were inventoried include: $PM_{2.5}$, SO_2, NO_X, VOC, and NH_3. The unit of measure for point and area sources is the traditional tons per year. Mobile source emissions are reported in terms of tons per day. The pre-processing model, SMOKE, converts all emissions to daily, weekly, and hourly values.

Area source emissions were projected to 2017 from the 2014 triannual inventory. Growth data from appropriate data sources, including information from the Governor's Office of Management and Budget, was used to project inventories to 2026 and 2035. Point source emissions are represented as the actual emissions from the 2017 triannual emissions inventory. Point sources were grown to 2026 and 2035 on a case-by-case basis for the projection inventories.

On-road mobile source emissions were calculated for each year using MOVES2014b in conjunction with the appropriate estimates for vehicle miles traveled (VMT). VMT estimates for the urban counties were provided by the local metropolitan planning organizations (MPOs), including the Wasatch Front Regional Council, the Mountainland Association of Governments, and the Cache Metropolitan Planning Organization and are based their travel demand modeling for 2017, 2026, and 2035. Non-road mobile source emission were calculated for each year using MOVES2014b. Growth data from appropriate data sources was used to project to 2026 and 2035. The TSD accompanying this SIP includes the Inventory Preparation Plan that details the growth factors used for each emissions source.

Source category emission inventories are expected to look quite different between 2017 and 2035. Population is expected to steadily increase between the 18-year span. On-road mobile emissions dominate the 2017 inventory; however, in 2035 area source emissions dominate the inventory. This is due to the tier 3 federal fuel standards and phase-in of newer cars driving on-road emission reductions. Area source emissions are relatively stable from 2017 to 2026 to 2035, besides a decrease in NOx from 2017 to 2026 due to the phase-in of area source rules.

Since this SIP subsection takes the form of a maintenance plan, it must demonstrate that the area will continue to attain the $PM_{2.5}$ NAAQS throughout a period of ten years from the date of EPA approval. It is also necessary to "spot check" this ten-year interval. Hence, projection inventories were prepared for 2026 and 2035. Table IX.A.27.10 summarizes these inventories. As described, it represents point, area, on-road mobile, and non-road mobile sources in the modeling domain and include $PM_{2.5}$, as well as the precursors SO_2, NO_X, VOC, and NH_3 as defined in 40 CFR Parts 50, 51, and 93.

More detail concerning any element of the inventory can be found in the appropriate section of the TSD. More detail about the general construction of the inventory can be found in the Inventory Preparation Plan.

Emissions (tons/day)	Sector	$PM_{2.5}$ Filterable	$PM_{2.5}$ Condensable	$PM_{2.5}$ Total	NOx	VOC	NH3	SO2
2017	Area Sources	1.75	0.29	2.04	5.01	13.32	6.54	0.06
	Mobile Sources	–	–	0.83	15.4	9.07	0.43	0.09
	NonRoad Sources	–	–	0.21	3.07	1.66	0	0.01
	Point Sources	0.18	0.12	0.3	1.12	0.18	0.42	0.05
	Total			**3.38**	**24.6**	**24.23**	**7.39**	**0.22**
2026	Area Sources	1.89	0.32	2.21	3.56	14.2	6.38	0.05
	Mobile Sources	–	–	0.42	5.79	4.58	0.36	0.05
	NonRoad Sources	–	–	0.14	2.14	1.65	0.01	0.01
	Point Sources	0.19	0.12	0.31	0.97	0.17	0.44	0.06
	Total			**3.08**	**12.46**	**20.6**	**7.19**	**0.17**
2035	Area Sources	2.06	0.35	2.41	3.67	16.32	6.24	0.05
	Mobile Sources	–	–	1.41	5.74	6.49	0.44	0.05
	NonRoad Sources	–	–	0.13	1.84	1.8	0.01	0.01
	Point Sources	0.19	0.12	0.31	0.97	0.17	0.44	0.06
	Total			**4.26**	**12.22**	**24.78**	**7.13**	**0.17**

Table IX.A.27. 10 Emissions Inventory in Tons Per Average Episode Day by Source Category and Year

(3) Additional Controls for Future Years

Since the emission limitations discussed in subsection IX.A.27.b(3) are federally enforceable and, as demonstrated in IX.A.27.c(1) above, are sufficient to ensure continued attainment of the $PM_{2.5}$ NAAQS, there is no need to require any additional control measures to maintain the $PM_{2.5}$ NAAQS.

(4) Mobile Source Budget for Purposes of Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the Act requires regional transportation plans and programs to show that "…emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan…" EPA's transportation conformity regulation (40 CFR 93, Subpart A, last amended at 77 FR 14979, March 14 2012) also requires that motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be established for any years deemed appropriate (see 40 CFR 93.118((b)(2)(i)).

For an MPO's Regional Transportation Plan, analysis years that are after the last year of the maintenance plan (in this case 2035), a conformity determination must show that emissions are less than or equal to the maintenance plan's motor vehicle emissions budget(s) for the last year of the implementation plan.

(a) Mobile Source $PM_{2.5}$ Emissions Budgets

In this maintenance plan, Utah is establishing transportation conformity motor vehicle emission budgets (MVEB) for direct $PM_{2.5}$, NO_X, and VOC for 2035. The MVEBs are established for tons per average winter weekday for NO_x, VOC, and direct $PM_{2.5}$ (primary exhaust $PM_{2.5}$ + brake and tire wear).

i. Direct $PM_{2.5}$, NO_x, and VOC

Direct (or "primary") $PM_{2.5}$ refers to $PM_{2.5}$ that is not formed via atmospheric chemistry. Rather, direct $PM_{2.5}$ is emitted straight from a mobile or stationary source. With regard to the emission budget presented herein, direct $PM_{2.5}$ includes road dust, brake wear, and tire wear as well as $PM_{2.5}$ from exhaust. Through atmospheric chemistry, NO_X and VOC emissions can substantially contribute to secondary $PM_{2.5}$ formation. For this reason, NO_X and VOC are considered $PM_{2.5}$ precursors and are the only $PM_{2.5}$ precursors emitted at a significant level by on-road mobile and therefore included in the MVEBs.

EPA's conformity regulation (40 CFR 93.124(a)) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. These additional emissions that can be allocated to the applicable MVEB are considered the "safety margin." As defined in 40 CFR 93.101, the safety margin represents the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for demonstrating maintenance. The implementation plan can then allocate some or all of this "safety margin" to the applicable MVEBs for transportation conformity purposes.

As presented in the TSD for on-road mobile sources, the estimated on-road mobile source emissions of direct $PM_{2.5}$, NOx, and VOC in 2035 for the Provo NAA, are listed in the first row (original MVEB) in Table IX.A.27.11. These mobile source emissions were included in the maintenance demonstration in Subsection IX.A.27.c which estimates a maximum $PM_{2.5}$ concentration of 28.5 $\mu g/m^3$ at the Lindon monitor in 2035 within the Provo NAA portion of the modeling domain. These emissions numbers are considered the MVEB for the maintenance plan prior to the application of any amount of safety margin.

The safety margin for the Provo NAA portion of the domain equates to 6.5 $\mu g/m^3$ (the 2006 24-hr $PM_{2.5}$ standard of 35.0 $\mu g/m^3$ minus the initial 2035 FDV of 28.5 $\mu g/m^3$). To evaluate the portion of safety margin that could be allocated to the MVEBs, modeling was re-run for 2035 using the same emission projections for point, area and non-road mobile sources with additional emissions attributed to the on-road mobile source (see 2nd row of Table IX.A.27.11 Additional Tons Per Day from Safety Margin). The revised maintenance demonstration for 2035 still shows maintenance of the $PM_{2.5}$ standard with a maximum $PM_{2.5}$ concentration of 29.5 $\mu g/m^3$ at the Lindon monitor in 2035 within the Provo NAA portion of the modeling domain. The final 2035 MVEB for the Provo NAA Metropolitan Planning Organization, Mountainland Association of Governments, is listed in the last row of Table IX.A.27.11 along with the 2035 design value that includes the revised MVEB.

	Direct $PM_{2.5}$	NO_X	VOC	Design Value @ controlling monitor
Original MVEB	.32	4.5	4.2	28.7 $\mu g/m^3$

Additional Tons Per Day from Safety Margin	1.18	2.0	2.8	--
Final 2035 MVEB	1.5	6.5	7.0	29.5 µg/m^3

Table IX.A.27. 11 2035 Mountainland Association of Government's Motor Vehicle Emission Budget in Tons per Winter Weekday

It is important to note that the MVEBs presented in Table IX.A.27.9 are somewhat different from the on-road summary emissions inventory presented in Table IX.A.27.8.

Overall the emissions established as MVEBs are calculated using MOVES to reflect an average winter weekday. The totals presented in the summary emissions inventory (Table IX.A.27.8), however, represent an average-episode-day. The episode used to make this average (December 31, 2010 through January 10, 2011) includes seven such winter weekdays, but also includes two weekends. Emissions produced on weekdays are significantly larger than those produced on both Saturdays and Sundays. Therefore, the weighted average of daily emissions calculated for an episode-day will be less than that of a weekday.

There are also some conventions to be considered in the establishment of MVEBs. In particular, $PM_{2.5}$ in the summary emissions inventory totals includes direct exhaust, tire & brake wear, and fugitive dust. For the MVEBs $PM_{2.5}$ includes direct exhaust, tire & brake but no fugitive dust. VOC emissions in the summary emissions inventory include refueling spillage and displacement vapor loss and are counted in the on-road mobile category. MVEBs for VOC do not include these emissions because, in this context, they are regarded as an area source.

40 CFR 93.118((b)(2)(i) also states "If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan."

Considering this, it is useful to compare the projected future design values in 2026 at all monitors in the NAA to the on-road mobile emission inventory as well as the percent of the total inventory that the on-road mobile sector comprises. As can be seen in Table IX.A.27.9, the design values in the Provo NAA are 29.1 and 28.4 µg/m^3. The Lindon monitor shows the highest value at 29.1 µg/m^3, which is 5.9 µg/m^3 below the standard. The on-road mobile source contribution to the overall inventory is shown in Table IX.A.27.12.

Emissions tons/day	$PM_{2.5}$	NO_X	VOC
2026 emission inventory total	3.08	12.46	20.6
2026 on-road mobile inventory	.42	5.79	4.58
On-road mobile % of total inventory	13.64%	46.47%	22.23%

Table IX.A.27. 12 Comparison of 2026 On-Road Mobile Inventory to Total Emissions Inventory

Although the on-road mobile NO_X contribution is almost half of the total NO_X in the inventory, the projected design values are so far below the standard, UDAQ is confident that there will not be any on-road mobile factors that will cause or contribute to a new violation of the NAAQS.

ii. Trading Ratios for Transportation Conformity

Per section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2035, a trading mechanism is established to allow future increases in on-road direct $PM_{2.5}$ emissions to be offset by future decreases in plan precursor emissions from on-road mobile sources at appropriate ratios established by the air quality model. Future increases in on-road direct $PM_{2.5}$ emissions may be offset with future decreases in NO_x emissions from on-road mobile sources at a NO_x to $PM_{2.5}$ ratio of 5.7 to 1 and/or future decreases in VOC emissions from on-road mobile sources at a VOC to $PM_{2.5}$ ratio of 28.6 to 1. This trading mechanism will only be used if needed for conformity analyses for years after 2035. To ensure that the trading mechanism does not impact the ability to meet the NO_x or VOC budgets, the NO_x emission reductions available to supplement the direct $PM_{2.5}$ budget shall only be those remaining after the 2035 NO_x budget has been met, and the VOC emissions reductions available to supplement the direct $PM_{2.5}$ budget shall only be those remaining after the 2035 VOC budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis. The assumptions used to create the trading ratios can be found in the TSDs.

(5) Nonattainment Requirements Applicable Pending Plan Approval

CAA 175A(c) - *Until such plan revision is approved and an area is redesignated as attainment, the requirements of CAA Part D, Plan Requirements for Nonattainment Areas, shall remain in force and effect.* The Act requires the continued implementation of the nonattainment area control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions. Utah will continue to implement the emissions limitations and measures from both $PM_{2.5}$ SIPs.

(6) Revise in Eight Years

CAA 175A(b) - Eight years after redesignation, the State must submit an additional plan revision which shows maintenance of the applicable NAAQS for an additional 10 years. Utah commits to submit a revised maintenance plan eight years after EPA takes final action redesignating the Provo area to attainment, as required by the Act.

(7) Verification of Continued Maintenance and Monitoring

Implicit in the requirements outlined above is the need for the State to determine whether the area is in fact maintaining the standard it has achieved. There are two complementary ways to measure this: 1) by monitoring the ambient air for $PM_{2.5}$; and 2) by inventorying emissions of $PM_{2.5}$ and its precursors from various sources.

The State will continue to maintain an ambient monitoring network for $PM_{2.5}$ in accordance with 40 CFR Part 58 and the Utah SIP. The State anticipates that the EPA will continue to review the ambient monitoring network for $PM_{2.5}$ each year, and any necessary modifications to the network will be implemented.

Additionally, the State will track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the State will perform appropriate studies to determine: 1) whether additional and/or re-sited monitors are necessary; and 2) whether mobile and stationary source emission projections are on target. The State will also continue to collect actual emissions inventory data from sources at thresholds defined in R307-150.

(8) Contingency Plan

CAA 175A(d) - Each maintenance plan shall contain contingency measures to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment. Such provisions shall include a requirement that the State will implement all control measures which were contained in the SIP prior to redesignation.

Upon redesignation, this contingency plan for the Provo NAA supersedes Subsection IX.A.22.9, Contingency Measures, which is part of the moderate Provo NAA $PM_{2.5}$ attainment SIP.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

(a) List of Potential Contingency Measures

Section 175(d) of the CAA requires the maintenance plan to include as potential contingency measures all of the $PM_{2.5}$ control measures contained in the attainment SIP that were relaxed or modified prior to redesignation. There were no control measures relaxed in the Provo NAA; however, below are potential contingency measure that will be evaluated. If it is determined through the triggering mechanism that additional emissions reductions are necessary, UDAQ will adopt and implement appropriate contingency measure as expeditiously as possible.

1. Measures to address emissions from residential wood combustion (i.e. emissions from fireplaces under the existing R307-302 rule), including re-evaluating the thresholds at which red or yellow burn days are triggered. Residential wood combustion represents a large emissions inventory source category at 43.6% of direct $PM_{2.5}$ emissions in the 2017 county-wide inventory.
2. Measures to address fugitive dust from area sources. Fugitive dust represents 28.1% of direct $PM_{2.5}$ emissions in the 2017 county-wide inventory.
3. Additional measures to address other $PM_{2.5}$ sources identified in the emissions inventory such as on-road vehicles, non-road vehicles and engines, and industrial sources. These source categories represent 43.2%, 8.3%, and 3.5%, respectively, of the overall 2017 baseyear emissions inventory.

In addition, UDAQ administers incentive and grant programs that reduce emissions in Utah's NAAs. The emissions reductions are not included in the quantitative maintenance demonstration; however, they are expected to contribute to the mitigation of $PM_{2.5}$ concentrations. Generally speaking, the programs target Utah nonattainment areas. The programs include approximately $25.5 million from the Volkswagen settlement and approximately $12.7 million to replace heavy-duty diesel trucks and

buses that are operating under old emissions standards. Nonroad diesel upgrades will see approximately $1.3 million on the Wasatch Front. Another $3.8 million of the Volkswagen funding will go towards installing electric vehicle supply equipment in Utah. UDAQ is in the process of using approximately $9.6 million in federal funding to implement wood stove changeout programs throughout the three Utah $PM_{2.5}$ NAAs.

(b) Tracking

The tracking plan for the three NAAs consists of monitoring and analyzing ambient $PM_{2.5}$ concentrations. In accordance with 40 CFR 58, the State will continue to operate and maintain an adequate $PM_{2.5}$ monitoring network in SLC, Provo, and Logan NAAs.

(c) Triggering

Triggering of the contingency plan does not automatically require a revision to the SIP, nor does it mean that the area will automatically be redesignated once again to nonattainment. Instead, the State will have an appropriate timeframe to correct the potential violation with implementation of one or more adopted contingency measures. In the event that violations continue to occur, additional contingency measures will be adopted until the violations are corrected.

Upon notification of a potential violation of the $PM_{2.5}$ NAAQS, the State will develop appropriate contingency measures intended to prevent or correct a violation of the $PM_{2.5}$ standard. Information about historical exceedances of the standard, the meteorological conditions related to the recent exceedances, and the most recent estimates of growth and emissions will be reviewed. The possibility that an exceptional event occurred will also be evaluated.

Upon monitoring a potential violation of the $PM_{2.5}$ NAAQS, including exceedances flagged as exceptional events but not concurred with by EPA, the State will identify a means of corrective action within six months after a potential violation. The maintenance plan contingency measures will be chosen based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate.

The State will require implementation of such corrective action no later than one year after the violation is confirmed. Any contingency measures adopted and implemented will become part of the next revised maintenance plan submitted to the EPA for approval.

ITEM 9

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-090-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Becky Close, Environmental Scientist

DATE: August 22, 2019

SUBJECT: PROPOSE FOR PUBLIC COMMENT: SIP Subsection IX.A.28: $PM_{2.5}$ Maintenance Provisions for Logan, UT-ID.

On December 3, 2014, UDAQ submitted to the Environmental Protection Agency (EPA) the Utah State Implementation Plan Subsection IX.A.23: *Control Measures for Area and Point Sources, Fine Particulate Matter, $PM_{2.5}$ for the Logan, UT-ID Nonattainment Area* (Moderate SIP). The Moderate SIP includes all necessary elements to support the demonstration, control strategy, and implementation of the moderate area designation attainment plan.

Under the EPA's Clean Data Policy, EPA finalized a clean data determination for the Logan Nonattainment Area (Logan NAA) on October 19, 2018. The Clean Data Determination shows that the Logan NAA attained the 2006 24-hr $PM_{2.5}$ national ambient air quality standard (NAAQS) based on validated monitored data from 2015-2017.

A finding that the area has attained the standard does not mean the area is automatically reclassified to attainment status. For that to happen, EPA must take action to redesignate an area from nonattainment back to attainment. The Clean Air Act (CAA) outlines five requirements that a nonattainment area must satisfy for redesignation to occur, and this proposed SIP addresses those requirements:

1. Attainment of the NAAQS
2. A fully approved Attainment SIP
3. A demonstration that improvements in air quality are due to permanent and enforceable emissions reductions

4. A demonstration that the State has met requirements applicable to the area under CAA Section 110 and Part D
5. A fully approved maintenance plan

Requirements 1 through 4 are addressed in the first section of this SIP as part of the documentation for the redesignation request. The maintenance plan is also included in this SIP package and includes a modeling demonstration that the Logan, UT-ID NAA continues to attain the NAAQS out to 2035, with an intermediate year check in of 2026. As noted in EPA guidance, the EPA approval action on SIP elements and the redesignation request may occur simultaneously. Therefore, some serious SIP elements may still be pending approval and will likely be approved by EPA concurrently with the redesignation to attainment status.

Recommendation: Staff recommends that the Board propose SIP Subsection IX.A.28: $PM_{2.5}$ Maintenance Provisions for Logan, UT-ID, for a 30-day public comment period.

UTAH STATE IMPLEMENTATION PLAN

$PM_{2.5}$ Maintenance Provisions for the Logan, UT-ID Nonattainment Area

SECTION IX.A.28

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List of Acronyms and Abbreviations

BACM	Best Available Control Measure
BACT	Best Available Control Technology
CAA	Clean Air Act
CDD	Clean Data Determination
CFR	Code of Federal Regulations
CAMx	Comprehensive Air Quality Model with Extensions
DAQ	Utah Division of Air Quality (also UDAQ)
EPA	Environmental Protection Agency
FR	Federal Register
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
MVEB	Motor Vehicle Emissions Budget
$\mu g/m^3$	Micrograms Per Cubic Meter
Micron	One Millionth of a Meter
NAAQS	National Ambient Air Quality Standards
NH_3	Ammonia
NO_x	Nitrogen Oxides
NNSR	Nonattainment New Source Review
PM	Particulate Matter
PM_{10}	Particulate Matter Smaller Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Smaller Than 2.5 Microns in Diameter
R-307	Utah Administrative Code Air Quality Rules
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SIP	State Implementation Plan
SLC NAA	Salt Lake City Nonattainment Area
SMAT	Software for Model Attainment Test
SMOKE	Sparse Matrix Operator Kernal Emissions
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
TPWW	Tons Per Winter Weekday
TPY	Tons Per Year
TSD	Technical Support Document
UAC	Utah Administrative Code
UT	Utah
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compounds
WRF	Weather Research and Forecasting

Section IX.A.28

$PM_{2.5}$ Maintenance Provisions for the Logan, UT-ID Nonattainment Area

IX.A.28.a Introduction

The Logan, UT-ID Nonattainment Area (Logan NAA) has attained the 2006 $PM_{2.5}$ 24-hour National Ambient Air Quality Standard (NAAQS). As a result, this Section has been added to the State Implementation Plan (SIP) to demonstrate that the Logan NAA is eligible for redesignation to attainment status. Under Section 107(d)(3)(E) of the Clean Air Act (CAA or the Act), a nonattainment area is eligible for redesignation when the area has met the following requirements: (1) the area has attained the national ambient air quality standard, (2) the area has an Environmental Protection Agency (EPA) approved attainment SIP, (3) the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP, (4) the state has met the SIP requirements of Section 110 and Part D of the Act, and (5) the area has an EPA approved Maintenance Plan.

As demonstrated in Subsection IX.A.28.b, the Logan NAA has satisfied the redesignation requirements of Section 107 and is eligible for redesignation pending the EPA's approval of the Logan NAA Maintenance Plan. The maintenance plan is included in Subsection IX.A.28.c and was written in compliance with Section 175A of the Act. The maintenance plan demonstrates that the Logan NAA will continue to maintain 2006 24-hour $PM_{2.5}$ NAAQS through at least the year 2035. The maintenance plan also includes contingency measures to assure that the State will promptly correct any violation of the standard that may occur after redesignation. Upon the EPA's approval of the maintenance plan, the State is requesting that the Logan NAA be redesignated to attainment for the 2006 $PM_{2.5}$ 24-hour NAAQS.[1]

a) Background

In October of 2006, EPA revised the 1997 NAAAQS for $PM_{2.5}$. While the annual standard remained unchanged at 15 µg /m^3 (until 2012), the 24-hr standard was lowered from 65 µg /m^3 to 35 µg /m^3. The Utah Division of Air Quality ("UDAQ") has monitored $PM_{2.5}$ since 2000 and found that all areas have been in compliance with the 1997 standards. Since the promulgation of the 2006 standard, all or parts of seven Utah counties have recorded monitoring data that was not in compliance with the new 24-hr standard. In 2012, EPA lowered the annual standard to 12 µg /m^3, and all areas of the state meet this new standard.

On November 13, 2009, EPA designated the Logan NAA, which includes Cache County in Utah and Franklin County in Idaho, as nonattainment for the 2006 24-hour $PM_{2.5}$ NAAQS under the Act's general provisions for nonattainment areas. On January 4, 2013, the D.C. Circuit Court of Appeals issued a decision holding that the specific provisions for PM_{10} nonattainment areas, which are found in Part D, Subpart 4 of the Act, also apply to $PM_{2.5}$ nonattainment areas. These provisions require EPA to classify a PM nonattainment area as "moderate" at the time it is designated nonattainment. On June 2, 2014, the

[1] Concurrent with the State's submittal of SIP Section IX.A.28 to the EPA, Governor Gary Herbert will submit a letter to EPA requesting that EPA approve the maintenance plan and redesignate the Logan NAA to attainment.

EPA classified the Logan NAA as a Moderate nonattainment area with an attainment date of December 31, 2015. Under CAA section 188(d) and 40 CFR 51.1005, the EPA may grant a state's request to extend the attainment date for a moderate area for a 24-hr $PM_{2.5}$ standard. EPA granted two 1-year extensions to both Utah and Idaho, resulting in an attainment date of December 31, 2017 (82 FR 42447).

The Act requires areas failing to meet the federal ambient $PM_{2.5}$ standard to develop a state implementation plan (SIP) with sufficient control requirements to expeditiously attain and maintain the standard. On December 3, 2014, UDAQ submitted a moderate area SIP[2] for the Logan NAA that demonstrated attainment of the $PM_{2.5}$ NAAQS by December 31, 2015. EPA approval of the SIP will be discussed in Section IX.A.28.b(2).

Under the 24-hour NAAQS, compliance is determined by the average of 3 years of 98th percentile values. Since the statutory deadline for the implementation of RACM was not until December 31, 2014, it was reasonable to presume that the area might not be able to show attainment with a 3-year data set until the end of 2015 even if the control measures were having the desired effect. Presumably for this reason, Section 188(d) of the Act, (42 U.S.C. 7513(d)) allows a state to request up to two 1-year extensions of the attainment date. In doing so, the state must show that it has met all requirements of the SIP, and that the 98th percentile 24-hour concentration at each monitor in the area for the calendar year that includes the applicable attainment date is less than or equal the standard.

On September 8, 2017, EPA published notice in the Federal Register (82 FR 42447) that Utah and Idaho's extension requests were granted. As a result, EPA must examine monitor data values from 2015-2017 to determine whether the Logan, UT-ID area attained the NAAQS by the extended attainment date.

On October 19, 2018 (83 FR 52983), the EPA published a final determination based on the validated data from 2015-2017, that the Logan, UT-ID nonattainment area attained the 2006 primary and secondary 24-hour $PM_{2.5}$ NAAQS by the December 31, 2017, attainment date. The purpose of this SIP submittal is to request redesignation of the area to attainment (IX.A.28.b) and document a ten-year maintenance plan (IX.A.28.c).

IX.A.28.b Redesignation Requirements

Section 107(d)(3)(E) of the Act outlines five requirements that a nonattainment area must satisfy before an area may be eligible for redesignation from nonattainment to attainment status. Table IX.A.28.1 identifies the redesignation requirements as they are stated in Section 107(d)(3)(E) of the Act. Each element will be addressed in turn, with the central element being the maintenance plan found in Subsection IX.A.28.c below.

[2] UDAQ. December 3, 2014. Utah State Implementation Plan. Control Measures for Area and Point Sources, Fine Particulate Matter, $PM_{2.5}$ SIP for the Logan, UT-ID Nonattainment Area. Section IX. Part A.23. https://deq.utah.gov/legacy/laws-and-rules/air-quality/sip/docs/2014/12Dec/SIP%20IX.A.23_Logan_FINAL_Adopted12-3-2014.pdf

Category	Requirement	Reference	Addressed in Section
Attainment of Standard	Three consecutive years of $PM_{2.5}$ monitoring data must show that violations of the standard are no longer occurring	CAA §107(d)(3)(E)(i)	IX.A.28.b(1)
Approved SIP	The attainment SIP for the area must be fully approved	CAA §107(d)(3)(E)(ii)	IX.A.28.b(2)
Permanent and Enforceable Emissions Reductions	The State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable	CAA §107(d)(3)(E)(iii), Calcagni memo (Sect 3, para 2)	IX.A.28.b(3)
Section 110 and Part D requirements	The State must verify that the area has met all requirements applicable to the area under section 110 and Part D	CAA: §107(d)(3)(E)(v), §110(a)(2), Sec 171	IX.A.28.b(4)
Maintenance Plan	The Administrator has fully approved the Maintenance Plan for the area as meeting the requirements of CAA §175A	CAA: §107(d)(3)(E)(iv)	IX.A.28.b(5) and IX.A.28.c

Table IX.A.28. 1 Prerequisites to Redesignation in the Clean Air Act

1) The Area Has Attained the $PM_{2.5}$ NAAQS

CAA 107(d)(3)(E)(i) – *The Administrator determines that the area has attained the national ambient air quality standard*. To satisfy this requirement, the State must show that the area is attaining the applicable NAAQS. According to EPA's guidance[3] concerning area, there are generally two components involved in making this demonstration. The first relies upon ambient air quality data which should be representative of the area of highest concentration and should be collected and quality assured in accordance with 40 CFR 58. The second component relies upon supplemental air quality modeling. Each component will be addressed in turn.

a) Ambient Air Quality Data (Monitoring) and Utah's Monitoring Network

The NAAQS for $PM_{2.5}$ are listed in 40 CFR 50.13. The 2006 24-hour NAAQS is 35 micrograms per cubic meter ($\mu g/m^3$) for a 24-hour period and is met when the 98th percentile 24-hr concentration is less than or equal to 35 $\mu g/m^3$. Each year's 98th percentile is the daily value beneath which 98% of all daily values would fall. The procedure for evaluating $PM_{2.5}$ data with respect to the NAAQS is specified in Appendix N of 40 CFR Part 50. Generally speaking, the 24-hr $PM_{2.5}$ standard is met when a three-year average of 98th percentile values is less than or equal to 35 $\mu g/m^3$.

$PM_{2.5}$ has been monitored in Utah since 2000, following the promulgation of the 1997 $PM_{2.5}$ NAAQS. UDAQ's monitors are appropriately located to assess concentration, trends, and changes in $PM_{2.5}$ concentrations. During Utah's wintertime temperature inversions, daily sampling and real time monitoring are necessary for both public notification and to provide data for the air quality models.

The UDAQ Air Monitoring Section maintains an ambient air monitoring network in Utah in accordance with 40 CFR 58 that collects both air quality and meteorological data. Figure IX.A.28.1 on the following

[3] John Calcagni. September 4, 1992. EPA Memorandum authored by John Calcagni "Procedures for Processing Requests to Redesignate Areas to Attainment.

page shows the location of sites along the Wasatch Front and in the Cache Valley that collect $PM_{2.5}$ data. The ambient air quality monitoring network along Utah's Wasatch Front and in the Cache Valley is routinely audited by the EPA, and meets the agency's requirements for air monitoring networks.

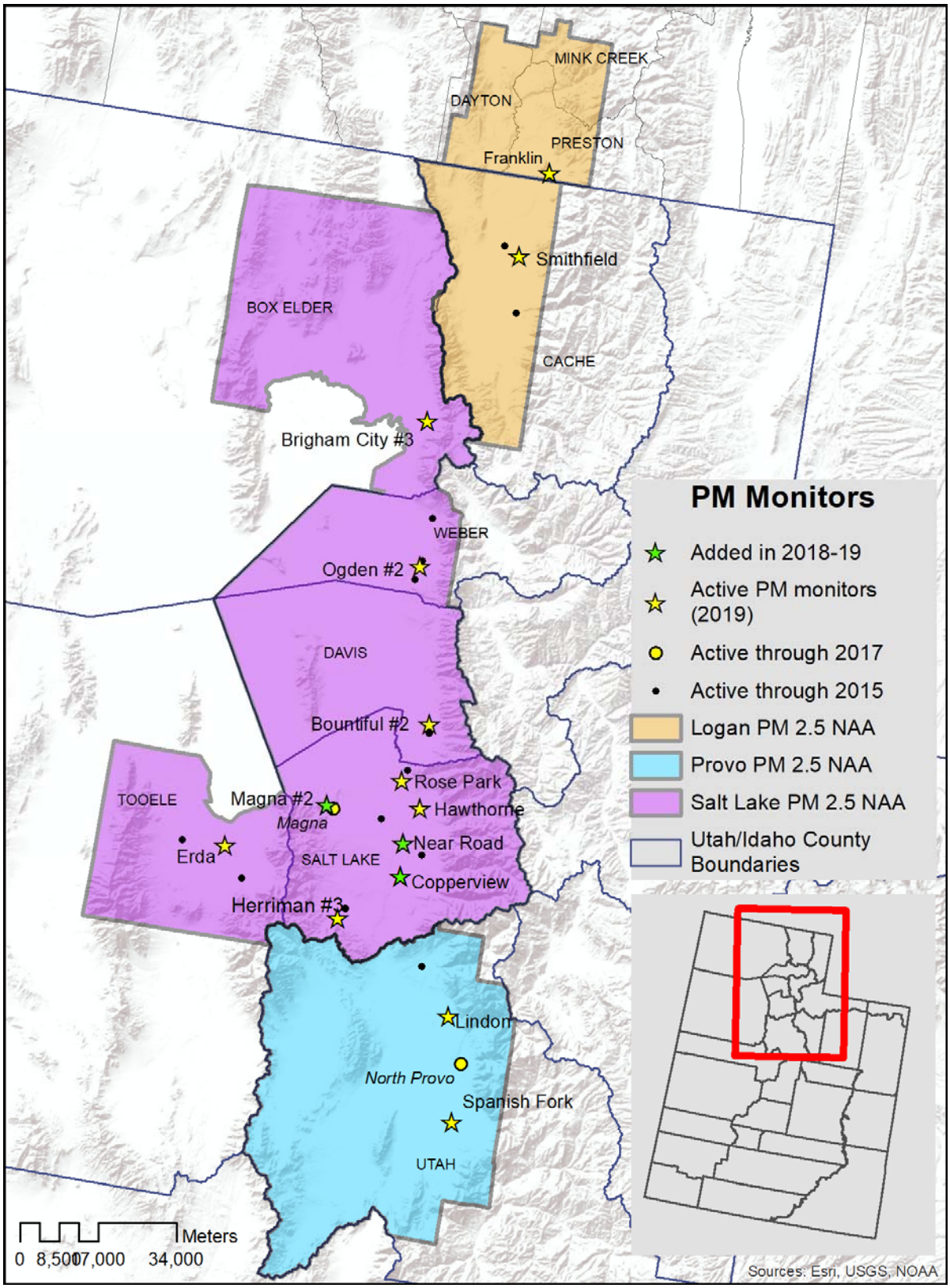


Figure IX.A.28. 1 Utah's $PM_{2.5}$ Monitoring Network

Data may be flagged when circumstances indicate that it would represent an event in the data set and not be indicative of the entire airshed or the efforts to reasonably mitigate air pollution within. 40 CFR 50.14, *Treatment of air quality monitoring data influenced by exceptional events,* anticipates this, and says that a State may request EPA to exclude data showing exceedances or violations of any national ambient air quality standard that are directly due to an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, from use in determinations. The protocol for data handling dictates that flagging is initiated by the state or local agency, and then the EPA either concurs or indicates that it has not concurred.

Table IX.A.28.2 below shows the 98th percentile values in µg /m^3 for 2015, 2016, and 2017 as well as the three-year average of these values. The validated data in Table IX.A.28.2 excludes several values from a wildfire exceptional event on September 6 and 7, 2017. On June 15, 2018, EPA concurred with this exceptional event and the documentation is included in the Region 8 docket for this action (EPA-R08-OAR-2018-0309). The three-year average, or design value, of 33 µg/m^3 from 2015-2017 was used by EPA in their final action of determination of attainment by attainment date for the Logan NAA (83 FR 52983). The Franklin, ID monitor is within the Logan NAA on the Idaho side of the border.

	2015	2016	2017	3-year average
Smithfield, UT	*28.9	34.4	36.0	33
Franklin, ID	18.8	33.3	38.3	30

Table IX.A.28. 2 Monitored Ambient 24-hr $PM_{2.5}$ Data

*This value combines monitor data from the Logan, UT and Smithfield, UT monitors for 2015.

i. Modeling Element

EPA guidance[4] concerning redesignation requests and maintenance plans (the Calcagni memo) discusses the requirement that the area has attained the standard and notes that air quality modeling may be necessary to determine the representativeness of the monitored data. Areas that were designated nonattainment based on modeling will generally not be redesignated to attainment unless an acceptable modeling analysis indicates attainment. The Logan NAA was not designated based on modeling; therefore, additional modeling is not necessary to determine the representativeness of the monitored data. The Logan NAA attainment by attainment date determination was made based on validated ambient monitored values. Consequently, modeling is not necessary to show attainment. However, modeling was conducted for the purpose of this maintenance demonstration to show continued compliance with the $PM_{2.5}$ NAAQS through the year 2035 (see section IX.A.28.c).

ii. (c) EPA Acknowledgement

The data presented in the preceding paragraphs demonstrates that the Logan NAA is attaining the 24-hr $PM_{2.5}$ NAAQS. On October 19, 2018, EPA published notice in the Federal Register (83 FR 52983) that pursuant to CAA section 199(b)(2), "the EPA is finalizing a determination based on the most recent three years (2015-2017) of valid data, that the Logan NAA attained the 2006 primary and secondary 24-hour

[4] Ibid

$PM_{2.5}$ NAAQS by the December 31, 2017 attainment date." This determination was based on quality-assured, quality-controlled, and validated ambient air monitoring data for 2015-2017.

2) Fully Approved Attainment Plan for $PM_{2.5}$

CAA 107(d)(3)(E)(ii) - The Administrator has fully approved the applicable implementation plan for the area under section 110(k).

On December 3, 2014, Utah submitted a SIP to EPA for the Logan NAA that demonstrated attainment of the $PM_{2.5}$ NAAQS by December 31, 2015, and subsequently, the two 1-year extensions were approved, extending the attainment date to December 31, 2017. Table IX.A.28.3 details the EPA action, date, and FR citation for SIP approval status.

Areas designated as nonattainment that attain the standard prior to the SIP submittal deadline, or prior to an area's approved attainment date, are eligible for reduced regulatory requirements as described in EPA's "Clean Data Policy."[5] Under the Clean Data Policy, a clean data determination was finalized on October 29, 2019 (83 FR 52983), for the Logan NAA. The approval status of the SIP is dependent on the clean data determination requirements as detailed in 81 CFR 51.1015. For a moderate $PM_{2.5}$ nonattainment area, the clean data policy suspends the requirements for the state to submit an attainment demonstration, reasonable further progress (RFP) plans, quantitative milestones, and contingency measures until such time as: (1) the area is redesignated to attainment, after which such requirements are permanently discharged; or (2) the EPA determines that the area has re-violated the $PM_{2.5}$ NAAQS, at which time the state shall submit such attainment plan elements for the nonattainment area by a future date to be determined by the EPA. Table IX.A.28.3 details the EPA SIP approval status. EPA had approved some elements of the moderate SIP prior to the publication of the clean data determination.

Additionally, EPA guidance[6] states that approval action on SIP elements and the redesignation request may occur simultaneously. Requirements listed in Table IX.A.28.3 that show pending approval may fall into this category.

Requirement	EPA Action & Date	FR Citation
Base Year and Projection Year Emission Inventories	Approved on 11/23/2018	82 FR 59315
Modeled Attainment Demonstration	Approved on 11/23/2018	82 FR 59315
RACT	Approved on 11/23/2018	82 FR 59315
On-Road Mobile RACM and Additional Reasonable Measure Demonstrations, including I/M Program	Approved on 11/23/2018	82 FR 59315
Direct $PM_{2.5}$, NO_X and VOC MVEB	Approved on 11/23/2018	82 FR 59315
Non-Road Mobile RACM	Approved on 11/23/2018	82 FR 59315

[5] Steve Page, Director, EPA Office of Air Quality Policy Planning and Standard. December 14, 2004. EPA Memorandum to Air Division Directors, "Clean Data Policy for the Fine Particle National Ambient Air Quality Standards."
[6] Calcagni (n 3)

Area Source RACM	See Table IX.A.28.4	--
Nonattainment New Source Review (R307-403)	Approved on 7/25/2019	84 FR 35832
Reasonable Further Progress	Clean Data Determination 10/29/2018	83 FR 52983
Quantitative Milestones	Clean Data Determination 10/29/2018	83 FR 52983
Contingency Measures	Clean Data determination 10/29/2018	83 FR 52983

Table IX.A.28. 3 Logan, UT-ID SIP Approval Status

As part of the Utah moderate SIPs, 24 area source rules were either introduced or augmented to control $PM_{2.5}$ and $PM_{2.5}$ precursors. On February 25, 2016 (81 FR 9343), and October 19, 2016 (81 FR 71988), the EPA approved area source rule revisions and Reasonably Available Control Measure (RACM) analyses (where appropriate) for the majority of the R307-300 series. See Table IX.A.28.4 for details on rules, approval dates, and implementation schedules. For the SLC NAA, the best available control measure (BACM) analysis resulted in revisions to 13 different area source rules which affect surface coating, graphic arts, and aerospace manufacture and rework facilities. These rule amendments reduce emissions in the Logan NAA as well since the rules apply statewide.

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-302 Solid Fuel Burning Devices [1] EPA conditionally approved* October 19, 2016 (81 FR 71988).	February 1, 2017
R307-303 Commercial Cooking [1] EPA approved February 25, 2016 (81 FR 9343).	December 15, 2015
R307-304 Solvent Cleaning [1]	December 6, 2017
R307-307 Road Salting and Sanding EPA approved February 25, 2016 (81 FR 9343).	January 1, 2014
R307-309 Nonattainment and Maintenance Areas for PM_{10} and $PM_{2.5}$: Fugitive Emissions and Fugitive Dust [1] EPA proposed for approval September 14, 2017 (82 FR 43205).	Salt Lake County, Utah County, and the City of Ogden – January 1, 2013. Remaining NAAs – April 1, 2013. Amended August 4, 2017
R307-312 Aggregate Processing Operations for $PM_{2.5}$ Nonattainment Areas. EPA approved October 19, 2016 (81 FR 71988).	February 4, 2016

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-335 Degreasing and Solvent Cleaning Operations [1] EPA approved February 25, 2016 (81 FR 9343).	All sources within Salt Lake and Davis Counties R307-335-3 through R307-335-6 – January 1, 2013. All other sources defined in R307-335-2 – September 1, 2013. All sources within Box Elder, Cache, Utah, Weber, and Tooele Counties R307-335-7 – August 1, 2014 Amended October 29, 2017, by removing sections 6 & 7 to for rule R307-304
R307-342 Adhesives & Sealants [1] EPA approved February 25, 2016 (81 FR 9343).	December 1, 2014
R307-343 Emissions Standards for Wood Furniture Manufacturing Operations [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – September 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-344 Paper, Film & Foil Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-345 Fabric & Vinyl Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2011. Amended December 6, 2017
R307-346 Metal Furniture Surface Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-347 Large Appliance Surface Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-348 Magnet Wire Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-349 Flat Wood Panel Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-350 Miscellaneous Metal Parts and Products Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – September 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-351 Graphic Arts [1] EPA approved February 25, 2016 (81 FR 9343)	Sources in Salt Lake and Davis Counties – February 1, 2013. Sources in Box Elder, Cache, Tooele, Utah, and Weber Counties – January 1, 2014. Amended December 6, 2017
R307-352 Metal Containers, Closure, and Coil Coatings [2] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-353 Plastic Parts Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-354 Automotive Refinishing Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended December 6, 2017
R307-355 Control of Emissions from Aerospace Manufacture and Rework Facilities [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2014 Amended March 8, 2018
R307-356 Appliance Pilot Light [1] EPA approved February 25, 2016 (81 FR 9343)	January 1, 2013

EPA-Approved/Conditionally Approved Control Measures for UT Moderate $PM_{2.5}$ SIPs	Implementation Schedule
R307-357 Consumer Products [1] EPA approved February 25, 2016 (81 FR 9343)	May 8, 2014
R307-361 Architectural Coatings [1] EPA approved February 25, 2016 (81 FR 9343)	October 31, 2013

Table IX.A.28. 4 Area Source Rules Implementation Xchedule and EPA Approval Status

[1] control measure implementation schedule and confirmation that measures have been implemented
[2] control measure implementation schedule and review if any new sources located in the NAA
*UDAQ submitted the committed revisions on February 1, 2017, within the one-year conditional approval window

Part of Franklin County, ID is included in the Logan, UT-ID NAA. As a result, Idaho DEQ submitted a moderate SIP to Region 10 in 2014. Table IX.A.28.5 outlines control measures developed by Idaho DEQ. On January 4, 2017 (82 FR 729), the EPA approved the residential woodstove curtailment program and change-out program. On March 25, 2014 (79 FR 16203), the EPA approved the road sanding agreements as a voluntary measure.

EPA-Approved Control Measures for the Idaho Portion of the Logan NAA	Implementation Schedule	Estimated Reductions (uncontrolled-to-controlled emissions) in tons-per-day
Residential Woodstove Curtailment Program	Fully implemented summer and fall 2012	0.06 tpd direct $PM_{2.5}$, 0.009 tpd NO_X, and 0.078 tpd volatile organic compounds (VOC)
Residential Woodstove Change-Out Program	2006–2007, 2011–2012, and 2013–2014	0.05 tpd direct $PM_{2.5}$, 0.003 tpd NO_X, 0.13 tpd VOC
Road Sanding Agreements	July 16, 2012 and October 25, 2012	0.10 tpd direct $P_{M2.5}$

Table IX.A.28. 5 Idaho Control Measures and Implementation Schedule

Considering the suspended SIP elements through the clean data policy and the approval or expected approval of required elements, Utah has met requirement 107(d)(3)(E)(ii) for the Logan NAA.

3) Improvements in Air Quality Due to Permanent and Enforceable Reductions in Emissions

CAA 107(d)(3)(E)(iii) - *The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and*

enforceable reductions. Speaking further on the issue, EPA guidance[7] reads that the State must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. In the following sections, both the improvement in air quality and the emission reductions themselves will be discussed.

a) Improvement in Air Quality

The improvement in air quality with respect to $PM_{2.5}$ can be shown in a number of ways. Improvement, in this case, is relative to the various control strategies that affected the airshed. For the Logan NAA, these control strategies were implemented as the result of the SIP submitted to EPA in December 2014 with a statutory control deadline of December 31, 2014. With this deadline in mind, the emission reduction results of the controls would not be reflected in the ambient data until 2015.

An assessment of the ambient air quality data collected at monitors in the NAA from the year monitoring began to 2018 (the last year of validated data) shows an observable decrease in monitored $PM_{2.5}$ (see Figures IX.A.28.2 and IX.A.28.3). The Logan NAA is designated nonattainment only for the 24-hour health standard, not for the annual standard. However, it is useful to observe both the 98th percentile average of 24-hr data as well as the annual arithmetic mean to understand trends (see Figure IX.A.28.2). Ambient concentrations in excess of the 24-hr standard are typically only incurred during winter months when cold-pool conditions drive and trap secondary $PM_{2.5}$. The actual cold-pool temperature inversions vary in strength and duration from year to year, and the $PM_{2.5}$ concentrations measured during those times reflect this variability far more than they reflect gradual changes in the emissions of direct $PM_{2.5}$ and $PM_{2.5}$ precursors. This variability is apparent in Figure IX.A.28.3. Despite the variability, if a line is fit through the 24-hr data, the trend is noticeably downward and indicates an improvement of a little under one µg /m^3 per year.

This episodic variability is reduced by looking at annual mean values of $PM_{2.5}$ concentrations shown in Figure IX.A.28.2. The data is still skewed more by winter data than summer data. It includes all of the high values identified as the 98th percentiles, as well as the values ranked even higher. Still the trend is downward. Fitting a line through the data collected at the Logan site reveals a trend that noticeably decreases, and indicates an improvement of approximately four µg /m^3 over the 18-year span.

Table IX.A.28.3 shows the annual 98th percentile values at the Logan or Smithfield monitor including the years used for nonattainment designation (2006-2008) to 2017. The statutory deadline for controls to be in place was December 31, 2014. Thus, 2015 marked the first year in which these control measures would be reflected in the data.

[7] Ibid

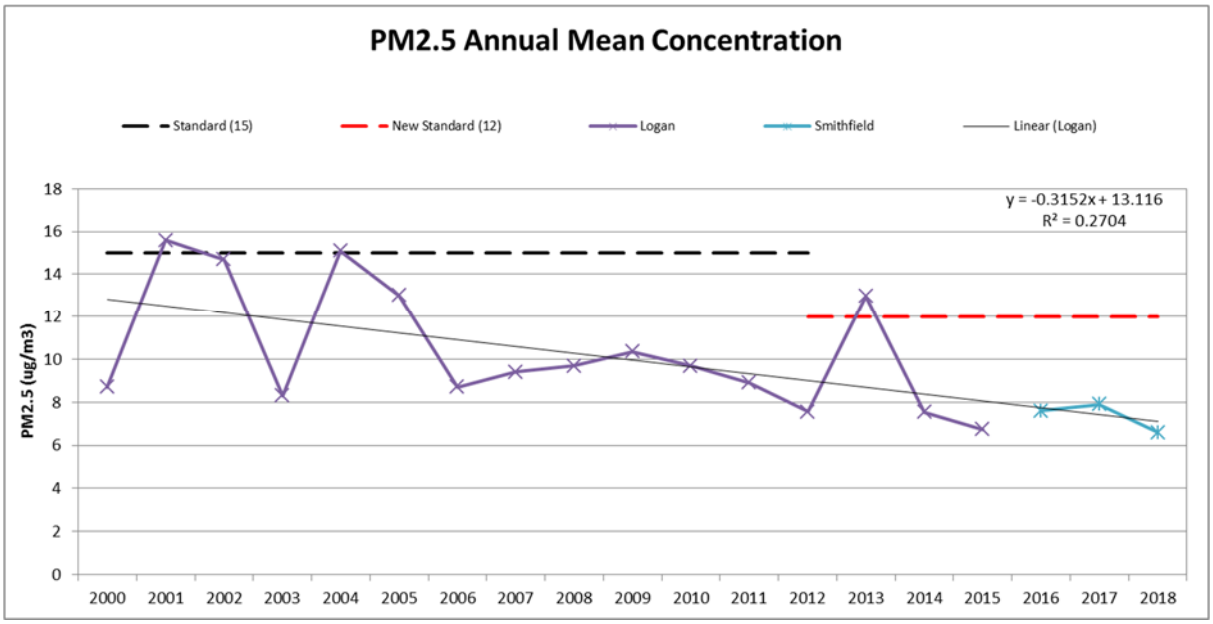


Figure IX.A.28. 2 Logan NAA $PM_{2.5}$ Annual Mean Concentration

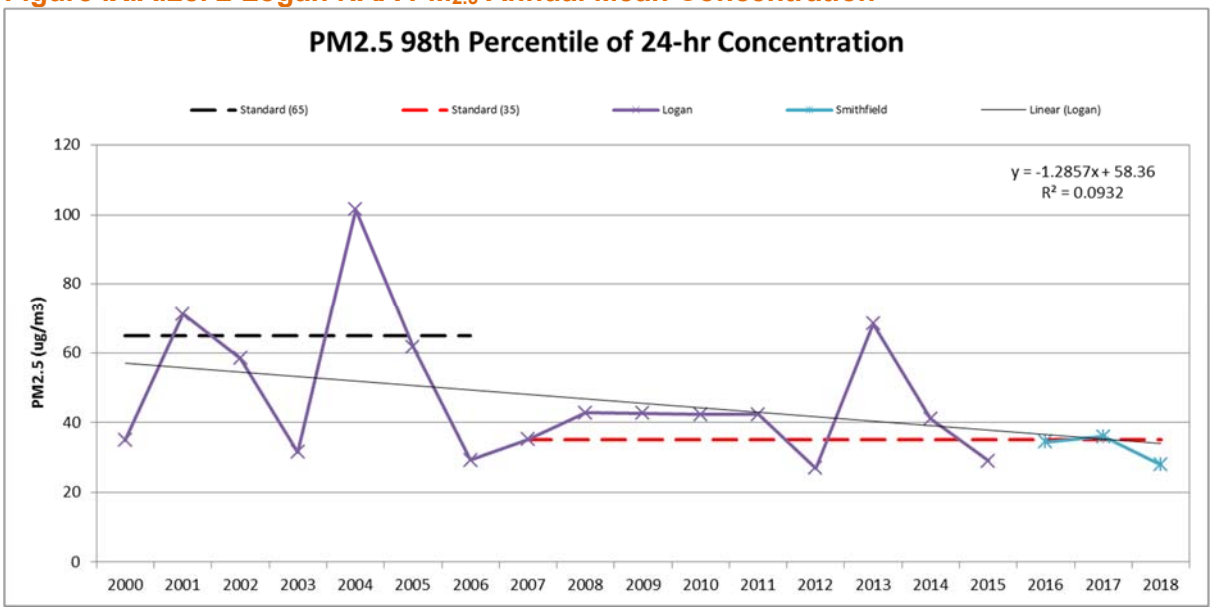


Figure IX.A.28. 3 Logan NAA $PM_{2.5}$ 98th Percentile of 24-hr Concentration

b) Reduction in Emissions

As stated above, EPA guidance[8] says that the State must be able to reasonably attribute the improvement in air quality to emission reductions that are permanent and enforceable. In making this showing, the State should estimate the percent reduction (from the year that was used to determine the design value)

[8] Ibid

achieved by Federal measures such as motor vehicle control, as well as by control measures that have been adopted and implemented by the State.

As mentioned, the ambient air quality data presented in Subsection IX.A.28.b(3)(a) includes values prior to the nonattainment designation through 2018 to illustrate the lasting effect of the implemented control strategies. In discussing the effect of the controls, as well as the control measures themselves, however, it is important to keep in mind the time necessary for their implementation.

The moderate nonattainment SIP for the Logan NAA included a statutory date for the implementation of RACM/RACT of December 31, 2014. Thus, 2015 marked the first year in which RACM/RACT was reflected in the emissions inventories for the Logan NAA. Section 189(c) of the CAA identifies, as a required plan element, quantitative milestones which are to be achieved every three years, and which demonstrate reasonable further progress (RFP) toward attainment of the standard by the applicable date. As defined in CAA Section 171(1), the term reasonable further progress means "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." Hence, the milestone report must demonstrate that the control strategy is achieving reasonable progress toward attainment.

The nonattainment SIP for the Logan NAA included a new vehicle inspection I/M program for on-road vehicles as well as a suite of area source rules targeting emissions of $PM_{2.5}$, NO_X, and VOC. This is discussed in SIP Subsection IX.A.23(6), and is reflected in the attainment demonstration presented in Subsection IX.A.23(4). The RACM prescribed by the nonattainment SIP and the subsequent implementation by the State is discussed in more detail in a milestone report submitted for the NAA to the EPA in 2017, which is included in the TSD. There are no stationary point sources in the Logan NAA with the potential to emit 100 tons per year of $PM_{2.5}$ or any $PM_{2.5}$ plan precursor.

Existing controls not implemented through the SIP process also affect the emission rates from non-stationary source categories. The federal motor vehicle control program has been one of the most significant control strategies affecting emissions that produce $PM_{2.5}$. Tier 1 and 2 standards were implemented by 1997 and 2008 respectively. Tier 3 vehicle/engine standards were initiated with new vehicles coming to market in 2017 (25% of new sales) with full phase in by 2021 (100% of new sales). For gasoline, the five Wasatch Front refineries and the Sinclair refinery in Wyoming that also supplies gasoline to the Wasatch Front market, are considered small refineries by EPA's rule. As such, these refineries have a tier 3 delayed implementation date of January 1, 2020, to produce a tier 3 (10 ppm sulfur) gasoline product or produce a gasoline product (greater than 10 ppm sulfur) with compensating sulfur credits. Similarly, the Heavy-Duty Engine and Vehicle Standards took effect in 2007 and were fully phased in by 2010. Air quality benefits, particularly those stemming from the light-duty and heavy-duty vehicle standards, continue to be realized as older, higher-polluting vehicles are replaced by newer, cleaner vehicles.

UDAQ submitted quantitative milestone reports to EPA on March 23, 2018, within the 90-day post-milestone date required by CAA 189(c)(2) and 51.1013(b). On October 24, 2018, EPA sent Governor Gary Herbert a letter stating "The Environmental Protection Agency has determined that the 2017 Quantitative Milestone Reports are adequate. The basis for this determination is set forth in the

enclosures. This determination is based on the EPA's review of information contained in the moderate area plans and additional information provided in the 2017 Quantitative Milestone Reports." This approval letter is included in the TSD.

Furthermore, since these control measures are incorporated into the Utah SIP, the emission reductions that resulted are consistent with the notion of permanent and enforceable improvements in air quality. Taken together, the trends in ambient air quality illustrated previously, along with the continued implementation of the nonattainment SIP for the Logan NAA, provide a reliable indication that these improvements in air quality reflect the application of permanent steps to improve the air quality in the region.

4) State has Met Requirements of Section 110 and Part D

CAA 107(d)(3)(E)(v) - The State containing such area has met all requirements applicable to the area under section 110 and part D. Section 110 of the Act deals with the broad scope of state implementation plans and the capacity of the respective state agency to effectively administer such a plan. Part D deals specifically with plan requirements for nonattainment areas, including those requirements that are specific to $PM_{2.5}$.

a) Section 110

The State has met all requirements applicable to the Logan NAA under Section 110 of the Act. Section 110(a)(2) contains the general requirements or infrastructure elements necessary for EPA approval of the SIP. On September 21, 2010, the State submitted an Infrastructure SIP to EPA demonstrating compliance with the requirements of Section 110 that are applicable to the 2006 $PM_{2.5}$ NAAQS. EPA approved the State's Infrastructure SIP on November 25, 2013 (78 FR 63883), for all Section 110 requirements that are applicable to redesignation.

b) Part D Subpart 1 and 4

Part D of the Act addresses "Plan Requirements for Nonattainment Areas." Subparts 1 and 4 of Part D contain planning elements that must be included in the SIP. This includes the requirement to submit an attainment demonstration, reasonable further progress plans, quantitative milestones and milestone reports, a motor vehicle emission budget for the attainment year for the purposes of transportation conformity, and contingency measures for the area. However, upon EPA's issuance of a final clean data determination demonstrating that the Logan NAA has attained the standard, these requirements are suspended (40 C.F.R. § 51.1015(b) and 84 FR 26054).

The remaining Part D requirements that are relevant to redesignation are requirements that are independent of helping the area achieve attainment. This includes the requirement to have a nonattainment new source review ("NNSR") program and emissions inventory submission. The State has satisfied these remaining requirements. Utah's NNSR program can be found in Utah Administrative Rule R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas. EPA fully approved the current version of the NNSR program on July 25, 2019 (84 FR 35832). The emissions inventory as included in the moderate SIP for the Logan NAA and was approved by the EPA on November 23, 2018 (82 FR 39315). Therefore, Utah has complied with all applicable Part D requirements.

5) Maintenance Plan for $PM_{2.5}$ Areas

As stated in the Act, an area may not be redesignated to attainment without first submitting and receiving EPA approval of a maintenance plan. The maintenance plan is a quantitative showing that the area will continue to attain the NAAQS for an additional 10 years (from EPA approval), accompanied by sufficient assurance that the terms of the numeric demonstration will be administered by the State and by the EPA in an oversight capacity. The maintenance plan is the central criterion for redesignation. It is contained in the following subsection.

IX.A.28.c Maintenance Plan

CAA 107(d)(3)(E)(iv) - The Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A. An approved maintenance plan is one of several criteria necessary for area redesignation as outlined in Section 107(d)(3)(E) of the Act. The maintenance plan itself, as described in Section 175A of the Act and further addressed in EPA guidance[9] has its own list of required elements. The following table is presented to summarize these requirements. Each will then be addressed in turn.

Category	Requirement	Reference	Addressed in Section
Maintenance demonstration	Provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation.	CAA: 175A(a)	IX.A.28.c (1)
Revise in 8 Years	The State must submit an additional revision to the plan, 8 years after redesignation, showing an additional 10 years of maintenance.	CAA: 175A(b)	IX.A.28.c (6)
Continued Implementation of Nonattainment Area Control Strategy	The Clean Air Act requires continued implementation of the NAA control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions.	CAA: 175A(c), 110(l), Calcagni memo	IX.A.28.c (5)
Contingency Measures	Areas seeking redesignation from nonattainment to attainment are required to develop contingency measures that include State commitments to implement additional control measures in response to future violations of the NAAQS.	CAA: Sec 175A(d)	IX.A.28.c (8)
Verification of Continued Maintenance	The maintenance plan must indicate how the State will track the progress of the maintenance plan.	Calcagni memo	IX.A.28.c (7)

Table IX.A.28. 6 CAA Maintenance Plan Requirements

[9] Ibid

1) Demonstration of Maintenance - Modeling Analysis

CAA 175A(a) - Each State which submits a request under section 107(d) for redesignation of a nonattainment area as an area which has attained the NAAQS shall also submit a revision of the applicable implementation plan to provide for maintenance of the NAAQS for at least 10 years after the redesignation. The plan shall contain such additional measures, if any, as may be required to ensure such maintenance. The maintenance demonstration is discussed in EPA guidance[10] as one of the core provisions that should be considered by states for inclusion in a maintenance plan.

According to the EPA guidance, a State may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory (discussed below) or by modeling to show that the future mix of sources and emission rates will not cause a violation of the NAAQS. Utah has elected to make its demonstration based on air quality modeling.

a) Introduction

The following chapter presents an analysis using observational datasets to detail the chemical regimes of Utah's NAAs. Prior to the develop of this maintenance plan, UDAQ conducted a technical analysis to support the development of the serious SIP for the SLC NAA. The analysis included preparation of emissions inventories and meteorological data, and the evaluation and application of a regional photochemical model. Part of this process included episode selection to determine the episode that most accurately replicates the photochemical formation of ambient $PM_{2.5}$ during a persistent cold air pool episode in the airshed. For this maintenance plan, UDAQ is using the same episode that was used for the serious SIP modeling.

b) Photochemical Modeling

UDAQ used the Comprehensive Air Quality Model with Extensions (CAMx) version 6.30 for air quality modeling. CAMx v6.30 is a state-of-the-art air quality model that includes State of Utah funded enhancements for wintertime modeling. These enhancements include snow chemistry, topographical and surface albedo refinements. CAMx is an EPA approved model for use in SIP modeling. Its configuration for use in this SIP, with respect to model options and model adjustments, is discussed in the Technical Support Document.

c) Emissions Preparation

The emissions processing model used in conjunction with CAMx is the Sparse Matrix Operator Kernel Emissions Modeling System (SMOKE) version 3.6.5[11]. SMOKE prepares the annual emissions inventory for use in the air quality model. There are three aspects to the preparation of an annual emissions inventory for air quality modeling:

- Temporal: Convert emissions from annual to daily, weekly, and hourly values.

[10] Ibid
[11] https://www.cmascenter.org/smoke/

- Spatial: Convert emissions from a county-wide average to gridded emissions.
- Speciation: Decompose $PM_{2.5}$ and VOC emissions estimates into individual subspecies using the latest Carbon Bond 6 speciation profiles.

The process of breaking down emissions for the air quality model was done with sets of activity profiles and associated cross reference files. These are created for point or large industrial source emissions, smaller area sources, and mobile sources. Direct $PM_{2.5}$ and $PM_{2.5}$ precursor estimates were modified via temporal profiles to reflect wintertime conditions.

Activity profiles and their associated cross reference files from the EPA's 2011v6[12] modeling platform were used. For stationary non-point and mobile sources, spatial surrogates from the EPA Clearinghouse for Inventories and Emissions Factors (CHIEF[13]) were used to distribute emissions in space across the modeling domain. Emissions from large industrial sources (point sources) were placed at the location of the source itself. Where reliable local information was available (population density, traffic demand modeling, residential heating), profiles and surrogates were modified or developed to reflect that information.

i. Photochemical Modeling Domains and Grid Resolution

The UDAQ CAMx v6.30 modeling framework consists of two spatial domains: a high-resolution 1.33 km domain nested inside of a coarser 4 km domain (see Figure IX.A.28.4). This configuration allows one to efficiently integrate regional effects with local impacts within the Logan NAA. Vertical resolution in the model consists of 41 layers extending to the top of the atmosphere.

[12] https://www.epa.gov/air-emissions-modeling/2011-version-6-air-emissions-modeling-platforms
[13] https://www.epa.gov/chief

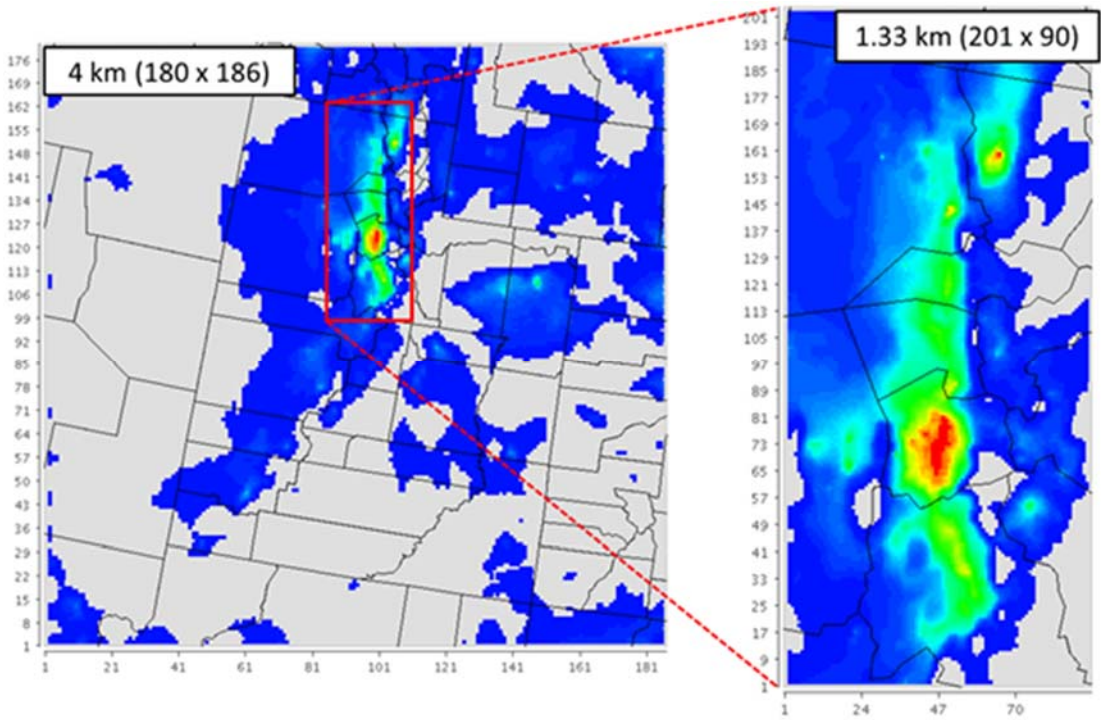


Figure IX.A.28. 4 CAMx Photochemical Modeling Domain in Two-Way Nested Configuration

The UDAQ 4 km coarse domain covers the entire state of Utah, a significant portion of Eastern Nevada (including Las Vegas), as well as smaller portions of Idaho, Wyoming, Colorado, and Arizona. The fine 1.33 km domain covers all of Utah's three $PM_{2.5}$ nonattainment areas, including the Logan NAA. Throughout this document, we will refer to the fine 1.33 km domain as the "modeling domain" when the coarse domain is not specified.

ii. Meteorological Data

Meteorological modeling was carried out by the University of Utah (University) with financial support from UDAQ.

Meteorological inputs were derived using the Weather Research and Forecasting[14] (WRF) Advanced Research WRF (WRF-ARW) model to prepare meteorological datasets for our use with the photochemical model. WRF contains separate modules to compute different physical processes such as surface energy budgets and soil interactions, turbulence, cloud microphysics, and atmospheric radiation. Within WRF, the user has many options for selecting the different schemes for each type of physical process. There is also a WRF Preprocessing System (WPS) that generates the initial and boundary conditions used by WRF, based on topographic datasets, land use information, and larger-scale atmospheric and oceanic models.

[14] https://www.mmm.ucar.edu/weather-research-and-forecasting-model

Model performance of WRF was assessed against observations at sites maintained by the University. WRF has reasonable ability to replicate the vertical temperature structure of the boundary layer (i.e., the temperature inversion), although it is difficult for WRF to reproduce the inversion when the inversion is shallow and strong (i.e., an 8-degree temperature increase over 100 vertical meters). A summary of the performance evaluation results for WRF is included in the TSD.

iii. Episode Selection

Part of the modeling exercise involves a test to see whether the model can successfully replicate the $PM_{2.5}$ mass and composition that was observed during prior episode(s) of elevated $PM_{2.5}$ concentration. The selection of an appropriate episode, or episodes, for use in this exercise requires some forethought and should determine the meteorological episode that helps produce the best air quality modeling performance.

EPA Guidance[15] identifies some selection criteria that should be considered for SIP modeling, including:

- Select episodes that represent a variety of meteorological conditions that lead to elevated $PM_{2.5}$.
- Select episodes during which observed concentrations are close to the baseline design value.
- Select episodes that have extensive air quality data bases.
- Select enough episodes such that the model attainment test is based on multiple days at each monitor violating NAAQS.

After careful consideration, the following meteorological episodes were selected as candidates for Utah's SIP modeling:

- January 1-10, 2011
- December 7-19, 2013
- February 1-16, 2016

In addition to the criteria identified in the modeling guidance, each of these candidate episodes may be characterized as having the following atmospheric conditions:

- Nearly non-existent surface winds
- Light to moderate winds aloft (wind speeds at mountaintop < 10-15 m/s)
- Simple cloud structure in the lower troposphere (e.g., consisting of only one or no cloud layer)
- Singular 24-hour $PM_{2.5}$ peaks suggesting the absence of weak intermittent storms during the episode

Previous work conducted by the University and UDAQ showed the four conditions listed above improve the likelihood for successfully simulating wintertime persistent cold air pools in the WRF model[16]. A

[15] Environmental Protection Agency. April 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze.
[16] https://www.mmm.ucar.edu/weather-research-and-forecasting-model

comprehensive discussion of the meteorological model performance for all three episodes may be found in the Technical Support Document for the meteorological modeling[17].

a) Model Adjustments and Settings

In order to better simulate Utah's winter-time inversion episodes six different adjustments were made to CAMx input data:

1. Increased vertical diffusion rates (Kvpatch)
2. Lowered residential wood smoke emissions to reflect burn ban compliance during forecasted high $PM_{2.5}$ days (burn ban)
3. Ozone deposition velocity set to zero and increased urban area surface albedo (snow chemistry)
4. Ammonia injection to account for missing ammonia sources in UDAQ's inventory. This is defined as artificially adding non-inventoried ammonia emissions to the inventoried emissions that are input into CAMx.
5. Reduced the dry deposition rate of ammonia by setting ammonia Rscale to 1. Rscale is a parameter in CAMx that reflects surface resistance.
6. Applied a 93% reduction to paved road dust emissions.

Depending on the episode, different adjustments were applied. All adjustments were applied to the January 2011 episode while select adjustments were applied to the other two episodes.

Kvpatch improved overall model performance by enhancing vertical mixing over urban areas. Snow chemistry modifications, which included reducing ozone deposition velocity and increasing surface albedo over urban areas, helped improve the model performance by better representing secondary ammonium nitrate formation during winter-time inversion episodes in Utah.

Rscale modification and burn ban adjustments were also only applied to the January 2011 episode. The burn ban adjustments reflect the compliance rate with the state's two-stage policy ban on wood-burning.

A 93% reduction in paved road dust emissions was only applied to the January 2011 emissions. This adjustment helped improve the model performance for crustal material.

b) Episodic Model Performance

Shown below for each of three episodes are the CAMx performance results for total 24-hour $PM_{2.5}$ mass and $PM_{2.5}$ chemical species, including nitrate (NO_3), sulfate (SO_4), ammonium (NH_4), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM) and other species (other mass).

January 1-10, 2011

[17] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

A comparison of 24-hr modeled and observed $PM_{2.5}$ during January 1-10, 2011, at the Logan monitoring station in the Logan NAA showed that the model overall captures the temporal variation in $PM_{2.5}$ well (Figure IX.A.28.5). The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. However, despite the overall good representation of the temporal variation of $PM_{2.5}$, concentrations are generally biased low in the model, particularly on January 4-9, 2011, which can be related to the meteorological model performance on these days. Temperature was overestimated by 5-15 °C in the meteorological model during this period and thick low-level clouds were simulated on January 5 while clouds were not observed on this day[18].

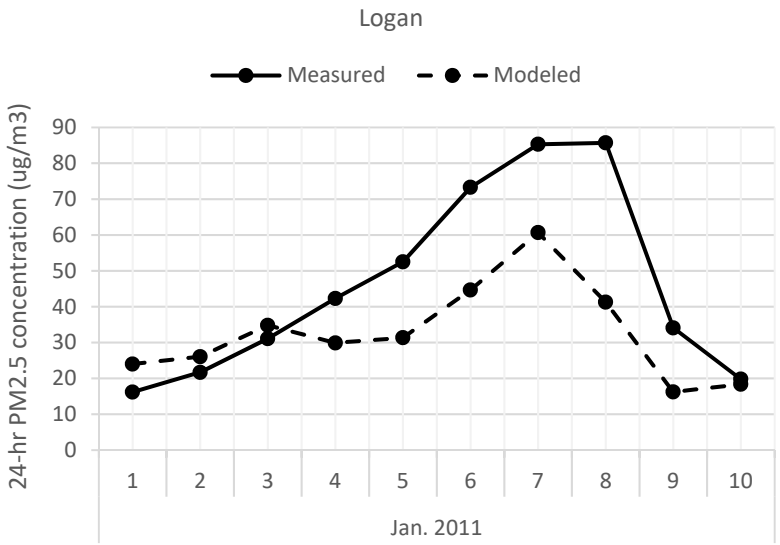


Figure IX.A.28. 5 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During January 1-10, 2011 at Logan Monitoring Station in the Logan NAA

The model performance for $PM_{2.5}$ species was overall good. Figure IX.A.28.6 shows a comparison of modeled and measured $PM_{2.5}$ chemical species on January 7, which corresponds to a $PM_{2.5}$ exceedance day. The model performance for SO_4 was reasonably good, with measured and modeled SO_4 accounting for 3 and 5% of $PM_{2.5}$ mass, respectively. The model also underestimated NO_3 and NH_4, which is partly related to the meteorological model performance where temperature was overestimated by 5-15 °C in WRF during January 4-10, 2011, as aforementioned. The underestimation in modeled NO_3 and NH_4 can also be related to an underestimation in modeled hydrochloric acid (HCl) and oxidants sources (more details are provided in the TSD). The model, on the other hand, overall overestimated elemental carbon (EC) and organic carbon (OC). The overprediction in these species on days when the simulated atmospheric mixing was particularly strong suggests that this overestimation is potentially related to an

[18] $PM_{2.5}$ State Implementation Plan Meteorological Modeling, available at https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

overestimation in their source emissions. It is, however, noteworthy that despite these biases in modeled $PM_{2.5}$ species, modeled NO_3 and NH_4 account for most of the $PM_{2.5}$ mass, in agreement with measurements.

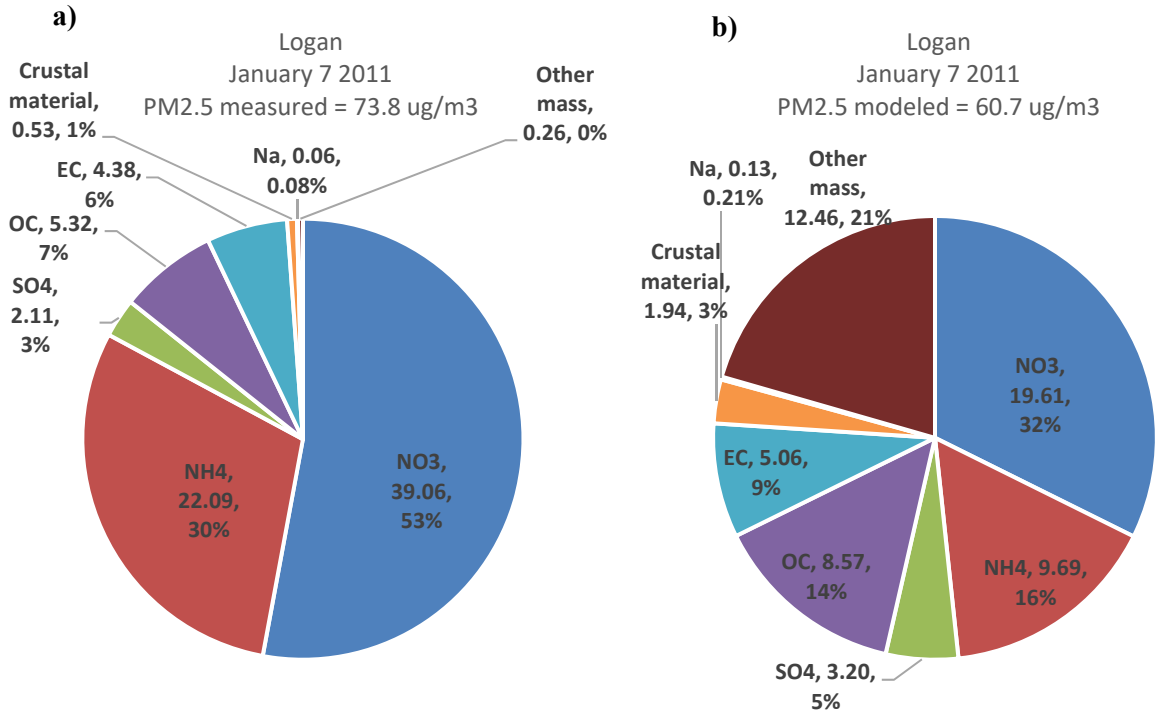


Figure IX.A.28. 6 a) Measured and b) Modeled Chemical Composition of 24-hour $PM_{2.5}$ (in ug/m^3 and %) of $PM_{2.5}$ at Logan monitoring station on January 7, 2011

Overall, the model simulated well the timing of the capping inversion during this January episode. PM2.5 chemical species are also reasonably well simulated in the model, suggesting that this episode is suitable for modeling.

December 7-19, 2013

A comparison of modeled and measured 24-hr $PM_{2.5}$ at Logan during the December 7-19, 2013, episode showed that the model did not represent well the temporal variation in $PM_{2.5}$ and the capping inversion (Figure IX.A.28.7). While observations show a peak in $PM_{2.5}$ concentrations on December 14, CAMx is simulating a drop in $PM_{2.5}$ levels. This can be attributed to the meteorological model performance, where the model did not properly capture the cold overnight low temperatures that were observed on this day[19].

[19] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf.

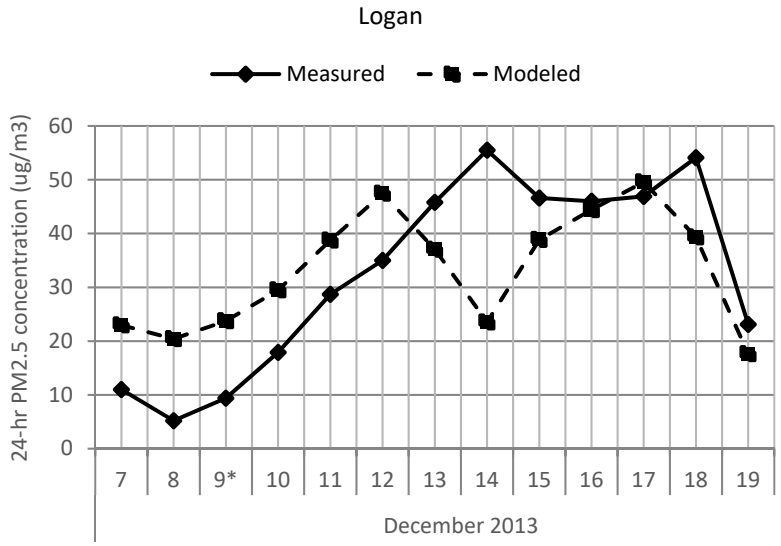


Figure IX.A.28. 7 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During December 7-19, 2013, at Logan Monitoring Station in the Logan NAA

The model performance for $PM_{2.5}$ chemical species was overall poor for this episode as indicated by a comparison of measured and modeled $PM_{2.5}$ chemical composition at Logan monitoring station on a $PM_{2.5}$ exceedance day (Figure IX.A.28.8). Given that measurements of $PM_{2.5}$ chemical species were not available for a $PM_{2.5}$ exceedance day during the December 7-19 modeling episode, this analysis is based on a comparison of the fraction of individual $PM_{2.5}$ chemical species in total $PM_{2.5}$ mass between 2013 model outputs and measurements from 2011. Measurements correspond to filter speciation data collected at Logan during a typical winter-time inversion event in 2011. As can be seen, NO_3 and NH_4 are both significantly underpredicted in the model, which can be related to the meteorological model performance, where WRF overpredicted surface temperatures, leading to increased mixing. Moreover, similarly to the model performance for the January 2011 episode, crustal material is overpredicted in the model. An adjustment to paved road dust emissions was not applied in the December 2013 simulations. OC was also overestimated in the model while the performance for SO_4 and EC was reasonably good.

Given that $PM_{2.5}$ species were poorly represented in this episode and that the strength of the capping inversion and timing of the $PM_{2.5}$ peaks were not well simulated, the December 2013 episode for the maintenance demonstration modeling is not desirable.

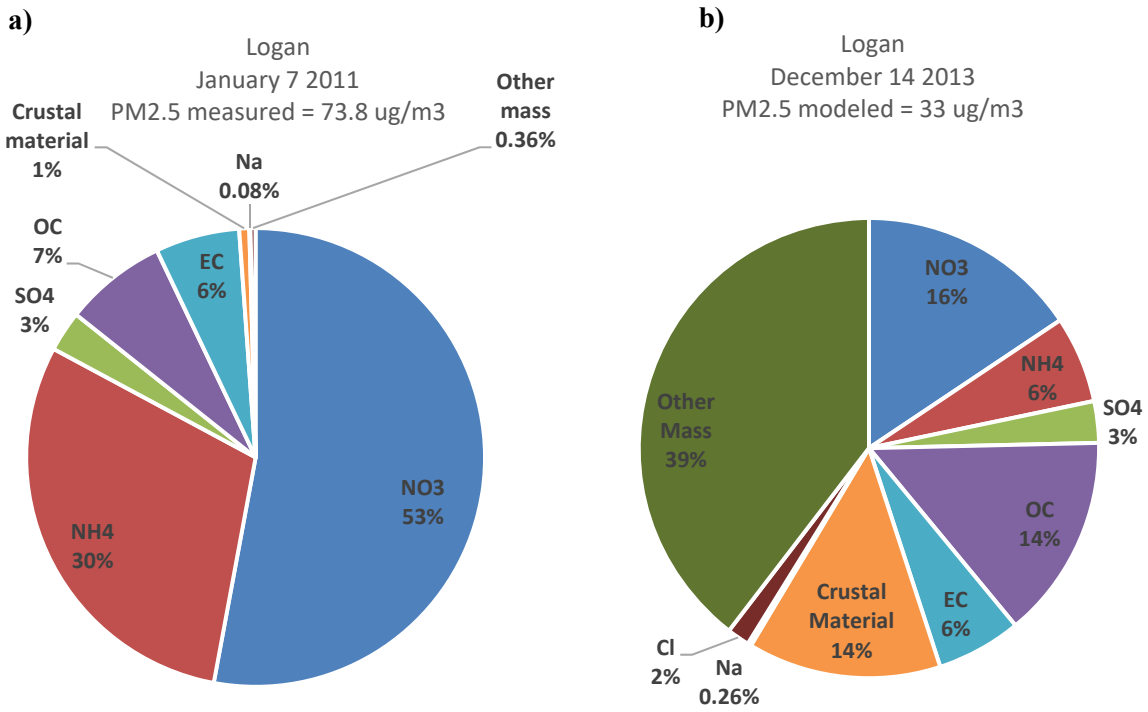


Figure IX.A.28. 8 a) Measured and b) Modeled Species Contribution (in ug/m^3 and %) to $PM_{2.5}$ at Logan Monitoring Station in the Logan NAA on a Typical 24-hr $PM_{2.5}$ Exceedance Day

February 1-16, 2016

A comparison of modeled and measured 24-hr $PM_{2.5}$ at Smithfield monitoring station in the Logan NAA shows that $PM_{2.5}$ concentrations are biased low in the model (Figure IX.A.28.9). The timing of the $PM_{2.5}$ peaks is also poorly simulated. This can be mainly related to the meteorological model performance. A warm modeled temperature bias in the Cache Valley due to early snow melt-out and premature dissipation of simulated clouds in the model likely contributed to increased mixing and dispersion of $PM_{2.5}$ in the photochemical model[20].

[20] https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

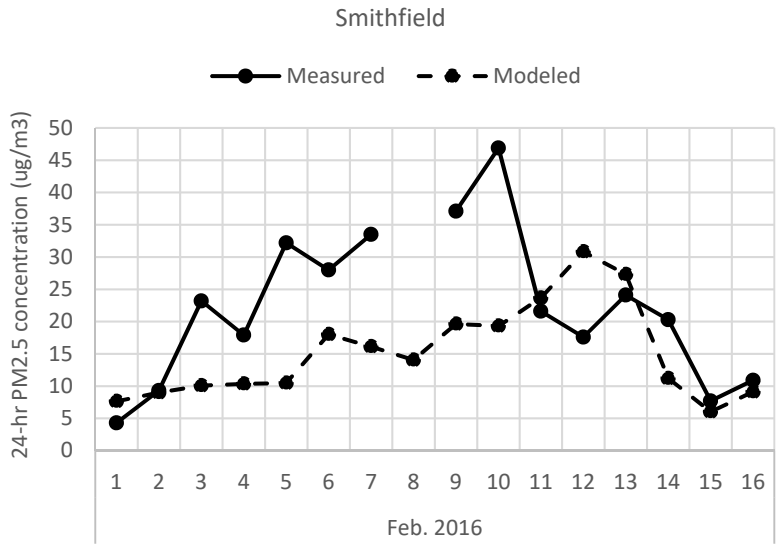


Figure IX.A.28. 9 Measured and Modeled 24-hr $PM_{2.5}$ Concentrations During February 1-16, 2016, at Smithfield Monitoring Station in the Logan NAA. Note that FRM filter data was missing for February 8, 2016.

The model performance for $PM_{2.5}$ chemical species was overall weak for this episode as indicated by a comparison of measured and modeled $PM_{2.5}$ chemical composition at Logan monitoring station on a $PM_{2.5}$ exceedance day (Figure IX.A.28.10). Given that measurements of $PM_{2.5}$ chemical species were not available for a PM2.5 exceedance day during the February 1-16 modeling episode, this analysis is based on a comparison of the fraction of individual $PM_{2.5}$ chemical species in total $PM_{2.5}$ mass between 2016 model outputs and measurements from 2011. Measurements correspond to filter speciation data collected at Logan during a typical winter-time inversion event in 2011. As can be seen, NO_3 and NH_4 are both underpredicted in the model, which can be partly related to the meteorological model performance, where WRF overpredicted surface temperatures. Moreover, similarly to the model performance for the January 2011 episode, EC and crustal material are overpredicted in the model. An adjustment to paved road dust emissions was not applied in the February 2016 simulations.

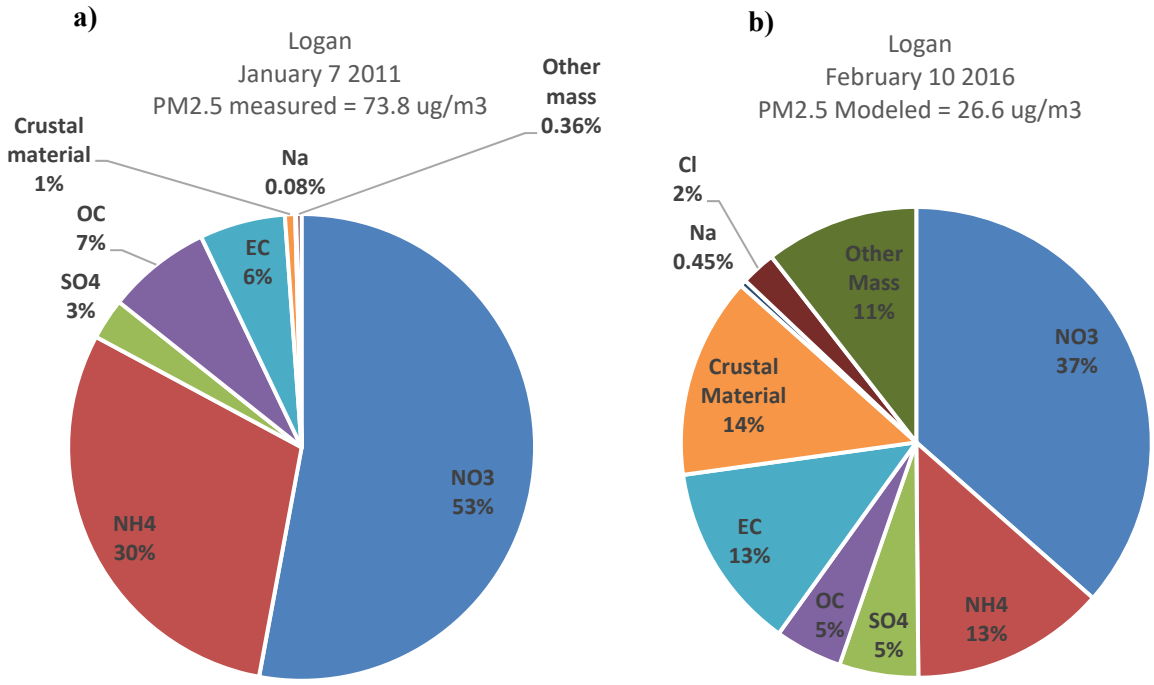


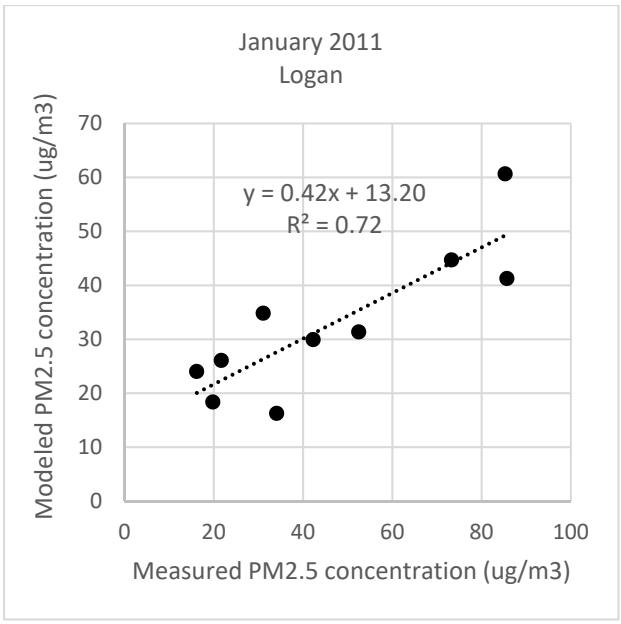
Figure IX.A.28. 10 a) Measured and b) Modeled Species Contribution (in %) to $PM_{2.5}$ at Logan Monitoring Station in the Logan NAA on a Typical 24-hr $PM_{2.5}$ Exceedance Day

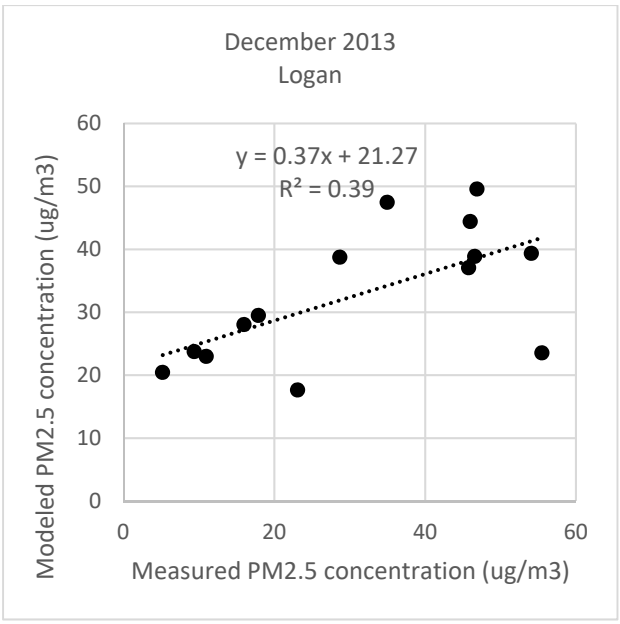
Given that $PM_{2.5}$ species and total mass are not well simulated and that the timing of the $PM_{2.5}$ peaks is poorly represented in the model, this episode is not suitable for maintenance demonstration modeling.

Conclusion

Examining the $PM_{2.5}$ model performance for all three episodes, it is clear that CAMx performed best when using the January 2011 WRF output, which was specifically calibrated to the meteorological conditions experienced during January 2011, a period that coincided with the Persistent Cold Air Pool Study (PCAPS)[21], an exhaustive field campaign. This was further confirmed by a linear regression analysis that showed that modeled and measured $PM_{2.5}$ at Logan monitoring station were more strongly correlated during the January 2011 episode ($R^2 = 0.72$) compared to the other two episodes ($R^2 = 0.18$ and 0.39) (Figure IX.A.28.11).

[21] http://www.pcaps.utah.edu/





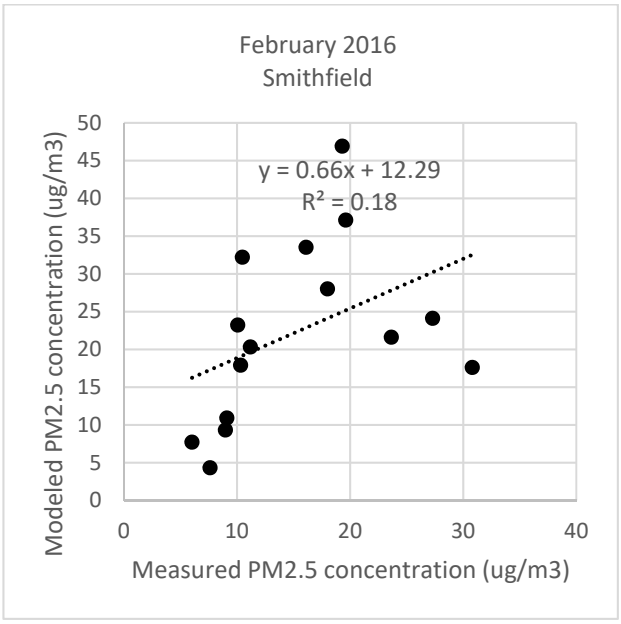


Figure IX.A.28. 11 Modeled vs. Measured 24-hr $PM_{2.5}$ for Each of the Three Modeling Episodes: January 2011, December 2013, and February 2016. Dots represent each individual day of the modeling episode. Linear regression fits (dashed line) and equation are shown for each episode,

The January 2011 WRF data produced superior performance for all important metrics when compared with the other two episodes. Therefore, UDAQ selected the January 2011 episode to conduct its modeled maintenance demonstration work. A more thorough discussion is provided in the Technical Support Document.

(c) Photochemical Model Performance Evaluation

Introduction

To assess how accurately the photochemical model predicts observed concentrations and to demonstrate that the model can reliably predict the change in pollution levels in response to changes in emissions, a model performance evaluation was conducted. This model performance evaluation also provides support for the model modifications and settings that were applied (ammonia injection, increase of surface resistance to ammonia, zeroing-out of ozone deposition velocity, snow albedo enhancement, vertical diffusion modifications and paved road dust emissions adjustment) to more accurately reproduce winter-time inversion episodes.

Available ambient monitoring data were used for this photochemical model performance evaluation. Data included 24-hr total $PM_{2.5}$ and 24-hr chemically-speciated $PM_{2.5}$ measurements collected at Logan monitoring station in the Logan NAA. Ammonia measurements collected during special field studies were also used for this performance evaluation. The evaluation was based on the January 1-10, 2011, episode and the 2011 emissions inventory were used as input data for the model simulations. The evaluation focused on days with $PM_{2.5}$ concentration exceeding the 24-hr national ambient air quality standard (> 35 $\mu g/m^3$).

A more detailed model performance evaluation that examines the model performance for gaseous species is provided in the TSD. More details on the model performance at various sites within the Logan NAA are also included in the TSD.

Daily $PM_{2.5}$ Concentrations

A comparison of 24-hr modeled and observed $PM_{2.5}$ during January 1-10 2011, at the Logan monitoring station in the Logan NAA showed that the model overall captures the temporal variation in $PM_{2.5}$ well (Figure IX.A.28.12). The gradual increase in $PM_{2.5}$ concentration and its transition back to low levels are generally well reproduced by the model. However, despite the overall good representation of the temporal behavior of $PM_{2.5}$, concentrations are overall biased low in the model, particularly on January 4-9, 2011, which can be partly related to the meteorological model performance on these days, as aforementioned. Temperature was overestimated by 5-15 ^oC during this period and thick low-level clouds were simulated on January 5 while clouds were not observed on this day[22]. This resulted in an increasingly deep sub-cloud mixing layer in the model compared to reality, which led to an underprediction in modeled $PM_{2.5}$ concentrations.

[22] $PM_{2.5}$ State Implementation Plan Meteorological Modeling, available at https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

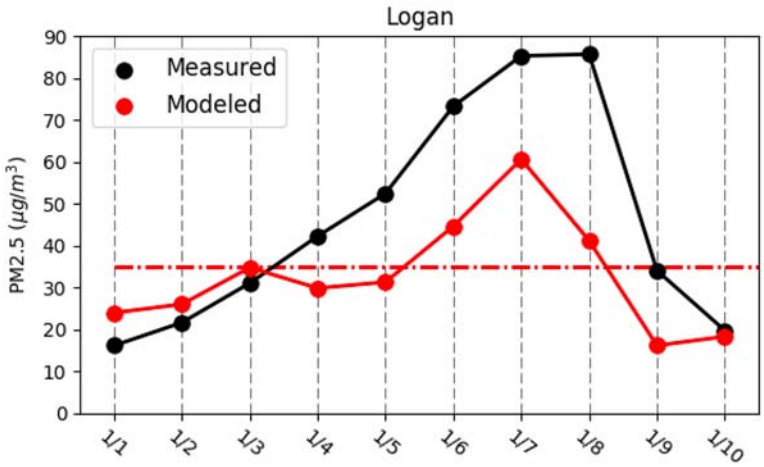


Figure IX.A.28. 12 Ten-day Time Series of Observed (black) and Modeled (red) 24-hour Average $PM_{2.5}$ Concentrations during January 1 – 10, 2011 at Logan Monitoring Station in the Logan NAA. Dashed red line shows 24-hr $PM_{2.5}$ NAAQS.

$PM_{2.5}$ Chemical Speciation

To further investigate the model performance, measured and modeled $PM_{2.5}$ chemical species were compared at the Logan monitoring site. Figure IX.A.28.13 shows a comparison of the bulk chemical composition of measured and modeled $PM_{2.5}$ at Logan on January 7, 2011, which corresponds to the only $PM_{2.5}$ exceedance day when measurement data are available. Chemical species, including nitrate (NO_3), sulfate (SO_4), ammonium (NH_4), organic carbon (OC), elemental carbon (EC), chloride (Cl), sodium (Na), crustal material (CM), and other species (other mass), were considered in this analysis. The model performance evaluation for non-$PM_{2.5}$ exceedance days is provided in the TSD.

The model performance for SO_4 was reasonably good, with measured and modeled SO_4 accounting for 3% and 5% of $PM_{2.5}$, respectively. The model also underestimated NO_3 and NH_4, which can be related to the meteorological model performance, where the model simulated a weaker temperature inversion compared to reality[23]. The underestimation in modeled NO_3 and NH_4 can also be related to an underestimation in modeled HCl and ClNO2 (more details are provided in the TSD). The model also overall overestimated primary $PM_{2.5}$ species, including crustal material and EC. OC was also overpredicted. The overprediction in these species on days when the simulated atmospheric mixing was particularly strong suggests that this overestimation is potentially related to an overestimation in their source emissions.

[23]https://documents.deq.utah.gov/air-quality/planning/technical-analysis/research/model-improvements/3-wintertime-episodes/DAQ-2017-014342.pdf

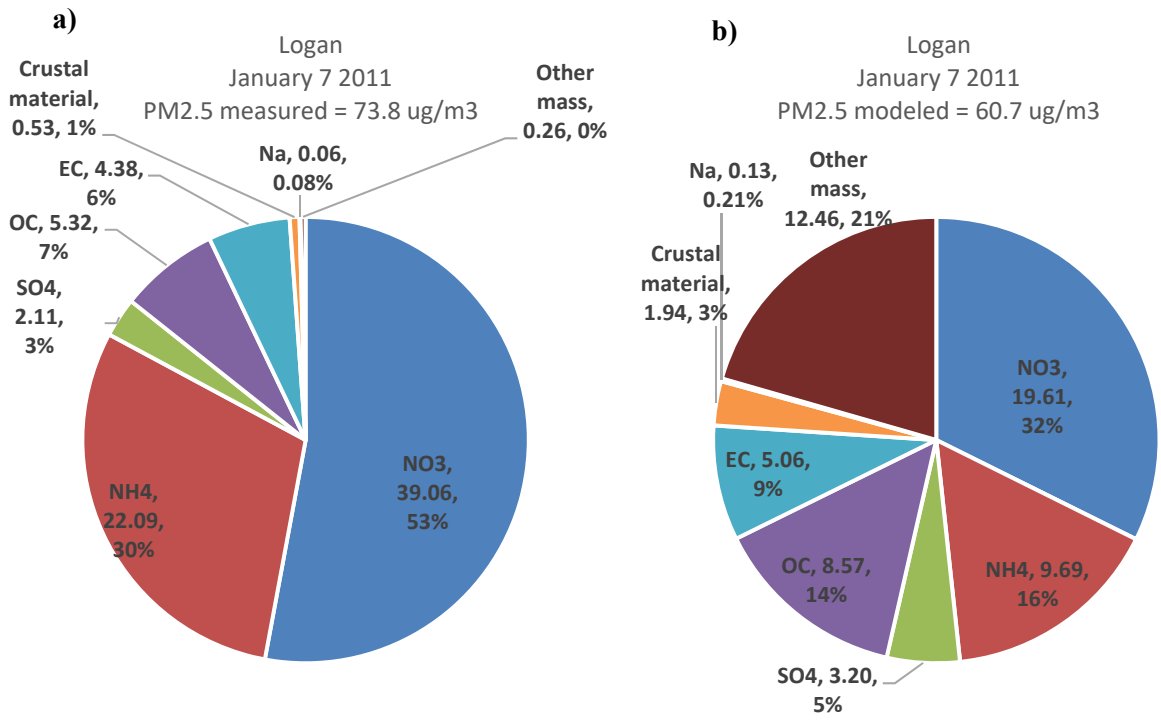


Figure IX.A.28. 13 a) Measured and b) Modeled Chemical Composition of 24-hour $PM_{2.5}$ in ug/m^3 and % of $PM_{2.5}$ at Logan Monitoring Station on January 7, 2011

The model performance was also evaluated for NH_3, which is an important precursor to the formation of ammonium nitrate, ammonium sulfate, and ammonium chloride, all of which are important $PM_{2.5}$ species accounting for over 50% of the $PM_{2.5}$ mass during winter-time inversion events.

Hourly modeled NH_3 (Figure IX.A.28.14) was compared to hourly NH_3 measurements (Figure IX.A.28.15) conducted at the Logan air monitoring station during a special field study in winter 2017. Measurements from 2017 were considered since measurements of NH_3 were not available during 2011. However, while these 2017 field study measurements cannot be directly compared to day-specific 2011 model simulations, the measurements are qualitatively useful to assess if the model predicts similar levels of NH_3 during strong inversion conditions.

A comparison of measured and modeled NH_3 shows that modeled NH_3 at the Logan site is well within the range observed in 2017.

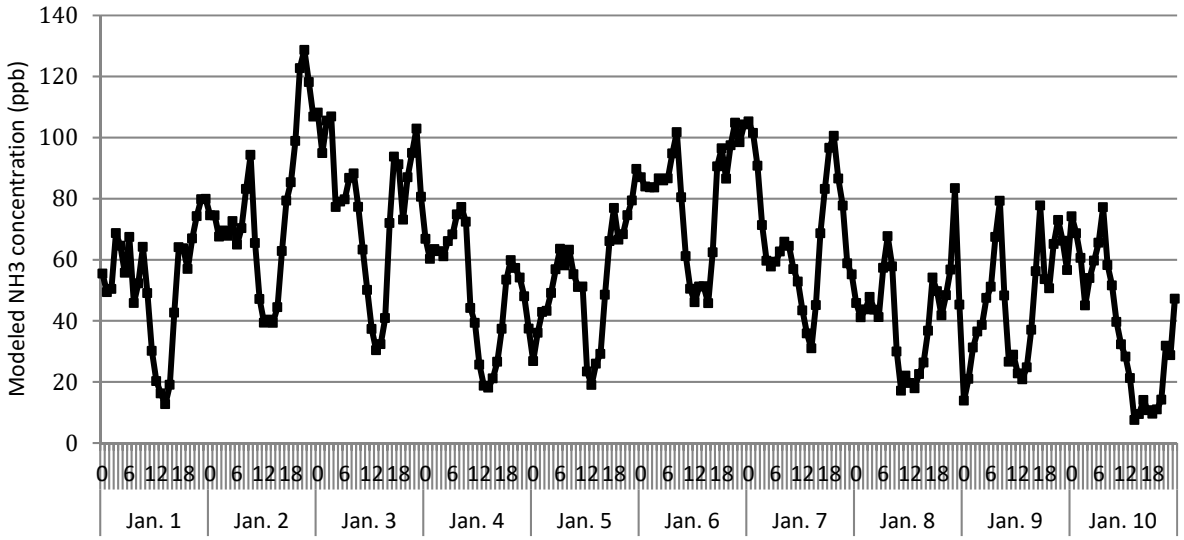


Figure IX.A.28. 14 Hourly Time Series of Modeled NH_3 (ppb) at Logan Monitoring Station During January 1-10, 2011

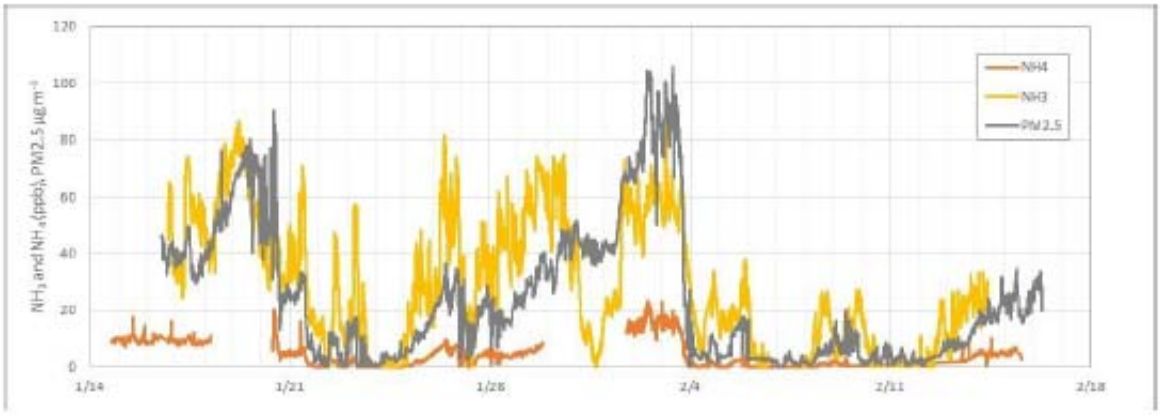


Figure IX.A.28. 15 Measured NH_3, Ammonium and $PM_{2.5}$ at Logan Monitoring Site During the 2017 Utah Winter Fine Particulate Study (UWFPS). Figure Retrieved from the UWFPS Final Report[24]

Summary of Model Performance

The model performance replicating the buildup and clear out of $PM_{2.5}$ is good overall. The model captures the temporal variation in $PM_{2.5}$ well. Moreover, total modeled $PM_{2.5}$ mass is dominated by NO_3, in agreement with measurements, and simulated concentrations of NH_3 are within the range of those observed. However, while $PM_{2.5}$ mass is dominated by NO_3, the model tends to underestimate ammonium nitrate, which is potentially due to an underestimation in free radical sources. Future research is needed to

[24] 2017 Utah Winter Fine Particulate Study
https://www.esrl.noaa.gov/csd/groups/csd7/measurements/2017uwfps/finalreport.pdf

evaluate how accurately the model simulates free radical sources, which would help further improve the model performance.

Several observations should be noted on the implications of these model performance findings on the attainment modeling presented in the following section. First, it has been demonstrated that model performance overall is good and, thus, the model can be used for air quality planning purposes. Second, consistent with EPA guidance, the model is used in a relative sense to project future year values. EPA suggests that this approach "should reduce some of the uncertainty attendant with using absolute model predictions alone."

d) Modeled Attainment Test

Introduction

With acceptable performance, the model can be utilized to make future-year attainment projections. For any given (future) year, an attainment projection is made by calculating a concentration termed the Future Design Value (FDV). This value is calculated for each monitor included in the analysis, and then compared to the NAAQS (35 $\mu g/m^3$). If the FDV at every monitor located within a NAA is less than the NAAQS, this demonstrates attainment for that area in that future year.

A maintenance plan must demonstrate continued attainment of the NAAQS for a span of ten years. This span is measured from the time EPA approves the plan, a date which is somewhat uncertain during plan development. To be conservative, attainment projections were made for 2035. An assessment was also made for 2026 as a "spot-check" against emission trends within the ten-year span.

$PM_{2.5}$ Baseline Design Values

For any monitor, the FDV is greatly influenced by existing air quality at that location. This can be quantified and expressed as a Baseline Design Value (BDV). The BDV is consistent with the form of the 24-hour $PM_{2.5}$ NAAQS, which is the 98th percentile value averaged over a three-year period. Quantification of the BDV for each monitor is included in the TSD, and is consistent with EPA guidance.

Relative Response Factors

In making future-year predictions, the output from the CAMx model is not considered to be an absolute answer. Rather, the model is used in a relative sense. In doing so, a comparison is made using the predicted concentrations for both the year in question and a pre-selected baseline year, which for this plan is 2017. This comparison results in a relative response factor (RRF).

The UDAQ used the Software for Model Attainment Test - Community Edition (SMAT-CE) v. 1.01 utility from EPA[25] to perform the modeled attainment test for daily $PM_{2.5}$. SMAT is designed to interpolate the species fractions of the PM mass from the Speciation Trends Network (STN) monitors to the FRM monitors. It also calculates the RRF for grid cells near each monitor and uses these to calculate

[25] https://www.epa.gov/scram/photochemical-modeling-tools

a future year design value for these grid cells. A grid of 3-by-3 (9) cells surrounding the monitors was used as the boundary for RRF calculations.

The State of Utah operates three Chemical Speciation Network (CSN) monitors: Hawthorne, Bountiful, and Lindon. Hawthorne is located in Salt Lake County, the Bountiful monitor is in Davis to the north, and the Lindon monitor is located in Utah County to the south. Of the three, Hawthorne samples one out of three days, while the other two sample one in six days.

This mismatch in sampling frequency lead, initially, to interpolated speciation profiles that were unexpectedly non-uniform across the Salt Lake Valley. To create more realistic speciation profiles, the CSN data collected at the Hawthorne monitor were applied to all of the FRM sites in the SLC NAA. UDAQ believes this is a reasonable assumption that is supported by recently conducted special studies. Further discussion may be found in the TSD.

For each monitor, the FDV is calculated by multiplying the BDV by the relative response factor: **FDV = RRF * BDV**. These FDV's are compared to the NAAQS in order to determine whether attainment is predicted at that location or not. The results for each of the monitors are shown below in Table IX.A.28.7.

For all projected years and monitors, no FDV exceeds the NAAQS. Therefore, continued attainment is demonstrated for the Logan NAA.

Monitor Location	2016-2018 BDV	2026 FDV	2035 FDV*
Smithfield	32.6	28.0	28.2

Table IX.A.28. 7 Baseline and Future Design Values (ug/m^3) at the Monitor in Logan NAA

*This value includes additional emissions added to the CMPO MVEB from the safety margin

2) Attainment Inventory

The attainment inventory is discussed in EPA guidance[26] as another one of the core provisions that should be considered by states for inclusion in a maintenance plan. According to the guidance, the stated purpose of the attainment inventory is to establish the level of emissions during the time periods associated with monitoring data showing attainment.

In cases such as this, where a maintenance demonstration is founded on a modeling analysis that is used in a relative sense, the modeled baseline inventory is used for comparison with every projection year model run. For this analysis, the state compiled a baseyear inventory for the year 2017. This year falls within the span of data representing current attainment of the $PM_{2.5}$ NAAQS. The guidance discusses the projection inventories as well, and notes that they should consider future growth, including population and industry, should be consistent with the baseyear inventory, and should document data inputs and assumptions. Any assumptions concerning emission rates must reflect permanent, enforceable measures.

[26] Calcagni (n 3)

Utah compiled projection inventories for use in the quantitative modeling demonstration. The years selected for projection include 2026 and 2035. The emissions contained in the inventories include sources located the modeling domain, encompassing all three $PM_{2.5}$ nonattainment areas, as well as a bordering region. See Figure IX.A.28. 4.

Since this bordering region is so large, the State identified a "core area" within this domain wherein a higher degree of accuracy is important. Within this core area (which includes Weber, Davis, Salt Lake, Utah, Box Elder, Tooele, Cache, and Franklin, ID counties), SIP-specific inventories were prepared to include seasonal adjustments and forecasting to represent each of the projection years. In the bordering regions away from this core, the State used the most current (2014) National Emissions Inventory from EPA for the analysis.

There are four general categories of emission sources included in these inventories: point sources, area sources, on-road mobile sources, and non-road mobile sources. For each of these source categories, the pollutants that were inventoried included: $PM_{2.5}$, SO_2, NO_X, VOC, and NH_3. The unit of measure for point and area sources is the traditional tons per year. Mobile source emissions are reported in terms of tons per day. The pre-processing model, SMOKE, converts all emissions to daily, weekly, and hourly values.

Area source emissions were projected to 2017 from the 2014 triannual inventory. Growth data from appropriate data sources, including information from the Governor's Office of Management and Budget, was used to project inventories to 2026 and 2035. Point source emissions are represented as the actual emissions from the 2017 triannual emissions inventory. Point sources were grown to 2026 and 2035 on a case-by-case basis for the projection inventories.

On-road mobile source emissions were calculated for each year using MOVES2014b in conjunction with the appropriate estimates for vehicle miles traveled (VMT). VMT estimates for the urban counties were provided by the local metropolitan planning organizations (MPOs), including the Wasatch Front Regional Council, the Mountainland Association of Governments, and the Cache Metropolitan Planning Organization and are based on their travel demand modeling for 2017, 2026, and 2035. Non-road mobile source emissions were calculated for each year using MOVES2014b. Growth data from appropriate data sources was used to project to 2026 and 2035. The TSD accompanying this SIP includes the Inventory Preparation Plan that details the growth factors used for each emissions source.

Source category emission inventories are expected to look quite different between 2017 and 2035. Population is expected to steadily increase between the 18-year span. On-road mobile emissions dominate the 2017 inventory; however, in 2035 area source emissions dominate the inventory. This is due to the tier 3 federal fuel standards and phase-in of newer cars driving on-road emission reductions. Area source emissions are relatively stable from 2017 to 2026 to 2035, besides a decrease in NOx from 2017 to 2026 due to the phase-in of area source rules.

Since this SIP subsection takes the form of a maintenance plan, it must demonstrate that the area will continue to attain the $PM_{2.5}$ NAAQS throughout a period of ten years from the date of EPA approval. It is also necessary to "spot check" this ten-year interval. Hence, projection inventories were prepared for 2026 and 2035. Table IX.A.28.8 summarizes these inventories. As described, it represents point, area,

on-road mobile, and non-road mobile sources in the modeling domain and include $PM_{2.5}$, as well as the precursors SO_2, NO_X, VOC, and NH_3 as defined in 40 CFR Parts 50, 51, and 93. More detail concerning any element of the inventory can be found in the appropriate section of the TSD. More detail about the general construction of the inventory can be found in the Inventory Preparation Plan.

Emissions (tons/day)	Sector	$PM_{2.5}$ Filterable	$PM_{2.5}$ Condensable	$PM_{2.5}$ Total	NOx	VOC	NH3	SO2
2017	Area Sources	0.56	0.04	0.6	0.92	3.8	13.48	0.03
	Mobile Sources	–	–	0.23	3.76	2.46	0.1	0.02
	NonRoad Sources	–	–	0.1	0.79	2.19	0	0
	Point Sources	0	0	0	0	0	0	0
	Total			**0.93**	**5.47**	**8.45**	**13.58**	**0.05**
2026	Area Sources	0.60	0.04	0.64	0.7	3.88	13.27	0.03
	Mobile Sources	–	–	0.13	1.52	1.39	0.09	0.01
	NonRoad Sources	–	–	0.06	0.59	1.27	0	0
	Point Sources	0	0	0	0	0	0	0
	Total			**0.83**	**2.81**	**6.54**	**13.36**	**0.04**
2035	Area Sources	0.63	0.04	0.67	0.71	4.29	13.11	0.03
	Mobile Sources	–	–	0.19	1.76	1.91	0.1	0.01
	NonRoad Sources	–	–	0.05	0.57	1.04	0	0
	Point Sources	0	0	0	0	0	0	0
	Total			**0.91**	**3.04**	**7.24**	**13.21**	**0.04**

Table IX.A.28. 8 Emissions Inventories in Tons per Average Episode Day by Year and Source Category

3) Additional Controls for Future Years

Since the emission limitations discussed in subsection IX.A.28.b(3) are federally enforceable and, as demonstrated in IX.A.28.c(1) above, are sufficient to ensure continued attainment of the $PM_{2.5}$ NAAQS, there is no need to require any additional control measures to maintain the $PM_{2.5}$ NAAQS.

4) Mobile Source Budget for Purposes of Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the Clean Air Act (CAA) requires regional transportation plans and programs to show that "…emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan…" EPA's transportation conformity regulation (40 CFR 93, Subpart A, last amended at 77 FR 14979, March 14 2012) also requires that motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be established for any years deemed appropriate (see 40 CFR 93.118((b)(2)(i)).

For an MPO's Regional Transportation Plan, analysis years that are after the last year of the maintenance plan (in this case 2035), a conformity determination must show that emissions are less than or equal to the maintenance plan's motor vehicle emissions budget(s) for the last year of the implementation plan.

a) Mobile Source $PM_{2.5}$ Emissions Budgets

In this maintenance plan, Utah is establishing transportation conformity motor vehicle emission budgets (MVEB) for direct $PM_{2.5}$, NO_X, and VOC for 2035. The MVEBs are established for tons per average winter weekday for NOx, VOC, and direct $PM_{2.5}$ (primary exhaust $PM_{2.5}$ + brake and tire wear).

(i) Direct $PM_{2.5}$, NO_x, and VOC

Direct (or "primary") $PM_{2.5}$ refers to $PM_{2.5}$ that is not formed via atmospheric chemistry. Rather, direct $PM_{2.5}$ is emitted straight from a mobile or stationary source. With regard to the emission budget presented herein, direct $PM_{2.5}$ includes road dust, brake wear, and tire wear as well as $PM_{2.5}$ from exhaust. Through atmospheric chemistry, NO_X and VOC emissions can substantially contribute to secondary $PM_{2.5}$ formation. For this reason, NO_X and VOC are considered $PM_{2.5}$ precursors and are the only $PM_{2.5}$ precursors emitted at a significant level by on-road mobile, and therefore included in the MVEBs.

EPA's conformity regulation (40 CFR 93.124(a)) allows the implementation plan to quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. These additional emissions that can be allocated to the applicable MVEB are considered the "safety margin." As defined in 40 CFR 93.101, the safety margin represents the amount of emissions by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for demonstrating maintenance. The implementation plan can then allocate some or all of this "safety margin" to the applicable MVEBs for transportation conformity purposes.

As presented in the TSD for on-road mobile sources, the estimated on-road mobile source emissions of direct $PM_{2.5}$, NOx, and VOC in 2035 for the Logan NAA, are listed in the first row (original MVEB) in Table IX.A.28.9. These mobile source emissions were included in the maintenance demonstration in Subsection IX.A.28.c.(1) which estimates a maximum $PM_{2.5}$ concentration of 25.9 $\mu g/m^3$ in 2035 within the Logan NAA portion of the modeling domain. These emissions numbers are considered the MVEB for the maintenance plan prior to the application of any amount of safety margin.

The safety margin for the Logan NAA portion of the domain equates to 9.1 $\mu g/m^3$ (the 2006 24-hr $PM_{2.5}$ standard of 35.0 $\mu g/m^3$ minus the initial 2035 FDV of 25.9 $\mu g/m^3$). To evaluate the portion of safety margin that could be allocated to the MVEBs, modeling was re-run for 2035 using the same emission projections for point, area and non-road mobile sources with additional emissions attributed to the on-road mobile source (see 2nd row of Table IX.A.28.9 Additional Tons Per Day from Safety Margin). The revised maintenance demonstration for 2035 still shows maintenance of the $PM_{2.5}$ standard with a maximum $PM_{2.5}$ concentration of 28.2 $\mu g/m^3$ at the Smithfield monitor in 2035 within the Logan NAA portion of the modeling domain. The final 2035 MVEB for WFRC is listed in the last row of Table IX.A.28.9 along with the 2035 design value that includes the revised MVEB.

	Direct $PM_{2.5}$	NO_X	VOC	Design Value @ controlling monitor
Original MVEB	0.1	1.02	1.18	25.9 µg/m^3
Additional Tons Per Day from Safety Margin	0.1	1.0	1.0	--
Final 2035 MVEB	0.2	2.02	2.18	28.2 µg/m^3

Table IX.A.28. 9 2035 Cache Metropolitan Planning Organization Motor Vehicle Emission Budget in Tons per Winter Weekday

It is important to note that the MVEBs presented in Table IX.A.28.9 are somewhat different from the on-road summary emissions inventory presented in Table IX.A.28.8.

Overall the emissions established as MVEBs are calculated using MOVES to reflect an average winter weekday. The totals presented in the summary emissions inventory (Table IX.A.28.8), however, represent an average-episode-day. The episode used to make this average (December 31, 2010 through January 10, 2011) includes seven such winter weekdays, but also includes two weekends. Emissions produced on weekdays are significantly larger than those produced on both Saturdays and Sundays. Therefore, the weighted average of daily emissions calculated for an episode-day will be less than that of a weekday.

There are also some conventions to be considered in the establishment of MVEBs. In particular, $PM_{2.5}$ in the summary emissions inventory totals includes direct exhaust, tire and brake wear, and fugitive dust. For the MVEBs $PM_{2.5}$ includes direct exhaust, tire and brake but no fugitive dust. VOC emissions in the summary emissions inventory include refueling spillage and displacement vapor loss and are counted in the on-road mobile category. MVEBs for VOC do not include these emissions because, in this context, they are regarded as an area source.

40 CFR 93.118((b)(2)(i) also states “If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budget(s) must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan."

Considering this, it is useful to compare the projected future design values in 2026 at all monitors in the NAA to the on-road mobile emission inventory as well as the percent of the total inventory that the on-road mobile sector comprises. As can be seen in Table IX.A.28.7., the design value at Smithfield in the Logan NAA is 28.0 µg/m^3. This value is 7.0 µg/m^3 below the standard. The on-road mobile source contribution to the overall inventory is shown in Table IX.A.28.10

Emissions tons/day	**$PM_{2.5}$**	**NO_X**	**VOC**
2026 emission inventory total	.83	2.81	6.55
2026 on-road mobile inventory	.13	1.52	1.39
On-road mobile % of total inventory	15.66%	54.09%	21.22%

Table IX.A.28. 10 2026 On-Road Mobile Inventory Compared to Total 2026 Emissions Inventory

Although the on-road mobile NO_X contribution is over half of the total NO_X in the inventory, the projected design value is far enough below the standard, UDAQ is confident that there will not be any on-road mobile factors that will cause or contribute to a new violation of the NAAQS.

(ii) Trading Ratios for Transportation Conformity

Per section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2035, a trading mechanism is established to allow future increases in on-road direct $PM_{2.5}$ emissions to be offset by future decreases in plan precursor emissions from on-road mobile sources at appropriate ratios established by the air quality model. Future increases in on-road direct $PM_{2.5}$ emissions may be offset with future decreases in NO_x emissions from on-road mobile sources at a NO_x to $PM_{2.5}$ ratio of 3.4 to 1. This trading mechanism will only be used if needed for conformity analyses for years after 2035. To ensure that the trading mechanism does not impact the ability to meet the NO_x or VOC budgets, the NO_x emission reductions available to supplement the direct $PM_{2.5}$ budget shall only be those remaining after the 2035 NO_x budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis. The assumptions used to create the trading ratios can be found in the TSD.

5) Nonattainment Requirements Applicable Pending Plan Approval

CAA 175A(c) - *Until such plan revision is approved and an area is redesignated as attainment, the requirements of CAA Part D, Plan Requirements for Nonattainment Areas, shall remain in force and effect.* The Act requires the continued implementation of the nonattainment area control strategy unless such measures are shown to be unnecessary for maintenance or are replaced with measures that achieve equivalent reductions. Utah will continue to implement the emissions limitations and measures from the $PM_{2.5}$ SIP.

6) Revise in Eight Years

CAA 175A(b) - Eight years after redesignation, the State must submit an additional plan revision which shows maintenance of the applicable NAAQS for an additional 10 years. Utah commits to submit a revised maintenance plan eight years after EPA takes final action redesignating the Cache/Franklin County area to attainment, as required by the Act.

7) Verification of Continued Maintenance and Monitoring

Implicit in the requirements outlined above is the need for the State to determine whether the area is in fact maintaining the standard it has achieved. There are two complementary ways to measure this: 1) by monitoring the ambient air for $PM_{2.5}$; and 2) by inventorying emissions of $PM_{2.5}$ and its precursors from various sources.

The State will continue to maintain an ambient monitoring network for $PM_{2.5}$ in accordance with 40 CFR Part 58 and the Utah SIP. The State anticipates that the EPA will continue to review the ambient monitoring network for $PM_{2.5}$ each year, and any necessary modifications to the network will be implemented.

Additionally, the State will track and document measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) and new and modified stationary source permits. If these and the resulting emissions change significantly over time, the State will perform appropriate studies to determine: 1) whether additional and/or re-sited monitors are necessary; and 2) whether mobile and stationary source emission projections are on target. The State will also continue to collect actual emissions inventory data from sources at thresholds defined in R307-150.

8) Contingency Plan

CAA 175A(d) - Each maintenance plan shall contain contingency measures to assure that the State will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment. Such provisions shall include a requirement that the State will implement all control measures which were contained in the SIP prior to redesignation.

Upon redesignation, this contingency plan for the Logan NAA supersedes Subsection IX.A.23.9, Contingency Measures, which is part of the moderate Logan NAA $PM_{2.5}$ attainment SIP.

The contingency plan must also ensure that the contingency measures are adopted expeditiously once triggered. The primary elements of the contingency plan are: 1) the list of potential contingency measures; 2) the tracking and triggering mechanisms to determine when contingency measures are needed; and 3) a description of the process for recommending and implementing the contingency measures.

(a) List of Potential Contingency Measures

Section 175(d) of the CAA requires the maintenance plan to include as potential contingency measures all of the $PM_{2.5}$ control measures contained in the attainment SIP that were relaxed or modified prior to redesignation. For the Logan NAA, this includes number one in the list below, followed by other potential contingency measures. If it is determined through the triggering mechanism that additional emissions reductions are necessary, UDAQ will adopt and implement appropriate contingency measure as expeditiously as possible.

1. Reinstate two speed idle (TSI) portion of the Cache County inspection and maintenance program (see section IX.A.28.c.(9) for explanation of 110(l) demonstration.
2. Measures to address emissions from residential wood combustion (i.e. emissions from fireplaces under the existing R307-302 rule), including re-evaluating the thresholds at which red or yellow burn days are triggered. Residential wood combustion represents a large emissions inventory source category at 52.9% of direct $PM_{2.5}$ emissions in 2017.
3. Measures to address fugitive dust from area sources. Fugitive dust represents a large emissions inventory source category at 21.1% of direct $PM_{2.5}$ emissions in 2017.
4. Additional measures to address other $PM_{2.5}$ sources identified in the emissions inventory such as on-road vehicles, and non-road vehicles and engines. These source categories represent 23.1%, 10.8%, respectively, of the overall 2017 baseyear emissions inventory.

In addition, UDAQ administers incentive and grant programs that reduce emissions in Utah's NAAs. The emissions reductions are not included in the quantitative maintenance demonstration; however, they are expected to contribute to the mitigation of $PM_{2.5}$ concentrations. Generally speaking, the

programs target Utah nonattainment areas. The programs include approximately $25.5 million from the Volkswagen settlement and approximately $12.7 million to replace heavy-duty diesel trucks and buses that are operating under old emissions standards. Nonroad diesel upgrades will see approximately $1.3 million on the Wasatch Front. Another $3.8 million of the Volkswagen funding will go towards installing electric vehicle supply equipment in Utah. UDAQ is in the process of using approximately $9.6 million in federal funding to implement wood stove changeout programs throughout the three Utah $PM_{2.5}$ NAAs.

(b) Tracking

The tracking plan for the three NAAs consists of monitoring and analyzing ambient $PM_{2.5}$ concentrations. In accordance with 40 CFR 58, the State will continue to operate and maintain an adequate $PM_{2.5}$ monitoring network in SLC, Provo, and Logan NAAs.

(c) Triggering

Triggering of the contingency plan does not automatically require a revision to the SIP, nor does it mean the that the area will automatically be redesignated once again to nonattainment. Instead, the State will have an appropriate timeframe to correct the potential violation with implementation of one or more adopted contingency measures. In the event that violations continue to occur, additional contingency measures will be adopted until the violations are corrected.

Upon notification of a potential violation of the $PM_{2.5}$ NAAQS, the State will develop appropriate contingency measures intended to prevent or correct a violation of the $PM_{2.5}$ standard. Information about historical exceedances of the standard, the meteorological conditions related to the recent exceedances, and the most recent estimates of growth and emissions will be reviewed. The possibility that an exceptional event occurred will also be evaluated.

Upon monitoring a potential violation of the $PM_{2.5}$ NAAQS, including exceedances flagged as exceptional events but not concurred with by EPA, the State will identify a means of corrective action within six months after a potential violation. The maintenance plan contingency measures will be chosen based on a consideration of cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the State deems appropriate.

The State will require implementation of such corrective action no later than one year after the violation is confirmed. Any contingency measures adopted and implemented will become part of the next revised maintenance plan submitted to the EPA for approval.

9) CAA Section 110(l) Analysis

CAA Section 110(l) allows for revisions to a SIP as long as it does not interfere with any applicable requirement concerning attainment and reasonable further progress. This maintenance plan includes a 110(l) demonstration that addresses the removal of the Inspection and Maintenance (I/M) Program Two Speed Idle (TSI) biennial testing procedure for Cache County, UT. Only the TSI portion will be removed in 2021 and the demonstration shows that there will be minimal impact on the overall on-road mobile source inventory within the Logan NAA. The 110(l) demonstration also shows non-interference for other

NAAQS being monitored in Cache County, Utah. See the full 110(l) demonstration in Appendix A for a more comprehensive discussion on other NAAQS.

Cache County officials and the Bear River Health Department successfully approved and implemented an I/M program on January 1, 2014. The I/M program is comprised of a decentralized test and repair network and requires a biennial test for all light duty gasoline vehicles 1969 and newer. Vehicles that are older than Model Year 1996 undergo TSI testing procedures while vehicles newer than Model Year 1996 are required to undergo On Board Diagnostic (OBD) testing procedures. The details of the program can be found in Section X, Part F, of the Utah SIP. The EPA approved the Cache County I/M program as an additional reasonable control measure for the moderate SIP.

In 2019, the Cache County Council adopted a county ordinance that discontinues only the TSI portion of the I/M program with an effective date of January 1, 2021. The TSI-tested vehicles comprise approximately 5% of the vehicles tested through the I/M program, and that percentage decreases each year as older vehicles requiring TSI are no longer operational. The estimated disbenefit of removing the TSI portion of the I/M program is detailed in Table IX.A.28.11 with numbers calculated use the EPA MOVES model.

On-Road Mobile	Vehicles tested	NO_X TPD	VOC TPD	NO_X+VOC TPD
		2021		
OBD+TSI	30,224	2.51	1.85	4.36
TSI	1,899	- .025	- .029	- .05
% change	6.2%	.98%	1.55%	2.53%
		2025		
OBD+TSI	32,298	1.78	1.53	3.31
TSI	1,341	- .013	- .023	- .036
% change	4.1%	.74%	1.53%	2.27%

Table IX.A.28. 11 TSI Removal Disbenefit of On-Road Emissions

	NO_X	VOC	NO_X+VOC TPD
2026 Total Inventory Emissions (tpd)	2.81	6.55	9.36
2025 TSI Emission Reduction (tpd)	0.013	0.023	.036
2026 TSI % of Total Emissions	0.46%	0.35%	.38%

Table IX.A.28. 12 TSI Removal Disbenefit of Total Emissions Inventory

The MOVES model only accepts vehicle inputs for 30 model years. Therefore, by 2026, the TSI program emissions reduction can no longer be quantified because TSI is performed on vehicles 1996 and older. Since MOVES modelling cannot determine the TSI disbenefit in 2026, Table IX.A.28.12 compares the 2025 TSI removal emission additions to the 2026 total inventory emission numbers. When compared to the overall inventory, the emissions addition resulting from TSI removal are minimal at less than half a percent and will not interfere with attainment of any NAAQS or other applicable requirements under the CAA. For the full 110(l) demonstration, see Appendix A.

Appendix A

TECHNICAL SUPPORT DOCUMENT

FOR A CAA 110(l) DEMONSTRATION

FOR THE LOGAN, UT-ID $PM_{2.5}$ NONATTAINMENT AREA

Utah Division of Air Quality

Planning Branch/Mobile Sources

Abstract

This report discusses the CAA section 110(l) demonstration regarding the emissions impact of removing the Inspection and Maintenance Program Two Speed Idle (TSI) testing procedure for Cache County in 2021. This report includes the on-road mobile inventory impacts for the Logan, UT-ID $PM_{2.5}$ nonattainment area. This assessment will cover the service life of the TSI program from 2021-2026.

On-road inventories were calculated using the EPA MOVES2014b (Motor Vehicle Emission Simulator) and were developed by the following agencies:

Cache Metropolitan Planning Organization (CMPO): Cache County

Utah Division of Air Quality (UDAQ)

Summary on-road emissions table inventories for a representative winter weekday are located at the end of the TSD for the following years: 2021-2026.

ii. Overview

The State of Utah submitted a State Implementation Plan (SIP) for the EPA designated 24-hour $PM_{2.5}$ Logan, Utah UT-ID nonattainment area in December of 2014. EPA approved the Cache County Inspection and Maintenance program (implemented by the Bear River Health Department) on September 9, 2015 (80 FR 54237), and it was included as an additional reasonable control measure in the SIP on November 23, 2018 (83 FR 59315). Pursuant to Utah Code Annotated 41-6a-1642(1), Cache County officials successfully implemented an I/M program on January 1, 2014. Cache County's I/M program is comprised of a decentralized test and repair network and requires a biennial test for all light duty gasoline vehicles 1969 and newer. Vehicles that are older than Model Year 1995 undergo Two Speed Idle (TSI) testing procedures while vehicles newer than Model Year 1996 are required to undergo On Board Diagnostic (OBD) testing procedures. The program exempts vehicles less than six years old from an emission inspection. The details of the program can be found in Section X, Part F, of the Utah SIP.

In December 2018 the Bear River Health Department proposed amending the Vehicle Emissions and Maintenance program. The proposal made to the Cache County Council was to discontinue the TSI program due to a diminishing fleet of older light duty gasoline vehicles participating within the program combined with increasing cost of maintaining TSI testing equipment. The Cache County Council passed the proposal to discontinue the TSI program with an effective date of January 1, 2021. The Utah Division of Air Quality, EPA Region 8, and the Bear River Health Department have been coordinating to ensure that the proposed I/M program changes do not interfere with State and Federal air quality regulations.

Section 110(l) of the Clean Air Act (CAA) allows for revisions to a SIP so long as it does not interfere with any applicable requirement concerning attainment and reasonable further progress or any other applicable requirement of this chapter of the CAA. This 110(l) demonstration addresses the removal of the I/M Program TSI biennial testing procedure for Cache County in 2021 and shows that there will be minimal impact on the overall on-road mobile source inventory within the Logan, UT-ID $PM_{2.5}$ nonattainment area (NAA) from 2021-2026 and demonstrates non-interference for other National Ambient Air Quality Standards (NAAQS) being monitored in Cache County, Utah.

The removal of the TSI program will not interfere with the ability of the Logan, UT-ID NAA to continue to attain the EPA 24 hour $PM_{2.5}$ national ambient air quality standard despite a very small increase in emissions. This document explains the emissions modeling assumptions used to develop the on-road mobile emissions estimates for the 110(l) demonstration. The modeling portion of the demonstration will cover the EPA MOVES model service life emissions credit for the TSI program for the years 2021-2026. The TSI testing program covers light duty gasoline

vehicles that are older than Model Year 1995 and was established as a control strategy in the Logan, UT-ID $PM_{2.5}$ Nonattainment SIP (December 3, 2014).

The analysis simply looks at the emissions credit assigned to the overall I/M program, including OBD and TSI within Cache County within the 2021-2026 period and compares it to the emissions credit without the TSI program (OBD only). Emission estimates are based on meteorological conditions that occurred during three $PM_{2.5}$ episodes: 2011 January 1-12, 2013 December 7-19, and 2016 February 1-17. Inventory estimations were created at the county level representing an average January weekday.

Emission estimates are confined to the EPA approved MOVES2014b (May 2017) emissions model. This model produces emissions estimates for on-road vehicles by providing emissions profiles for exhaust, evaporative, and wear conditions. Inputs include speeds, vehicle fuel profiles and specifications, vehicle miles traveled (VMT), I/M program profiles, VMT mix, vehicle age distributions, and meteorological conditions. Specific MOVES input parameters and outputs can be found in the Cache IM Program 110(l).xlsx workbook and specific MOVES modeling inputs can be furnished upon request.

Additional analysis was also performed comparing the $PM_{2.5}$ SIP I/M 2015 program credit that the EPA approved for Cache County to the new proposed I/M program for 2021. Ambient air quality monitoring data from the Smithfield, Cache County site also demonstrates non-interference with the NAAQS when looking at the small increase in emissions due to the removal of the TSI program. Cache County, Utah is currently attaining the six NAAQS.

iii. MOVES Modeling Procedure

The discussion below identifies the procedures followed to model the episodic inventories. The following agencies developed on-road mobile source emissions inventories:

CMPO: Cache Metropolitan Planning Organization

Utah Division of Air Quality

1. MOVES Default Database Enhancement for Local Roads

   The local road enhancement allows the EPA MOVES2014b model to produce emissions results according to the Highway Performance Monitoring System (HPMS) utilized by the Federal Highway Administration, Utah Department of Transportation, Cache Metropolitan Planning Organization (CMPO), and the Utah Division of Air Quality (UDAQ). Arterial and local roads have very different travel characteristics. This simplified approach allows each road type to have specific VMT, speed and vehicle distribution by road type (vehicle mix) inputs. Modeling specific road types creates an

inventory approach that matches the HPMS road types that are reported within local transportation plans.

Modifications to Local Road Tables

Table Names	Data Columns	Description of Changes
avgspeeddistribution	roadTypeID	Road types rural local(32) and urban local(52) added.
drivescheduleassoc	avgSpeedBinID	
hourvmtfraction	driveScheduleID	
roadtype	hourVMTFraction	
roadtypedist	roadDesc	
zoneroadtype	roadTypeVMTFraction	

2. MOVES2014 Daily Pollutants

Pollutants selected for analysis:

- Ammonia (NH3)
- Oxides of Nitrogen (NOx)
- $PM_{2.5}$ & PM_{10} (Primary Exhaust, Brake, & Tire)
- Sulfur Dioxide (SO2)
- Volatile Organic Compounds (VOC)

3. MOVES2014b Local Model Inputs

County Data Manager Development

MOVES organizes data inputs into databases called County Data Manager (CDM) tables. CDMs were developed for all of the Logan, UT-ID $PM_{2.5}$ NAA for: 2021-2026, for an average weekday in January.

(1) Average Speed Distribution and VMT

Cache MPO obtained average speed distributions from its 2019 Travel Demand Model. The TDM analyzes thousands of separate traffic segments called "links" that together comprise the network of roads in Cache County. Each link is assigned, for each of the four major time periods during the day (AM peak, midday, PM peak and nighttime), an average speed, an increment of VMT and an increment of VHT (vehicle hours traveled). A specific number of links are assigned to each of the UDOT HPMS functional classes (road types, e.g., rural local, urban local, rural minor arterial, urban minor arterial, and so on). In effect, average speeds, VMT and VHT for each of the functional classes are combined to obtain average speed, VMT and VHT for rural arterials, urban arterials, rural local roads and urban local roads. (There are no interstates in Cache County).

(2) AVFT (Diesel, Gasoline, Electric Fractions)

MOVES AVFT (alternative vehicle and fuel technology) was updated with 2017 State DMV registration data on fuel type for registered light duty vehicles (passenger cars and light duty trucks). The fuel type data provided covers gasoline, diesel, flex, and electric light duty vehicles. The DMV fractions were specifically applied to all model years for passenger car and light duty trucks. (MOVES source types 21,31,32) MOVES2014a default AVFT values were used for all remaining source type vehicles (MOVES sourcetypes 40-60).

(3) Fuel & HourVMTFraction

MOVES 2014a default fuel and hour VMT fraction parameters were used.

(4) HPMSvTypeYear (VMT)

Cache MPO VMT was constructed from its 2019 Travel Demand Model. UDOT Division of Systems Planning and Programming provided 2017 VMT travel fractions for FHWA vehicle classes grouped by Gross Vehicle Weight Rating (GVWR) ranges. The travel fractions were obtained by county from automated pneumatic counters that detect axle spacing and "weigh-in motion" (WIM) counters placed on arterial, interstate, and local roads. UDOT also provided average VMT daily adjustment factors (2016) to provide winter month and daily activity detail. The VMT daily adjustment factors allow for the modeling of an average weekday, Saturday, and Sunday in January.

(5) I/M Coverage

UDAQ constructed I/M Program coverages in consultation with the Bear River Health Department in Cache County. The Cache County I/M program exempts the first six model years and performs a biennial test on light duty gasoline vehicles beginning in the seventh model year. Vehicles older than 1995 undergo a TSI test and vehicles newer than 1996 undergo OBD. The EPA MOVES model service life emissions credit for the TSI program is essentially removed in 2026. The compliance rate was calculated utilizing EPA I/M reports and incorporated the waiver rate, total OBD and TSI failures, and regulatory class coverage. This work is shown in the Cache IM Program 110(l).xlsx workbook.

(6) Road Type Distribution

UDOT Division of Systems Planning and Programming provided 2017 VMT travel fractions for FHWA vehicle classes grouped by GVWR ranges. The travel fractions were obtained by county from automated pneumatic counters that detect axle spacing and WIM counters placed on arterial, interstate, and local roads. CMPO TDM 2019 VMT and Vehicle Mix data were used to construct road type distribution and VMT by sourcetype.

(7) Source Type Age Distribution

Utah Department of Motor Vehicle (DMV) provided a single age distribution for passenger cars (21) and light trucks (31,32) for 2017. The age distribution was held constant for all years modeled. MOVES2014b default age distribution values were used for all remaining source type vehicles.

(8) Source Type Year (Vehicle Population)

CMPO utilized Utah DMV 2017 registration data for Model Years 2017-1969 for motor cycles, passenger cars, and light duty trucks up to 10,000 GVWR. The MOVES default vehicle fraction for these vehicles was used to determine the difference between cars and trucks since the DMV data could not discern between a passenger car and light duty truck. MOVES 2014a default vehicle populations were used for heavy duty vehicles. The VMT growth rate from the CMPO travel demand model was used to estimate future population growth.

(10) ZoneMonthHour (Meteorological Data)

The UDAQ Technical Analysis Section provided metrological conditions from Meso West University of Utah from three $PM_{2.5}$ episodes: 2011 January 1-12, 2013 December 7-19, and 2016 February 1-17. The UDAQ modeling section provided hourly temperature and relative humidity profiles from representative weather stations in Cache County. The meteorology data represents the hour by hour average for all of the days in the 2011 January 1-12, 2013 December 7-19, and 2016 February 1-17 $PM_{2.5}$ episodes. The average of all the hourly temperatures and relative humidity readings over the three episodes for each representative weather station was used to reflect the atmospheric conditions that represent the $PM_{2.5}$ season.

iv. Emissions Trend Estimates

The Logan, UT-ID $PM_{2.5}$ Nonatttaiment SIP (December 3, 2014) established the TSI testing biennial emissions control strategy that covers light duty gasoline vehicles that are older than Model Year 1995. The purpose of this 110(l) demonstration is to show the amount of emissions credit being lost by the removal of the TSI testing program in the Logan, UT-ID NAA in 2021. Specifically, the demonstration shows the small amount of emissions credit being lost will not interfere with the ability of the NAA to continue to attain the EPA 24 hour $PM_{2.5}$ standard from 2021-2026.

The MOVES model service life credit for the TSI program will essentially phased out completely by the year 2026. The MOVES model only accepts vehicle inputs covering 30 model years. In 2026 the model year coverage is 2026-1996. This modeling concept does not allow for the input of vehicles that are model year 1995 and older to be modeled in the year 2026. The emissions trends in Table 1 on page 12 shows the fading impact of the TSI program in terms of reduced vehicles being tested and the result of diminishing emissions credit through the 2021-2025 testing period.

MOVES 2014b vehicle input estimates regarding the removal of the TSI emissions program for the years 2021-2026 for the Logan, UT-ID $PM_{2.5}$ NAA shows that the number of pre-1996 biennial TSI vehicles being tested over time is declining. Meanwhile, the number of vehicles undergoing biennial OBD testing program is growing (1996 and newer). In the year 2021, it is estimated that the amount of pre-1996 TSI vehicles are estimated to be 1,899 vehicles. In 2025, the number of pre-1996 TSI vehicles is trending downward toward 1,341 vehicles. This is a result of the pre-1996 TSI vehicles getting older and leaving the fleet. Meanwhile in the same period the number of vehicles that are 1996 and newer undergoing OBD is increasing. In the year 2021 it is estimated that the number of 1996 and newer vehicles will be 28,325. In 2025, that number is trending upward 30,958 vehicles being tested. The vehicle population of pre-1996 TSI vehicles TSI is declining as older vehicles are being scrapped, while the 1996 OBD vehicle population is growing as brand new vehicles are being purchased.

The MOVES 2014b emissions estimates for the TSI program shows that the emissions credit from pre-1996 vehicles TSI is declining over a period of time as the overall vehicle population of pre-1996 TSI vehicles declines. In 2021, the removal of the TSI program is projected to increase emissions by an estimated .053 tons per day of NOx and VOC emissions combined, an increase of 2.53%. This is equivalent to increasing emissions by 107 pounds per day. In 2025 the removal of the TSI program is projected to increase emissions by an estimated .036 tons per day of NOx and VOC combined, an increase of 2.27%. This is equivalent to increasing emissions by 73 pounds per day. In 2026 the TSI emissions credit is essentially phased out of the EPA MOVES emission model. (Please note that MOVES emissions model only provides TSI emissions credits for Oxides of Nitrogen (NOx) and Volatile Organic Compounds (VOC).

Additional analysis was performed comparing the original 2015 SIP I/M program credit to the new proposed I/M program for 2021. The original SIP I/M program (OBD+TSI) was estimated

to reduce emissions by .426 tons per day of NOx and VOC combined in 2015. In 2021, the removal of the TSI program is projected to increase emission by an estimated .053 tons per day of NOx and VOC emissions combined. This is equivalent to increasing emissions by 107 pounds per day. Using the emissions increase from the removal of the TSI program the original 2015 I/M program would have seen an estimated increase in NOx emissions by 11% and VOC by 13%, or a combined 12% increase. This analytical approach is conservative and does not take into account the shrinking vehicle population and emissions of pre 1996 vehicles, increase vehicle population and emissions of 2017 newer model year vehicles that meet Federal Tier 3 emissions standards, and VMT growth. The conservative analysis does indicate that the previous MOVES modeling demonstration showing a 2.53% increase in emissions in 2021 is within a reasonable range.

	Cache Attainment SIP I/M Emissions Credit for 2015 OBD + TSI			TSI I/M Credit to be removed for 2021			Cache Attainment SIP I/M Emissions Credit for 2015 OBD			Lost TSI Credit % for 2015		
	NOX	VOC	NOx +VOC	NOx	VOC	NOx +VOC	NOx	VOC	NOx +VOC	NOx	VOC	NOx +VOC
Tons Per Day	0.214	0.2	0.426	0.025	0.029	0.053	0.189	0.183	0.372			
										-11.45%	-13.44%	-12.44%
LBS Per Day	428	424	852	49	57	107	379	367	746			

The design values at the monitor in Smithfield, Cache County are in compliance with the following NAAQS and indicate that a 2.5% increase in NOx and VOC emissions combined will not interfere with Cache County, Utah being able to attain the NAAQS.

Smithfield NAAQS Design Value						
Parameter	**2016**	**2017**	**2018**	**Design Value (3 yr. Average)**	**Standard**	**Unit**
Ozone	0.062	0.063	0.069	0.064	0.07	ppm
PM 2.5 98 %tile	34	36	27.9	33	35	µg/m3
PM 2.5 Annual Mean	7.6	7.9	7.3	7.6	12	µg/m3
PM 10	0	0	0	0	1	Est. Exceedances
NO2	37	37	30	35	100	ppb

The table below shows the most current air quality standards for the six criteria air pollutants and Cache County's designation status with respect to each standard.

Current National Ambient Air Quality Standards and Designation Status For Cache County, UT				
Pollutant	**Primary/ Secondary NAAQS**	**Averaging Time**	**Level**	**Designation Status**
CO	Primary	8-hour	9 ppm	Attainment
		1-hour	35 ppm	Attainment
Lead	Primary and Secondary	Rolling 3 month average	0.15 µg/m^3	Attainment
NO_2	Primary	1-hour	100 ppb	Attainment
	Primary and Secondary	Annual	53 ppb	Attainment
Ozone	Primary and Secondary	8-hour	0.070 ppm	Attainment
$PM_{2.5}$	Primary	Annual	12 µg/m^3	Attainment
	Secondary		15 µg/m^3	Attainment
	Primary and Secondary	24-hour	35 µg/m^3	Nonattainment
PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Attainment
SO2	Primary	1-hour	75 ppb	Attainment
	Secondary	3-hour	0.5 ppm	Attainment

Although Logan, UT-ID is currently designated as a nonattainment area for the 24-hr $PM_{2.5}$ NAAQS, on October 19, 2018 (83 FR 52983), the EPA published a final determination that based on the validated data from 2015-2017, the Logan, UT-ID nonattainment area attained the 2006 primary and secondary 24-hr PM2.5 NAAQS by the December 31, 2017 attainment date. Utah will submit a redesignation request to EPA in 2019.

The CAA 110(l) demonstration regarding the removal of the I/M TSI for Cache County, Utah in 2021 finds that there will be minimal impact on the overall on-road mobile source inventory within the Logan, UT-ID $PM_{2.5}$ NAA from 2021-2026. The TSI test program covers light duty gasoline vehicles that are older than Model Year 1995. The MOVES 2014b vehicle population and emissions estimates clearly indicate a shrinking vehicle population and emissions from pre-

1996 TSI light duty gasoline vehicles. The increase in emissions from the MOVES analysis indicated a 2.5% increase of NOx and VOC combined.

Table 1. Cache County On-Road Mobile Source Emissions for Average Winter Weekday (Tons Per Day)

Cache County On-Road Mobile Source Emissions for Average Winter Weekday (Tons Per Day) DMV																	
Year	I/M Test Type	NH3	NOx TPD	PM10	PM25	SO2	VOC TPD	VOC_Refuel	VMT	Vehicles Tested	NOx TPD Shortfall	NOx TPD % Change	VOC TPD Shortfall	VOC TPD % Change	NOx + VOC TPD (Total) Shortfall	NOx + VOC LBS (Total) Shortfall	NOx + VOC TPD % Change
2021	OBD + TSI	0.10	2.51	0.43	0.17	0.01	1.85	0.08	3,312,467	30,224							
	OBD	0.10	2.54	0.43	0.17	0.01	1.88	0.08	3,312,467	28,325							
	(-)TSI		-0.02	0.00	0.00	0.00	-0.03	0.00		1,899	-0.025	-0.98%	-0.029	-1.55%	-0.053	-107	-2.53%
2022	OBD + TSI	0.10	2.29	0.42	0.16	0.01	1.75	0.08	3,373,213	30,730							
	OBD	0.10	2.31	0.42	0.16	0.01	1.77	0.08	3,373,213	29,181							
	(-)TSI		-0.02	0.00	0.00	0.00	-0.02	0.00		1,549	-0.021	-0.93%	-0.025	-1.41%	-0.046	-92	-2.34%
2023	OBD + TSI	0.10	2.09	0.42	0.15	0.01	1.65	0.07	3,433,958	31,244							
	OBD	0.10	2.11	0.42	0.15	0.01	1.67	0.07	3,433,958	29,671							
	(-)TSI		-0.02	0.00	0.00	0.00	-0.02	0.00		1,573	-0.018	-0.87%	-0.021	-1.25%	-0.039	-78	-2.12%
2024	OBD + TSI	0.10	1.91	0.41	0.14	0.01	1.59	0.07	3,494,700	31,767							
	OBD	0.10	1.92	0.41	0.14	0.01	1.62	0.07	3,494,700	30,447							
	(-)TSI		-0.01	0.00	0.00	0.00	-0.03	0.00		1,320	-0.015	-0.77%	-0.026	-1.64%	-0.041	-81	-2.40%

2025	OBD + TSI	0.10	1.78	0.41	0.13	0.01	1.53	0.07	3,568,339	32,298							
	OBD	0.10	1.79	0.41	0.13	0.01	1.55	0.07	3,568,339	30,958							
	(-)TSI		-0.01	0.00	0.00	0.00	-0.02	0.00		1,341	-0.013	-0.74%	-0.023	-1.53%	-0.036	-73	-2.27%

2026	OBD	0.10	1.61	0.41	0.13	0.01	1.42	0.07	3,641,979	32,865							

v. Appendix: Inventories For 110(l) Demonstration

Input files will be furnished upon request:

vi. References

The following documents were used as references in creating the 110(l) demonstration:

1. U.S. Environmental Protection Agency, Office of Transportation and Air Quality (OTAQ), Assessment and Standards Division, "MOVES2014a User Guide", EPA-420-B-095, November 2015, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNCY.txt

2. U.S. Environmental Protection Agency, OTAQ, Transportation and Regional Programs Division, "MOVES2014 and 2014a Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity", EPA-420-B-15-093),

https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NN9L.txt , November 2015.

4. I/M Programs Bear River Health Department, 655 East 1300 North. Logan, UT 84341, 801-792-6500

5. MESOWEST UTAH, (met data archive), University of Utah, Department of Atmospheric Sciences, http://mesowest.utah.edu/.

6. US EPA Design Value Report May 6, 2019

ITEM 10

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-083-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Liam Thrailkill, Environmental Planning Consultant

DATE: August 20, 2019

SUBJECT: PROPOSE FOR PUBLIC COMMENT: Amend R307-110-10. Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter.

The amendments to Section IX, Control Measures for Area and Point Sources, Part A, for Fine Particulate Matter will have to be incorporated into the Utah Air Quality Rules. R307-110-10 is the rule that incorporates the new amendments to Part A into the rules. If the Board adopts the amendments proposed to Part A, these amendments will become part of Utah's State Implementation Plan (SIP). This proposal incorporates the latest amendments to the SIP into the Utah Administrative Code.

Recommendation: Staff recommends the Board propose R307-110-10 for public comment.

Appendix 1: Regulatory Impact Summary Table

Fiscal Costs	**FY 2020**	**FY 2021**	**FY 2022**
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Person	$0	$0	$0
Total Fiscal Costs:	**$0**	**$0**	**$0**
Fiscal Benefits			
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Persons	$0	$0	$0
Total Fiscal Benefits:	**$0**	**$0**	**$0**
Net Fiscal Benefits:	**$0**	**$0**	**$0**

***This table only includes fiscal impacts that could be measured. If there are inestimable fiscal impacts, they will not be included in this table. Inestimable impacts for State Government, Local Government, Small Businesses and Other Persons are described in the narrative. Inestimable impacts for Non-Small Businesses are described in Appendix 2.**

Appendix 2: Regulatory Impact to Non-Small Businesses

This rule change is not expected to have any fiscal impacts on non-small businesses revenues or expenditures, because the plan being incorporated into the rule shows how existing regulations will lead to the attainment of the PM2.5 air quality standard.

The Interim Executive Director of the Department of Environmental Quality, Scott Baird, has reviewed and approved this fiscal analysis.

****"Non-small business" means a business employing 50 or more persons; "small business" means a business employing fewer than 50 persons.**

R307. Environmental Quality, Air Quality.
R307-110. General Requirements: State Implementation Plan.
...

R307-110-10. Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter.

The Utah State Implementation Plan, Section IX, Control Measures for Area and Point Sources, Part A, Fine Particulate Matter, as most

recently amended by the Utah Air Quality Board on [~~January 2~~]December 4, 2019, pursuant to Section 19-2-104, is hereby incorporated by reference and made a part of these rules.

KEY: air pollution, PM10, PM2.5, ozone
Date of Enactment or Last Substantive Amendment: 2019
Notice of Continuation: January 27, 2017
Authorizing, and Implemented or Interpreted Law: 19-2-104

ITEM 11

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-087-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Jay Baker, Environmental Scientist

DATE: August 20, 2019

SUBJECT: PROPOSE FOR PUBLIC COMMENT: Amend SIP Section IX.H.21(e). General Requirements: Control Measures for Area and Point Sources, Emission Limits and Operating Practices, Regional Haze Requirements.

In July 2016, the EPA approved the Regional Haze State Implementation Plan (SIP) section addressing best available retrofit technology (BART) for particulate matter (PM). EPA conditionally approved the recordkeeping requirements for the PM_{10} emission limits specifically described in Section IX, Part H.21(e) of the SIP. The purpose of this SIP revision is to meet the commitment that the State made to address this portion of the SIP.

This SIP revision addresses the reporting requirements for Hunter and Huntington Power plants. Under the current language, they are only required to report exceedances of PM_{10} emissions limits if those exceedances are due to a breakdown. The revised language requires them to report any exceedances of permitted PM_{10} limits, regardless of the cause.

Recommendation: Staff recommends that the Board propose revisions to SIP Section IX, Part H.21(e) for public comment.

Utah State Implementation Plan

Emission Limits and Operating Practices

Section IX, Part H

Adopted by the Air Quality Board [Insert Date]

H.21. General Requirements: Control Measures for Area and Point Sources, Emission Limits and Operating Practices, Regional Haze Requirements

a. Except as otherwise outlined in individual conditions of this Subsection IX.H.21 listed below, the terms and conditions of this Subsection IX.H.21 shall apply to all sources subsequently addressed in Subsection IX.H.22. Should any inconsistencies exist between these two subsections, the source specific conditions listed in IX.H.22 shall take precedence.

b. The definitions contained in R307-101-2, Definitions and R307-170-4, Definitions, apply to Section IX, Part H. In addition, the following definition also applies to Section IX, Part H.21 and 22:

Boiler operating day means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the boiler. It is not necessary for fuel to be combusted for the entire 24-hour period.

c. The terms and conditions of R307-107-1 and R307-107-2 shall apply to all sources subsequently addressed in Subsection IX.H.22.

d. Any information used to determine compliance shall be recorded for all periods when the source is in operation, and such records shall be kept for a minimum of five years. All records required by IX.H.21.c shall be kept for a minimum of five years. Any or all of these records shall be made available to the Director upon request.

e. All emission limitations listed in Subsections IX.H.22 shall apply at all times, unless otherwise specified in the source specific conditions listed in IX.H.22. Each source shall submit a report of any deviation from the applicable requirements of Subsection IX.H, including those attributable to upset conditions, the probable cause of such deviations, and any corrective actions or preventive measures taken. The report shall be submitted in accordance with the requirements of R307-170, Continuous Emission Monitoring Program. Deviations due to breakdowns shall be reported according to the breakdown provisions of R307-107.

f. Stack Testing:

i. As applicable, stack testing to show compliance with the emission limitations for the sources in Subsection IX.H.22 shall be performed in accordance with the following:

A. Sample Location: The testing point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or the most recent version of the EPA-approved test method if approved by the Director.

B. Volumetric Flow Rate: 40 CFR 60, Appendix A, Method 2, or the most recent version of the EPA-approved test method if approved by the Director.

C. Particulate (PM): 40 CFR 60, Appendix A, Method 5B, or the most recent version of the EPA-approved test method if approved by the Director. A test shall consist of

three runs, with each run at least 120 minutes in duration and each run collecting a minimum sample of 60 dry standard cubic feet. The back half condensables shall also be tested using Method 202. The back half condensables shall not be used for compliance demonstration but shall be used for inventory purposes.

D. Calculations: To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors to give the results in the specified units of the emission limitation.

E. A stack test protocol shall be provided at least 30 days prior to the test. A pretest conference shall be held if directed by the Director.

g. Continuous Emission and Opacity Monitoring.

i. For all continuous monitoring devices, the following shall apply:

A. Except for system breakdown, repairs, calibration checks, and zero and span adjustments required under paragraph (d) 40 CFR 60.13, the owner/operator of an affected source shall continuously operate all required continuous monitoring systems and shall meet minimum frequency of operation requirements as outlined in R307-170 and 40 CFR 60.13.

B. The monitoring system shall comply with all applicable sections of R307-170; 40 CFR 13; and 40 CFR 60, Appendix B – Performance Specifications.

C. For any hour in which fuel is combusted in the unit, the owner/operator of each unit shall calculate the hourly average NOx concentration in lb/MMBtu.

D. At the end of each boiler operating day, the owner/operator shall calculate and record a new 30-day rolling average emission rate in lb/MMBtu from the arithmetic average of all valid hourly emission rates from the CEMS for the current boiler operating day and the previous 29 successive boiler operating days.

E. An hourly average NOx emission rate in lb/MMBtu is valid only if the minimum number of data points, as specified in R307-170, is acquired by the owner/operator for both the pollutant concentration monitor (NOx) and the diluent monitor (O2 or CO2).

ITEM 12

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-088-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Liam Thrailkill, Environmental Planning Consultant

DATE: August 20, 2019

SUBJECT: PROPOSE FOR PUBLIC COMMENT: Amend R307-110-17. Section IX, Control Measures for Area and Point Sources, Part H, Emission Limits.

Amendments to Section IX, Control Measures for Area and Point Sources, Part H, Emission Limits must be incorporated into the Utah Air Quality Rules. R307-110-17 is the rule that incorporates Part H into the rules. If the Board adopts the amendments proposed to Part H, those amendments will become part of Utah's State Implementation Plan (SIP), and this proposal incorporates the latest amendments to the SIP into the Utah Administrative Code.

Recommendation: Staff recommends the Board propose R307-110-17 for public comment.

Appendix 1: Regulatory Impact Summary Table

Fiscal Costs	**FY 2020**	**FY 2021**	**FY 2022**
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Person	$0	$0	$0
Total Fiscal Costs:	**$0**	**$0**	**$0**
Fiscal Benefits			
State Government	$0	$0	$0
Local Government	$0	$0	$0
Small Businesses	$0	$0	$0
Non-Small Businesses	$0	$0	$0
Other Persons	$0	$0	$0
Total Fiscal Benefits:	**$0**	**$0**	**$0**
Net Fiscal Benefits:	**$0**	**$0**	**$0**

***This table only includes fiscal impacts that could be measured. If there are inestimable fiscal impacts, they will not be included in this table. Inestimable impacts for State Government, Local Government, Small Businesses and Other Persons are described in the narrative. Inestimable impacts for Non-Small Businesses are described in Appendix 2.**

Appendix 2: Regulatory Impact to Non-Small Businesses

This rule change is not expected to have any fiscal impacts on non-small businesses revenues or expenditures because the requirements added to the State Implementation Plan (SIP) being incorporated into the rule are already found in the existing permit conditions.

The Interim Executive Director of the Department of Environmental Quality, Scott Baird, has reviewed and approved this fiscal analysis.

****"Non-small business" means a business employing 50 or more persons; "small business" means a business employing fewer than 50 persons.**

R307. Environmental Quality, Air Quality.
R307-110. General Requirements: State Implementation Plan.
…
R307-110-17. Section IX, Control Measures for Area and Point Sources, Part H, Emission Limits.

The Utah State Implementation Plan, Section IX, Control Measures for Area and Point Sources, Part H, Emission Limits and Operating Practices, as most recently amended by the Utah Air Quality Board on [~~January 2~~]December 4, 2019, pursuant to Section 19-2-104, is hereby incorporated by reference

and made a part of these rules.

KEY: air pollution, PM10, PM2.5, ozone
Date of Enactment or Last Substantive Amendment: March 5, 2019
Notice of Continuation: January 27, 2017
Authorizing, and Implemented or Interpreted Law: 19-2-104

ITEM 13

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-084-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Liam Thrailkill, Environmental Planning Consultant

DATE: August 16, 2019

SUBJECT: Five-Year Review: R307-125. Clean Air Retrofit, Replacement, and Off-Road Technology Program; R307-501. Oil and Gas Industry: General Provisions; R307-502. Oil and Gas Industry: Pneumatic Controllers, R307-503. Oil and Gas Industry: Flares, and R307-504. Oil and Gas Industry: Truck Tank Loading.

Utah Code 63G-3-305 requires each agency to review and justify each of its rules within five years of the rule's original effective date or within five years of the filing of the last five-year review. This review process is not a time to revise or amend the rules, but only to verify that the rule is still necessary and allowed under state and federal law. As part of this process, we are required to identify any comments received since the last five-year review of each rule.

DAQ has completed a five-year review of R307-125, Clean Air Retrofit, Replacement, and Off-Road Technology Program; R307-501, Oil and Gas Industry: General Provisions; R307-502, Oil and Gas Industry: Pneumatic Controllers; R307-503, Oil and Gas Industry: Flares; and R307-504, Oil and Gas Industry: Truck Tank Loading. No comments were received for the aforementioned rules. The results of these reviews are found in the attached Five-Year Notice of Review and Statement of Continuation forms.

Recommendation: Staff recommends that the Board continue these rules by approving the attached forms to be filed with the Office of Administrative Rules.

R307. Environmental Quality, Air Quality.
R307-125. Clean Air Retrofit, Replacement, and Off-Road Technology Program.
R307-125-1. Authority and Purpose.

(1) This rule specifies the requirements and procedures of the Clean Air Retrofit, Replacement and Off-Road Technology Program that is authorized in 19-2-203.

(2) The procedures of this rule constitute the minimum requirements for the application for and the awarding of funds that are designated for the Clean Air Retrofit, Replacement, and Off-Road Technology Program.

R307-125-2. Definitions.

The terms "certified," "cost," "director," "division," "eligible equipment," "eligible vehicle," and "verified" are defined in 19-2-202.

R307-125-3. Grants Under 19-2-203(1).

(1) A grant under 19-2-203(1) may only be used for:

(a) verified technologies for eligible vehicles or equipment; and

(b) certified vehicles, engines, or equipment.

(2) In prioritizing grant awards, the director shall consider:

(a) whether and to what extent the applicant has already secured some other source of funding;

(b) the air quality benefits to the state and local community attributable to the project;

(c) the cost-effectiveness of the proposed project;

(d) the feasibility and practicality of the project; and

(e) other factors that the director determines should apply based on the nature of the application.

(3) In prioritizing grant awards, the director may also, at the request of an applicant, consider the financial need of the applicant.

(4) A successful grant applicant will be required to agree:

(a) to provide information to the division about the vehicles, equipment, or technology acquired with the grant proceeds;

(b) to allow inspections by the division to ensure compliance with the terms of the grant;

(c) to permanently disable replaced vehicles, engines, and equipment from use; and

(d) for any grant that is not given on a reimbursement basis, to commit to complete the project as proposed;

(e) not to change the location or use of the vehicle, engine or equipment from the location or use proposed in their application without approval of the director; and

(f) to any additional terms as determined by the director.

(5) Eligible vehicles are defined in 19-2-202(7). No additional vehicles under 19-2-202(7)(e) are eligible at this time.

(6) The division shall use the following procedures to implement the grant program:

(a) The division shall provide notice on the division's website of the availability of grants and of cut-off dates for applications.

(b) An application for a grant shall be on a form provided by the division.

(c) The director may provide grants on a reimbursement basis or as an advance award.

(d) Successful grant applicants will be required to sign a grant agreement that contains the terms described in R307-125-3(4).

(e) State agencies and employees are eligible to participate in the program and are subject to program requirements.

R307-125-4. Exchange, Rebate, or Low-Cost Purchase Programs Under 19-2-203(2).

(1) The director has discretion to choose whether to use an exchange, rebate or low-cost purchase program.

(2) The division shall use the following procedures to implement an exchange, rebate or low-cost purchase program:

(a) The division shall provide notice on the division's website of any exchange, rebate or low-cost purchase program.

(b) An application for an exchange, rebate, or low-cost purchase shall be on a form provided by the division.

(c) State agencies and employees are eligible to participate in any program and are subject to program requirements.

(d) The director may establish additional procedures appropriate to the specific program.

(3) A participant in an exchange, rebate, or low-cost purchase program will be required to agree to the terms outlined in the application as determined by the director.

KEY: air quality, grants, rebates, purchase program
Date of Enactment or Last Substantive Amendment: March 3, 2017
Authorizing, and Implemented or Interpreted Law: 19-1-203; 19-2-203

R307. Environmental Quality, Air Quality.
R307-501. Oil and Gas Industry: General Provisions.
R307-501-1. Purpose.

R307-501 establishes general requirements for prevention of emissions and use of good air pollution control practices for all oil and natural gas exploration and production operations, well production facilities, natural gas compressor stations, and natural gas processing plants.

R307-501-2. Definitions.

(1) The definitions in 40 CFR 60, Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution, which is incorporated by reference in R307-210 apply to R307-501.

(2) "Well production facility" means all equipment at a single stationary source directly associated with one or more oil wells or gas wells. This equipment includes, but is not limited to, equipment used for production, extraction, recovery, lifting, stabilization, storage, separation, treating, dehydration, combustion, compression, pumping, metering, monitoring, and flowline.

(3) "Oil well" means an onshore well drilled principally for the production of crude oil.

(4) "Oil transmission" means the pipelines used for the long distance transport of crude oil, condensate, or intermediate hydrocarbon liquids (excluding processing). Specific equipment used in transmission includes, but is not limited to, the land, mains, valves, meters, boosters, regulators, storage vessels, dehydrators, pumps and compressors, and their driving units and appurtenances. The transportation of oil or natural gas to end users is not included in the definition of "transmission".

R307-501-3. Applicability.

(1) R307-501 applies to all oil and natural gas exploration, production, and transmission operations; well production facilities; natural gas compressor stations; and natural gas processing plants in Utah.

(2) R307-501 does not apply to oil refineries.

R307-501-4. General Provisions.

(1) General requirements for prevention of emissions and use of good air pollution control practices.

(a) All crude oil, condensate, and intermediate hydrocarbon liquids collection, storage, processing and handling operations, regardless of size, shall be designed, operated and maintained so as to minimize emission of volatile organic compounds to the atmosphere

to the extent reasonably practicable.

(b) At all times, including periods of start-up, shutdown, and malfunction, the installation and air pollution control equipment shall be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions.

(c) Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the director, which may include, but is not limited to, monitoring results, infrared camera images, opacity observations, review of operating and maintenance procedures, and inspection of the source.

(2) General requirements for air pollution control equipment.

(a) All air pollution control equipment shall be operated and maintained pursuant to the manufacturing specifications or equivalent to the extent practicable and consistent with technological limitations and good engineering and maintenance practices.

(b) The owner or operator shall keep manufacturer specifications or equivalent on file.

(c) In addition, all such air pollution control equipment shall be adequately designed and sized to achieve the control efficiency rates established in rules or in approval orders issued under R307-401 and to handle reasonably foreseeable fluctuations in emissions of VOCs during normal operations. Fluctuations in emissions that occur when the separator dumps into the tank are reasonably foreseeable.

KEY: air pollution, oil, gas
Date of Enactment or Last Substantive Amendment: December 1, 2014
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

R307. Environmental Quality, Air Quality.
R307-502. Oil and Gas Industry: Pneumatic Controllers.
R307-502-1. Purpose.

(1) The purpose of R307-502 is to reduce emissions of volatile organic compounds from pneumatic controllers that are associated with oil and gas operations.

(2) The rule requires existing pneumatic controllers to meet the standards established for new controllers in 40 CFR Part 60, Subpart OOOO.

R307-502-2. Definitions.

(1) The definitions in 40 CFR 60, Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution, which is incorporated by reference in R307-210 apply to R307-502.

(2) "Existing pneumatic controller" means a pneumatic controller affected facility as described in 40 CFR 60.5365(d)(1) through (3) that was constructed, modified, or reconstructed prior to October 15, 2013.

R307-502-3. Applicability.

R307-502 applies to the owner or operator of any existing pneumatic controller in Utah.

R307-502-4. Retrofit Requirements.

(1) Effective December 1, 2015, all existing pneumatic controllers in Duchesne County or Uintah County shall meet the standards established for pneumatic controller affected facilities that are constructed, modified or reconstructed on or after October 15, 2013, as specified in 40 CFR 60, Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution.

(2) Effective April 1, 2017 all existing pneumatic controllers in Utah shall meet the standards established for pneumatic controller affected facilities that are constructed, modified or reconstructed on or after October 15, 2013 as specified in 40 CFR 60, Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution.

R307-502-5. Documentation Required.

(1) The tagging requirements in 40 CFR 60.5390(b)(2) and 40 CFR 60.5390(c)(2), incorporated by reference in R307-210, are modified to not require the month and year of installation, reconstruction or modification for existing pneumatic controllers.

(2) The recordkeeping requirements in 40 CFR 60.5420(c)(4)(i),

incorporated by reference in R307-210, are modified to not require records of the date of installation or manufacturer specifications for existing pneumatic controllers.

KEY: air pollution, oil, gas, pneumatic controllers
Date of Enactment or Last Substantive Amendment: December 1, 2014
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

R307. Environmental Quality, Air Quality.
R307-503. Oil and Gas Industry: Flares.
R307-503-1. Purpose.

R307-503 establishes conditions to ensure that flares used in the oil and gas industry are operated effectively.

R307-503-2. Definitions.

(1) "Auto igniter" means a device which will automatically attempt to relight the pilot flame of a flare in order to combust volatile organic compound emissions.

(2) "Enclosed flare" means a flare that has an enclosed flame.

(3) "Flare" means a thermal oxidation system designed to combust hydrocarbons in the presence of a flame.

(4) "Open flare" means a flare that has an open (without enclosure) flame.

R307-503-3. Applicability.

(1) R307-503 applies to all oil and gas exploration and production operations, well sites, natural gas compressor stations, and natural gas processing plants in Utah.

(2) R307-503 does not apply to oil refineries.

R307-503-4. Auto-Igniters.

(1) Flares used to control emissions of volatile organic compounds shall be equipped with and operate an auto-igniter as follows:

(a) All open flares and all enclosed flares installed on or after January 1, 2015, shall be equipped with an operational auto-igniter upon installation of the flare.

(b) All enclosed flares installed before January 1, 2015 in Duchesne County or Uintah County shall be equipped with an operational auto-igniter by December 1, 2015, or after the next flare planned shutdown, whichever comes first.

(c) All enclosed flares installed before January 1, 2015 in all other areas of Utah shall be equipped with an operational auto-igniter by April 1, 2017, or after the next flare planned shutdown, whichever comes first.

R307-503-5. Recordkeeping.

The owner or operator shall maintain records demonstrating the date of installation and manufacturer specifications for each auto-igniter required under R307-503-4.

KEY: air pollution, oil, gas, flares
Date of Enactment or Last Substantive Amendment: December 1, 2014
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

R307. Environmental Quality, Air Quality.
R307-504. Oil and Gas Industry: Tank Truck Loading.
R307-504-1. Purpose.

R307-504 establishes control requirements for the loading of liquids containing volatile organic compounds (VOCs) at oil or gas well sites.

R307-504-2. Definitions.

The definitions in 40 CFR 60, Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution, incorporated by reference in R307-210, apply to R307-504.

"Bottom Filling" means the filling of a tank through an inlet at or near the bottom of the tank designed to have the opening covered by the liquid after the pipe normally used to withdraw liquid can no longer withdraw any liquid.

"Submerged Fill Pipe" means any fill pipe with a discharge opening which is entirely submerged when the liquid level is six inches above the bottom of the tank and the pipe normally used to withdraw liquid from the tank can no longer withdraw any liquid.

"Vapor Capture Line" means a connection hose, fitted with a valve that can be connected to tanker trucks during truck loading operations. The vapor capture line shall be designed, installed, operated, and maintained to optimize capture efficiency.

"Well Site" means all equipment at a single stationary source directly associated with one or more oil wells or gas wells.

R307-504-3. Applicability.

(1) R307-504-4(1) applies to any person who loads or permits the loading of any intermediate hydrocarbon liquid or produced water at a well site after January 1, 2015.

(2) R307-504-4(2) applies to owners and operators that are required to control emissions from storage vessels in accordance with R307-506.

R307-504-4. Tank Truck Loading Requirements.

(1) Tanker trucks used for intermediate hydrocarbon liquid or produced water shall be loaded using bottom filling or a submerged fill pipe.

(2) VOC emissions during truck loading operations shall be controlled at all times using a vapor capture line. The vapor capture line shall be connected from the tanker truck to a control device or process, resulting in a minimum 95 percent VOC destruction efficiency.

(a) Well sites in operation on January 1, 2018 shall comply with R307-504-4(2) no later than July 1, 2019.

KEY: air pollution, oil, gas
Date of Enactment or Last Substantive Amendment: March 5, 2018
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

ITEM 14

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-085-19

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Jason Krebs, Environmental Scientist

DATE: August 19, 2019

SUBJECT: Western Water Solutions, Inc. – Final Settlement Agreement

---

Western Water Solutions, Inc. (WWS) owns and operates a produced water and solids disposal facility located south of Myton in Duchesne County, Utah. On May 1, 2017, the Utah Division of Air Quality (DAQ) issued a Notice of Violation to WWS for constructing and operating the Sand Pass Ranch produced water and solids disposal facility prior to submitting a notice of intent (NOI) and obtaining an approval order (AO). After 464 days, WWS submitted an NOI to DAQ on August 8, 2018.

To settle the Notice of Violation, DAQ and WWS have negotiated a total settlement of $105,000. Of this settlement amount, $52,500 will be paid in twelve equal monthly payments. The remaining $52,500 will be deferred for a twenty-four month period. The deferred portion of the penalty shall be immediately due and payable if WWS, at any of its operations within the State, violates any provisions of the negotiated settlement, the Act, Rules, or Orders within that twenty-four month period. If during this period WWS does not violate its AO and Utah environmental laws, the deferred portion will be waived.

In accordance with Section 19-2-104(3)(b)(i) of the Utah Code, this settlement agreement is provided to the Board for review as the penalty exceeds $25,000. A copy of the Settlement Agreement is provided. DAQ will withhold any further action on this matter until the Board approves the penalty amount and the Settlement Agreement.

Recommendation: Staff recommends that the Board approve the penalty amount and the settlement agreement for Western Water Solutions, Inc.

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQC-0268-19
Site ID: 15439 (B1)

June 25, 2019

Sent Via Certified Mail No. 70171070000091093368

Ms. Kristen Lamb
Western Water Solutions
3214 North University Pkwy, Unit 133
Provo, Utah 84604

Dear Ms. Lamb:

Re: Settlement Agreement – Western Water Solutions Sand Pass Ranch

On May 1, 2017, the Utah Division of Air Quality (DAQ) issued a Notice of Violation (NOV) to Western Water Solutions (WWS). WWS responded to the NOV on May 12, 2017. Based on response to the NOV, the DAQ determined that WWS was in violation of:

1. UAC R307-401-5(1) (Notice of Intent)

   Notice of Intent (NOI) was not submitted and permit was not issued prior to constructing and operating the Sand Pass Ranch produced water and solids disposal facility.

Section 19-2-115 of the Utah Code Annotated provides that violations of the Utah Air Conservation Act and/or any order issued thereunder may be subject to a civil penalty of up to $10,000 per day for each violation. Based upon our civil penalty policy, we calculated a preliminary civil penalty for the above listed violation of $105,000.

The monetary amount of the DAQ settlement offer specified below is derived from a pre-established schedule of penalties, which takes into account, among other factors, the magnitude and severity of the violation, economic benefit, cooperation of the source as well as the prior history of violations.

All parties we deal with, whether private, commercial, or governmental are treated similarly in the settlement process. Settlement Agreements are based on the evaluation of the same factors

and criteria in all cases. The DAQ acknowledges that the violation on May 1, 2017, was addressed by WWS's submittal of a complete NOI on August 8, 2018.

If you are interested in settling this violation, we are authorized to offer settlement in accordance with the DAQ Penalty Policy as follows:

1. WWS agrees to pay a civil penalty in the sum of $105,000. Payment of a civil penalty precludes further civil enforcement for the above described violation against the named source.

    a. $52,500 of the stipulated penalty will be deferred for a two year period. This portion of the penalty shall be immediately due and payable if WWS, at any of its operations within the State, violates the provisions of this Settlement Agreement, the Act, Rules, or Orders within the next two years.

    b. $52,500 will be paid in twelve equal monthly installments of $4,375. The first payment will be paid by September 1, 2019. The eleven remaining payments will be due on the 1st day of each month until the balance is paid in full.

2. The DAQ retains its authority to take any enforcement actions based on any and all violations not specifically described above.

3. In the event any further violations of the Utah Air Quality Rules occur, the DAQ may consider the violation described above in assessing a penalty for the subsequent violations, in accordance with the provisions of Utah Administrative Code R307-130.

4. Entering into this Settlement Agreement shall not constitute an admission of violation of the Utah Air Quality Rules, nor shall it be inferred to be such an admission in any administrative or judicial proceeding. The described violation will constitute part of the company compliance history for any purpose for which such history is relevant to the DAQ.

This Settlement Agreement constitutes an offer of settlement and is not a demand for payment. If the above terms are acceptable to you, please sign and return this Settlement Agreement to the DAQ at the letterhead address within twenty (20) business days of receipt of this agreement. Utah Code 19-2-104(3)(b)(i), requires the Utah Air Quality Board (UAQB) to review and approve/disapprove any settlement negotiated by the Director that results in a civil penalty of $25,000 or more in accordance with Subsection 19-2-107(2)(b)(viii). The DAQ will present this to the UAQB at the August 2019 board meeting for review and will recommend approval of the negotiated settlement.

You may write or call to request a settlement conference with DAQ representative listed below. A conference must be scheduled within twenty (20) business days of your receipt of this Settlement Agreement. If we do not receive a signed copy of this Settlement Agreement or other

correspondence from you within twenty (20) business days of your receipt, we will assume that you are not interested in resolving this matter as outlined above.

This Settlement Agreement is intended to quickly resolve the non-compliance issues listed above and requires the immediate attention of your company. Failure to resolve this matter as outlined above may result in this offer being revoked and/or having this matter referred to a formal enforcement process.

If you have any additional questions regarding this matter, please contact Rik Ombach at (801) 536-4160, or by email at rombach@utah.gov.

Sincerely,

Bryce C. Bird
Director

BCB:RO:bp

cc: Tri-County Health Department

Acceptance of Settlement Agreement

I have read the above Settlement Agreement and I agree to the terms and conditions thereof.

Western Water Solutions:

Name: R. JASON MENDENHALL

Title: CHIEF EXECUTIVE OFFICER

Signature	Date	Telephone Number
	5 Jul 19	435-338-3323

Utah Division of Air Quality General Administrative Penalty Worksheet

Source: Western Water Solutions
SID No.: 15439 | **HPV: No**

Class: B
Violation Date: May 1, 2017
Days to Resolution: 464

Home

Table 1: Gravity Criteria

Citation	Description of the Violation	Revenue	Category	Gravity Criteria (Gc) Gc 1	Gc 2	Gc 3	Gc 4	Daily Gravity	Accumulated Gravity
R307-401-5(1)	Constructing and operating the Sand Pass Ranch produced water and solids disposal facility prior to submitting a Notice of Intent and obtaining an Approval Order.	15	B	3	3	1	2	$7,000	$105,000

Gc 5 History of violations within the last five (5) years

Date of Early Settlement/NOV	Description of Early Settlement/NOV	Category		
		☐ Same Violation		
		☐ Same Violation		
		☐ Same Violation		
		☐ Same Violation		
		☐ Same Violation		
	Total Gravity			$105,000

Table 2: Adjustments

Economic Benefit Collectable	**Use the information that gives you the most correct value of benefit. This may be the BEN Model, Net Income, Tax Records, Company Records, or any other economic benefit information.**		
Other	**Other Monies Collected**		
	Early Settlement Reduction (20%) -	☑ Remove 20%	$0
Total Penalty			$105,000

Gravity Criteria Definitions

Gc 1. Was the violation a result of excess emissions and/or reporting?

0	If the violation was not a result of excess emissions and/or reporting
1	If a minor reporting or other problem occurred, but no emissions were involved
2	If a reporting or other problem occurred which involved minor emissions
3	If a reporting or other problem occurred involving significant emissions

Gc 2. Did the violation appear to be willful or due to gross negligence?

0	If the source clearly did not know that the action/inaction constituted a violation
1	If the source should have known that the action/inaction would result in a violation
2	If the source clearly knew that the action/inaction would result in a minor violation
3	If the source clearly knew that the action/inaction would result in a significant violation

Gc 3. Was the violator unresponsive in correcting the violation?

0	If the source was cooperative and the violation was corrected as soon as possible
1	If the source was cooperative but the violation was corrected in a less timely manner
2	If the source was cooperative but did not correct the problem
3	If the source was not cooperative and did not attempt to correct the problem

Gc 4. Was the violation a result of improper operation or inadequate maintenance?

0	If the source was following an acceptable O & M plan at the time the violation occurred
1	If the source was following an inadequate/incomplete O & M plan at the time the violation occurred
2	If the source did not have and O & M plan at the time the violation occurred
3	If the source did not have an O & M plan and the violation was clearly the result of improper O & M

ITEM 15

Air Toxics

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQA-653-19

M E M O R A N D U M

TO: Air Quality Board

FROM: Bryce C. Bird, Executive Secretary

DATE: August 14, 2019

SUBJECT: Air Toxics, Lead-Based Paint, and Asbestos (ATLAS) Section Compliance Activities – July 2019

Asbestos Demolition/Renovation NESHAP Inspections	19
Asbestos AHERA Inspections	18
Asbestos State Rules Only Inspections	3
Asbestos Notification Forms Accepted	269
Asbestos Telephone Calls	431
Asbestos Individuals Certifications Approved/Disapproved	36/0
Asbestos Company Certifications/Re-Certifications	0/2
Asbestos Alternate Work Practices Approved/Disapproved	7/0
Lead-Based Paint (LBP) Inspections	3
LBP Notification Forms Approved	0
LBP Telephone Calls	35
LBP Letters Prepared and Mailed	14
LBP Courses Reviewed/Approved	0
LBP Course Audits	0
LBP Individual Certifications Approved/Disapproved	5/0

LBP Firm Certifications	2
Notices of Violation Sent	0
Compliance Advisories Sent	13
Warning Letters Sent	11
Settlement Agreements Finalized	2
Penalties Agreed to:	
Larry Crandall	$1,100.00
Boxer Construction LLC/Investor Connections Inc	$1,125.00
Total	$2,225.00

Compliance

State of Utah
GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Interim Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQC-1061-19

M E M O R A N D U M

TO: Air Quality Board

FROM: Bryce C. Bird, Executive Secretary

DATE: August 13, 2019

SUBJECT: Compliance Activities – July 2019

Annual Inspections Conducted:

- Major 7
- Synthetic Minor 7
- Minor 40

On-Site Stack Test Audits Conducted: 1

Stack Test Report Reviews: 32

On-Site CEM Audits Conducted: 0

Emission Reports Reviewed: 4

Temporary Relocation Requests Reviewed & Approved: 12

Fugitive Dust Control Plans Reviewed & Accepted: 194

Open Burn Permit Applications Completed 0

Soil Remediation Report Reviews: 0

[1]Miscellaneous Inspections Conducted: 29

195 North 1950 West • Salt Lake City, Utah
Mailing Address: P.O. Box 144820 • Salt Lake City, Utah 84114-4820
Telephone (801) 536-4000 • Fax (801)536-4099 • T.D.D. (801) 903-3978
www.deq.utah.gov

Complaints Received: 7

Breakdown Reports Received: 1

Compliance Actions Resulting from a Breakdown 0

Warning Letters Issued: 0

Notices of Violation Issued: 1

Unresolved Notices of Violation:

US Magnesium	08/27/2015
Western Water Solutions	05/02/2017
Geneva Rock Products	10/20/2017
Norbest	11/15/2017
Strang Excavating	01/17/2018
US Magnesium	03/02/2018
Gordon Creek Compressor Station	05/16/2018
JRJ Services	06/21/2018
JRJ Services	09/07/2018
Compass Minerals	12/10/2018
US Magnesium	01/08/2019
Mel Clark Construction	01/11/2019
Picasso Shutters	02/13/2019
Sunroc	02/28/2019
University of Utah	07/18/2019

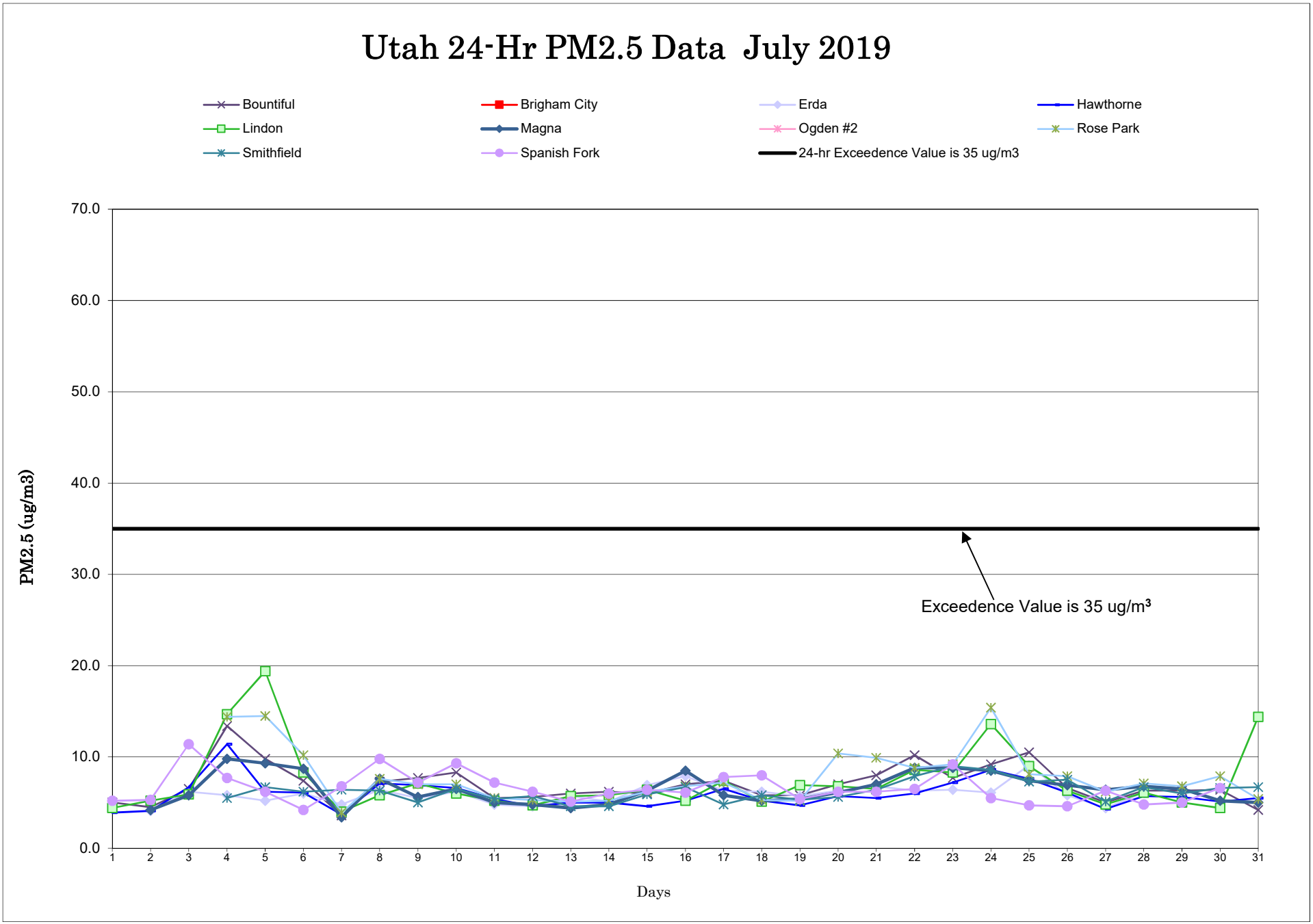
Compliance Advisories Issued: 9

Settlement Agreements Reached: 0

[1]Miscellaneous inspections include, e.g., surveillance, level I inspections, VOC inspections, complaints, on-site training, dust patrol, smoke patrol, open burning, etc.

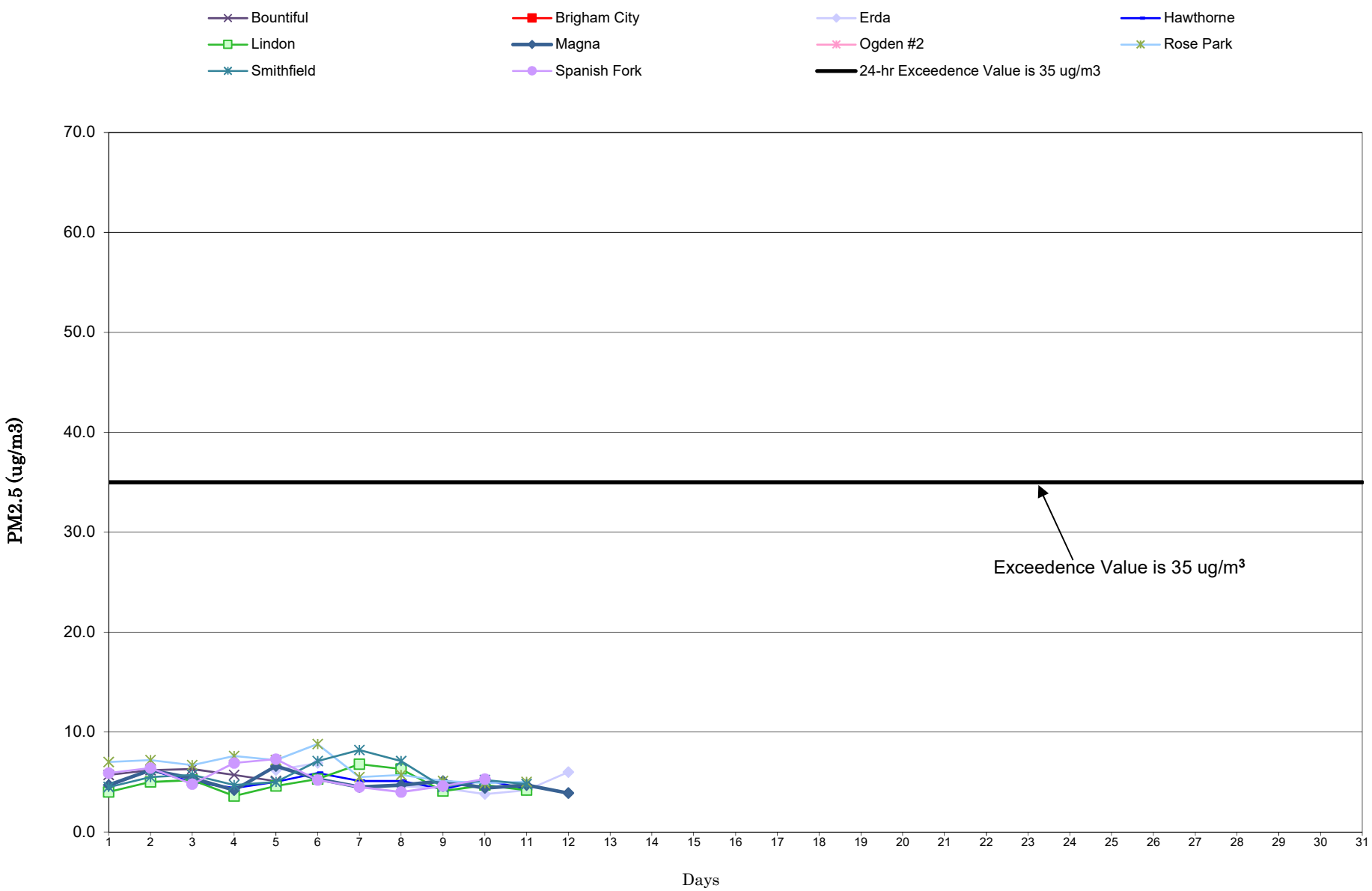
Air Monitoring

Utah 24-Hr PM2.5 Data July 2019



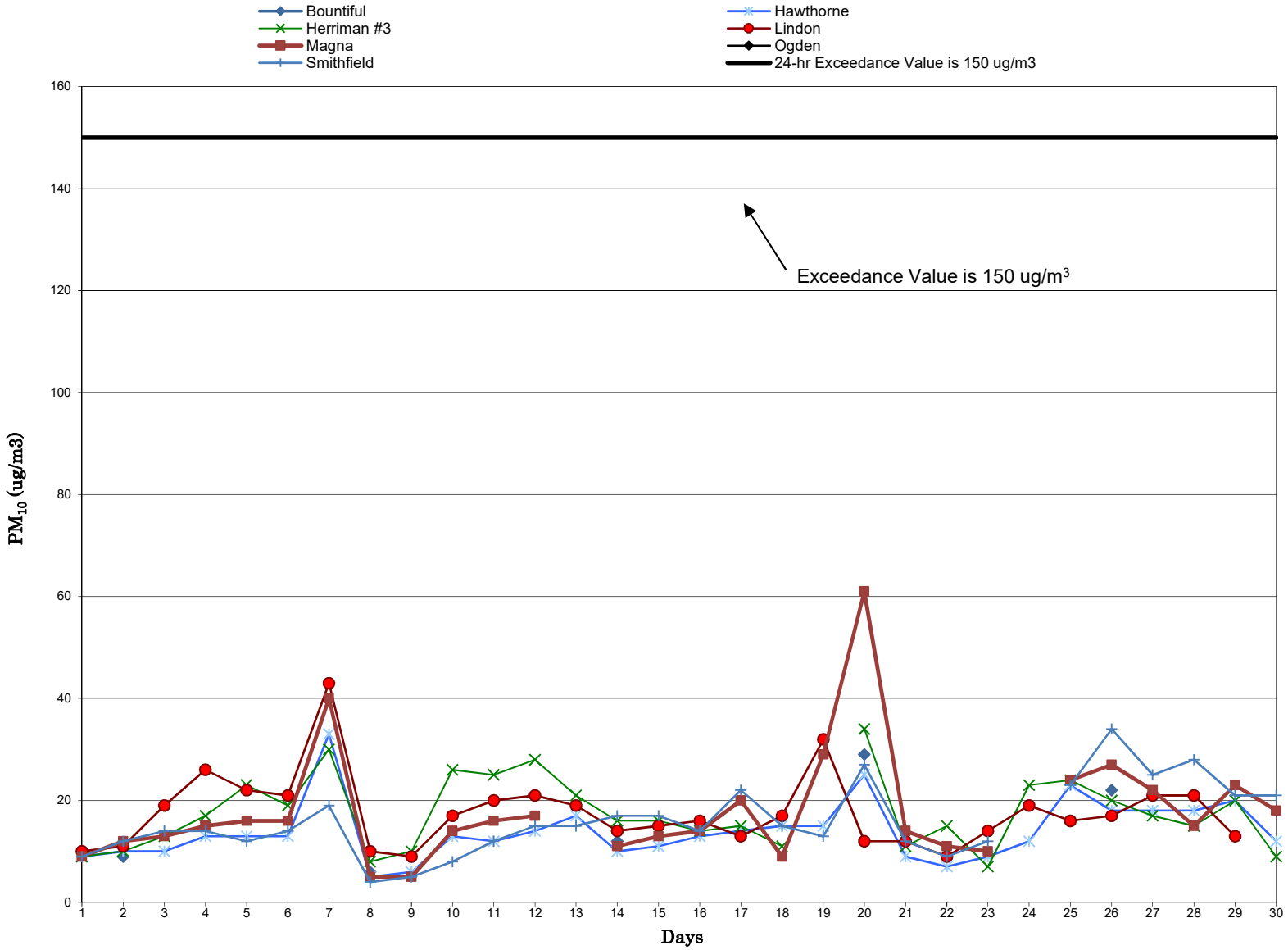
Utah Division of Air Quality

Utah 24-Hr PM2.5 Data August 2019

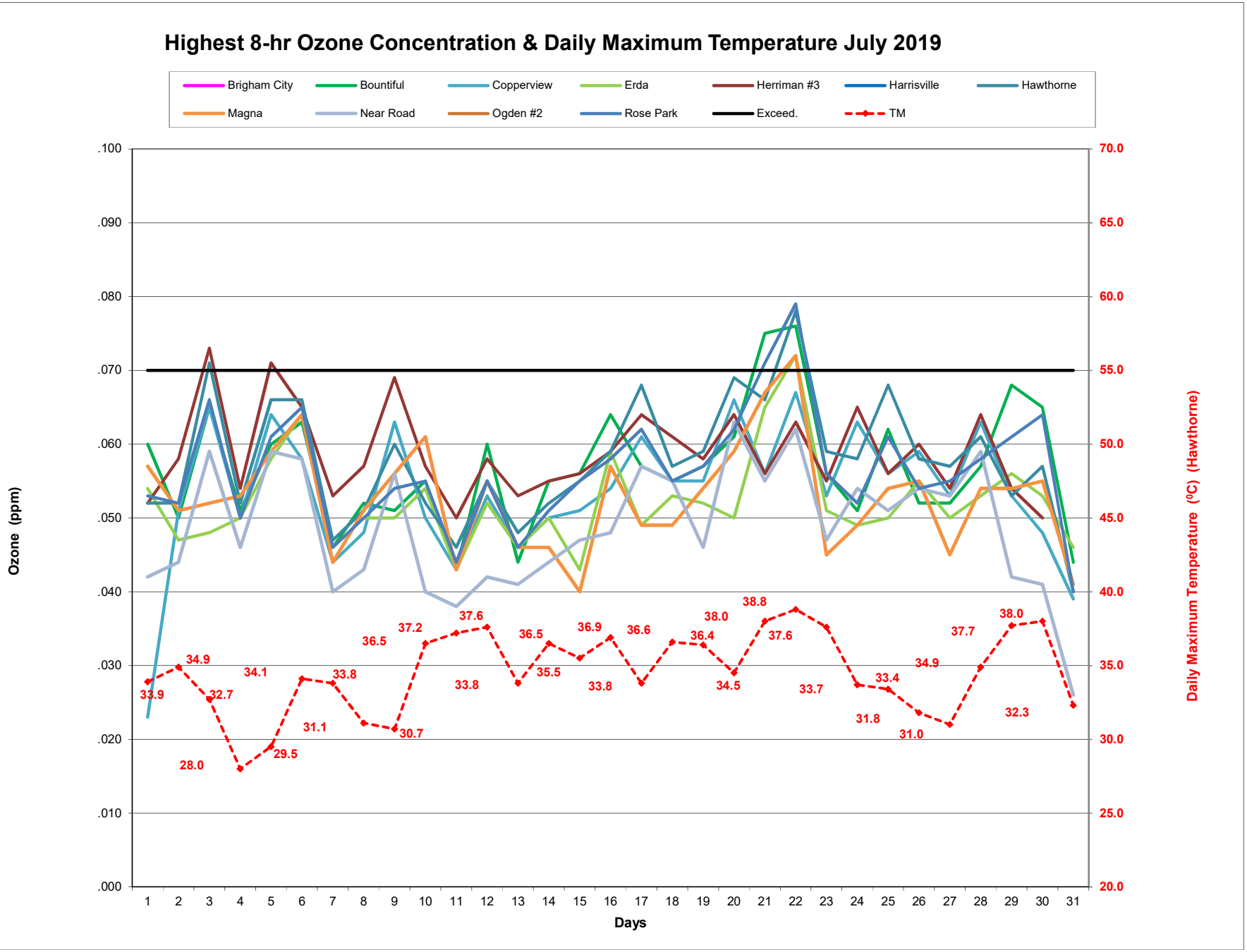


Utah Division of Air Quality

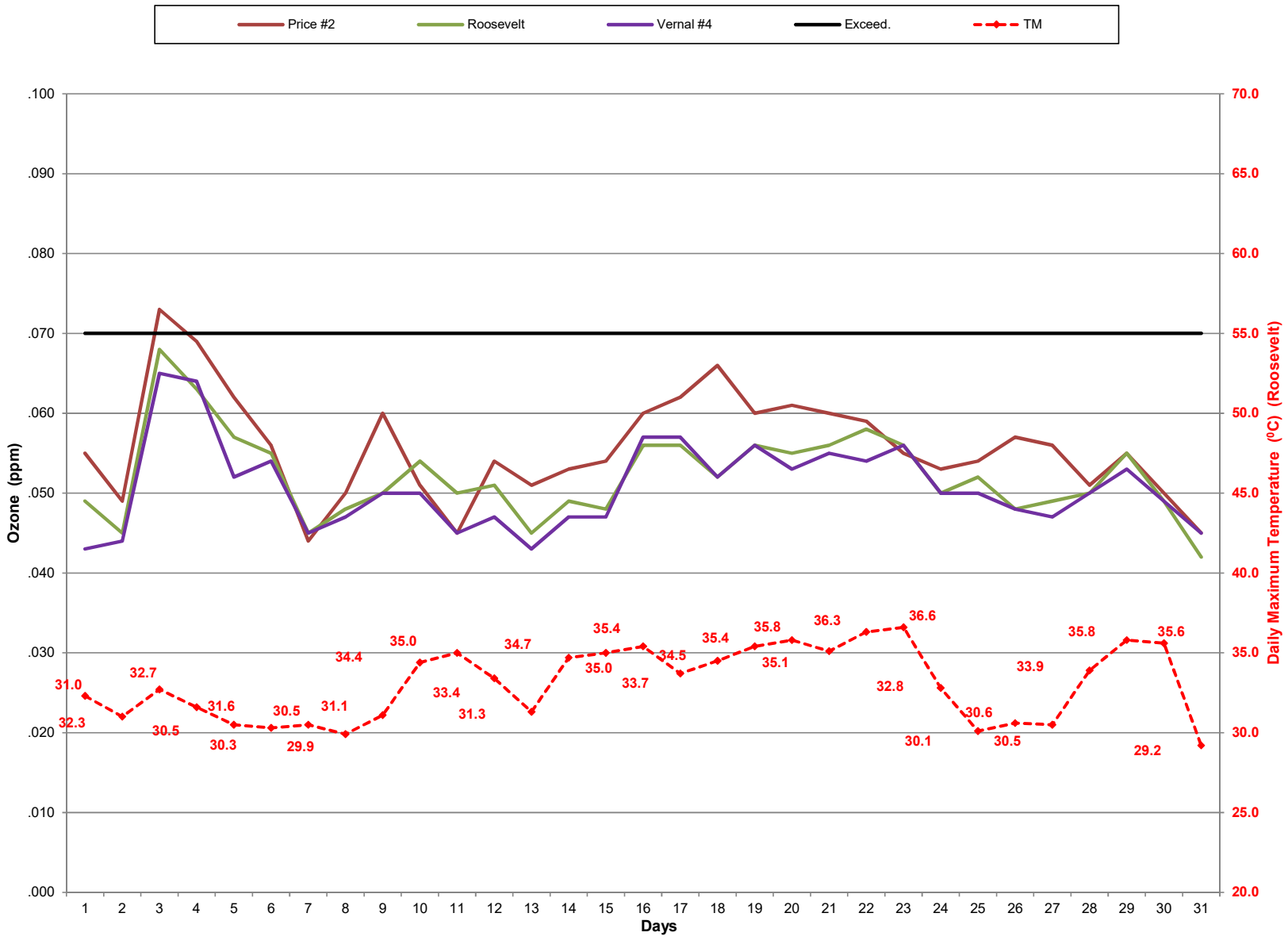
Utah 24-hr PM_{10} Data June 2019



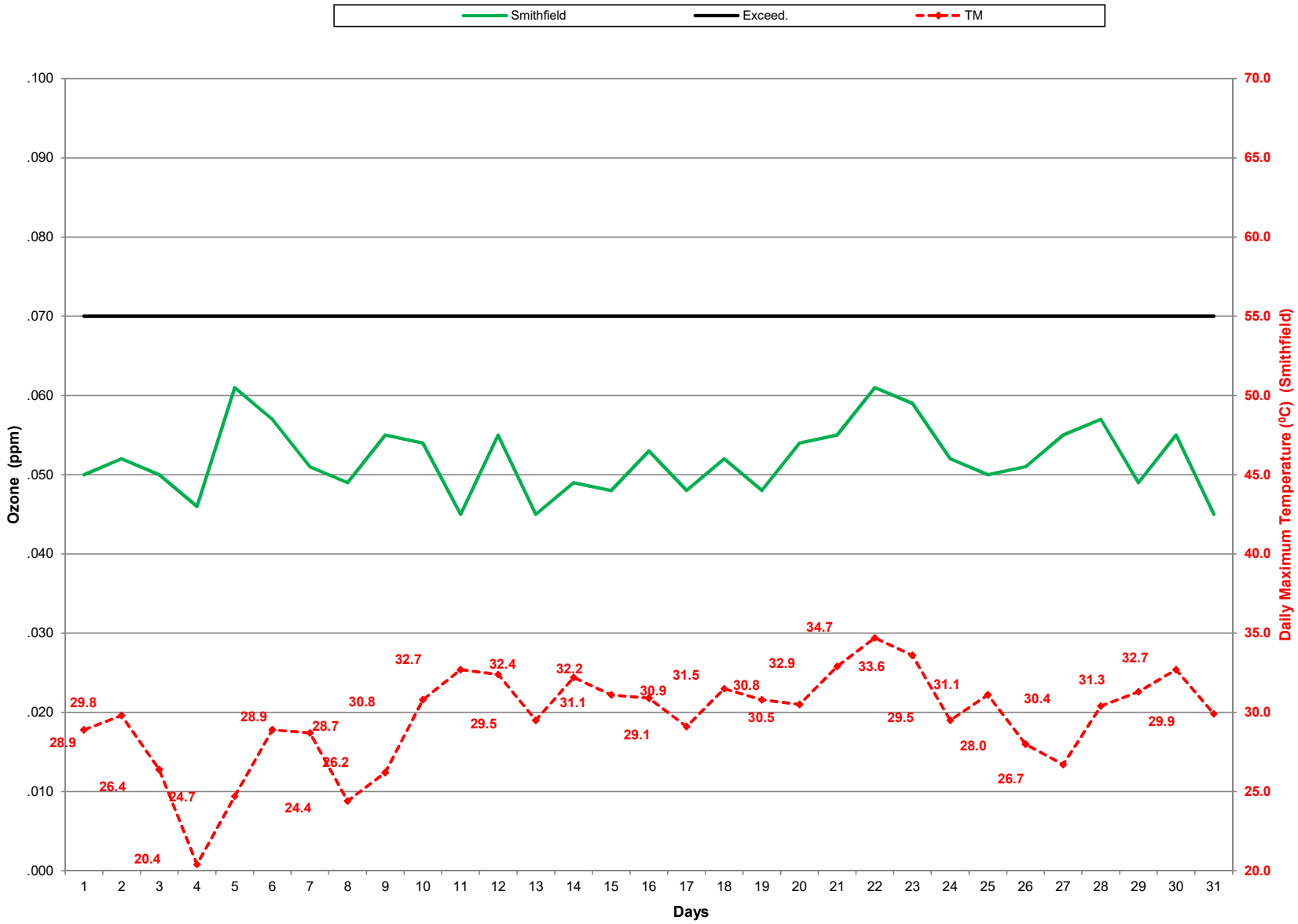
Utah Division of Air Quality


Highest 8-hr Ozone Concentration & Daily Maximum Temperature July 2019
Brigham City
Bountiful
Copperview
Erda
Herriman #3
Harrisville
Hawthorne
Magna
Near Road
Ogden #2
Rose Park
Exceed.
TM
Ozone (ppm)
.100
.090
.080
.070
.060
.050
.040
.030
.020
.010
.000
Daily Maximum Temperature (°C) (Hawthorne)
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Days
33.9
34.9
32.7
28.0
34.1
29.5
31.1
33.8
36.5
30.7
37.2
33.8
37.6
36.5
35.5
36.9
33.8
36.6
36.4
34.5
38.0
38.8
37.6
33.7
31.8
33.4
31.0
34.9
37.7
38.0
32.3

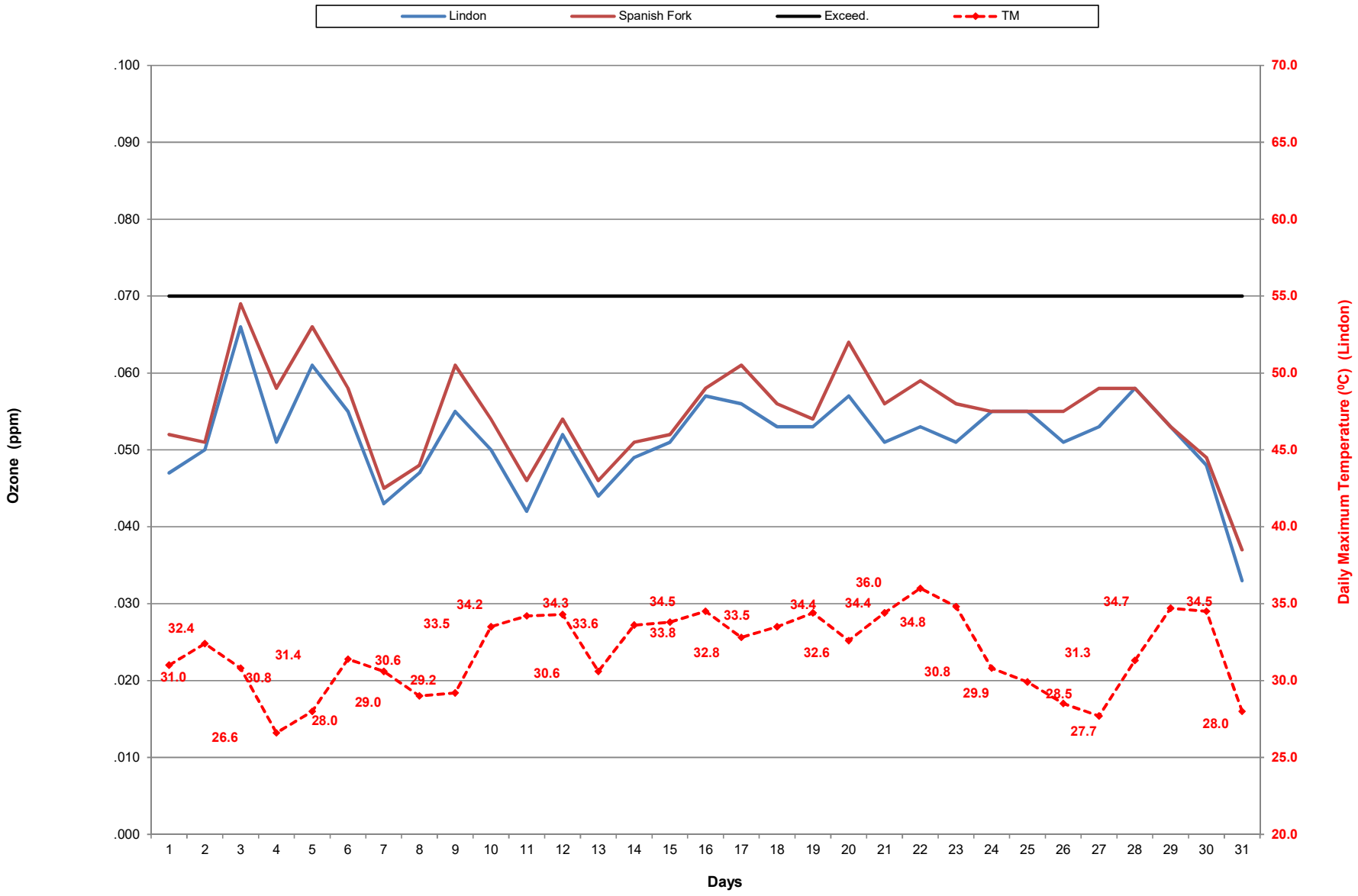
Highest 8-hr Ozone Concentration & Daily Maximum Temperature July 2019



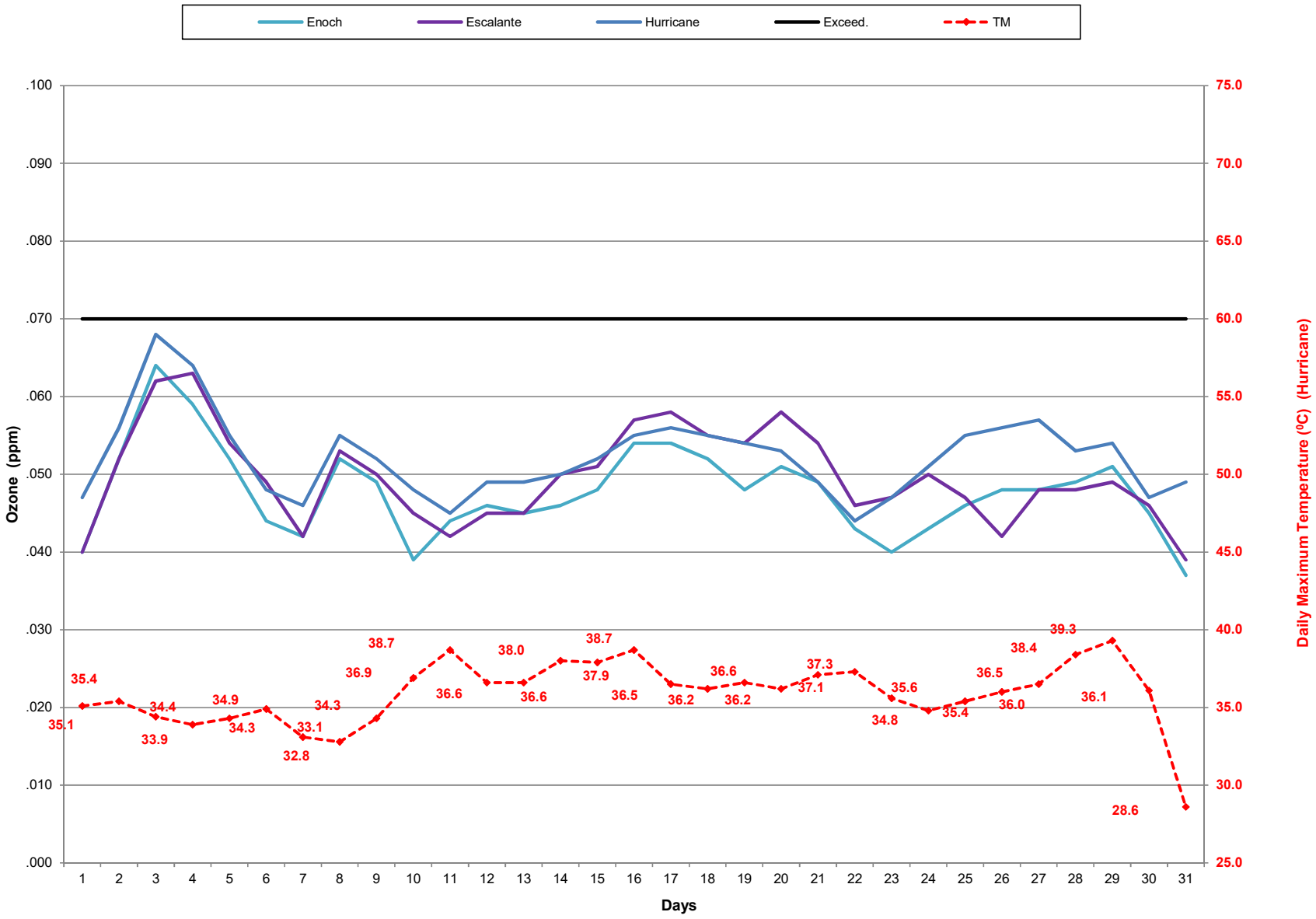
Highest 8-hr Ozone Concentration & Daily Maximum Temperature July 2019

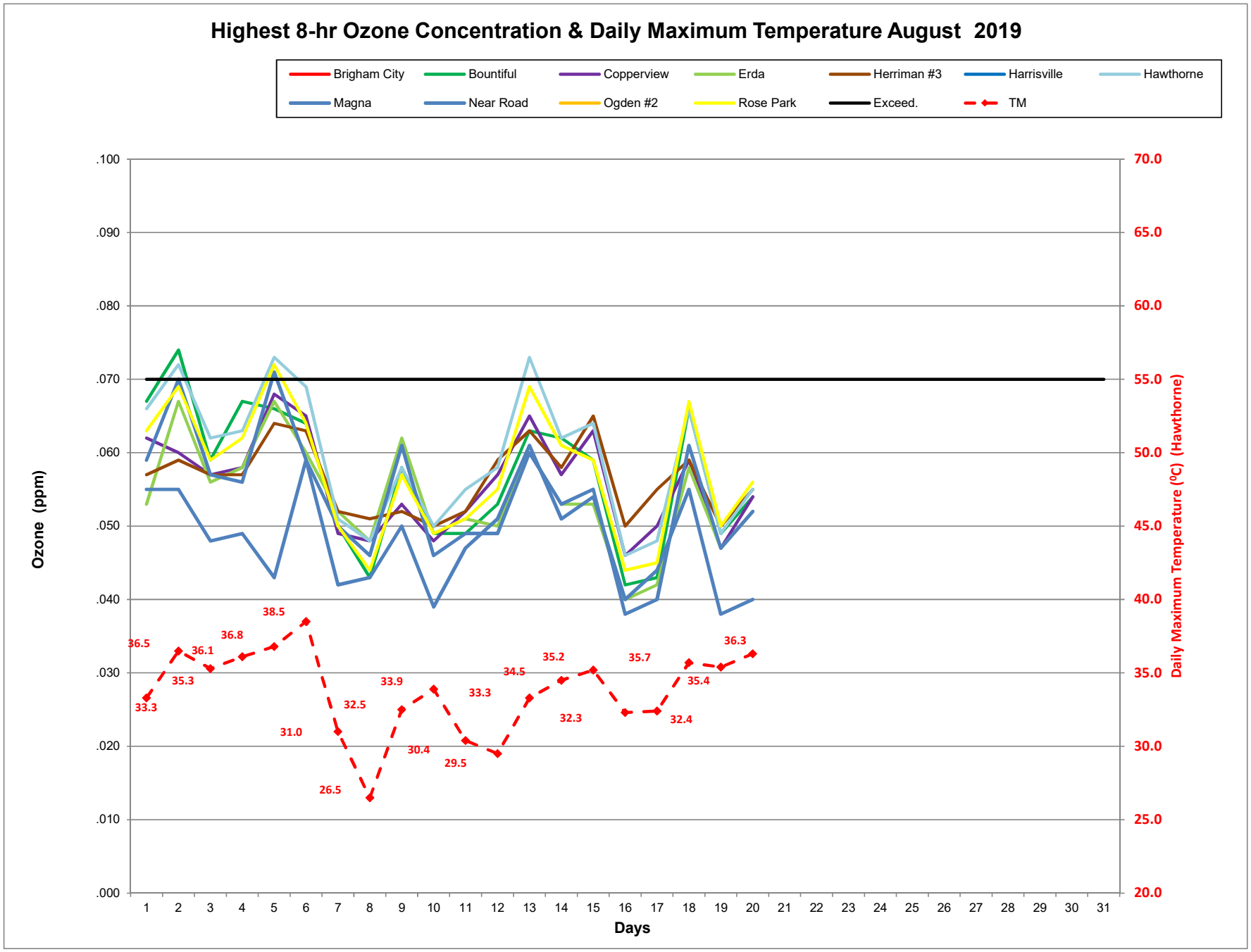


Highest 8-hr Ozone Concentration & Daily Maximum Temperature July 2019



Highest 8-hr Ozone Concentration & Daily Maximum Temperature July 2019




Highest 8-hr Ozone Concentration & Daily Maximum Temperature August 2019
Brigham City
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Copperview
Erda
Herriman #3
Harrisville
Hawthorne
Magna
Near Road
Ogden #2
Rose Park
Exceed.
TM
Ozone (ppm)
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.070
.060
.050
.040
.030
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.010
.000
Daily Maximum Temperature (ºC) (Hawthorne)
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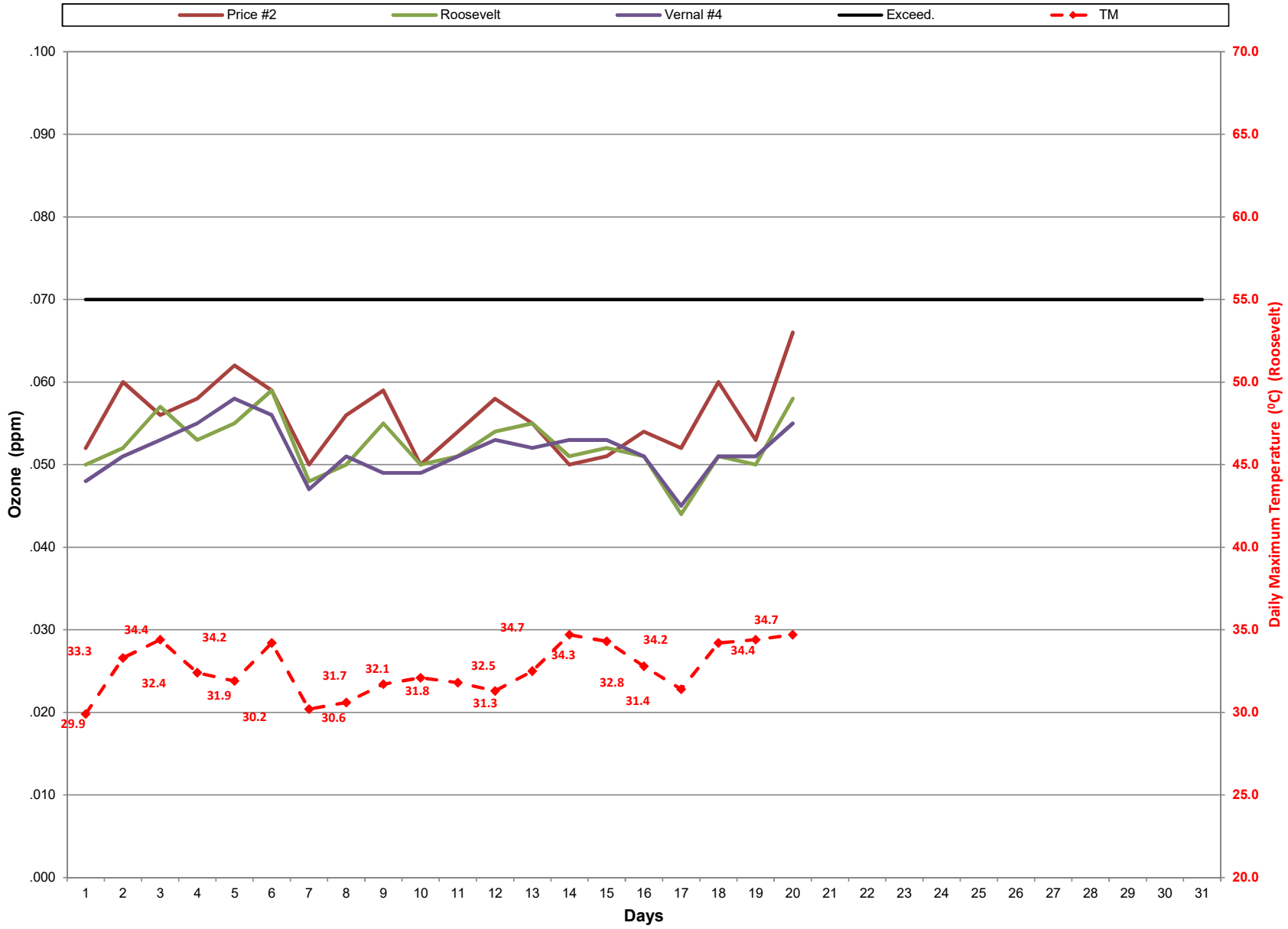
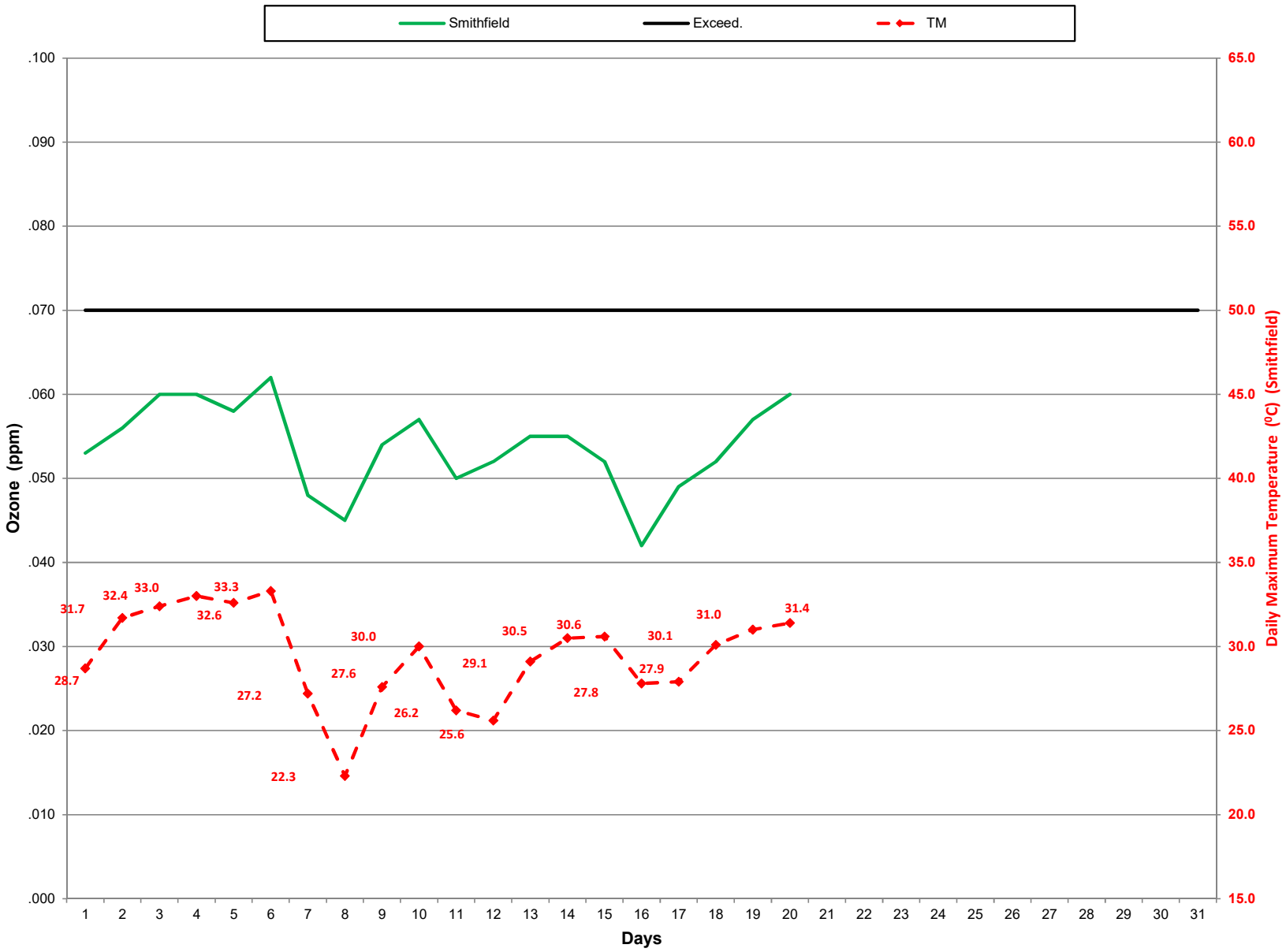
30.0
25.0
20.0
Days
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
36.5
33.3
35.3
36.1
36.8
38.5
31.0
26.5
32.5
33.9
30.4
29.5
33.3
34.5
35.2
32.3
35.7
32.4
35.4
36.3

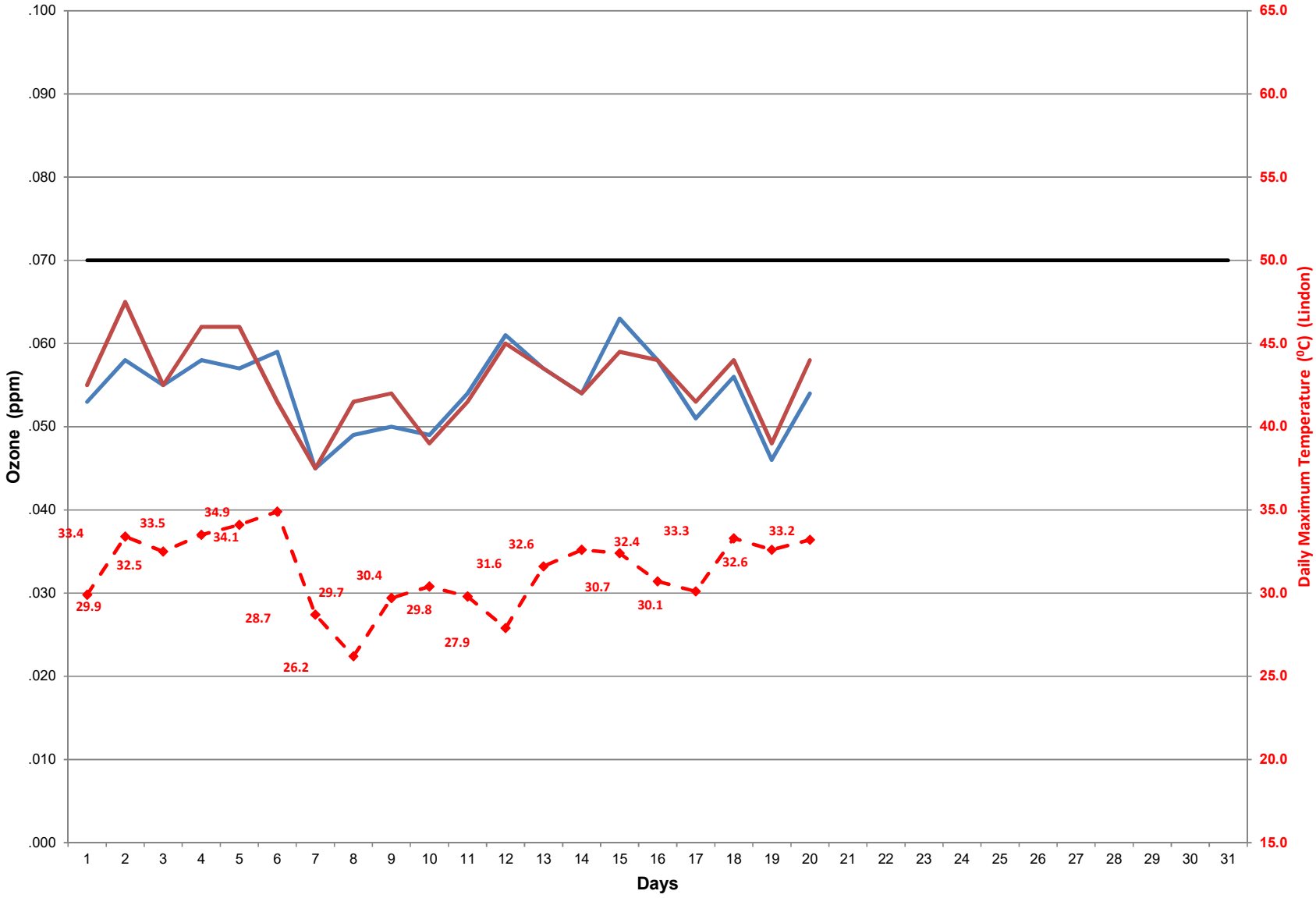
Highest 8-hr Ozone Concentration & Daily Maximum Temperature August 2019

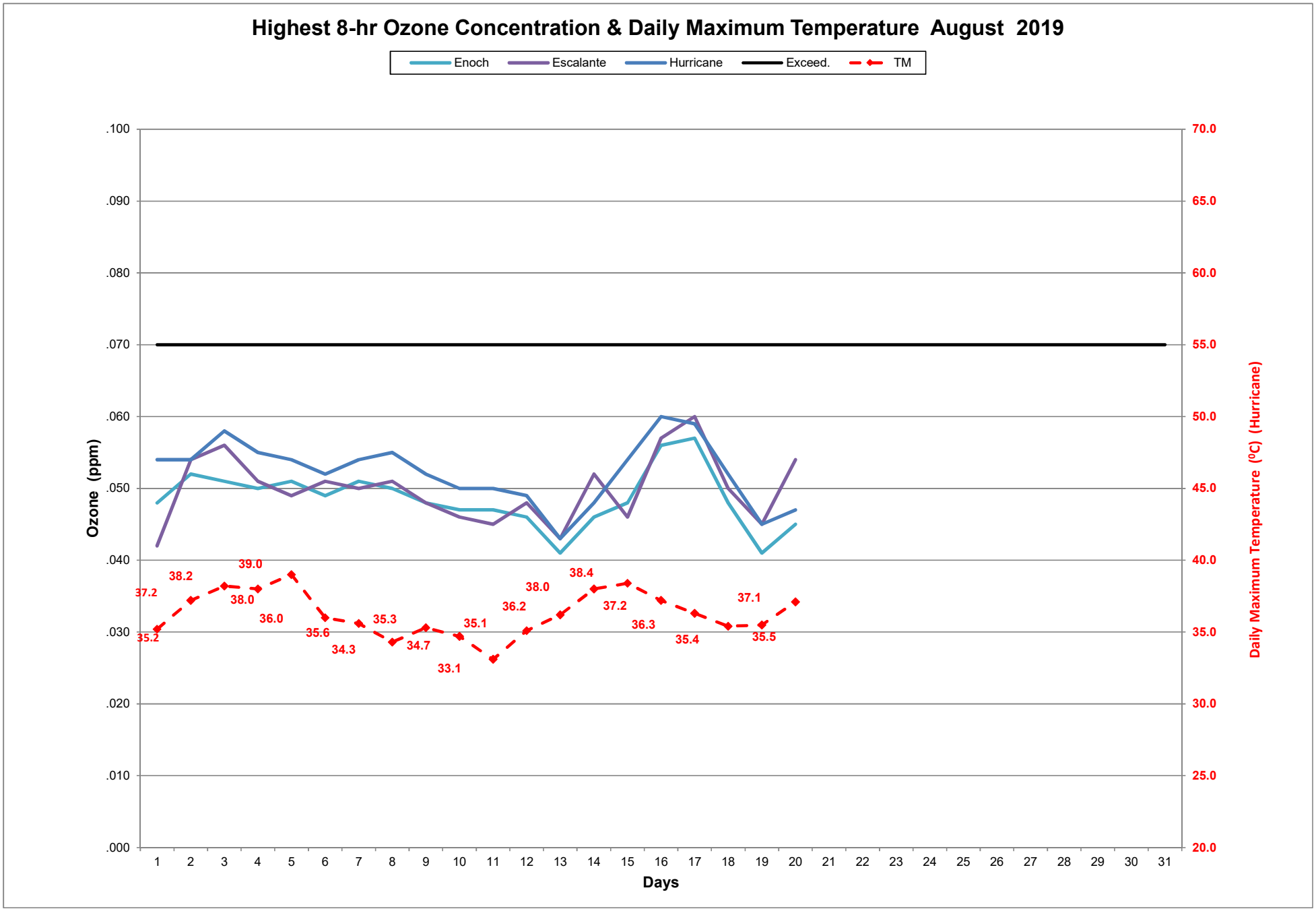


Highest 8-hr Ozone Concentration & Daily Maximum Temperature August 2019



Highest 8-hr Ozone Concentration & Daily Maximum Temperature August 2019




Highest 8-hr Ozone Concentration & Daily Maximum Temperature August 2019
Enoch
Escalante
Hurricane
Exceed.
TM
Ozone (ppm)
.100
.090
.080
.070
.060
.050
.040
.030
.020
.010
.000
Daily Maximum Temperature (°C) (Hurricane)
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Days
37.2 38.2 39.0 38.0 36.0 35.6 34.3 35.3 34.7 35.1 33.1 36.2 38.0 38.4 37.2 36.3 35.4 37.1 35.5
35.2