WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

Second 10-Year Maintenance Plan for the Truckee Meadows 24-Hour PM_{10} Attainment Area

May 23, 2024

Public Health
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HEALTH DISTRICT
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Public Health
Prevent. Promote. Protect.

VISION

A healthy community

MISSION

To improve and protect our community's quality of life and increase equitable opportunities for better health.

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Acronyms and Abbreviations

ADT	Average Daily Traffic
AERR	Air Emissions Reporting Rule
AP-42	Compilation of Air Pollutant Emissions Factors
AQMD	Washoe County Health District - Air Quality Management Division
AQS	Air Quality System
AVMT	Annual Vehicle Miles of Travel
CFR	Code of Federal Regulations
CAA	Clean Air Act
CERR	Consolidated Emission Reporting Rule
CM	Contingency Measure
CMTC	Contingency Measure Trigger Calculations
CO	Carbon Monoxide
COVID-19	CoronaVirus Disease of 2019
DBOH	District Board of Health
EC	Elemental Carbon
EE	Exceptional Event
EER	Exceptional Event Rule
EI	Emissions Inventory
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information Systems
HA 87	Hydrographic Area 87
HDDV	Heavy Duty Diesel Vehicle
HWDE	High Wind Dust Event
INI	Initial Notification
LVMT	Local Vehicle Miles Traveled
MA	Maintenance Area
MSA	Metropolitan Statistical Area
MPO	Metropolitan Planning Organization
µg/m^3	Micrograms per cubic meter
MOVES	MOtor Vehicle Emission Simulator
MVEB	Motor Vehicle Emissions Budget
NAAQS	National Ambient Air Quality Standards
NDOT	Nevada Department of Transportation
NSPS	New Source Performance Standard
NCore	National Core Multi-Pollutant Monitoring Station
NAA	Nonattainment area
NO	Nitrogen Oxide
NO2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NRS	Nevada Revised Statutes
OC	Organic Carbon
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 microns in aerodynamic diameter
PM_{10}	Particulate Matter less than or equal to 10 microns in aerodynamic diameter
POC	Parameter Occurrence Code
RTC	Regional Transportation Commission of Washoe County, Nevada
RTP	Regional Transportation Plan

RWC	Residential Wood Combustion
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Station
SCC	Source Classification Code
SPM	Special Purpose Monitoring
STN	Speciation Trends Network
TAZ	Transportation Analysis Zones
VMT	Vehicle Miles Traveled
WBD	Wood-burning device
WF	Wildfires
ZIP	Zone Improvement Plan

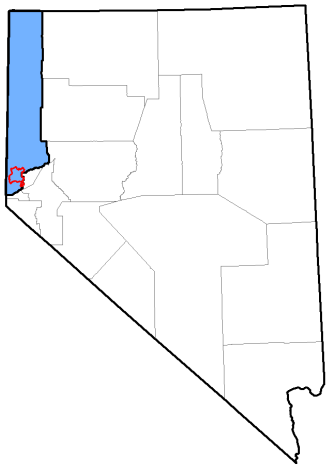
Introduction

The Washoe County Health District – Air Quality Management Division (AQMD) Maintenance Area (MA) has attained the 24-hour PM_{10} National Ambient Air Quality Standard (NAAQS) since 2011.[1] The Redesignation Request and Maintenance Plan for the Truckee Meadows PM_{10} Nonattainment Area (NAA) was submitted to the Environmental Protection Agency (EPA) on November 7, 2014, and the Truckee Meadows was redesignated to attainment status effective January 7, 2016.[2]

The Primary PM_{10} NAAQS is described as a 24-hour average of 150 µg/m^3 not to be exceeded more than once per year on average over a three-year period. A design value for PM_{10} can be determined using the method described in 40 CFR 50 Appendix K by summing the total exceedances of the PM_{10} NAAQS in a three-year period and dividing this total by three to obtain the average number of expected exceedances per year. For example, AQMD recorded a 2022 PM_{10} design value of 5.3 expected exceedances at the Toll State and Local Air Monitoring Station (SLAMS). This design value was found by adding the total exceedances of the 24-hour standard of 150 µg/m3 in 2020, 2021, and 2022, 16 total exceedances, and dividing this number of total exceedances by three to obtain the annual average of expected exceedances in this period, 5.3. With EPA concurrence of exceptional events demonstrations submitted concurrently with this Maintenance Plan (See Appendix G for an example), AQMD's PM_{10} design values will not be violating the Primary PM_{10} NAAQS. These exceptional events were initiated as a result of several wildfires in 2021 and 2022.

Washoe County is located in the northwest portion of Nevada and is bounded by the states of California, Oregon, and the counties of Humboldt, Pershing, Storey, Churchill, Lyon, and Carson City (Figure 1-1). The Truckee Meadows is approximately 200 square miles in size and situated in the southern portion of Washoe County. It is geographically identified as Hydrographic Area 87 (HA 87) as defined by the State of Nevada, Division of Water Resources. It is surrounded by mountain ranges, which can lead to wintertime temperature inversions. Much of Washoe County's urban population lives in the Truckee Meadows PM_{10} MA. Anthropogenic activities, such as automobile use and residential wood combustion (RWC), are also concentrated here.

Figure 1
Washoe County, Nevada



The Truckee Meadows PM_{10} MA covers an area governed by three political entities the County of Washoe, the City of Reno, and the City of Sparks. The AQMD is the designated agency responsible for air quality management throughout the entire county.

[1] 76 FR 21807
[2] 80 FR 76232

The three SLAMS found in the PM_{10} MA, Sparks (32-031-1005), Reno4 (32-031-0031), and Toll (32-031-0025), are currently violating the 24-hour PM_{10} NAAQS due to wildfire smoke impacts from the Antelope, Tamarack, Caldor, Dixie, and Mosquito Fires in the year 2021 and 2022. To exclude that data from planning and regulatory decision-making like a maintenance plan, four exceptional event demonstrations are being submitted concurrently with this Second 10-Year Maintenance Plan. Concurrence with these four exceptional event demonstrations by EPA would exclude 15 days from PM_{10} design value calculations resulting in expected exceedances of 1.0 or less for the MA PM_{10} monitors (See Table 9). To meet the criteria of an exceptional event, these wildfires must be unlikely to recur or were a natural event. All exceptional event demonstrations provided clear justification for exclusion of PM_{10} data. See Appendix G for an example of one of the exceptional event demonstrations.

This Maintenance Plan was prepared in accordance with Section 175A(b) of the Clean Air Act (CAA) which requires that eight years after redesignation of any area as an attainment area, an additional plan revision for maintaining the primary air quality standard for ten years after the expiration of the initial ten-year period must be submitted to EPA. This Maintenance Plan is being submitted prior to the expiration of the ten-year period. The plan demonstrates continued maintenance of the PM_{10} standards through 2036 with PM_{10} expected exceedances at all SLAMS in the MA of less than 1.0 (See Table 1 for a detailed timeline) This plan revises the Motor Vehicle Emissions Budget (MVEB) for 2025 and 2030 established in the first PM_{10} 10-year Maintenance Plan[2] and establishes a 2040 motor vehicle emissions budget of 4,609 pounds per day for the Truckee Meadows PM_{10} MA.

Table 1
Years Covered by the Washoe County PM_{10} Maintenance Plans
with Baseline and Projected Inventory Years

Years	Maintenance Plan	Baseline Inventory	Projected Inventory
2011		2011	
2012			
2013			
2014			
2015			
2016	1st 10-Year		2015
2017		2017	
2018			
2019			
2020			2020
2021			
2022			
2023			
2024			
2025			2025
2026	2nd 10-Year		
2027			
2028			
2029			
2030			2030
2031			
2032			
2033			
2035			
2036			
2037			
2038			
2039			
2040			2040

Maintenance Plan

In accordance with Section 175A(b) of the CAA, the AQMD has prepared and is submitting the Second 10-year Maintenance Plan eight years after the redesignation/maintenance plan was approved. The purpose of this revision is to provide for maintenance of the 24-hour PM_{10} NAAQS for an additional ten years following the first ten-year period. This maintenance plan meets Section 175A requirements by including the following core provisions to ensure continued maintenance of the 24-hour PM_{10} NAAQS and contains the following sections:

- General Conformity;
- Attainment Inventory;
- Maintenance Demonstration;
- Motor Vehicle Emissions Budget;
- Monitoring Network;
- Air Quality Trends;
- Verification of Continued Attainment
- Contingency Plan; and
- Public Review Process

General Conformity

General conformity is the federal regulatory process for preventing major federal actions or projects from interfering with air quality planning goals. Conformity provisions ensure that federal funding and approval are given only to those activities and projects that are consistent with state air quality implementation plans (SIPs). Conformity with the SIP means that major federal actions will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Current federal rules require that federal agencies use the emissions inventory from an approved SIP's attainment or maintenance demonstration to support a conformity determination. The emissions inventory in this second PM_{10} maintenance plan may be used for general conformity purposes. A detailed seasonal emissions inventory is provided in Appendix B as references for the future general conformity analysis.

Clean Air Act (CAA) Section 176 states that no federal department may engage in, support, provide financial assistance, license, or approve any activity that does not conform to an approved SIP. The United States Environmental Protection Agency (EPA) promulgated the conformity regulations for general federal actions (75 FR 17254; 40 CFR 51.851; 40 CFR 93 subpart B) under CAA section 176(c). The "General Conformity" Rule sets the requirements a federal agency must meet to make a conformity determination. General conformity does not allow federal agencies and departments to support or approve an action that does any of the following (40 CFR 93.153(g)(1)):

- Causes or contributes to new violations of any NAAQS in an area;
- Interfere with provisions in the applicable SIP for maintenance of any standard;
- Increases the frequency or severity of an existing violation of any NAAQS; or
- Delays timely attainment of any NAAQS or any required interim emission reductions or other milestone.

Examples of general federal actions that may require a conformity determination include, but are not limited to, the following: leasing of federal land, private construction on federal land, reuse of military bases, airport construction and expansions, construction of federal office buildings, and construction or modifications of dams or levees. These actions are further discussed in 40 CFR 93.153.

General conformity requirements (40 CFR 93.153) apply if direct or indirect emissions from a federal action has the potential to exceed the *de minimis* threshold levels established for each criteria or precursor pollutant in a nonattainment area or maintenance area. The thresholds are shown in 40 CFR 93.153(b)(1)(2). For a moderate PM_{10} nonattainment area and any PM_{10} maintenance area, the threshold level is 100 tons per year of PM_{10} or Nitrogen Oxides (NOx).

Direct emissions of a criteria pollutant or its precursors (40 CFR 93.152) are emissions that are caused or created by the federal action and occur at the same time and place as the action. Indirect emissions are reasonably foreseeable emissions that occur within the same nonattainment area as the project but are further removed from the federal action in time and/or distance and can be practicably controlled by the federal agency due to a continuing program responsibility (40 CFR 93.152). A federal agency can indirectly control emissions by placing conditions on federal approval or federal funding. There are certain federal actions listed in 40 CFR 93.153 (c)(2)(i-xxii) that would result in no emissions increase, or an increase in emissions that is clearly *de minimis*. These include but are not limited to continuing and recurring activities such as permit renewals where activities conducted will be similar in scope and operation to the activities currently being conducted, and rulemaking and policy development and issuance.

To meet the conformity determination emissions criteria, the total of direct and indirect emissions from a federal action must meet all relevant requirements and milestones contained in the applicable SIP (40 CFR 93.158(c)), and must meet other specified requirements, such as:

- For any criteria pollutant or precursor, the total of direct and indirect emissions from the action must be specifically identified and accounted for in the applicable SIP's attainment or maintenance demonstration (40 CFR 93.158(a)(1)); or
- For precursors of ozone, nitrogen dioxide, or particulate matter, the total of direct and indirect emissions from the action must be fully offset within the same nonattainment (or maintenance) area through a revision to the applicable SIP or a similarly enforceable emissions control measure in the SIP (40 CFR 93.158(a)(2)).

AQMD does not anticipate that general conformity will be triggered during the maintenance plan through 2036. If general conformity is triggered, the project would be required to reduce emissions to show that there is no emissions increase, or that those emissions are already accounted in the maintenance demonstration. No

additional emissions will be included in the Second Maintenance Plan for projects that would trigger general conformity thresholds.

Attainment Inventory

The AQMD developed a 1988 baseline emissions inventory as part of the "Moderate" PM_{10} NAA State Implementation Plan (SIP). The 1988 inventory was scaled up to 1990 levels using growth factors based on demographic and economic data. Since 1990, periodic emission inventories have been compiled on a triennial schedule. Although the most recent periodic emission inventory occurred in 2020, due to the Coronavirus Disease of 2019 (COVID-19) effect on emissions from all sources, the 2017 periodic emissions inventory will be used. Emissions during COVID-19 shutdowns were influenced not due to local, state, or federal emission control mitigation strategies or regulations. Subsequently, motor vehicle emissions and economic activity were also influenced due to the circumstances of these shutdowns. For these reasons, the 2020 emissions inventory should not be used to project future emissions for the purposes of this plan. Further, EPA recommended a previous emissions inventory to use as a baseline.

These inventories were prepared using EPA guidance and models. Past year periodic emissions inventories including 2017 are incorporated into the National Emissions Inventory[1] on a three-year schedule per 40 CFR 51.315. Seasonal emissions were derived using seasonal adjustment factors (SAFs) utilizing days, months, and activity/throughput for all source classification codes (SCC) and applying SAFs to annual emission totals. Residential Wood Combustion and Unpaved Roads emissions were recalculated using updated, more accurate methodologies and emissions factors (See Appendix C and E, respectively).

The on-road motor vehicles category incorporated the most recent planning assumptions for the transportation network including VMT and vehicle types and speeds. These planning assumptions were consistent with those used by the metropolitan planning organization (MPO) for their transportation plans. The designated MPO is the Regional Transportation Commission of Washoe County, Nevada (RTC). County VMT data is gathered through the Nevada Department of Transportation's (NDOT) Annual Vehicle Miles Travel (AVMT) Report for the first year in the Regional Transportation Plan (RTP). NDOT uses automated traffic recorders to measure the VMT for the year. RTC uses this data to project future year VMT using traffic surveys and the travel demand model. Local Vehicle Miles Traveled (LVMT) is defined as the travel that occurs on local roads. The NDOT AVMT Report calculates LVMT for Washoe County in the base year, RTC uses the ratio of travel on local roads from the AVMT report and the projected VMT from the travel demand model to project future year LVMT.

Precursor emissions of PM_{10} including VOCs, NOx, and SOx were determined to be negligible in the First 10-Year Maintenance Plan in reference to the 2011 emissions inventory. There have been no substantial changes to the emissions inventories or new

[1] 2017 National Emissions Inventory (NEI) Data. https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data. Accessed February 23, 2024

major sources within the MA for VOCs, NOx, and SOx since 2011. The current attainment SIP for PM_{10} includes control strategies for direct PM_{10} source categories that have continued to reduce emissions through the two 10-Year Maintenance Plans. Precursor sources have not been included in these source categories and are not correlated with reductions in PM_{10} emissions and ambient concentrations. Therefore, the impact of precursor emissions on the 2017 emissions inventory for PM_{10} is determined to be negligible for this Second 10-Year Maintenance Plan.

Areas near and upwind of the PM_{10} MA including surrounding hydrographic areas and buffer zone sources within 25 miles have a negligible contribution to ambient air concentrations of PM_{10}.

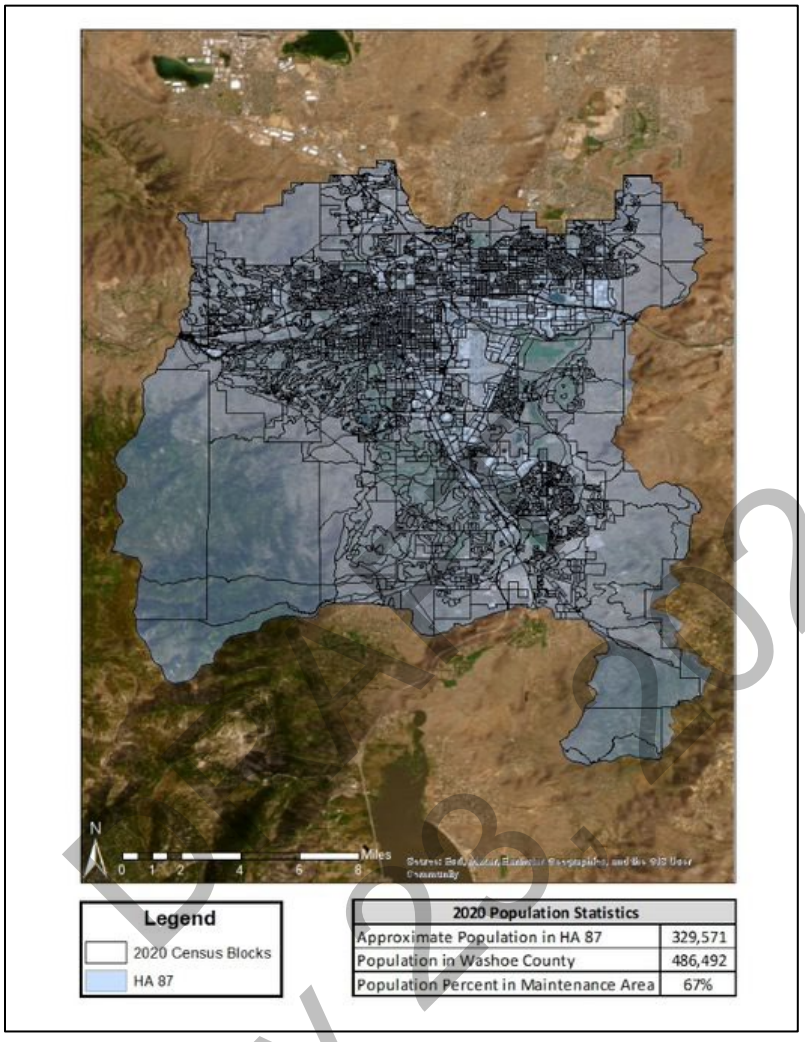
The data used to derive growth factors for estimating point and nonpoint source emissions were derived from the 2022 Washoe County Consensus Forecast data, National Climatic Data Center, and the 2018 Master Plan and Federal Aviation Administration data. On-road and non-road mobile source emissions for the 2017 EI were estimated using EPA's MOtor Vehicle Emission Simulator (MOVES2014b). The on-road mobile sources emissions were modeled by the RTC using MOVES3 for 2025, 2030, and 2040 and are found in the latest Regional Transportation Plan (RTP) adopted March 19, 2021. Each modeled year was done as a separate MOVES run and did not use 2020 as a baseline year to project future years.

Below is a summary of procedures used to ensure that PM_{10} emissions were calculated and apportioned accurately for the Truckee Meadows.

Point Sources: Latitude/Longitude coordinates are maintained for each point source. Geographic Information Systems (GIS) software (ArcMap Version 10.8.2) was used to overlay HA 87 onto all point sources to determine if it was to be included in the Truckee Meadows PM_{10} National Emissions Inventory.

Nonpoint Sources: Nonpoint sources with an AQMD operating permit are managed in the emissions inventory as if it were a point source (see above). Other nonpoint sources are grouped by source classification code (SCC) and assigned a surrogate, which is spatially representative of that process. Typical surrogates are population, dwelling units, employment, and VMT. Surrogates are spatially disaggregated into a variety of geographies such as census areas (blocks, block groups, and tracts), Transportation Analysis Zones (TAZ), and Zone Improvement Plan (ZIP) codes. GIS (ArcMap Version 10.8.2) is used to determine what portion of each surrogate is included in HA 87. This fraction is applied to county-level emissions for each SCC to determine Truckee Meadows PM_{10} emissions.

Figure 2
Population Estimate of Hydrographic Area 87 using 2020 Census Blocks



Non-Road Mobile Sources: Non-Road Mobile Sources are grouped by SCCs and assigned a surrogate which is spatially representative of that process. Surrogate fractions are applied to county-level emissions for each SCC to determine Truckee Meadows PM_{10} emissions.

On-Road Mobile Sources: The MPO manages the regional transportation demand model. The model includes planning assumptions, such as population and VMT, for each TAZ in the county. GIS software was used to overlay HA 87 onto all TAZs to determine if it was to be included in the Truckee Meadows PM_{10} emissions inventory. Data from TAZs within HA 87 were combined and incorporated into the MOVES3 model to calculate on-road mobile source PM_{10} emissions.

Table 2
Truckee Meadows PM_{10} Attainment Emission Inventory (lbs/day)

Category	2017 Attainment Inventory
Point	43
Nonpoint	8,324
Non-Road Mobile	743
On-Road Mobile	954
Total*	10,064

*Totals may not add up due to rounding.

Maintenance Demonstration

Maintaining the PM_{10} NAAQS may be demonstrated by showing that future emissions will not exceed the level of the attainment inventory. Also, attainment must be demonstrated for the 10-year period following EPA's approval action on this Second 10-year MA. This Maintenance Plan demonstrates attainment for the second 10-year period (2026-2036). This plan has set conformity budgets for years typically modeled by the MPO (e.g. 2025, 2030, 2040). Even through the 2040 motor vehicle emission budget extends beyond the Second Maintenance Plan period, AQMD does not intend to extend the period during which conformity is required beyond the 20-year period from the effective date of EPA's approval of the first 10-year maintenance plan.

Truckee Meadows Maintenance Emissions Limit

The 2017 periodic emissions inventory was used as a baseline to develop a maintenance emissions limit for the Truckee Meadows. This limit is the level considered to be sufficient to ensure continued attainment of the NAAQS in future planning years. Growth and control factors were applied to many of the emission categories of the 2017 inventory to generate a 2040 Truckee Meadows emissions budget. The growth factors were based on demographic, economic, VMT, and meteorological data (Appendix A, Table A-1), and the control factors were based on planned emission reduction strategies.

Wildfires within Washoe County have been occurring every emissions inventory year since 2011. To approximate expected wildfire emissions during the PM_{10} season within the Maintenance Area, an average of the four previous inventory years' (1999, 2002, 2005, and 2008) equaling 21 lbs/day of wildfire emissions was used for future projected year emissions of 2025, 2030, and 2040. The baseline year of 2017 used the actual 2017 emission inventory number of 26 lbs/day. The rationale is that wildfire emissions alone should not drive future year planning purposes. Any natural events that occur including wildfires that

result in PM_{10} exceedances and/or NAAQS violations will be treated as exceptional events and will be submitted to the EPA for exclusion if there is an affected regulatory decision.

Table 3
Historic Truckee Meadows PM_{10} Wildfire Emission Inventories (lbs/day)

Year	PM_{10} Emissions
1999	19
2002	40
2005	10
2008	15
2011	10,947
2014	15,610
2017	26
2020	1,238
Average (1999-2008)	**21**
Average (2011-2020)	**7,011**

The 2017 Truckee Meadows PM_{10} maintenance emissions limit will be identified as the attainment inventory because it:

- Uses the most accurate emissions inventory methodologies;
- Is a comprehensive and current emissions inventory;
- Identifies the level of emissions in the Truckee Meadows sufficient to maintain the NAAQS; and
- Will be the emissions inventory most consistent with the 2040 projected inventory required for demonstrating maintenance of the NAAQS.

Table 4
Truckee Meadows PM_{10} Emission Inventories (lbs/day)

Category	2017 Periodic Inventory	2017 Maintenance Emission Limit
Point	43	43
Nonpoint	8,329	8,324
Non-Road Mobile	743	743
On-Road Mobile	954	954
Total*	10,068	10,064

*Totals may not add up due to rounding.

Maintenance of the NAAQS

The projected 2040 emissions inventory used the 2017 Truckee Meadows Periodic Emissions Inventory as its baseline except for the wildfire category, which is explained in the previous section. Each of the emission categories in the 2017 Truckee Meadows emissions inventory (Appendix B) were projected to 2040 using one of the following EPA emission methodologies or models.

1. Baseline Emission Projections: Washoe County's 2040 population, employment, and VMT forecasts (Appendix A, Table A-1) were used as surrogates to project to the 2040 emissions. These forecasts were consistent with those used by the local MPO.

2. EPA Models: To ensure consistency throughout the maintenance demonstration period, the same models were used to estimate the 2040 inventory.

   The 2040 on-road vehicles category incorporated the latest planning assumptions of the transportation network including VMT, vehicle speeds, and vehicle population for passenger cars and trucks. As with the previous periodic emission inventories, these planning assumptions were consistent with those used by the MPO for their transportation plans.

3. Emissions Category Surveys: Residential wood combustion (RWC) is a significant source of PM_{10} emissions. The RWC category is updated on a regular basis via an emission category survey. As part of the PM_{10} maintenance plan SIP, the AQMD is committed to conducting this survey at least once every three years. See Appendix C for the methodology used to estimate seasonal emissions from RWC.

Table 5 lists the 2017 Truckee Meadows Maintenance Emissions Limit and the 2025, 2030, and 2040 projected emissions for the four major PM_{10} emissions categories. A more detailed inventory can be found in Appendix B.

Table 5
Truckee Meadows PM_{10} Maintenance Area Emissions Projections
(lbs / Typical PM_{10} Season Day)

Category	2017*	2025	2030	2040
Point	43	41	57	69
Nonpoint	8,324	8,202	8,140	7,824
Non-Road Mobile	743	321	299	274
On-Road Mobile	954	643	665	706
Total**	10,064	9,207	9,160	8,891

* Truckee Meadows Maintenance Emissions Limit.
** Totals may not add up due to rounding.

Summary

Population, households, employment, and VMT are projected to increase through 2040. Federally enforceable PM_{10} control programs targeting mobile sources and RWC will help offset this growth. Because future emissions are not projected to exceed the level of the 2017 Truckee Meadows Maintenance Emissions Limit, the 24-hour PM_{10} NAAQS will be maintained through the remaining portion of the attainment demonstration period.

Motor Vehicles Emissions Budget

Transportation conformity is required by Section 176(c) of the CAA. Under EPA's transportation conformity regulations, transportation plans and improvement programs must be consistent with, or conform to, the motor vehicle emissions budget (MVEB) defined in the applicable SIP. These budgets specify the level of the on-road motor vehicle emissions that are consistent with attainment and maintenance of air quality standards and should include an adequate safety margin (40 CFR 93.101).

The MVEB includes on-road vehicles, road construction, paved and unpaved road fugitives, and a safety margin. HDDV idling has been incorporated with on-road vehicles. The safety margin is the excess emissions between the total projected emissions for a specific year and the 2017 maintenance emissions limit (Table 6).

Table 6
Truckee Meadows PM_{10} Safety Margin (lbs/day)

Category	2025	2030	2040
2017 Maintenance Emissions Limit	10,064	10,064	10,064
PM_{10} Maintenance Emissions Inventory	9,207	9,160	8,891
Safety Margin	857	904	1,173

The MVEB is set at a level that keeps the intermediate (2025 and 2030) and horizon year (2040) MA emissions less than the 2017 Truckee Meadows maintenance emissions limit. Because the seasonal 24-hour max concentration for PM_{10} in 2017 was 17% below the PM_{10} NAAQS, there is an extra factor of safety built into the MVEB. Transportation conformity ends at the end of this 10-year maintenance plan in 2036 even though the horizon year of this plan is 2040. For years beyond 2040, the MVEB will remain at the 2040 level of 4,609 lbs/day (Table 7). Because of significant updates to emission models, emission methodologies, and planning assumptions, this MVEB will replace the 2025 and 2030 MVEB projections that EPA approved in the first 10-year maintenance plan for PM_{10}. Specifically, The MVEB set for 2025 and 2030 in this plan differs from the values from the first 10-year PM_{10} maintenance plan due to updates in calculation methodologies, updates to emission factors, and updates to performance standards for certain source types such as motor vehicles and woodstoves.

Consultation among federal, state of Nevada, and local agencies occurred during the development of this motor vehicle emissions budget. The Air Quality Interagency Consultation Group which consists of representatives from EPA, RTC, Nevada Department of Environmental Protection, Federal Highway Administration, and Nevada Department of Transportation meet on a quarterly basis. The September 19, 2023 meeting had a presentation by AQMD staff about the maintenance plan and solicited public comment from the representatives. Prior to this meeting, RTC and EPA were both consulted for a preliminary review. AQMD initiated monthly meetings with EPA for exceptional event demonstrations and this maintenance plan.

Table 7
Truckee Meadows PM_{10} MVEB (lbs/day)

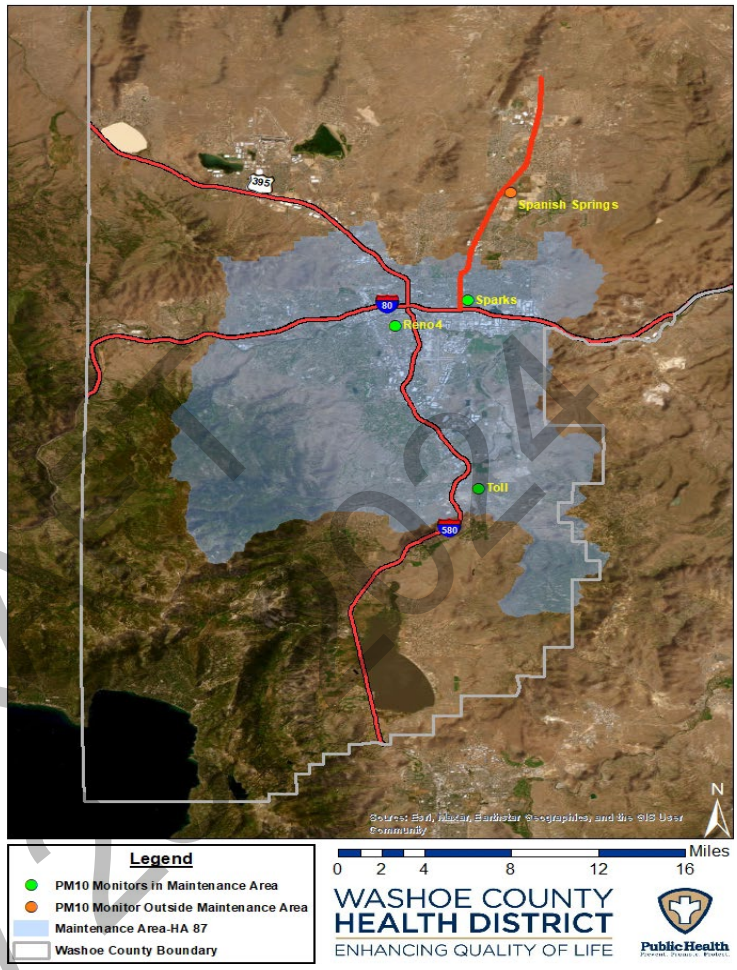
Category	2017	2025	2030	2040
Road Construction	505	253	269	285
Paved Roads - Fugitives	1409	1,767	1,870	2,015
Unpaved Roads - Fugitives	763	742	653	430
On-Road Vehicles	954	643	665	706
Safety Margin	N/A	857	904	1,173
Motor Vehicle Emissions Budget	N/A	4,262	4,361	4,609

A significant decrease in emissions between 2017 and the rest of the years of the plan for source categories such as road construction, paved road (sanding and salting), on-road vehicles, and non-road mobile sources are explained as follows. The year of 2017 was an abnormally large year for road construction in the Maintenance Area due to the creation of a major arterial road known as Veterans Parkway. This scale of project is not expected to be repeated within the Maintenance Area. The year of 2017 also experienced above average snowfall, causing more emissions from paved road (sanding and salting). This source category is projected using historical averages for snowfall within the Maintenance Area. On-road vehicle emissions and non-road mobile sources are both estimated using MOVES for the baseline year and projected years. Any decrease in emissions from these source categories can be attributed to EPA regulations and EPA assumptions such as the market penetration of electric vehicles, the market penetration of electric non-road equipment, or updated motor vehicle tailpipe emissions standards.

Monitoring Network

The PM_{10} MA has continued to maintain the PM_{10} NAAQS. The AQMD has and will continue to operate an appropriate PM_{10} monitoring network, in accordance with 40 CFR 58, to verify the attainment status of the area. In addition, AQMD's PM_{10} monitoring network will be reviewed annually pursuant to 40 CFR 58.10 to ensure the network meets all relevant monitoring requirements defined in 40 CFR 58.

Figure 3
Current Washoe County PM_{10} Monitors



All PM_{10} monitors are located within the Reno-Sparks Metropolitan Statistical Area (MSA) which includes Washoe and Storey Counties. Title 40 CFR 58, Appendix D, Section 4.6 specifies PM_{10} monitoring requirements in MSAs based on population and design values. The number of PM_{10} stations in an area where MSA population are from 500,000 to 1,000,000 must be in the range of 4 to 8 stations, depending on ambient concentration levels. The Reno-Sparks MSA population is 506,062 according to Table 5 of the 2023 Ambient Air Monitoring Network Plan.[1] Currently, there are 4 active PM_{10} monitors. An additional PM_{10} monitor will be added in calendar year 2025 (Verdi SLAMS) which will be in the MSA and outside of the MA as detailed in the 2023 Ambient Air Monitoring Network Plan and the 2020 Ambient Air Monitoring Network Assessment. [2]

Ambient PM_{10} monitoring data will continue to be collected and quality assured in accordance with 40 CFR 58, recorded in the Air Quality System (AQS), and made available for public review via **AirNow** and **AirData** on a near-real time and monthly

[1] Washoe County 2023 Ambient Air Monitoring Annual Network Plan. Air Quality Monitoring Webpage. (https://www.nnph.org/programs-and-services/air-quality/Monitoring.php). Accessed February 20, 2024

[2] Washoe County 2020 Ambient Air Monitoring Network Assessment. Air Quality Monitoring Webpage. (https://www.nnph.org/programs-and-services/air-quality/Monitoring.php). Accessed February 20, 2024

basis, respectively. Annually, AQMD publishes on OurCleanAir.com a Trends Report[1] detailing all criteria air pollutant trends and previous year high values. Table 8 lists the active PM_{10} monitors that AQMD currently operates as of December 2023. The MA monitors in Figure 3 and Table 8 are all primary, continuous Federal Equivalent Method (FEM) that are comparable to the NAAQS. The Federal Reference Method (FRM) monitor within the MA at Reno4 is used to satisfy the collocation requirements for NCore stations and is not used to compare to the NAAQS. There are no expected changes to the PM_{10} monitoring network within the MA during this Second 10-Year Maintenance Plan. If any changes to the monitoring network are needed, AQMD will submit a network modification request pursuant to 40 CFR 58.14.

Table 8
Active AQMD PM_{10} Monitors

Monitor AQS ID	Station Name	Station Address	City	Monitoring Method
32-031-0031-1*	Reno4	1260-A Stewart St.	Reno	FRM
32-031-0031-2	Reno4	1260-A Stewart St.	Reno	FEM
32-031-1007-1**	Spanish Springs	7200 Pyramid Wy.	Sparks	FEM
32-031-1005-4	Sparks	750 4th St.	Sparks	FEM
32-031-0025-2	Toll	684A State Route 341	Reno	FEM

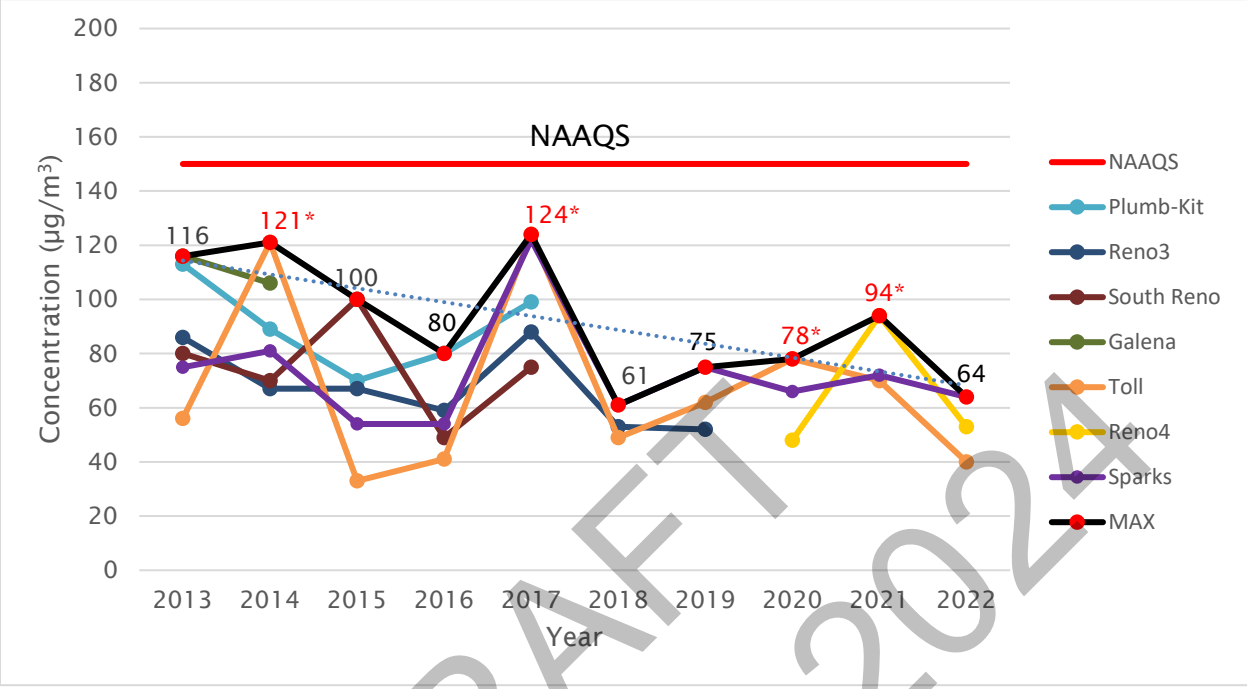
*Monitor not comparable to NAAQS
**Monitor outside of the PM_{10} MA

Air Quality Trends

Ambient air quality data for PM_{10} is collected through the air monitoring network described in the previous section. The continuous PM_{10} data is expressed as 24-hour averages in order to compare the data with the 24-hour PM_{10} NAAQS. This section discusses the 24-hour seasonal PM_{10} concentrations from the monitoring stations within the Truckee Meadows Maintenance Area. The PM_{10} season for HA 87 is January, November, and December. Figure 4 shows the maximum 24-hour average PM_{10} concentrations between 2011 and 2022 during these three months.

[1] Air Quality Management Reports and Data Webpage (https://www.nnph.org/programs-and-services/air-quality/air-quality-reports-and-data.php). Accessed February 16, 2024

Figure 4
Truckee Meadows Maximum PM_{10} 24-Hour Concentrations
Seasonal Trend (Jan., Nov., Dec.)



*High Wind affected days flagged using IJ Qualifier Code in AQS.

Verification of Continued Attainment

As described in the previous section, the AQMD will continue to operate and maintain an appropriate PM_{10} monitoring network. Ambient air monitoring data will be used to verify attainment and maintenance of the 24-hour PM_{10} NAAQS. Below, Table 9 shows 2022 PM_{10} design values with and without concurrence of Exceptional Event Demonstrations submitted concurrently with this Maintenance Plan of all SLAMS operated by AQMD in the MA. Table 10 shows design values for each monitoring site in the MA for the first 10-year maintenance period. Table 11 shows all 24-hour PM_{10} exceedances at each site, the date in which it was recorded, and their concentrations. Upon concurrence of the four exceptional events demonstrations, these tables show continued attainment of the PM_{10} NAAQS in the MA.

Table 9
2022 (current) PM_{10} Design Values in MA With and Without Exceptional Event Concurrence

Monitor (AQS ID and POC)	Design Value (without EPA concurrence on any of the exceptional events submitted concurrently with this Plan)	Design Value (with EPA concurrence on all exceptional events submitted concurrently with this plan)
Toll (32-031-0025-81102-2)	5.3 expected exceedances	1.0 expected exceedances
Sparks (32-031-1005-81102-4)	3.0 expected exceedances	1.0 expected exceedances
Reno4 (32-031-0031-81102-2)	3.7 expected exceedances	1.0 expected exceedances

Table 10
Design Values for First 10-Year Maintenance Period

Monitor (AQS ID and POC)	2016	2017	2018	2019	2020	2021	2022
Toll (32-031-0025-81102-2)	0.3	0.3	0.0	0.0	1.0	4.0	5.3
Sparks (32-031-1005-81102-4)	0.0	0.0	0.0	0.0	1.0	2.7	3.0
Reno4 (32-031-0031-81102-2)	n/a	n/a	n/a	n/a	0.3*	2.7**	3.7
Reno3 (32-031-0016-81102-1)	0.0	0.0	0.0	0.0	n/a	n/a	n/a
Plumb/Kit (32-031-0030-81102-1)	0.0	0.0	n/a	n/a	n/a	n/a	n/a
South Reno (32-031-0020-81102-2)	0.0	0.0	n/a	n/a	n/a	n/a	n/a

*Only one valid year of monitoring data
**Only two valid years of monitoring data
Yellow cells indicate a violating design value

Table 11
All Exceedances at All Sites in the MA and Their Concentrations for the First 10-Year Maintenance Period (µg/m³)

	Toll	Sparks	Reno4	Reno3	Plumb/Kit	South Reno	Galletti
2014	-	-		-	-	-	09/18 159
2015	02/06 155	-		-	-	-	
2016	-	-		-	-	-	
2017	-	-		-	-	-	
2018	-	-		-			
2019	-	-		-			
2020	09/08 192	09/08 194	09/08 196				
	09/15 158	09/12 177	-				
	09/16 156	09/13 175	-				
2021	08/06 156	07/26 174	07/26 171				
	08/17 161	08/07 163	08/07 198				
	08/20 176	08/21 190	08/21 200				
	08/21 204	08/23 214	08/22 210				
	08/22 261	08/24 168	08/23 304				
	08/23 319	-	08/24 233				
	08/24 284	-	08/25 164				
	08/25 211	-	-				
	08/26 174	-	-				
2022	09/11 173	09/14 231	09/14 177				
	09/14 187	-	09/15 162				
	09/15 230	-	09/16 220				
	09/16 192	-	-				

Grayed out cells indicate no data captured during that year due to discontinuation of the monitor (see Appendix H for all applicable monitoring network modifications completed in accordance with 40 CFR 58.14 during this period). Blacked out cells indicate years prior to a monitor being active. In this case, Reno4 started on January 1, 2020.

Tracking actual emissions can identify potential increases in ambient PM_{10} levels. The AQMD has three existing mechanisms to track emissions. These mechanisms, listed below, will remain in place, and be used to screen for significant increases in actual PM_{10} emissions.

1. Periodic Emissions Inventories: The AQMD will continue to prepare, and submit to EPA, comprehensive periodic PM_{10} emissions inventories on a triennial schedule. The last periodic emissions inventory was prepared for calendar year 2020.
2. Consolidated Emissions Reporting Rule (CERR) and Air Emissions Reporting Rule (AERR): The CERR and AERR simplify and streamline emissions reporting requirements. It requires regular updates of point and area sources within Washoe County. The AQMD will continue to meet the requirements of the CERR and AERR.
3. Residential Wood Use Survey: Residential wood combustion is a significant PM_{10} source during the winter season. The AQMD has completed twelve residential wood use surveys between 1993 and 2022. These surveys estimated the device (fireplaces, woodstoves, and pellet stoves) population, amount of wood burned, and PM_{10} emissions in Washoe County. As part of this maintenance plan, as well as the carbon monoxide (CO) maintenance plan, the AQMD is committed to conducting this survey at least once every three years.

AQMD's Compliance Branch will continue to ensure compliance with our federally enforceable, local air quality regulations. Compliance staff will inspect for permit conditions, respond to complaints, and patrol and enforce emergency episode curtailments in the wintertime. Cases of non-compliance are assembled by the compliance staff for the Enforcement Panel to make a penalty recommendation to the District Board of Health.

When wintertime curtailments are issued by the District Health Officer (Control Officer), the compliance staff will patrol neighborhoods for visible smoke from chimneys. They also respond to complaints made by the public during those curtailments. If continued non-compliance is observed from the homeowner or permittee during curtailments, penalties may be assessed.

The new source performance standard[1] (NSPS) for wood-burning devices (WBD) resulted in a local rule revision to AQMD's local regulation (DBOH Regulations Governing Air Quality Management **PART 040.051**) that further strengthened with replacement of older, higher emitting WBDs with cleaner burning devices upon home transaction and

[1] **85 FR 18448**

limiting installation of new WBDs that meet the 2020 NSPS within HA 87 to property sizes greater than one acre.

AQMD's Street Sanding and Sweeping Program (DBOH Regulations Governing Air Quality Management **PARTS 040.031** and **040.032**) is another component to control PM_{10}. Each jurisdiction (City of Reno, City of Sparks, Washoe County, and NDOT) is required to submit its sanding and sweeping report on an annual basis by June 30, which includes date of each storm event, amount of sand and salt or brine applied to roadways, as well as the sand pick up date after each storm event.

There has been a gradual shift over the last several years from sand to more brine solutions for roadway deicing. The shift was in part due to the proactive approach taken by the jurisdictions to apply the brine solutions before an impending storm to prevent accidents. In doing so, it also saves vehicle fuel, reduces emissions, and lowers the need for manpower and time associated with sand removal after a storm event. Continued ambient air monitoring, emissions tracking, and enforcement will ensure verification of continued attainment and maintenance of the 24-hour PM_{10} NAAQS for this category of seasonal emissions.

Contingency Plan

Section 175A of the CAA requires that a maintenance plan include contingency provisions, as necessary, to promptly correct any violation of the PM_{10} NAAQS that occurs after redesignation of the area. The plan should clearly identify:

- Specific indicators, or triggers, which will be used to determine when contingency measures need to be implemented;
- The contingency measures to be adopted;
- A schedule and procedure for adoption and implementation; and
- A specific time limit for action.

Contingency provisions are traditionally held in reserve and are implemented only if air quality deteriorates beyond a specific level. In general, exceedances or violations of the PM_{10} NAAQS are acceptable triggers for contingency plan implementation. Under this contingency plan trigger process, implementation of the contingency plan will be required when the number of exceedances recorded at a monitor averaged over three consecutive years, is greater than 1.05. The contingency plan trigger process, however, allows an exceedance to be excluded from this calculation. There may be exceedances of the PM_{10} NAAQS caused by high wind dust events (HWDE) or wildfires (WF), despite the implementation of reasonable controls. All ambient air quality data including PM_{10} will be reviewed every quarter no later than two weeks prior to the quarterly data submittal deadlines as described in 40 CFR 58.16(b) as a part of the Quality Assurance (QA) quarterly review conducted by the QA Manager as described in the Quality Assurance Project Plan (QAPP) approved by EPA on December 10, 2019. This review includes AQS reports to ensure data completeness and data quality indicators are met and exceedances are documented. Hourly or daily NAAQS violations will be determined during these quarterly reviews. Annual NAAQS violations are determined during annual data certification which is no later than May 1 of the following year.

To ensure appropriate implementation of the contingency plan, the following process will be used for evaluating the exclusion of particular NAAQS exceedance due to HWDE or WF events from contingency measure trigger calculations (CMTC) that determine when the trigger for contingency measures (CM) has occurred. AQMD will submit to EPA an exclusion request for an exceedance that AQMD is proposing to exclude from CMTC and that AQMD believes meet the CMTC exclusion screening criteria set forth below. Exceedances proposed for exclusion need to have been flagged with exceptional events flags in AQS. The exclusion request shall contain the following elements:

- For each group of exceedances associated with an "event" proposed to be excluded, a brief description of the event, including event type: WF or HWDE. An event cannot be a hybrid type: WF and HWDE.
- Identification of the dates, monitors, and air pollutant concentrations to be excluded. This should be in the same format as for Initial Notification of Potential Exceptional Event (EE/INI). If the exceedance was already listed in an EE/INI submitted to EPA, attach that EE/INI.
- Information describing how the exceedance(s) meet the CMTC exclusion screening criteria.

Upon receipt of the exclusion request, EPA will review the request and provide a response. The response will comprise:

- A request for additional information; or
- EPA's agreement for exclusion of one or more of the requested exceedances; or
- EPA's rejection of exclusion of one or more of the requested exceedances.

EPA's agreement for exclusion of an exceedance from the CMTC does not constitute concurrence that the exceedance was caused by an EE.

If AQMD disagrees with EPA's rejection of a requested exceedance, AQMD may submit an EE demonstration. While EPA is reviewing the full EE demonstration, the AQMD will proceed with the contingency process (with the exceedance included in the CMTC) due to the time requirements of the full EE process. EPA's review of the EE demonstration will result in the following:

- If EPA reviews and concurs with the EE demonstration, the exceedance is not included in the CMTC.
- If EPA reviews and does not concur with the EE demonstration, the exceedance is included in the CMTC.

<u>Evaluation of Potential HWDE Events to Exclude from CMTC</u>

No later than 90 days after the conclusion of each calendar quarter, AQMD will submit to EPA the exclusion request for any proposed exceedances that occurred during the

previous quarter or notify EPA that no exceedance occurred. EPA will review and respond to the exclusion request, as described above.
HWDE CMTC Exclusion Screening Criteria:

- Where there were multiple monitors in the specified area(s), whether there were exceedances at multiple monitors in the specified areas indicating it's a regional event, hourly and 24-hour average concentrations (i.e. > 2 monitors/exceedance day);
- Wind speed ≥ 25 mph in vicinity of exceeding monitors and/or in source area (if source area is sufficiently distant from the area with the exceeding monitors) with increase in hourly PM_{10}.
  - Can be supported by wind speed/direction and HYSPLIT showing the dust was transported to the monitor;
  - NOAA LCD/NWS hourly observation tables
  - If using met data from the monitors, the wind speed shall be averaged at 2-min or greater
- Spatial/temporal consistency of reduced visibility (< 10 miles) and increase in hourly PM_{10}.
- Issuance of NWS advisories or warnings in the specified forecast areas consistent with increase in hourly PM_{10}.
- Summaries of dust complaints and/or notice of violations (e.g., no dust complaints are received, or supporting information that dust complaints do not involve anthropogenic source(s) located upwind of an exceeding monitor).
- If any of the above five criteria is not met, or if other available data contradict the assessment, prior to submittal of the exclusion request, AQMD will confer with EPA to discuss possible additional information and analysis to include in the exclusion request to support exclusion of the exceedance. This additional information and analysis might include:
  - More detailed analysis of upwind wind speed and direction;
  - Additional PM_{10} and/or $PM_{2.5}$ concentrations from non-regulatory monitors in the area;
  - Additional HYSPLIT back-trajectory analysis;
  - satellite image or remote sensing analysis;
  - an evaluation of upwind source area (including further evaluation of dust complaints/NOVs or known contributing anthropogenic sources);
  - PM speciation or $PM_{10}/PM_{2.5}$ ratio analysis; and/or
  - other event specific analysis needed to appropriately determine cause of exceedance.

<u>Evaluation of Potential WF Events to Exclude from CMTC</u>

No later than 90 days after the conclusion of each calendar quarter, AQMD will submit to EPA the exclusion request for any proposed exceedances that occurred during the previous quarter or notify EPA that no exceedance occurred. EPA will review and respond to the exclusion request, as described above.
WF CMTC Exclusion Screening Criteria:

- Specifically named fires and locations of the fires for those days, description of surface and met conditions during the event.
- Evidence of impact on the ground (PM_{10} concentration clearly higher than non-event related concentrations, PM concentrations for each day and how they compare to historical PM concentrations for that season, e.g., what percentile are they).
- Evidence of fire emissions transport (some examples may include: HYSPLIT trajectory analysis or satellite plume imagery, upwind wind speed and direction, smoke map progression).
- Issuance of NWS advisories or warnings in the specified forecast areas consistent with increase in concentration.
- Spatial/temporal consistency between supposed arrival of fire emissions and increase in PM_{10} concentrations based on one or more WF indicators (e.g. NO, NO2, CO/NOx ratios, CO/PM_{10} ratios, PM_{10}/$PM_{2.5}$ ratios, OC/EC ratios, PM speciation data).
- If any of the above criteria is not met, or if other available data contradict the assessment, prior to submittal of the exclusion request, AQMD will confer with EPA to discuss possible additional information and analysis to include in the exclusion request to support exclusion of the exceedance. This additional information and analysis might include:
  - Additional PM_{10} and/or $PM_{2.5}$ concentrations from non-regulatory monitors in the area;
  - Additional HYSPLIT back/forward-trajectory analysis;
  - satellite image or remote sensing analysis;
  - Q/D (ratio of fire emissions/distance) ≥ 100 tpd/km.)

If monitoring data indicates a PM_{10} violation, then the Contingency Plan begins control measure development and implementation.

Contingency Plan

Trigger Mechanism: A violation of the 24-hour PM_{10} NAAQS verified from any SLAMS, SPM, or NCore site operated by the AQMD that is not determined to be the result of an exceedance due to an exceptional event. Violation of the NAAQS is defined as when the expected number of days per calendar year with a 24-hour concentration above 150 $\mu g/m^3$, as determined in accordance with 40 CFR 50, Appendix K, is greater than one.

Contingency Measure: The AQMD will maintain a list of potential contingency measures and provide recommendations for implementation to the DBOH. Recommendations to the DBOH shall occur at their next regularly scheduled meeting, but no later than 45 days after reaching Trigger Mechanism levels. The recommendations will also include a timeline for adoption and implementation. Contingency measures recommended to the DBOH shall be adopted and implemented as promptly and expediently as possible. Any rule revision should be adopted and implemented before the next PM_{10} season (November, December, and January). Prompt action and implementation of contingency measures may prevent future exceedances and violations of the PM_{10} NAAQS.

The list of potential contingency measures will concentrate on the significant emission categories impacting PM_{10} season emissions. Table 12 summarizes the current list. Because of changes in growth and technology, the effectiveness of each measure may vary over time. A triennial review and reprioritization of the measures in coordination with the periodic PM_{10} emissions inventory should be adequate to anticipate the need for additional emission reductions. In addition, the EPA Regional Office will be notified within 30 days of implementation of Contingency Measure.

Should a contingency measure be inadequate or not listed, and Washoe County has jurisdiction and authority to control the source of a PM_{10} NAAQS violation, this maintenance plan and/or revise the Washoe County Portion of the Nevada SIP to allow for the control of that source.

Table 12
Potential PM_{10} Contingency Measures

Emission Category	Potential Contingency Measure
Paved Roads	• Increase stringency of street sanding and sweeping programs • Transportation control measures to reduce VMT
Unpaved Roads	• Improve unpaved roads and shoulders • Post speed limits to decrease vehicle speeds • Restrict access to decrease ADT and VMT
Dust Control	• Phased mass grading • Mass grading allocation system • Stabilize projects during PM_{10} season • Decrease one acre dust control permit exemption
Residential Wood Combustion	• Increase one acre lot size exemption • Mandatory curtailment at lower PM_{10} concentrations • Change-out program to cleaner burning device
Mobile Sources (Diesel)	• Non-road & on-road diesel engine repowers and rebuilds • Non-road & on-road diesel tailpipe controls • Truck Stop Electrification systems for heavy-duty vehicles • Fleet modernization • More stringent inspection & maintenance program of light-duty, medium-duty vehicles, and heavy-duty vehicles

Summary

The AQMD Contingency Plan meets Condition 5.e of the Calcagni Memorandum[1] by promptly and expediently addressing future exceedances of the PM_{10} NAAQS with clearly defined trigger mechanisms, contingency measures, adoption schedules, and implementation schedules.

Public Review Process

AQMD will hold a 30-day public comment period for this Second 10-Year Maintenance Plan. AQMD will post a public notice requesting comments on OurCleanAir.com and via AQMD's listserv email with a link to an electronic copy of this Second 10-Year Maintenance Plan. The notice will detail the 30 days in which the public can review this Second 10-Year Maintenance Plan and the public hearing and potential adoption date by the District Board of Health. The public hearing and adoption will also be publicly noticed in the Reno Gazette Journal newspaper three times prior to the public hearing and adoption as required by the Nevada Revised Statutes (NRS) Chapter 238 – Legal Notices and Advertisements.

[1] "Procedures for Processing Requests to Redesignate Areas to Attainment." John Calcagni, Director. Air Quality Management Division (MD-15). September 4, 1992. https://www.epa.gov/ground-level-ozone-pollution/procedures-processing-requests-redesignate-areas-attainment. Accessed August 10, 2023

Appendix A

Growth Factors for Emissions Projections

Appropriate and reasonable growth and control assumptions ensure that planning emissions for 2017 through 2040 are realistically projected. Control factors were developed based on historic data and reasonable assumptions.

Growth and control factors for each emission category are listed in Table A-1. Detailed data for the growth factors are further listed. Portions of the growth factors are based on various data from the Washoe County Consensus Forecast, used by the MPO in the 2050 RTP. Airport passenger data was from the 2018 Master Plan and Federal Aviation Administration data. Population and employment data are not specifically included in the main body of the RTP, but were used as inputs for the transportation model that generates VMT data.

The historic climatic data were obtained from the National Oceanic and Atmospheric Agency, with future data based on 15-year normal averages between 2006 and 2020 for January, November, and December.

Growth rates for population and households for 2017 are from the Nevada State Demographer. Growth rates for employment for 2017 are from the Nevada Department of Employment, Training, and Rehabilitation.

Population residing within HA 87 calculated to be 67% based on 2020 Census block data (See Figure 2).

Data for 2020 are listed, but not included in the growth rate calculation and projections due to impacts from the COVID-19 pandemic.

Table A-1
Growth Factors for 2025-2040 Projection for the Truckee Meadows Hydrographic Area

Growth Factors	2017	2020	2025	2030	2040	Reference
Uniform (UNI)	1.000		1.000	1.000	1.000	---
Vehicle Miles Traveled (VMT)	5,862,502	6,728,714	7,165,610	7,539,191	8,179,769	
Ratio using 2017 Baseline	1.000		1.222	1.286	1.395	RTC of Washoe County; "2050 Regional Transportation Plan." Table C-5. December 22, 2022
						NDOT AVMT 2017 & 2020 Reports
Local Vehicle Miles Traveled (LVMT)	674,447	777,981	828,495	871,689	945,753	
Ratio using 2017 Baseline	1.000		1.228	1.292	1.402	RTC of Washoe County; "2050 Regional Transportation Plan." Table C-5. December 22, 2022
						NDOT AVMT 2017 & 2020 Reports
Population (POP)	302,788	329,571	340,109	358,534	388,391	
Ratio using 2017 Baseline	1.000		1.123	1.184	1.283	2022 WC Consensus data, as interpreted by RTC of Washoe County; "2050 Regional Transportation Plan", December 22, 2022
Annual Population Growth Rate (PGR)	1.018		1.006	1.011	1.008	
Ratio using 2017 Baseline	1.000		0.989	0.993	0.990	2022 WC Consensus data, as interpreted by RTC of Washoe County; "2050 Regional Transportation Plan", December 22, 2022
Households (HH)	123,085	133,972	138,256	145,745	157,883	
Ratio using 2017 Baseline	1.000		1.123	1.184	1.283	2022 WC Consensus data. Population per Household (PPH) is 2.46
Annual Household Growth Rate (HHGR)	1.018		1.006	1.011	1.008	
Ratio using 2017 Baseline	1.000		0.989	0.993	0.990	2022 WC Consensus data, as interpreted by RTC of Washoe County; "2050 Regional Transportation Plan", December 22, 2022
Employment (EMP)	268,372	291,431	327,485	343,713	373,604	
Ratio using 2017 Baseline	1.000		1.220	1.281	1.392	2022 WC Consensus data
Annual Employment Growth Rate (EGR)	1.020		1.025	1.010	1.009	
Ratio using 2017 Baseline	1.000		1.005	0.990	0.989	2022 WC Consensus data
Ag/Mining/Constr Employment (AMC)	14,590	14,878	15,594	16,404	17,391	
Ratio using 2017 Baseline	1.000		1.069	1.124	1.192	TAZ based employment data wtihin HA 87 used by RTC of Washoe County in the "2050 Regional Transportation Plan," December 22, 2022
AMC Emp Growth Rate (AMCGR)	1.009		1.010	1.010	1.006	
Ratio using 2017 Baseline	1.000		1.001	1.002	0.997	TAZ based employment data wtihin HA 87 used by RTC of Washoe County in the "2050 Regional Transportation Plan," December 22, 2022
Mfg/Trans/Com/Util/wholesale (MTCUW)	25,975	26,502	27,847	29,214	31,124	
Ratio using 2017 Baseline	1.000		1.072	1.125	1.198	TAZ based employment data wtihin HA 87 used by RTC of Washoe County in the "2050 Regional Transportation Plan," December 22, 2022
MTCUW Emp Growth Rate (MTCUWGR)	1.009		1.010	1.010	1.007	
Ratio using 2017 Baseline	1.000		1.001	1.001	0.998	TAZ based employment data wtihin HA 87 used by RTC of Washoe County in the "2050 Regional Transportation Plan," December 22, 2022
Service & Office Emp (SVCOF)	82,981	85,169	89,631	92,926	101,242	
Ratio using 2017 Baseline	1.000		1.080	1.120	1.220	TAZ based employment data wtihin HA 87 used by RTC of Washoe County in the "2050 Regional Transportation Plan," December 22, 2022
SVCOF Emp Growth Rate (SVCOGR)	1.010		1.010	1.007	1.009	
Ratio using 2017 Baseline	1.000		1.000	0.997	0.999	TAZ based employment data wtihin HA 87 used by RTC of Washoe County in the "2050 Regional Transportation Plan," December 22, 2022
RNO Airport Passenger (AP)	4,015,381	1,953,874	3,563,570	5,320,000	6,660,000	
Ratio using 2017 Baseline	1.000		0.887	1.325	1.659	Reno-Tahoe Airport Authority 2018 Master Plan and Federal Aviation Administration data.
						2017 & 2020 is actual data, the rest projected
Airport Passenger Growth Rate (APGR)	1.073		1.165	1.099	1.025	
Ratio using 2017 Baseline	1.000		1.086	1.024	0.956	Reno-Tahoe Airport Authority 2018 Master Plan and Federal Aviation Administration data
						2017 & 2020 are actual data, the rest projected
Heating Degree Days (HDD)*	2,356	2,330	2,403	2,403	2,403	National Climatic Data Center
Ratio using 2017 Baseline	1.000	0.989	1.020	1.020	1.020	2017 & 2020 Local Climatological Data
Rainfall >= 0.01 inch (Rain)*	21	11	17	17	17	National Climatic Data Center
Ratio using 2017 Baseline	1.000	0.524	0.810	0.810	0.810	2017 & 2020 Local Climatological Data
Snowfall >= 1 inch (SNO)*	6	1	3	3	3	National Climatic Data Center
Ratio using 2017 Baseline	1.000	0.167	0.500	0.500	0.500	2017 & 2020 Local Climatological Data
Episodic RWC EI Factors:						
Rule Penetration	0.87	0.87	0.87	0.87	0.87	"Washoe County District Health Department; Air Quality Management Division; Residential Wood Use Survey"; InfoSearch; May 2016
Rule Effectiveness	0.76	0.76	0.76	0.76	0.76	
Control Efficiency	1.00	1.00	1.00	1.00	1.00	

* Includes Jan, Nov, & Dec., 2025 - 2040 data are 15-year normal from 2006-2020

Note: The population and employment data are not specifically included in the main body of the RTP, but were used as inputs for the transportation model that generates VMT data. These data (25, 30, and 40) came from 2022 Washoe County Consensus Forecast.

Assumed 67% of Washoe County population resides in HA 87.

Appendix B

Truckee Meadows Projected PM_{10} Seasonal Emissions

Table B-1
Truckee Meadows PM_{10} Seasonal Emissions (lbs/day)

Major Category	Sub-Category (SCC)	2017		Growth Surrogate	2017		2025		2030		2040	
		EI	Episodic EI		Maint Em Limit	Maint Capacity	EI	Episodic EI	EI	Episodic EI	EI	Episodic EI
POINT SOURCES												
	Geothermal (20100102)	0	0	POP	0	0	0	0	0	0	0	0
	Bulk Fuel Terminal (40400250)	1	1	POP	1	1	1	1	1	1	1	1
	Airports & Heliports (See Table D-1)	34	34	AP	34	41	30	30	45	45	57	57
	Rail Yard (28500201)	8	8	EMP	8	10	10	10	10	10	11	11
	Buffer Zone (N/A)	1,936	1,936	POP&EMP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	subtotal without Buffer Zone	43	43		43	52	41	41	57	57	69	69
	subtotal	1,979	1,979									
NONPOINT SOURCES												
	Stationary Source Fuel Combustion											
	Industrial Fuel Combustion (21020 - 04002, 06000)	4	4	EMP	4	4	4	4	5	5	5	5
	Com/Inst Fuel Combustion (21030 - 04002, 06000, 11000)	12	12	EMP	12	14	14	14	15	15	16	16
	Res. Fuel Combustion (21040 - 04000, 06000, 07000, 11000)	21	21	HH&HDD	21	25	24	24	25	25	27	27
	Res. Wood Combustion											
	Fireplaces (2104008100)	2,517	853	UNI&HDD&EF	2,517	3,045	2,362	800	2,233	757	1,977	670
	Woodstoves/Inserts											
	Pre 1992 (2104008310)	478	162	Appendix C	478	579	389	132	328	111	205	69
	Post 1992 (2104008320)	422	143	Appendix C	422	510	499	169	533	180	567	192
	Pellet Stoves (2104008400)	32	11	HH&HDD	32	39	37	12	39	13	42	14
	subtotal	3,485	1,205		3,485	4,216	3,329	1,156	3,177	1,106	2,838	994
	Industrial Processes											
	Chemical Manufacturing (2301000000)	4	4	EMP	4	5	5	5	5	5	6	6
	Commercial Cooking (See Table F-1)	508	508	POP	508	615	571	571	602	602	652	652
	Food & Kindred Products - Manufacturing (2302000000)	192	192	EMP	192	232	234	234	246	246	267	267
	Mineral Processes (2305000000)	56	56	EMP	56	68	68	68	72	72	78	78
	Rubber/Plastic Processes (2308000000)	92	92	EMP	92	111	112	112	117	117	128	128
	Fabricated Metals (2309000000)	38	38	EMP	38	46	47	47	49	49	53	53
	Construction - Stationary											
	Road Construction (2311030000)	505	505	RD CON(RTP)	505	611	253	253	269	269	285	285
	Residential Dust Projects (Non-Road Const.) (2311010000)	483	483	PGR	483	584	477	477	480	480	478	478
	Commercial Dust Projects (Non-Road Const.) (2311020000)	213	213	EGR	213	258	214	214	211	211	211	211
	Mining and Quarrying - Stationary (2325030000)	77	77	EMP	77	93	94	94	98	98	107	107
	Miscellaneous Industrial Processes (2399000000)	6	6	EMP	6	7	7	7	7	7	8	8
	subtotal	2,174	2,174		2,174	2,630	2,082	2,082	2,156	2,156	2,273	2,273
	Other Solvent Utilization											
	Misc. Industrial Processes (2440000000)	3	3	EMP	3	3	3	3	3	3	4	4
	subtotal	3	3		3	3	3	3	3	3	4	4
	Waste Disp/Treat/Recovery											
	Commercial/Industrial Incineration (2601030000)	0	0	EMP	0	0	0	0	0	0	0	0
	subtotal	0	0		0	0	0	0	0	0	0	0
	Misc. Non-Point Sources											
	Paved Road Fugitive Emissions (2294000000)	1,409	1,409	VMT(RTP)	1,409	1,704	1,767	1,767	1,870	1,870	2,015	2,015
	Paved Road Fugitive Emissions, Sanding & Salting (2294000000)	429	429	SNO	429	519	214	214	214	214	214	214
	Unpaved Road Fugitive Emissions (2296000000)	763	763	Appendix E	763	923	742	742	653	653	430	430
	Wildfires (2810001000)	26	26	UNI	21	25	21	21	21	21	21	21
	Structure Fires (2810030000)	-	-	UNI	-	-	-	-	-	-	-	-
	Motor Vehicle Fires (2810050000)	-	-	UNI	-	-	-	-	-	-	-	-
	Firefighting Training (2810035000)	-	-	UNI	-	-	-	-	-	-	-	-
	Open/Permit Burning (2610000400)	-	-	UNI	-	-	-	-	-	-	-	-
	Prescribed Burning (2810005001)	-	-	UNI	-	-	-	-	-	-	-	-
	Refuse Fires (2610030000)	19	19	UNI	19	23	19	19	19	19	19	19
	Assay Labs (2851001000)	0	0	EMP	0	0	0	0	0	0	0	0
	Human & Animal Cremation (2810060 - 100, 200)	21	21	POP	21	26	24	24	25	25	27	27
	subtotal	2,667	2,667		2,662	3,220	2,787	2,787	2,803	2,803	2,727	2,727
	TOTAL NONPOINT SOURCES	8,329	6,048		8,324	10,070	8,202	6,029	8,140	6,068	7,842	5,997
NON-ROAD MOBILE SOURCES (various between 2260001010 - 2285006015)												
	CNG Engines	1	1	MOVES	1	1	1	1	1	1	1	1
	Diesel Engines	503	503	MOVES	503	608	102	102	65	65	15	15
	Gasoline Engines	224	224	MOVES	224	271	198	198	211	211	233	233
	LPG Engines	5	5	MOVES	5	6	8	8	9	9	10	10
	Locomotives	10	10	EMP	10	12	12	12	13	13	14	14
	subtotal	743	743		743	898	321	321	299	299	274	274
ON-ROAD MOBILE SOURCES (various between 2201110080 - 2209620080)												
	On-Road Vehicles	954	954	MOVES(RTP)	954	1,154	643	643	665	665	706	706
	subtotal	954	954		954	1,154	643	643	665	665	706	706
	Grand Total	10,068	7,788		10,064	12,174	9,207	7,034	9,160	7,089	8,891	7,046
	Safety Margin						857		904		1,173	
	MVEB						4,262		4,361		4,609	

Appendix C

Residential Wood Combustion Emissions Methodology

Residential wood combustion (RWC) is a significant source of PM_{10} in the Truckee Meadows. The RWC category is updated on a regular basis via an emission category survey. As part of the PM_{10} maintenance plan SIP, the AQMD is committed to conducting this survey at least once every three years.[1] The survey used for the 2017 emissions inventory calculation was completed for the 2015-2016 winter season.

An adjustment factor based on heating degree days (HDD) was applied to the 2017 RWC emission to calculate the emissions from 2025 through 2040. Projected HDDs were determined using the National Climatic Data Center 15-year HDD average (Table A-1). Table C-1 is a summary of the adjustment methodologies used to project future RWC emissions. This estimate is conservative and assumes that projected PM_{10} emissions stay consistent with the heating degree days and allowable future RWC devices within the Truckee Meadows. RWC in the Truckee Meadows is controlled by regulation **PART 040.051** that: 1) is permanent and enforceable, 2) restricts installation of new wood burning devices, and 3) requires uncertified devices to be upgraded or removed upon real estate transactions.

Table C-1
Truckee Meadows PM_{10} Emission Projection Calculation Methodologies for RWC

RWC Device	Future Emission Projection Methodology	Rationale
Fireplaces	Device number set at 2017 EI level, adjusted by HDD.	No new fireplaces can be installed within the Truckee Meadows unless the property is greater or equal to 1 acre in size.
Pre 1992 Woodstoves	Device number decreases by 71 per annum from 2017 EI level, based on the average number of devices removed from 2013 – 2017, adjusted by HDD.	Uncertified woodstoves are prohibited from installation within the Truckee Meadows and are removed upon real estate transactions.
Post 1992 Woodstove	Device number increases by 69 per annum from 2017 EI level, adjusted by HDD.	Woodstove replacement numbers are gathered by the AQMD's wood burning device program. 1st time installation of wood-stove is not included due to restrictions on installation with HA 87.
Pellet stoves	Device number is constant, emissions adjusted by HDD.	Pellet stoves are subject to PART 040.051. Wood use survey shows low numbers of pellet stoves in HA 87. AQMD expects negligible changes in amount of pellet stoves in the future.

[1] "Redesignation Request and Maintenance Plan for the Truckee Meadows 24-Hour PM10 Nonattainment Area." Washoe County AQMD. August 28, 2014. **https://www.nnph.org/files/air-quality/sip/pm10-sip-2014-08-28.pdf**. Accessed December 28, 2023

Table C-2

Emissions Calculation Table for Wood Stoves

Year	No. of Devices		Wood Density (lbs/cord)	PM_{10} EF (lbs/ton)		Avg wood consumption (cords/device/year)		PM_{10} Emissions (lbs/day)	
	Pre 92	Post 92		Pre 92	Post 92	Pre 92	Post 92	Pre 92	Post 92
2017	2813	2612	2889	20	14.6	0.93	1.21	478	422
2025	2245	3026	2889	20	14.6	0.93	1.21	382	489
2030	1890	3233	2889	20	14.6	0.93	1.21	321	522
2040	1180	3440	2889	20	14.6	0.93	1.21	201	556

Emissions Calculation Equation:

Since wood-burning does not happen all year long, AQMD had to calculate a seasonal adjustment factor (SAF) for the PM_{10} season. See equation below.

$$SAF = \frac{U_s * O_A}{O_s}$$

Where:

U_s = Seasonal Usage Percentage
O_A = Annual Months of Operation
O_s = Seasonal Months of Operation

Residential wood-burning emissions are calculated using the equation below:

$$E_{Daily} = \frac{N_D * W_C * \rho_w * EF * SAF}{2000 * O_d * O_w}$$

Where:

E_{Daily} = Daily emissions (lbs/day)
N_D = Number of devices
W_C = Average Annual Wood Consumption (cords/year)
ρ_w = density of wood (lbs/cord)
EF = Emission Factor (lbs of emission/ton of wood burned)
SAF = Seasonal Adjustment Factor
O_d = Weekly days of operation (days/week)
O_W = Annual weeks of operation (weeks/year)

Equation inputs and their sources:

N_D: The number of devices in 2017 was established using the 2015-2016 Wood Use survey. The rate that Pre 92 stoves decreases in the future was estimated using average wood stove removal data for the 5 years prior to 2017. The rate that Post 92 stoves increases in the future was estimated using average wood stove replacement data for the 5 years prior to 2017. See table C-3 below for wood stove removal/replacement data.

Table C-3
2013-2017 Wood Stove Removal/Replacement data from Notice of Exemption Program

Wood Stove Removal/Replacement		
Year	Removed	Replaced
2013	88	83
2014	63	80
2015	50	85
2016	66	57
2017	88	40
Avg	**71**	**69**

W_C: Average wood consumption is calculated using the 2015-2016 Wood Use survey. Respondents that have a wood stove are asked to quantify their annual wood consumption and then the rate of wood consumption is calculated in cords per device.

ρ_w: Average wood density is calculated using the 2015-2016 Wood Use survey. Respondents that have a wood stove are asked what type of wood they use. Average wood density is then calculated based on their response.

EF: Emission factors for wood stoves are taken from AP-42 Chapter 1.10 – Residential Wood stoves. The emission factor for fireplaces is taken from updated emissions factor used in 2020 National Emissions Inventory (23.6 lb/ton) which uses a different source.[2] This emission factor for fireplaces is used in the EPA Wagon Wheel Tool.

SAF: The seasonal adjustment factor was determined using wood burning usage data from the 2018-2019 wood use survey. The 2018-2019 survey included questions that allowed a more accurate PM_{10} seasonal adjustment factor to be calculated. The seasonal adjustment factor includes seasonal usage percentage (U_s) which was determined to be 58% from the wood use survey for wood stoves and 64% for fireplaces. The annual months of operation (O_A) is 6 months and the seasonal months of operation (O_s) is 3 months.

O_d: The weekly days of operation are 7 days a week.

O_w: The annual weeks of operation are 26 weeks. Wood burning is assumed to be half the year in our region.

[2] Houck, J.E., J. Crouch, and R.H. Huntley. 2001. Review of Wood Heater and Fireplace Emission Factors. Technical presentation at the International Emission Inventory Conference. Denver, CO.

Appendix D

Point Source Inventory

Point sources in the Truckee Meadows maintenance area are a small contributor to overall PM_{10} concentrations. Table D-1 below shows all point sources located within the maintenance area.

Table D-1: List of all point sources in Truckee Meadows maintenance area

Source Name	EIS Facility ID	Sub-Category	Associated SCC(s)
Ormat	5148111	Geothermal	20100102
SFPP	5148411	Bulk Fuel Terminal	40400250
Reno-Tahoe International Airport	9376411	Airport/Heliport	2265008005, 2267008005, 2268008005, 2270008005, 2275001000, 2275020000, 2275050000, 2275050011, 2275050012, 2275060000, 2275060011, 2275060012, 2275070000
Northern Nevada Medical Center	11405411		
REMSA Care Flight	12147411		
Renown Regional Medical Center	11405111		
St. Mary's Regional Medical Center	12146911		
Sparks Rail Yard	14444711	Rail Yard	28500201

Point Source Emissions Calculation Methodology:

Ormat: Ormat owns and operates a geothermal power plant within the maintenance area. The PM_{10} emissions that come from the source are generated by emergency back up generators that are onsite. The emissions from these generators are calculated with activity data (annual hours of usage, annual diesel throughput) acquired by AQMD and emission factors based on the Tier rating of the engine. Those emissions are disaggregated evenly over the year with a seasonal adjustment factor (SAF) of 1. As can be seen in Table B-1 in Appendix B, the emissions from these engines create less than 1 pound per day of PM_{10}.

SFPP: The bulk fuel terminal owned by SFPP, LP, utilizes a thermal oxidizer that generates small amounts of PM_{10} emissions. The PM_{10} emissions from this source are calculated by the permit holders and submitted annually to AQMD. The source uses AP-42 Section 1.5 emission factors and the amount of fuel routed to the thermal oxidizer to calculate annual PM_{10} emissions. Those emissions were disaggregated evenly over the year with a SAF of 1.

All airports/heliports: There is one airport within the maintenance area and multiple heliports associated with the healthcare industry within the maintenance area. The heliports contribute negligible PM_{10} emissions to the maintenance area. PM_{10} emissions for Reno-Tahoe International Airport were calculated by EPA based on landing/takeoff (LTO) data. AQMD disaggregated and adjusted this data to the PM_{10} season using actual LTO data received from Reno-Tahoe International Airport. It was found that 23% of the flights in 2017 occurred during the PM_{10} season. The SAF of 0.92 was found using the equation described in Appendix C.

Sparks Rail Yard: PM_{10} emissions for the rail yard located within the maintenance area was found using 2017 diesel throughput data supplied by Union Pacific railroad for the Sparks Rail Yard. The emission factor used is sourced from Table 6 of EPA's 2009 Technical Highlights Emission Factors for Locomotives.[3] The annual emissions were disaggregated evenly over the year with a SAF of 1.

[3] https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100500B.txt

Appendix E

Unpaved Road Fugitive Dust – Seasonal Allocation and Emission Projections

Since Unpaved Road Fugitive Dust (SCC: 2296000000) emissions are a more complicated source category, this appendix is written to explain how the emissions are allocated to the maintenance area and adjusted to the PM_{10} season. The methodology for projecting Unpaved Road Fugitive Dust emissions is also included in this appendix.

Seasonal/Spatial Allocation:

As per the 2017 National Emissions Inventory (NEI), an estimated 1703 tons of PM_{10} is emitted in Washoe County per year due to fugitive dust on unpaved roads. As recommended by EPA, these emissions are adjusted to the Truckee Meadows maintenance area using GIS data from Open Street Map for unpaved roads in Washoe County and the Maintenance Area.. Using ArcMap 10.8.2, AQMD found that 8.81% of the unpaved roads in Washoe County are located in the maintenance area. Additionally, AQMD calculated a seasonal adjustment factor for the PM_{10} season using Automated Traffic Recorders (ATRs) located in the maintenance area. The seasonal adjustment factor was found to be 0.928. The equation below shows the 2017 emissions adjusted seasonally to the maintenance area.

$$763\,\frac{lbs}{day} = \frac{1703\,\frac{tons}{year} \times 2000\,\frac{lbs}{ton} \times 8.81\% \times 0.928}{365\,\frac{days}{year}}$$

Emission Projections

Unpaved road fugitive dust is expected to change in the future based on Local Vehicle Miles Traveled (LVMT). Since local roads are the closest road type to unpaved roads, the changes in travel on local roads is used as a proxy for the changes in travel expected on unpaved roads. Changes in LVMT through the maintenance period are shown in Table A-1. Additionally, unpaved road emissions are projected to decrease over time as more roads are paved and the maintenance area continues to develop. It is expected that paved road miles will increase annually at 2.6% in the maintenance area based on historical changes to paved road miles. This factor was also used to project forward in AQMD's 1st 10-Year Maintenance Plan for PM_{10}. Table E-1 below shows emission projections through the end of the maintenance period. As can be seen in the emissions projections, the projected decrease in unpaved road miles in the maintenance area is more impactful than the projected increase in LVMTs.

Table E-1: Unpaved road fugitive PM_{10} emissions projections through 2040

Year	2017	2025	2030	2040
Unpaved Road Fugitive Emissions (lbs/day) (SCC: 2296000000)	763	742	653	430

Appendix F

Commercial Cooking Source Classification Codes (SCCs)

Table F-1: Commercial Cooking SCCs by Process

Commercial Cooking Process	Associated SCC
Charbroiling, Conveyorized	2302002100
Charbroiling, Under-fired	2302002200
Deep Fat Frying	2302003000
Flat Griddle Frying	2302003100
Clamshell Griddle Frying	2302003200
Wood Oven (Charbroiling)	2302002000
BBQ Smoke (Charbroiling)	2302002000

Appendix G

Exceptional Event Demonstration Example

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

Exceptional Event Demonstration for July 26, 2021 PM_{10} Exceedance due to Dixie/Tamarack Fire

Submitted to U.S. EPA Region 9 on Date

Public Health
Prevent. Promote. Protect.

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

Public Health
Prevent. Promote. Protect.

VISION

A healthy community

MISSION

To improve and protect our community's quality of life and increase equitable opportunities for better health.

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Acronyms and Abbreviations

AGL	Above Ground Level
AQI	Air Quality Index
AQMD	Washoe County Health District - Air Quality Management Division
AQS	Air Quality System
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
EE	Exceptional Event
EER	Exceptional Events Rule
EPA	U.S. Environmental Protection Agency
ºF	Degrees Fahrenheit
FCCS	Fuel Characteristic Classification System
HA 87	Hydrographic Area 87
HMS	Hazardous Mapping System
HYSPLIT	Hybrid Single-Particle Lagrangian Integrated Trajectory
Lbs	Pounds
µg/m^3	Micrograms per cubic meter
MPH	Miles Per Hour
NAAQS	National Ambient Air Quality Standards
NAM	North American Mesoscale
NSPS	New Source Performance Standards
NOAA	National Oceanic and Atmospheric Administration
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NOy	Reactive Nitrogen Compounds
NWS	National Weather Service
O_3	Ozone
PG&E	Pacific Gas and Electric
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 microns in aerodynamic diameter
PM_{10}	Particulate Matter less than or equal to 10 microns in aerodynamic diameter
ppm	Parts Per Million
PST	Pacific Standard Time
R^2	Coefficient of Determination
SO_2	Sulfur Dioxide
TSP	Total Suspended Particles

1.0 Introduction

1.1 Purpose

The analysis in this report demonstrates that the exceedance of the primary and secondary 24-hour PM_{10} National Ambient Air Quality Standard (NAAQS) recorded on July 26, 2021, at the Sparks and Reno4 air monitoring sites were caused by the Dixie and Tamarack wildfires. Pursuant to the Exceptional Event (EE) requirements under the Clean Air Act (CAA), the data may be excluded from regulatory decisions for PM_{10} NAAQS. Washoe County Health District Air Quality Management Division (AQMD) is requesting to exclude all PM_{10} data from the Reno4 (AQS ID: 32-031-0031-81102-2) and Sparks (AQS ID: 32-031-1005-81102-4) PM_{10} primary monitors on July 26, 2021. Exclusion of the data caused by this exceptional event will have a regulatory impact on the approval of the 2nd 10-Year Maintenance Plan for PM_{10}.

1.2 Exceptional Events Rule Procedure

On October 3, 2016, the Environmental Protection Agency (EPA) finalized revisions to the "Treatment of Data Influenced by Exceptional Events", regulations that govern the exclusion of event-influenced air quality data from certain regulatory decisions under the CAA Section 319(b). This rule is known as the Exceptional Events Rule (EER). The EER contains definitions, procedural requirements, requirements for air agency demonstrations, and criteria for EPA approval for the exclusion of air quality data from regulatory decisions. The EER states that the EPA has the authority to exclude air quality monitoring data from regulatory determinations related to exceedances or violations of the NAAQS and avoid designating an area as nonattainment, redesignating an area as nonattainment, or reclassifying an existing nonattainment area to a higher classification if a State adequately demonstrates that an exceptional event has caused an exceedance or violation of a NAAQS. The CAA includes four requirements that, collectively, define an exceptional event:

1. The event affected air quality,
2. The event was not reasonably controllable or preventable,
3. The event was caused by human activity that is unlikely to recur at a particular location or was a natural event,
4. There exists a clear causal relationship between the specific event and the monitored exceedance.

EPA regulations in the Code of Federal Regulations (CFR) - 40 CFR 50.14(c)(3)(iv) states that exceptional events demonstrations must address and include the following elements:

1. A narrative conceptual model; (See **Section 2** of this document)
2. A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance; (See **Section 4** of this document)
3. Analyses comparing the claimed event influenced concentrations at the monitoring site; (See **Section 4** of this document)
4. A demonstration that the event was both not reasonably controllable and not reasonably preventable; (See **Section 3** of this document)
5. A demonstration that the event was a human activity unlikely to recur at a particular location or was a natural event. (See **Section 5** of this document)

1.3 Public Comment Process

This demonstration was available for public comment from October 26 to November 26, 2023 at the AQMD website (OurCleanAir.com). A hardcopy of the plan was also available at the AQMD office. See Appendix A for AQMD's Public Comment Plan.

1.4 Agency Contacts

For information or questions regarding this Exceptional Events Demonstration, please contact the following individuals of the AQMD.

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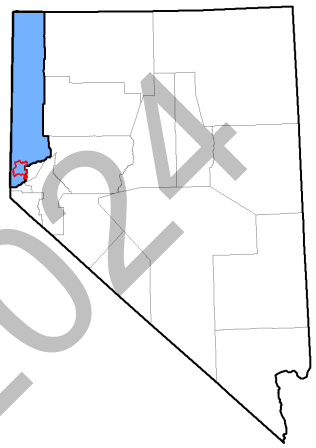
2.0 Conceptual Model

2.1 Regional Description

Washoe County is located in the northwest portion of Nevada. It is bounded by California, Oregon, and the Nevada counties of Humboldt, Pershing, Storey, Churchill, Lyon, and Carson City (Figure 2-1). The Truckee Meadows is approximately 200 square miles in size and situated in the southern portion of Washoe County. It is geographically identified as Hydrographic Area 87 (HA 87) as defined by the State of Nevada, Division of Water Resources. Most of Washoe County's population lives in and around the Truckee Meadows.

The Truckee Meadows sits at an elevation of 4,400 feet above sea level and is surrounded by mountain ranges. To the west, the Sierra Nevada rises to elevations of 9,000 to 11,000 feet. Hills to the east reach 6,000 to 8,000 feet. The Truckee River, flowing from the Sierra Nevada eastward, drains into Pyramid Lake to the northeast of the Truckee Meadows.

Figure 2-1
Washoe County, Nevada



Climate

Average annual wind speed measured at the Reno-Tahoe International Airport is 6.4 miles per hour (mph). January is the calmest month (4.5 mph) with April being the windiest (8.3 mph). Wintertime (November-January) averages 4.9 mph and summertime (June-August) averages 7.2 mph.

Most of Reno's precipitation falls from November through March in the form of rain and snow. Reno receives an average of 7.35 inches of precipitation per calendar year (1991-2020 climate normals). Table 2-1 lists temperature and precipitation normals as measured at the Reno-Tahoe International Airport.

Table 2-1: Monthly Normal Temperature and Rainfall (1991-2020)

	Temperature (°F)			Precipitation (inches)
Month	Maximum	Minimum	Mean	Mean
January	47.7	26.1	36.9	1.25
February	52.1	29.0	40.6	1.03
March	59.2	34.0	46.6	0.80
April	64.7	38.5	51.6	0.44
May	74.1	46.6	60.3	0.55
June	84.6	53.8	69.2	0.41
July	93.9	60.4	77.2	0.20
August	92.1	58.1	75.1	0.24
September	83.8	50.3	67.0	0.21
October	70.4	39.7	55.1	0.50
November	56.7	31.0	43.8	0.62
December	46.7	25.7	36.2	1.1

Maximum temperatures of 90 °F or above normally occur between July 3 and August 21. Maximum temperatures typically peak at 94 °F between July 22 and July 29.

Demographics

The 2020 population of Washoe County was 486,492. Approximately two-thirds of Washoe County's residents live in the Truckee Meadows, which includes the cities of Reno and Sparks. Anthropogenic activities such as transportation, manufacturing, freight distribution, and residential wood use are also concentrated in the Truckee Meadows.

Seasons

Washoe County experiences two distinct air pollution seasons - wintertime particulate matter (PM) and summertime ozone (O_3). Wildfire smoke throughout the year, especially during the summer months, can dramatically increase summertime PM and O_3.

Wintertime temperature inversions combined with light winds can contribute to elevated levels of Particulate Matter less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$), Particulate Matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}), Nitrogen Dioxide (NO_2), and Carbon Monoxide (CO). Inversions are common in mountain valleys such as the Truckee Meadows. Air pollution episodes persist until stronger winds scour the cold air out of the valley and break the temperature inversion.

Northern Nevada receives an abundant amount of sunshine and solar radiation during the summer months. Mobile sources (i.e., cars and trucks) emit O_3 precursors and their activity increases during the summer. Ozone concentrations are typically highest between May and September, especially during the months of June, July, and August.

Strong winds can occur at any time of year. Two-minute gusts over 40 mph are not uncommon. These winds lower the gaseous pollutant (O_3, CO, NO_2, and SO_2) concentrations but typically increase PM levels, especially PM_{10}. Hourly PM_{10} levels can reach more than 500 micrograms per cubic meter ($\mu g/m^3$) for several hours.

Attainment Status

All areas of Washoe County currently attain or are unclassifiable for all National Ambient Air Quality Standards (NAAQS). However, portions of Washoe County had previously been designated non-attainment for the following NAAQS: 1) 1971 Total Suspended Particles (TSP) (24-hour and Annual); 2) CO (8-hour); 3) 1979 O_3 (1-hour); and 4) 1987 PM_{10} (24-hour and Annual). Some pollutants and standards, such as 1-hour O_3 and TSP, have been revoked and no longer apply. For the other pollutants, CO and PM_{10}, the HA 87 planning area was redesignated to maintenance after the standard was met. Since the 1970's, AQMD has implemented control strategies to target mobile sources, wood-burning devices, and dust control to achieve attainment with the NAAQS.

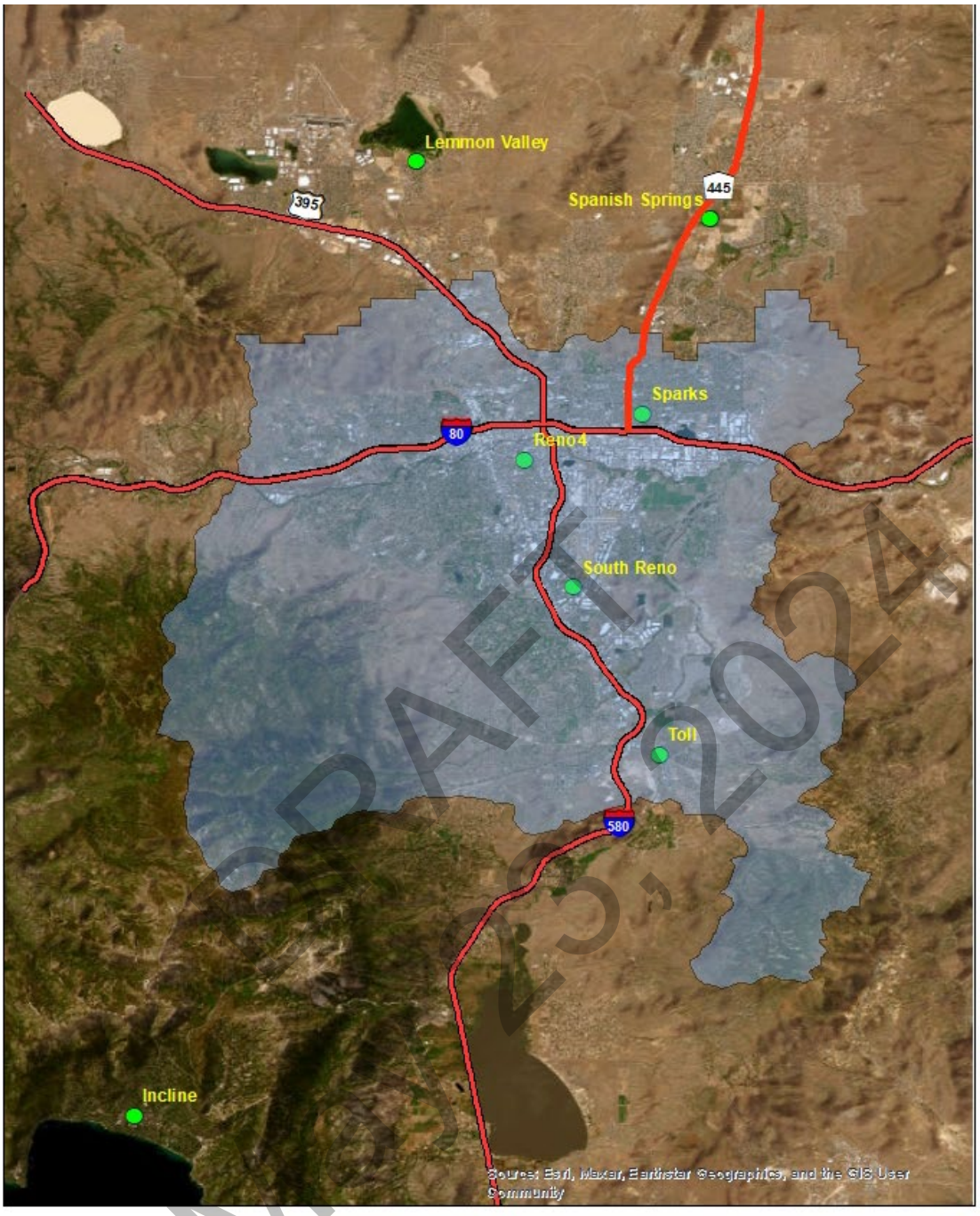
2.2 Overview of Monitoring Network

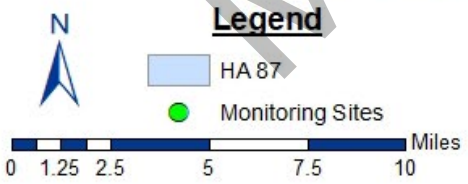
In 2021, the Washoe County Health District, Air Quality Management Division (AQMD) operated seven ambient air monitoring sites in Washoe County (Figure 2-2). The blue boundary delineates HA 87 as defined by the State of Nevada, Division of Water Resources. Table 2-2 lists the parameters monitored in 2021, sorted by site.

Table 2-2: List of Monitoring Sites and Pollutants Monitored in 2021

Site	O_3	CO	Trace CO	Trace NO	NO_2	NO_x	Trace NOy	Trace SO_2	PM_{10}	$PM_{2.5}$	PM_{coarse}	$PM_{2.5}$ Speciation	Meteorology
Incline	✓												
Lemmon Valley	✓												
Reno4	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
South Reno	✓												✓
Sparks	✓	✓							✓	✓	✓		✓
Spanish Springs	✓								✓	✓	✓		
Toll	✓								✓	✓	✓		✓

Figure 2-2: Washoe County Health District - AQMD Ambient Air Monitoring Sites





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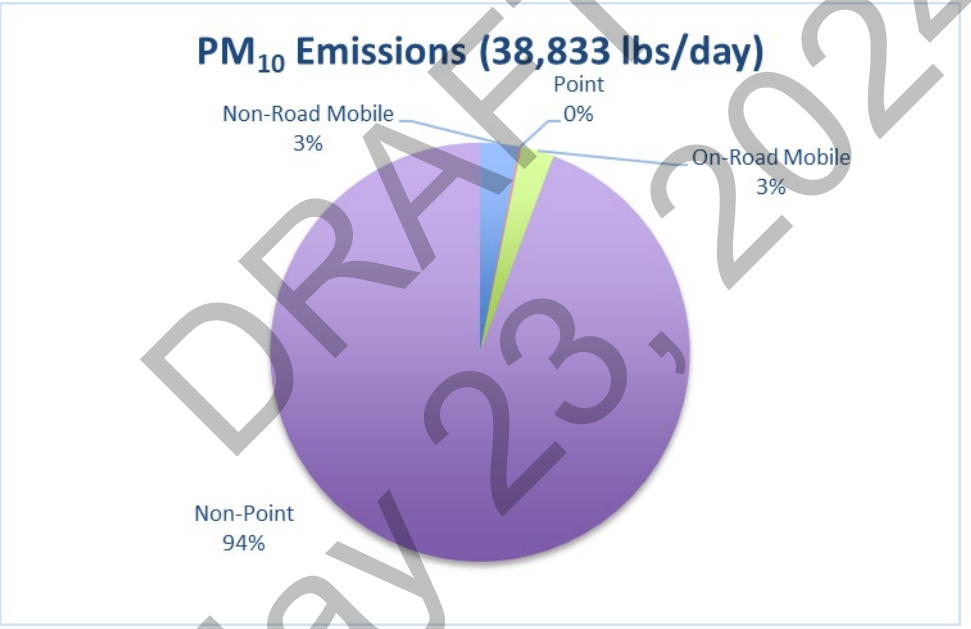
The AQMD's ambient air monitoring network meets the minimum monitoring requirements for all criteria pollutants pursuant to Title 40, Part 58 of the Code of Federal Regulations (CFR), Appendix D. Washoe County's monitoring network is reviewed annually pursuant to 40 CFR 58.10 to ensure the network meets the monitoring objectives defined in 40 CFR 58, Appendix D. Data was collected and quality assured in accordance with 40 CFR 58 and submitted to the Air Quality System (AQS). Additionally, 2021 data was certified on April 26, 2022. (See Appendix C).

2.3 Characteristics of Non-event PM_{10} Concentrations

Without exceptional events, ambient PM_{10} concentrations within Washoe County are under the limit of the PM_{10} NAAQS standard. This is because the PM_{10} emissions that Washoe County produces have been regulated through different policy instruments such as a dust control program, New Source Performance Standards (NSPS) for wood-burning devices, and street sanding/sweeping regulations. Figure 2-3 shows that Washoe County produces 38,833 lbs/day of PM_{10} emissions as per the 2020 Periodic Emissions Inventory. This includes emissions from wildfires within the Washoe County limits. Emissions from purely anthropogenic sources make up about 31,786 lbs/day.

Figure 2-3: PM_{10} Emissions by Source Category



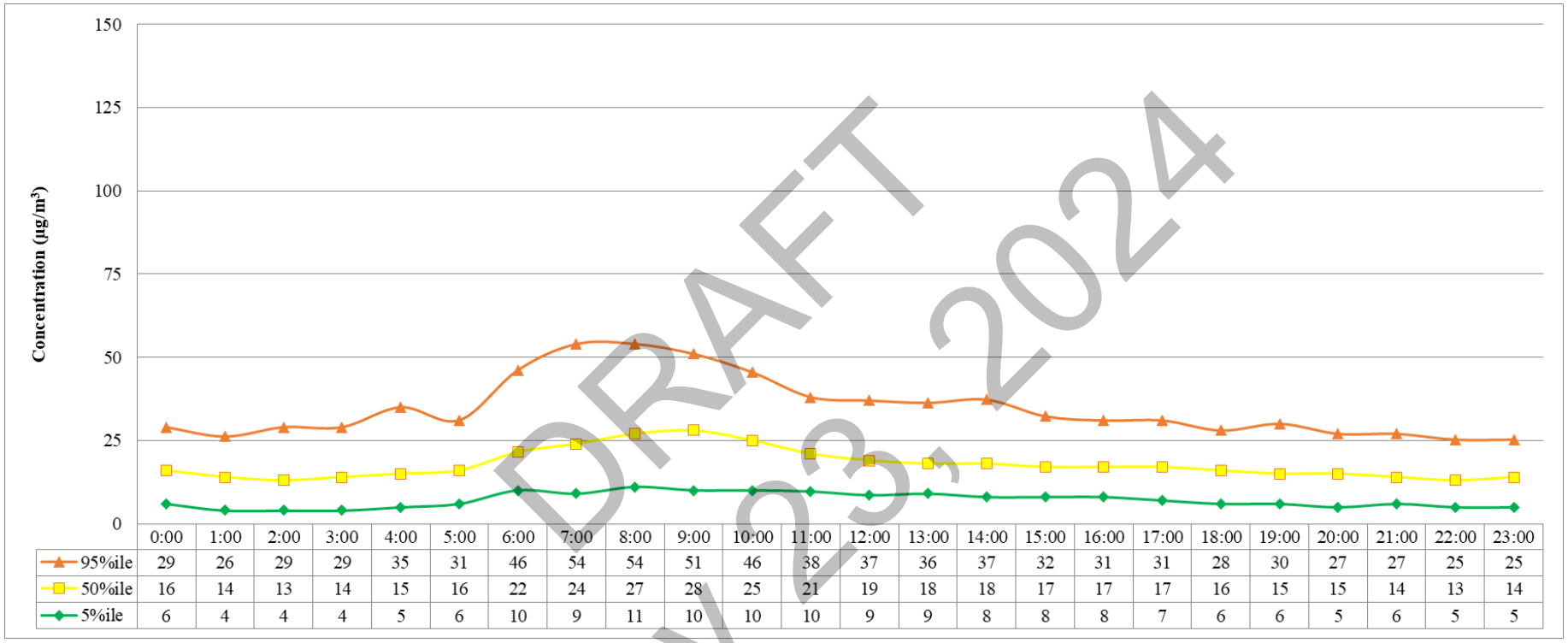
Based on historic, non-event PM_{10} monitoring data for the previous six years, below are the characteristics of PM_{10} levels throughout the year in the Truckee Meadows.

1. October through March: Ambient PM_{10} concentrations are relatively high during the colder months because some Washoe County residents utilize wood-burning devices for heat. Additionally, PM_{10} concentrations can increase after snowstorms due to local street sanding and sweeping. The Truckee Meadows region also struggles with inversion layers in which cold air gets trapped at ground level, causing poor atmospheric mixing. This inhibits PM emissions from leaving the air basin and can cause higher concentrations of PM_{10}. Despite this, the region rarely experiences 24-hour PM_{10} averages over 100 $\mu g/m^3$ during these times.

2. April through June: Ambient PM_{10} concentrations during this period are usually the lowest of the year. With higher temperatures, there is less residential wood-burning. Additionally, soil generally hasn't been dried by high temperatures such as what could be seen at the end of summertime. Wind speeds are higher in the spring which helps with air mixing and vacating any PM_{10} buildup from the region.
3. July through September: Ambient PM_{10} concentrations are the highest during this time period. This coincides with the wildfire season in the western United States. Although wildfire season is sometimes described as June-August, changes in climate in the western United States has caused wildfire smoke impacts to be more commonly felt in September rather than June. The Washoe County area has been impacted by wildfire events during these months for nine out of the last ten years. The main source of anthropogenic PM_{10} emissions during this time comes from fugitive dust that has been dried after months of high temperatures.

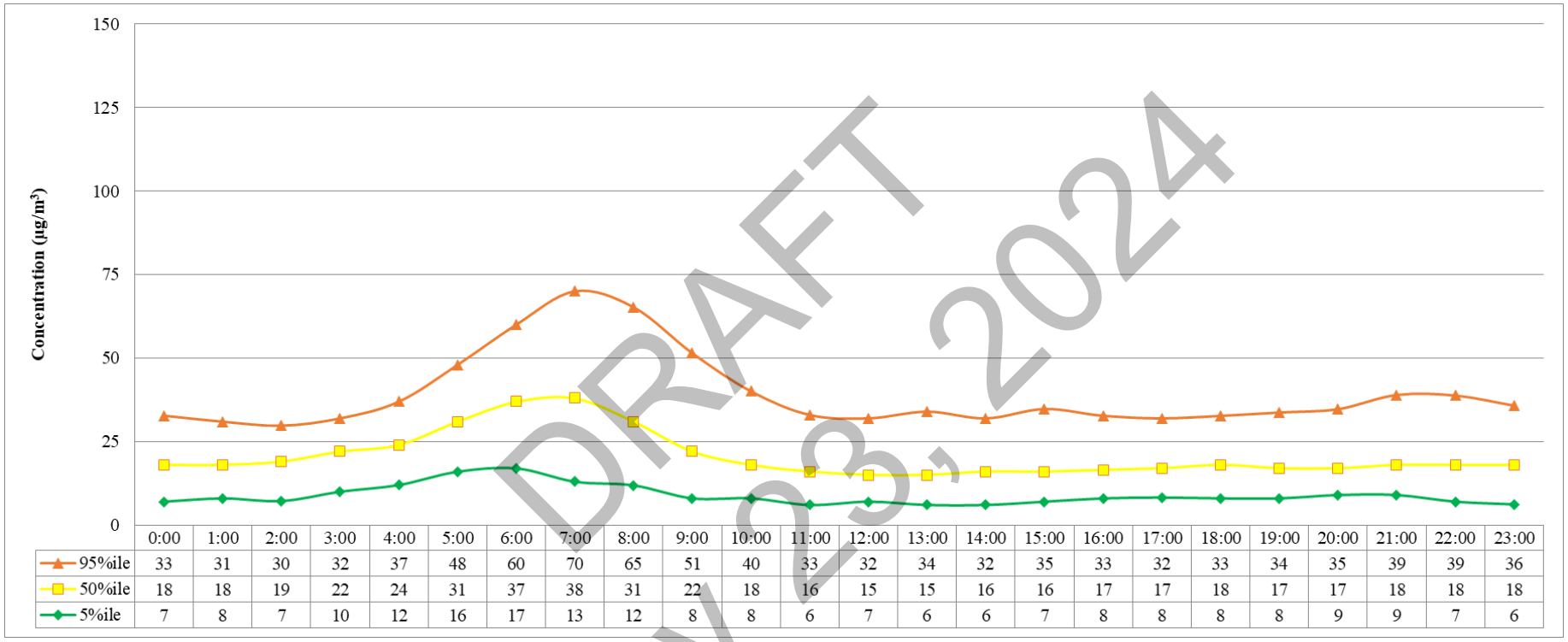
The wildfire events that have caused exceedances have occurred in the July through September period. For the purpose of this demonstration, it is worthwhile to evaluate the diurnal pattern of PM_{10} concentrations during this time period. Figure 2-4 and Figure 2-5 below shows the 2016-2020 PM_{10} diurnal pattern for non-event days at both the Reno4 and Sparks monitors with the 5^{th}, 50^{th}, and 95^{th} percentile included. Throughout the day, PM_{10} concentrations generally rise and peak between the hours of 5:00 PST and 11:00 PST.

Figure 2-4: 2016-2020 Wildfire Season PM_{10} Diurnal Pattern at Reno4



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
95%ile	29	26	29	29	35	31	46	54	54	51	46	38	37	36	37	32	31	31	28	30	27	27	25	25
50%ile	16	14	13	14	15	16	22	24	27	28	25	21	19	18	18	17	17	17	16	15	15	14	13	14
5%ile	6	4	4	4	5	6	10	9	11	10	10	10	9	9	8	8	8	7	6	6	5	6	5	5

Figure 2-5: 2016-2020 Wildfire Season PM_{10} Diurnal Pattern at Sparks



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
95%ile	33	31	30	32	37	48	60	70	65	51	40	33	32	34	32	35	33	32	33	34	35	39	39	36
50%ile	18	18	19	22	24	31	37	38	31	22	18	16	15	15	16	16	17	17	18	17	17	18	18	18
5%ile	7	8	7	10	12	16	17	13	12	8	8	6	7	6	6	7	8	8	8	8	9	9	7	6

2.4 Description of Fires that caused PM_{10} Exceedance

Tamarack Fire

On July 4, 2021, the Tamarack Fire ignited on U.S. Forest Service land in the Humboldt-Toiyabe National Forest in Alpine County, California, approximately 60 miles south of the Truckee Meadows region. The fire started as a single tree on a rocky ridgetop that had been struck by lightning. At the time, 23 other lightning fires were burning so the decision was made to not fight the fire and just monitor the fire, due to the rugged terrain in the area. Around July 16, high wind and low humidity caused the fire to spread rapidly. Fire crews then fought the fire until the fire was fully contained on October 25, 2021. In total, the Tamarack fire burned 68,637 acres with a perimeter illustrated in Figure 2-6.

Dixie Fire

On July 13, 2021, the Dixie fire ignited on U.S. Forest Service land in the Plumas National Forest in Butte County, California, approximately 90 miles northwest of the Truckee Meadows region. The fire started when a tree fell onto a PG&E power transmission line and one of the fuses remained active, causing electric arcing onto wildfire fuels below. From then on, the fire grew rapidly over the next few months with some days showing an increase of up to 100,000 acres burned. Fire crews fought the fire until it was announced as fully contained on October 25, 2021. In total, the Dixie Fire burned 963,309 acres with a perimeter illustrated in Figure 2-6.

An important factor in the start of these fires was dry wildfire fuels. The fires took place in areas that were considered to be either Extreme or Exceptional Drought based on the U.S. Drought Monitor. Figure 2-7 shows what the U.S. Drought Monitor was on July 27, 2021 and illustrates how dry the wildfire fuels were at that time.

Figure 2-6: The Dixie and Tamarack Fire in Relation to Washoe County

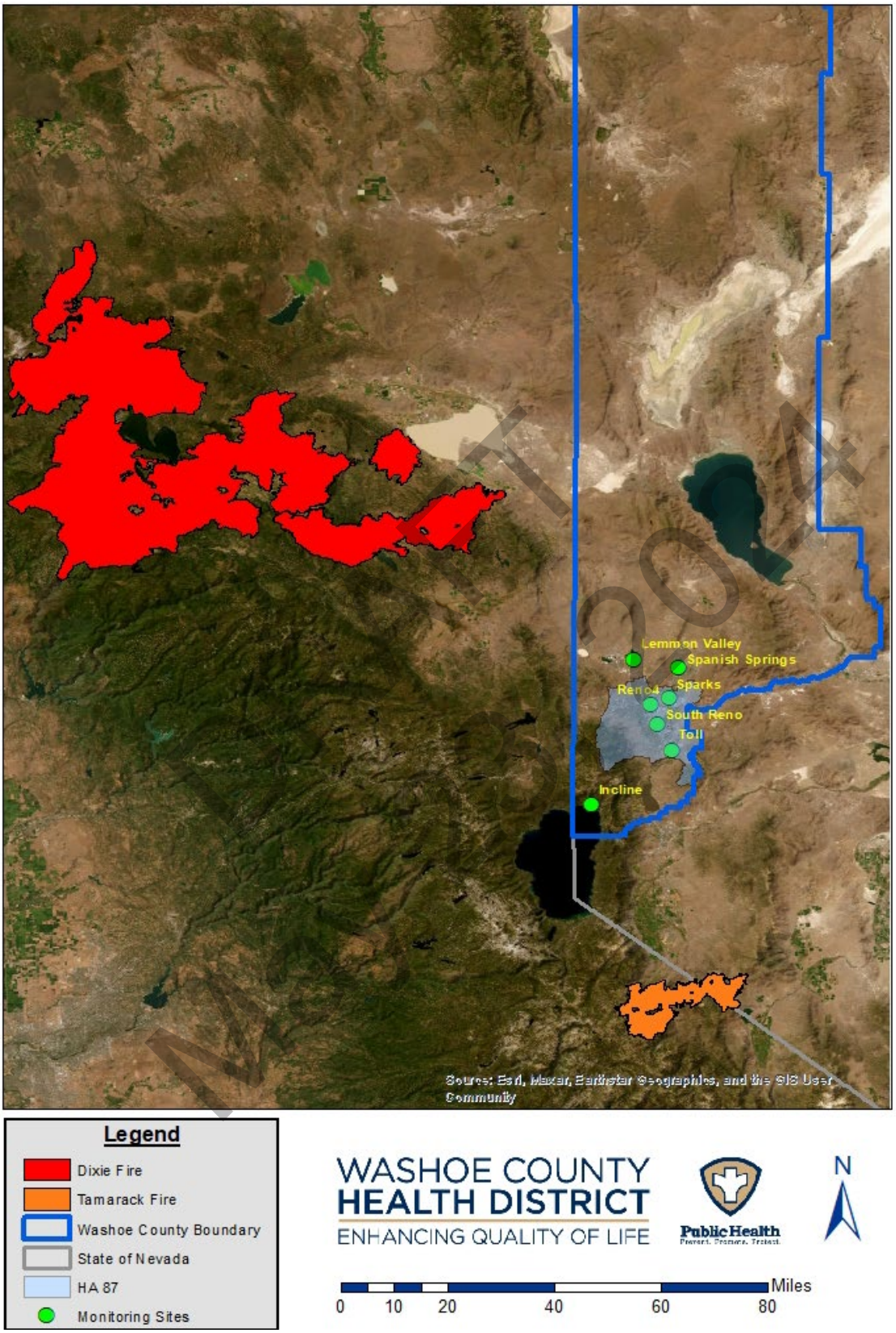
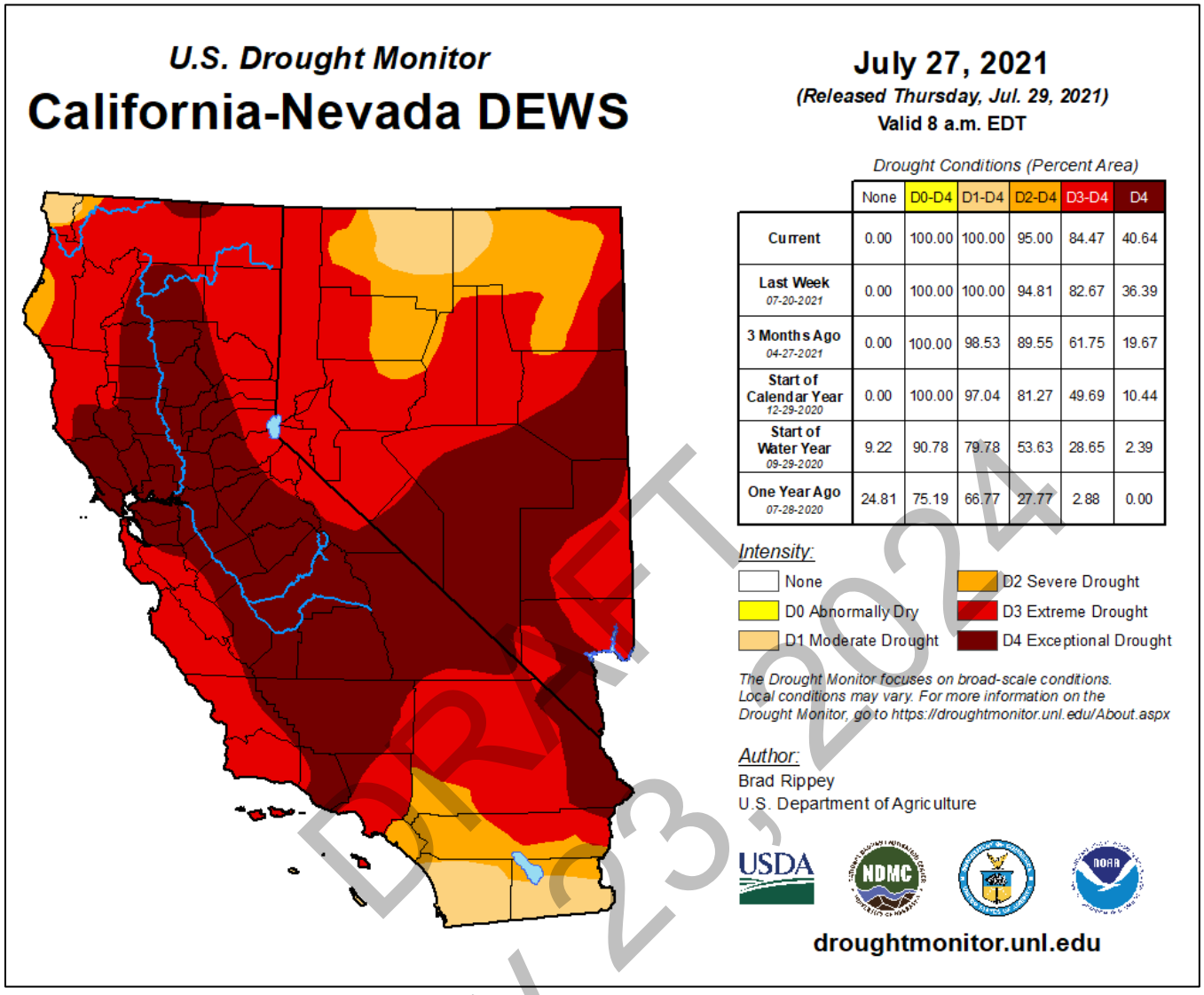


Figure 2-7: The Drought Conditions at the Time of the Tamarack and Dixie Fires



2.5 PM_{10} Air Quality Impacts from the Dixie and Tamarack Fires

2.5.1 Data Requested to be Excluded

As was mentioned in Section 1.1 of this document, the purpose of this demonstration is to request exclusion of air quality data that was elevated due to exceptional events. Table 2-3 below shows the data that is requested to be excluded as part of this exceptional events demonstration and the corresponding 24-hour PM_{10} NAAQS averages. AQMD is requesting exclusion of all hourly PM_{10} data points on the day of the exceedance from 0000 PST through 2300 PST. For a complete list of each data point to be excluded, see Appendix D of this document.

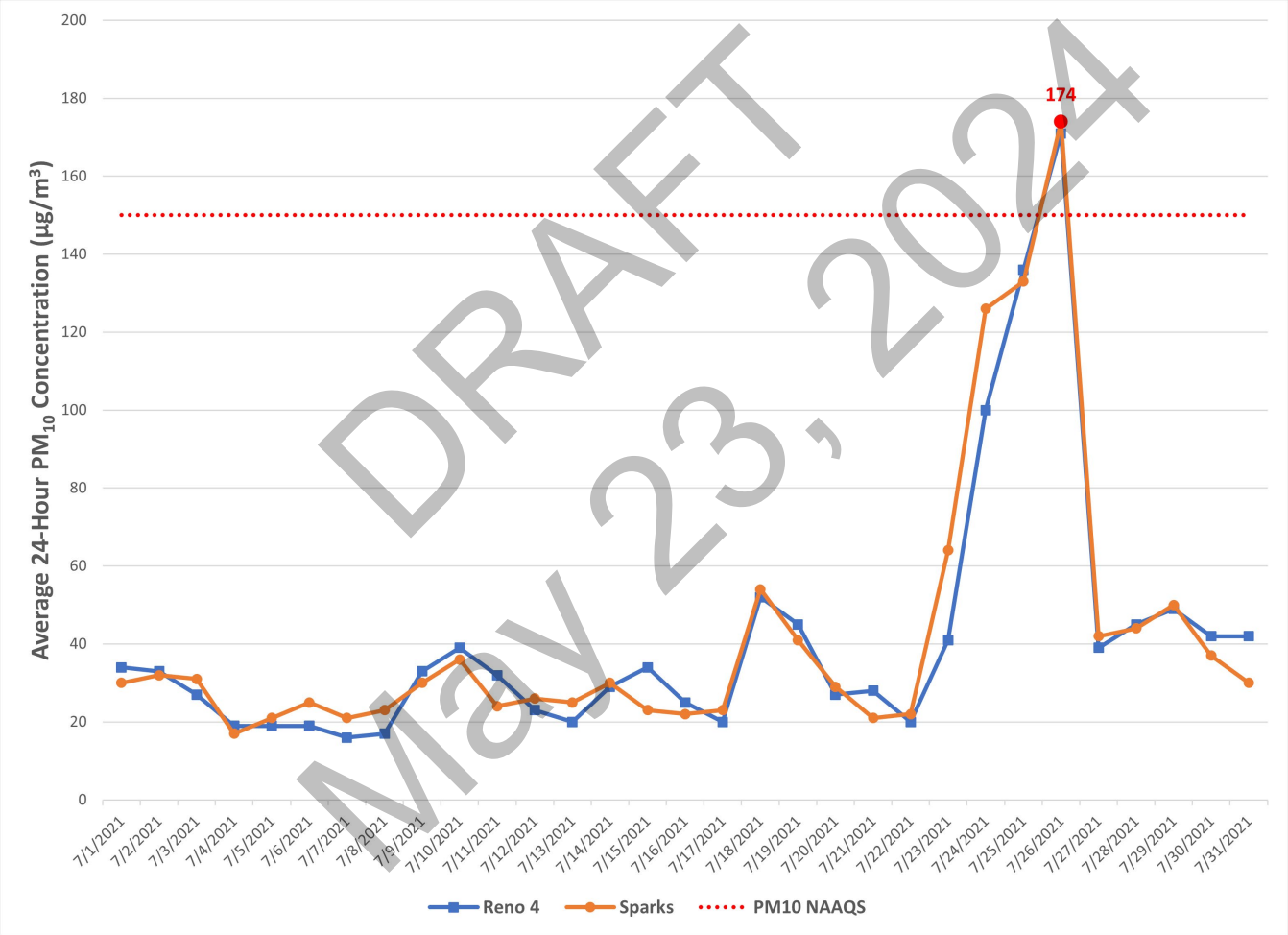
Table 2-3: PM_{10} Data Requested to be Excluded

Monitoring Site (AQS ID)	7/26/2021
Reno4 (AQS ID: 32-031-0031-81102-2)	171 µg/m^3
Sparks (AQS ID: 32-031-1005-81102-4)	174 µg/m^3

2.5.2 Narrative of Air Quality Impacts

In July of 2021, wildfire smoke was transported into the Truckee Meadows from the Dixie and Tamarack Fires which eventually led to PM_{10} exceedances at the Sparks and Reno4 air monitoring stations within HA 87. At Reno4, the 24-hour average concentration for PM_{10} was as low as 20µg/m^3 on July 22, 2021. As smoke entered the region, the 24-hour average rose drastically to a peak of 171µg/m^3 on the day of the exceedance, July 26, 2021. Similarly, at Sparks, the 24-hour average concentration for PM_{10} was as low as 22µg/m^3 on July 22, 2021. The 24-hour average at Sparks also quickly increased to a peak of 174µg/m^3 on the day of the exceedance. As winds shifted and a thunderstorm system moved into the area, the wildfire smoke within HA 87 quickly vacated the area in the days after the exceedance. An overview of 24-hour average concentrations for PM_{10} for the month of July 2021 is shown in Figure 2-8. The day of the exceedance is denoted by the red data points on July 26, 2021.

Figure 2-8: 24-hour PM_{10} Concentrations in July 2021



2.5.3 Area Forecast Discussions, Satellite Imagery, and Daily Weather Maps

The National Weather Service (NWS) Office in Reno, Nevada provides at least two daily Area Forecast Discussions that summarize the short and long-term weather forecast for the area. It also provides a synopsis of current observations as well as weather events such as smoke and haze. Below is an excerpt from an area forecast discussion issued the day before the exceedance. This excerpt confirms that the previously mentioned sequence of events is accurate.

> *"Greatest issue impacting many people today and probably again Monday will be the smoke from ongoing wildfires, predominately from the Tamarack and Dixie Fires. The lack of the typical afternoon zephyr breezes and the tendency for northwest-north low-level winds overnight ("heat low" in Basin) are expected to keep smoke as the main large-scale hazard. Keep windows closed and try to limit outdoor activity as much as feasible. While there could be some improvement in the afternoon and evening thanks to mixing and weak westerly flow, smoke is expected to filter back in as flow turns northwest-north the next couple of nights. Visit fire.airnow.gov for the latest AQI readings in your vicinity."*
>
> Excerpt from NWS-Reno Area Forecast Discussion (251 AM PDT SUN JUL 25 2021)

Satellite imagery also confirms the sequence of events of the exceedance. As can be seen in Figure 2-9 below, smoke from the Tamarack and Dixie fires had not entered HA 87 as of July 22, 2021. As wind patterns shifted, smoke from the events moved into HA 87 until the day of the exceedance on July 26, 2021. This is seen in Figure 2-10 below. Within a few days, the smoke had vacated HA 87 which can be seen in Figure 2-11 below. The maps shown in Figures 2-12, 2-13, and 2-14 are daily weather maps that were issued by the National Weather Service around the time of the exceedance that provide extra evidence in support of the aforementioned sequence of events.

Figure 2-9: Satellite Imagery from July 22, 2021

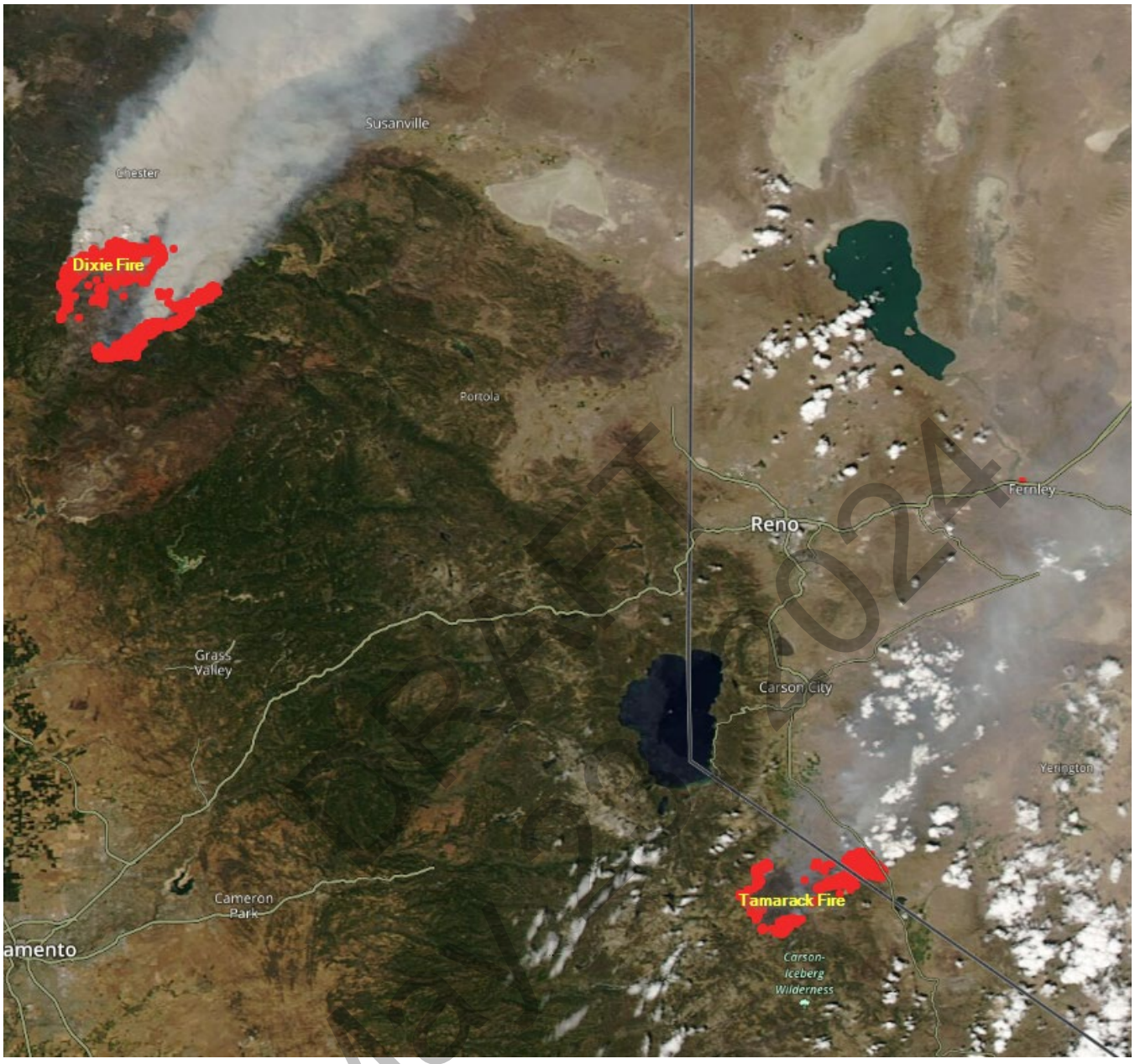


Figure 2-10: Satellite Imagery from July 26, 2021

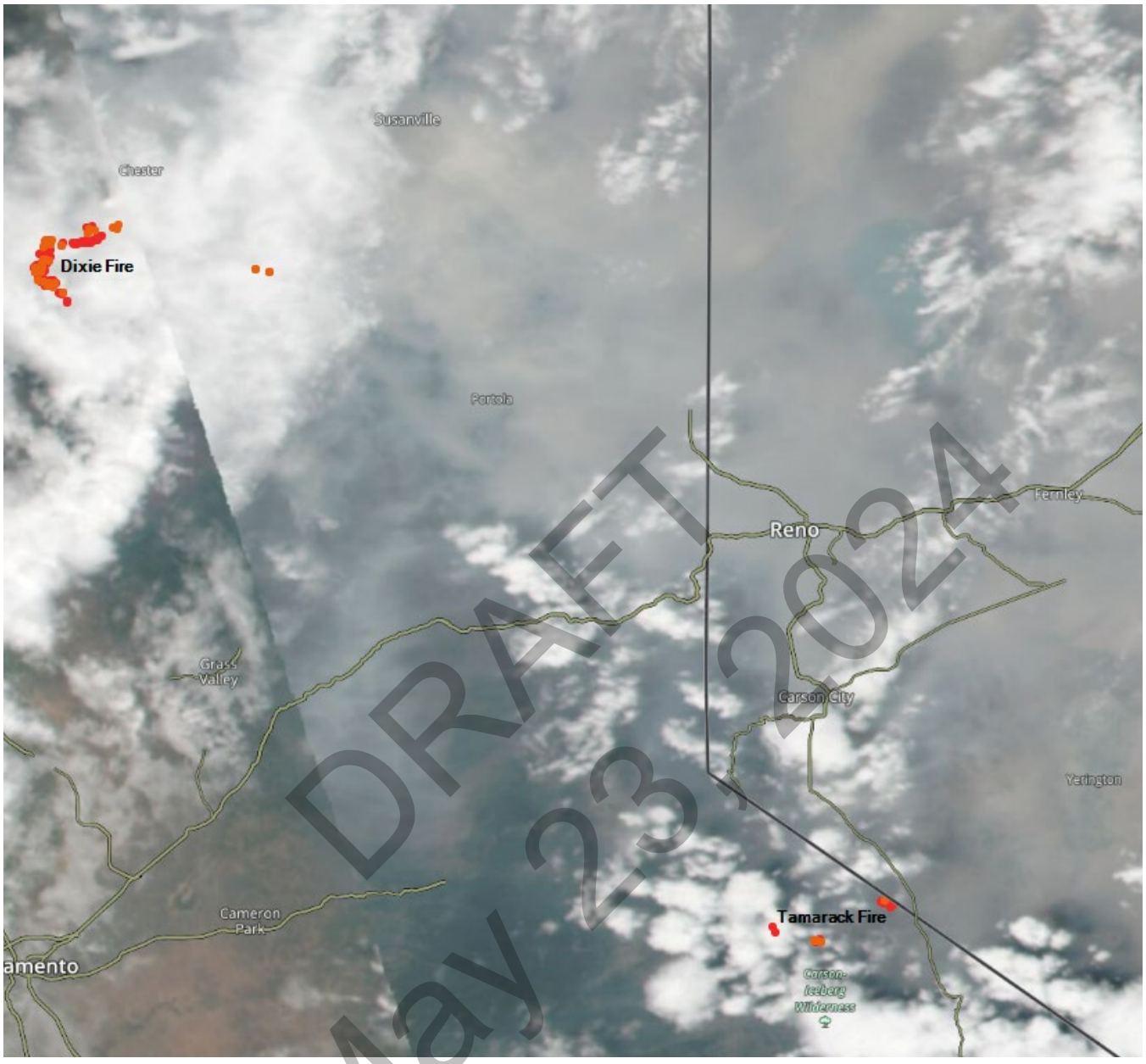


Figure 2-11: Satellite Imagery from July 28, 2021

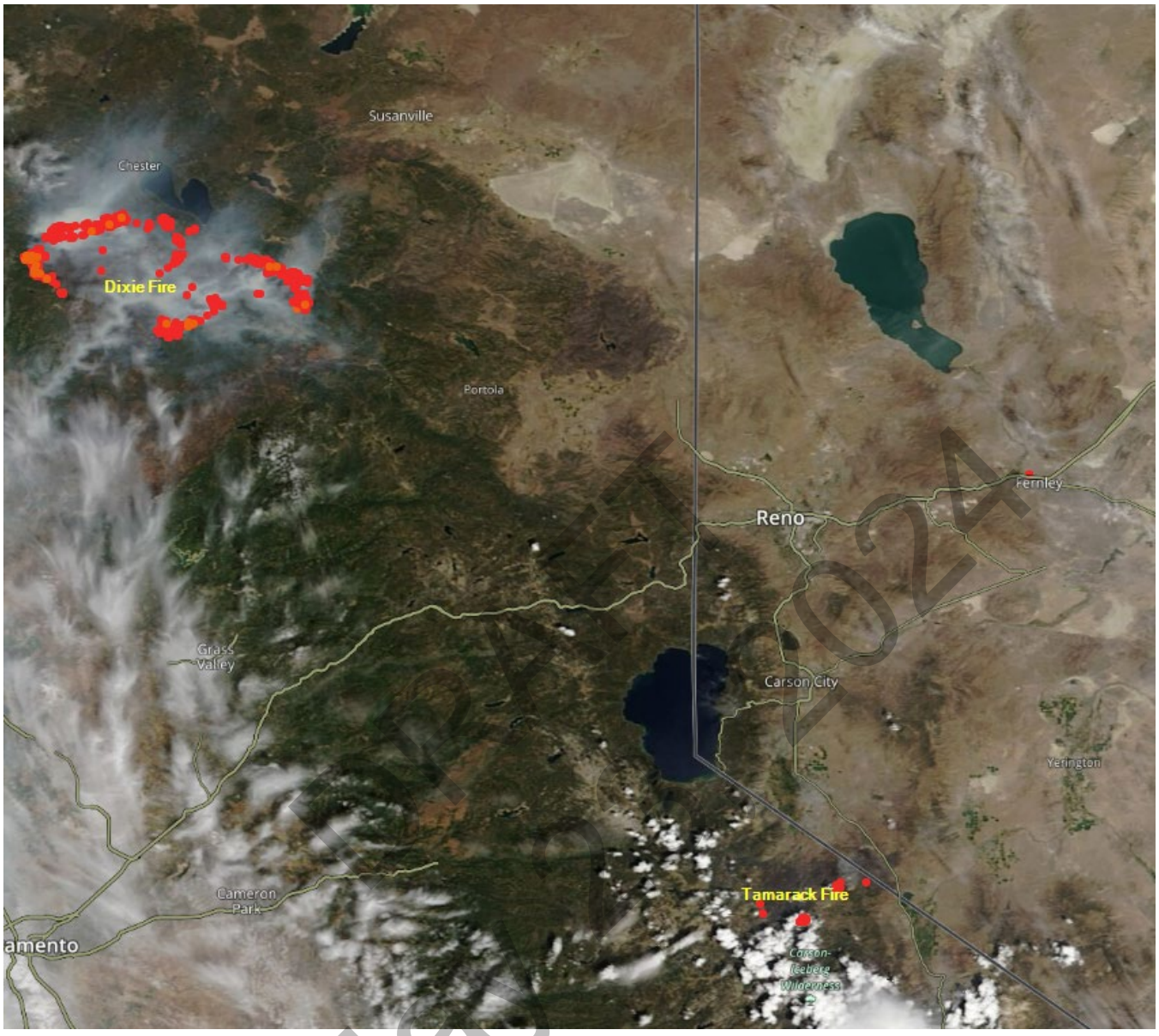


Figure 2-12: Daily Weather Maps for July 22, 2021

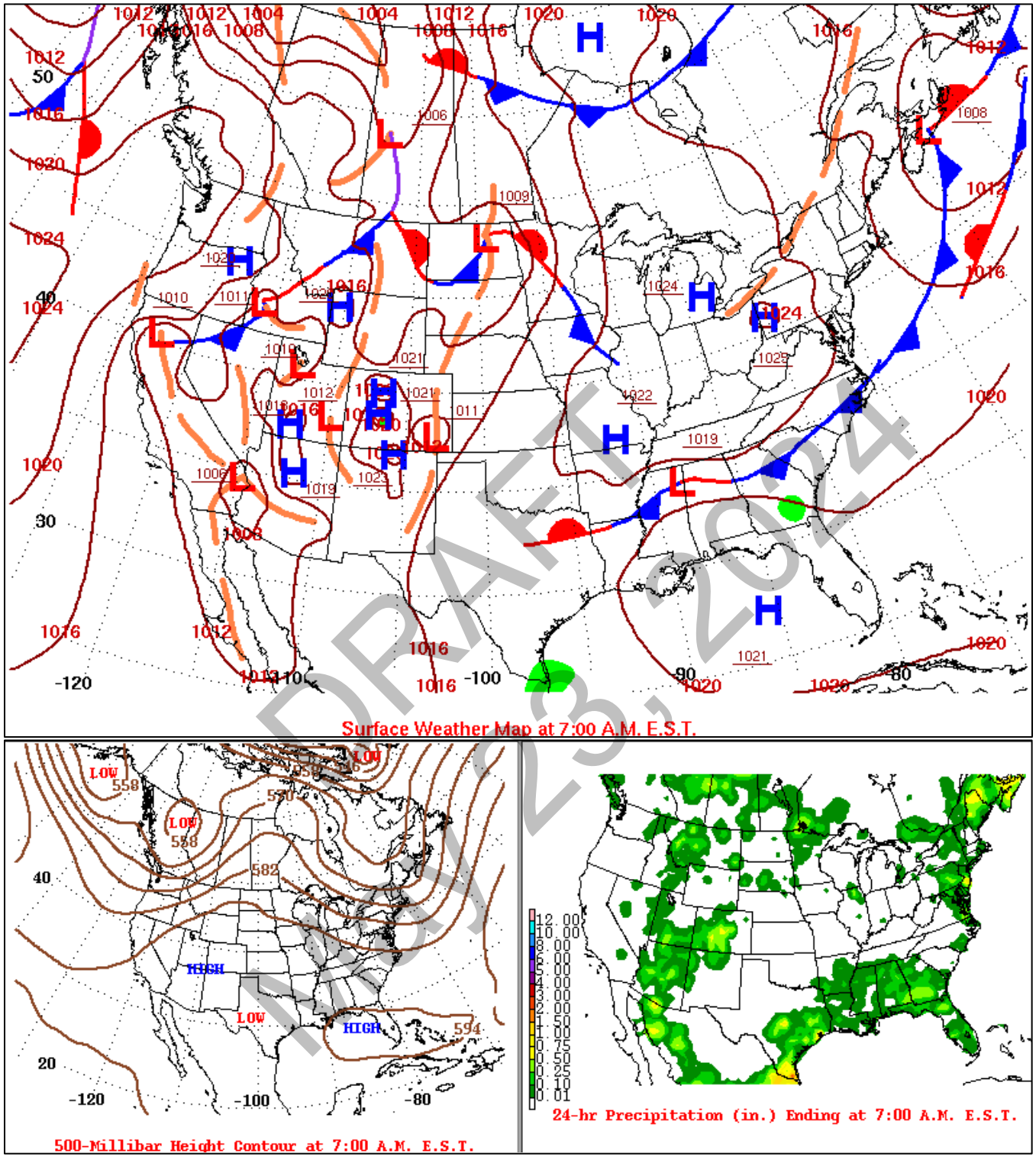


Figure 2-13: Daily Weather Maps for July 26, 2021

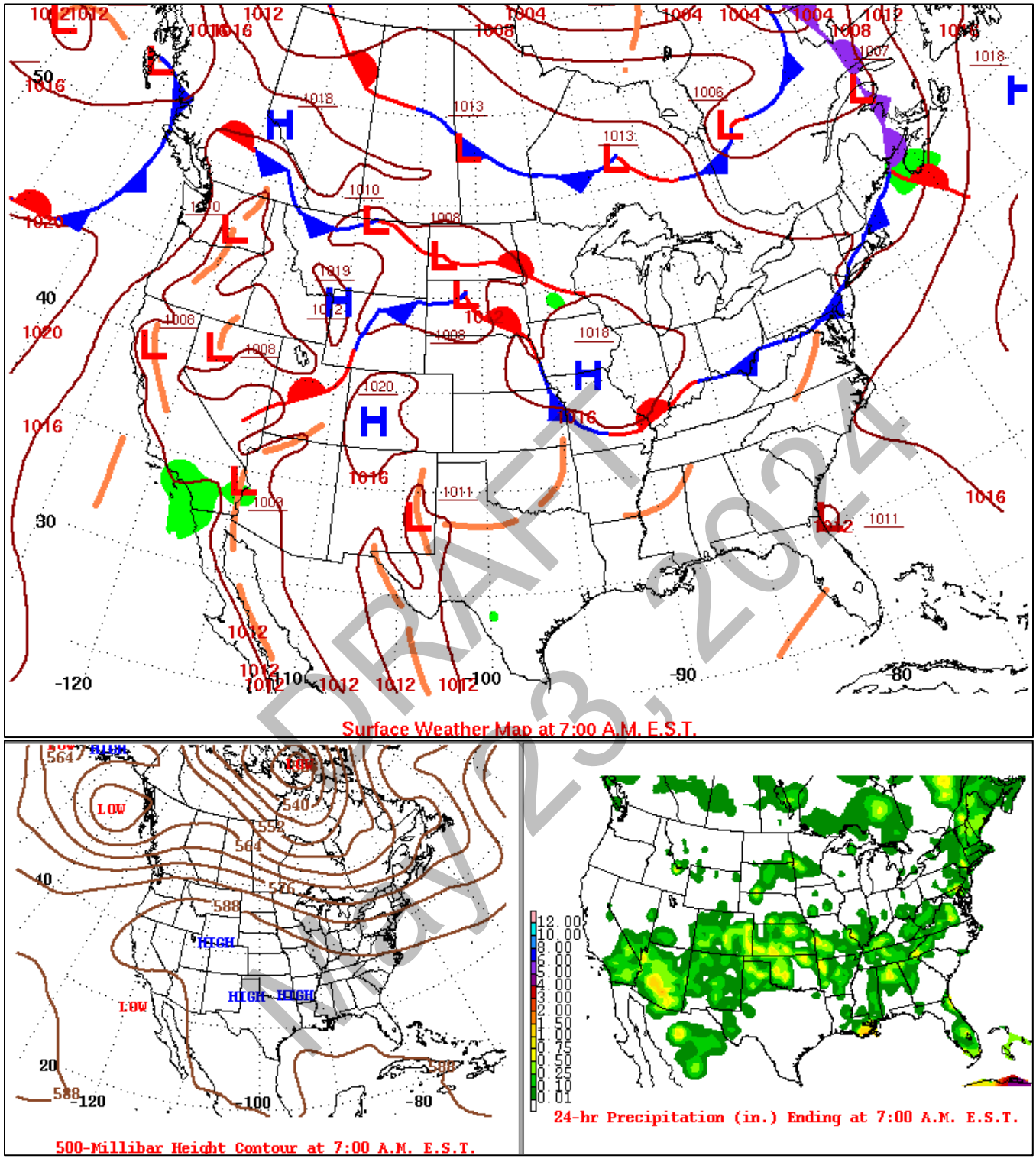
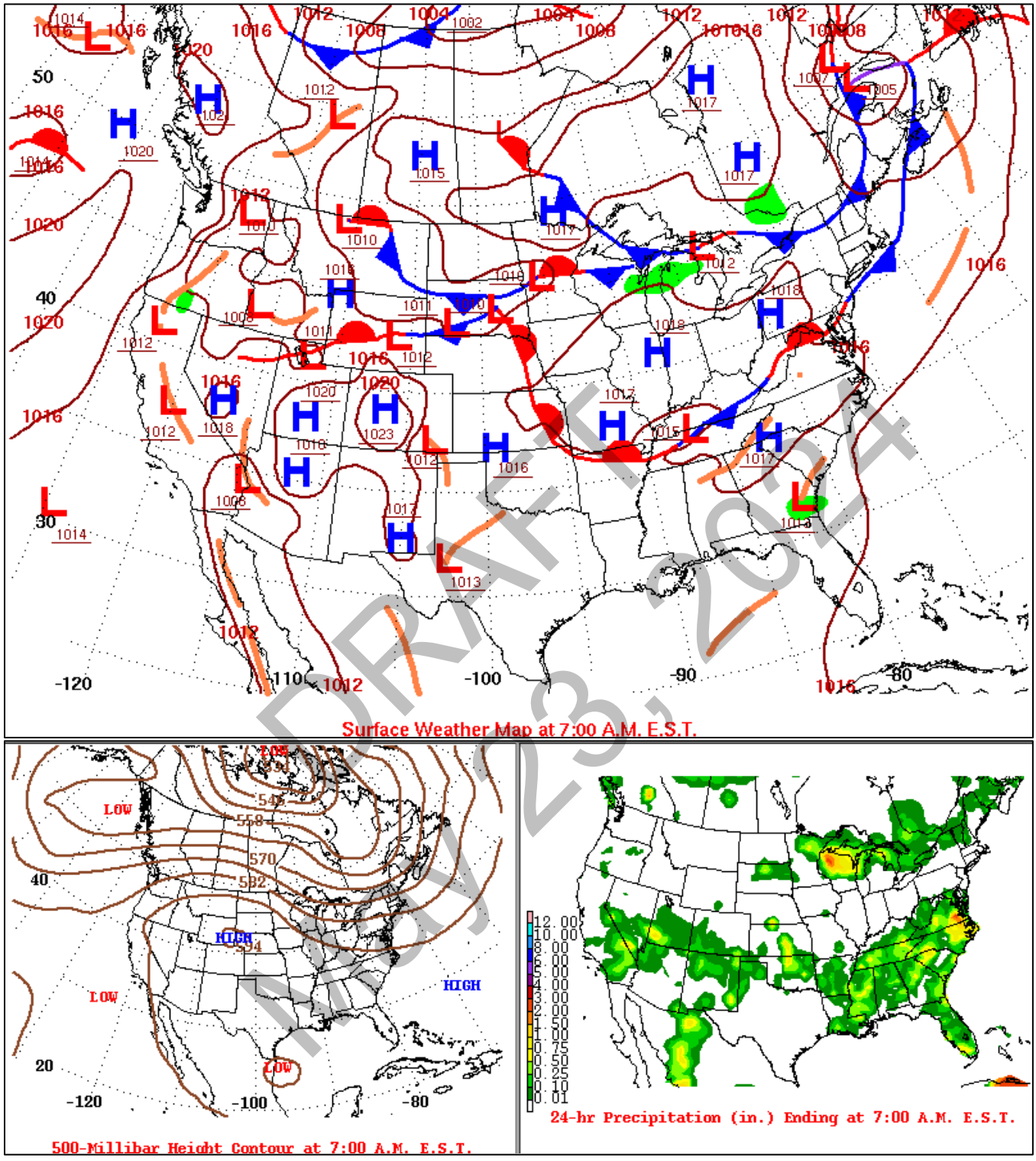


Figure 2-14: Daily Weather Maps for July 27, 2021



3.0 Not Reasonably Controllable or Preventable

Section 40 CFR 50.14 (c)(3)(iv)(D) requires a demonstration that the event was both not reasonably controllable and not reasonably preventable. Wildfires on wildland satisfy both requirements unless there is evidence to the contrary. This is explained in 40 CFR 50.14(b)(4) which states:

> *The Administrator shall exclude data from use in determinations of exceedances and violations where a State demonstrates to the Administrator's satisfaction that emissions from wildfires caused a specific air pollution concentration in excess of one or more national ambient air quality standard at a particular air quality monitoring location and otherwise satisfies the requirements of this section. Provided the Administrator determines that there is no compelling evidence to the contrary in the record, the Administrator will determine every wildfire occurring predominantly on wildland to have met the requirements identified in paragraph (c)(3)(iv)(D) of this section regarding the not reasonably controllable or preventable criterion.*

As was shown in Figure 2-6, the wildfires that caused the PM_{10} exceedance on July 26, 2021, were both started in the State of California on US Forest Service land. According to the definition of wildland provided in 40 CFR Part 50, §50.1(o), both the Dixie and Tamarack fires occurred on wildland because the areas that the fires started were in areas with little human activity.

> *40 CFR 50.1(o): Wildland means an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.*

In addition, since the wildfires were not within the jurisdiction of Washoe County and the pollution impacts were due to interstate transport, there is no reasonable control method that AQMD could have taken to prevent the PM_{10} exceedance from happening. The exceedance was caused by the excessive PM_{10} emissions from the Dixie and Tamarack fire, not from anthropogenic sources within Washoe County. This is proven beyond a reasonable doubt in Section 4 of this document, Clear Causal Relationship.

4.0 Clear Causal Relationship

4.1 Fire Emissions Analysis

As can be seen in Figure 2-8, smoke from the Tamarack and Dixie fires impacted the Reno4 and Sparks PM_{10} monitors starting on July 23, 2021. Between July 22 – July 26, 2021, the wildfires grew quickly and burned through large amounts of fuel, sending thousands of tons of emissions into the air, some of which was transported to the Truckee Meadows region, causing a PM_{10} exceedance. PM_{10} emissions from the fire during this time frame were estimated by AQMD using the U.S Forest Service BlueSky Playground tool, Version 3.5. The inputs to the BlueSky Playground modeling tool include 1) Latitude and Longitude of fire origination, 2) Emissions Type, 3) Fuel Moisture Condition, 4) FCCS Fuelbed type and 5) acreage burned. For the Tamarack Fire, the latitude and longitude were (38.628, -119.8592), the emissions type was "Wildfire", the Fuel Moisture Condition was "Dry", and the FCCS Fuelbed type was "Fuel bed code 17 – Red fir forest." For the Dixie Fire, the latitude and longitude were (39.8713, -121.3894), the emissions type was "Wildfire", the Fuel Moisture Condition was "Dry", and the FCCS Fuelbed type was "Fuel bed code 16 – Jeffrey pine-ponderosa pine-Douglas Fir-California black oak forest." The Fuel Moisture Condition was determined to be "Dry" as a conservative estimate based on the U.S. Drought Monitor from July 27, 2021 shown in Figure 2-7. Fire acreage growth for both fires was determined by changes in acreage burned between daily Smoke Outlook reports issued by the Interagency Wildland Fire Air Quality Response Program. At most large wildfire events, a daily Smoke Outlook report is issued by an Air Resource Advisor that includes the size of the fire (in acres). By finding the difference in fire size listed on consecutive daily Smoke Outlook reports, daily fire growth can be calculated.

As can be seen in Table 4-1, the total PM_{10} emissions that resulted from the Tamarack and Dixie Fires between July 22 and July 26, 2021 was approximately 77,693 tons. As was mentioned in Section 2.3, and as per the 2020 Emissions Inventory, Washoe County produces approximately 38,833 lbs/day of PM_{10}. That is a total of 7,087 tons over the course of the year. By comparison, the emissions from the Tamarack Fire and Dixie Fire over the five-day period before the exceedance was over ten times the annual PM_{10} emissions that Washoe County produces.

Table 4-1: PM_{10} Emissions Calculations for the Period Prior to the Exceedance

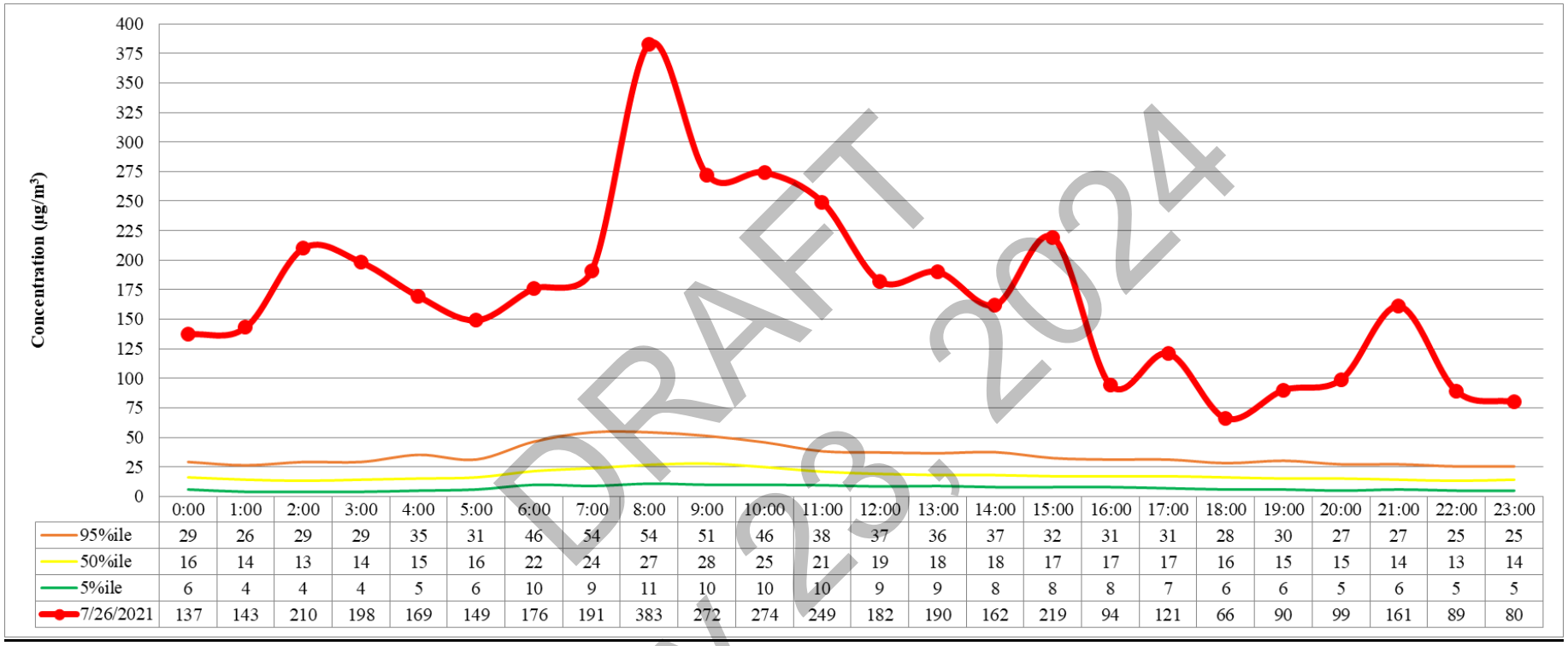
Date	Tamarack Fire Growth (Acres)	Dixie Fire Growth (Acres)	Tamarack Fire PM_{10} Emissions (Tons)	Dixie Fire PM_{10} Emissions (Tons)	Total PM_{10} Emissions (Tons)
July 22, 2021	8,288	63,520	10,434.82	32,121.22	42,556.04
July 23, 2021	6,735	13,859	8,479.55	7,008.31	15,487.86
July 24, 2021	1,592	9,336	2,004.37	4,721.09	6,725.46
July 25, 2021	1,020	6,862	1,284.21	3,470.02	4,754.23
July 26, 2021	339	15,312	426.81	7,743.08	8,169.89
Total	**17,974**	**108,889**	**22,629.76**	**55,063.72**	**77,693.48**

4.2 Comparison of Event PM_{10} Concentrations to Historical Concentrations

In order to prove that the day of the exceedance had abnormally high PM_{10} concentrations, AQMD compared the hourly data to what would be expected on a non-event day in wildfire season. AQMD completed a diurnal pattern analysis to do this. Each hour on the exceedance day was compared to the 5th percentile, 50th percentile, and 95th percentile of historical hourly concentrations. The historical concentrations were from the five-year period from 2016-2020 in the wildfire season of July-September. This analysis was done at both the Reno4 and Sparks PM_{10} monitors. For the Reno4 historical PM_{10} concentrations of 2016, 2017, 2018, and 2019, Reno3 data was used to add to Reno4's 2020 data.

As can be seen in Figure 4-1 and Figure 4-2 below, the hourly PM_{10} concentrations at both Reno4 and Sparks on the day of the exceedance are much higher than what would be expected based on historical concentrations. All hourly concentrations were orders of magnitude higher than what would be expected (50th percentile). Additionally, all hourly concentrations were much higher than the 95th percentile of the data set.

Figure 4-1: 2016-2020 PM_{10} Diurnal Pattern Comparison to Exceedance at Reno4



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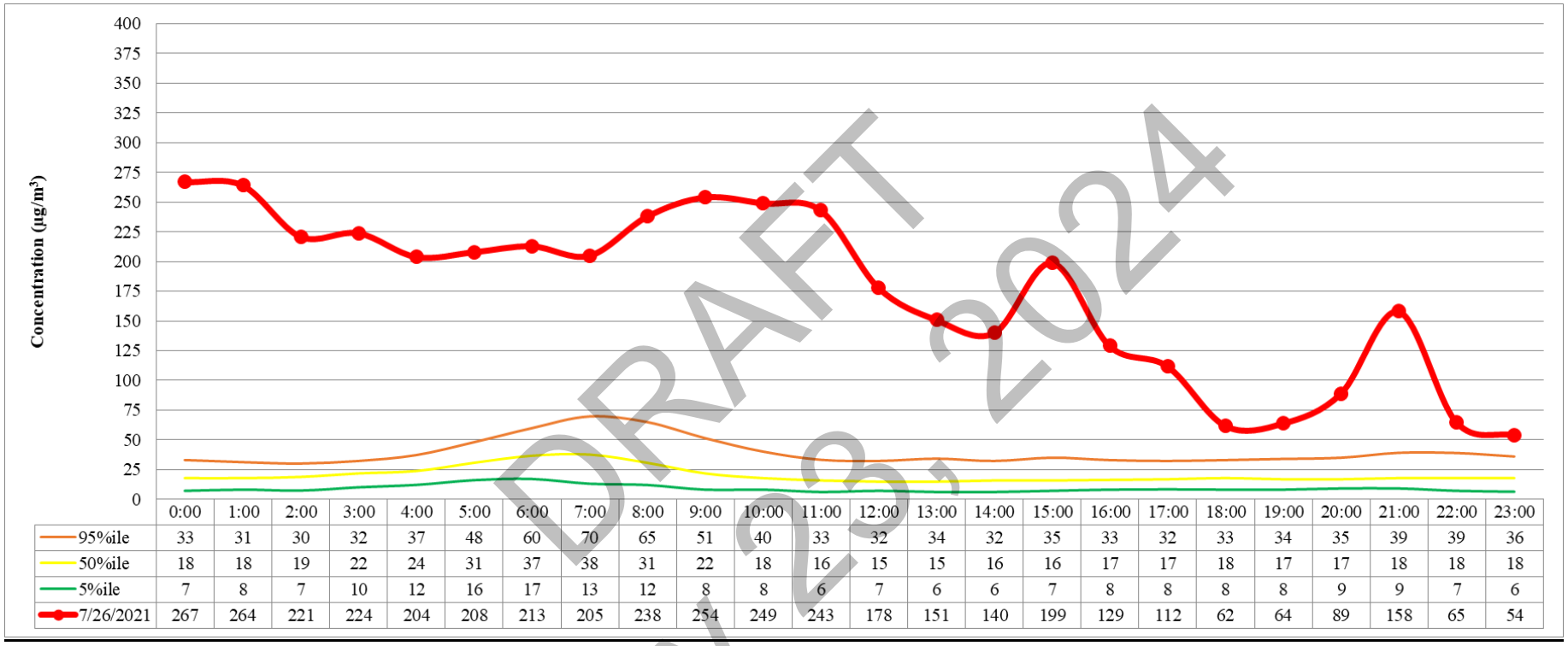
95%ile	29	26	29	29	35	31	46	54	54	51	46	38	37	36	37	32	31	31	28	30	27	27	25	25
50%ile	16	14	13	14	15	16	22	24	27	28	25	21	19	18	18	17	17	17	16	15	15	14	13	14
5%ile	6	4	4	4	5	6	10	9	11	10	10	10	9	9	8	8	8	7	6	6	5	6	5	5
7/26/2021	137	143	210	198	169	149	176	191	383	272	274	249	182	190	162	219	94	121	66	90	99	161	89	80

Figure 4-2: 2016-2020 PM_{10} Diurnal Pattern Comparison to Exceedance at Sparks



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
95%ile	33	31	30	32	37	48	60	70	65	51	40	33	32	34	32	35	33	32	33	34	35	39	39	36
50%ile	18	18	19	22	24	31	37	38	31	22	18	16	15	15	16	16	17	17	18	17	17	18	18	18
5%ile	7	8	7	10	12	16	17	13	12	8	8	6	7	6	6	7	8	8	8	8	9	9	7	6
7/26/2021	267	264	221	224	204	208	213	205	238	254	249	243	178	151	140	199	129	112	62	64	89	158	65	54

4.3 Methods for Determining the Presence of Wildfire Smoke

4.3.1 $PM_{2.5}$ Concentrations

Although this demonstration is written for PM_{10}, analyzing the $PM_{2.5}$ concentrations during the event supports this demonstration by highlighting that the fine particulate matter concentrations followed the same trend as PM_{10}. If the particulate is made up of smoke, $PM_{2.5}$ and PM_{10} should follow the same trend. If the particulate was made up of something else such as a geologic source, $PM_{2.5}$ would not follow the same trend as PM_{10}. As can be seen in Figure 4-3 and Figure 4-4, concentrations of $PM_{2.5}$ and PM_{10} followed the same trend over duration of the event at both affected monitors, thus supporting AQMD's position that wildfire smoke was present.

Figure 4-3: 24-hour $PM_{2.5}$ and PM_{10} Concentrations at Reno4 in July 2021

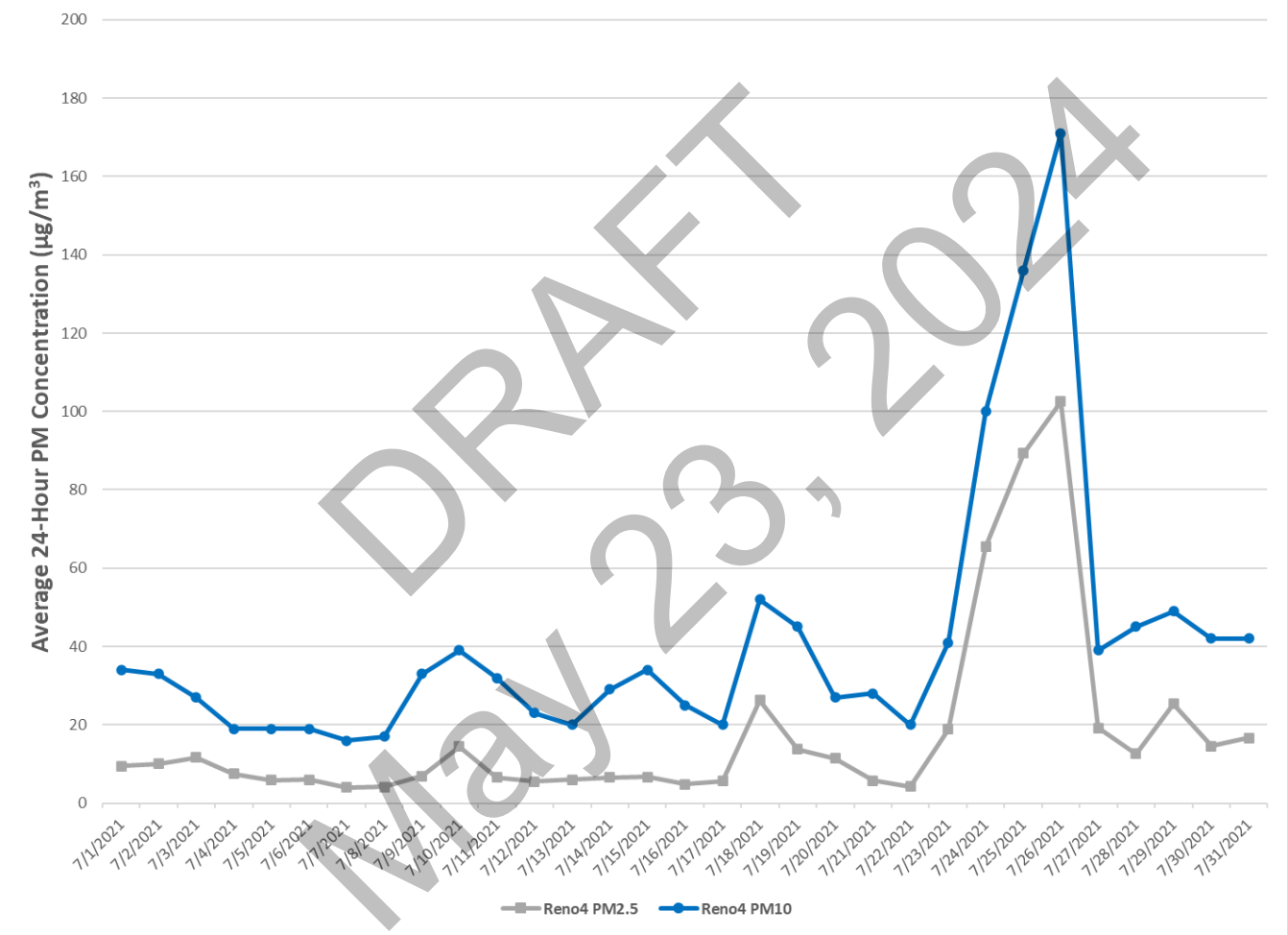
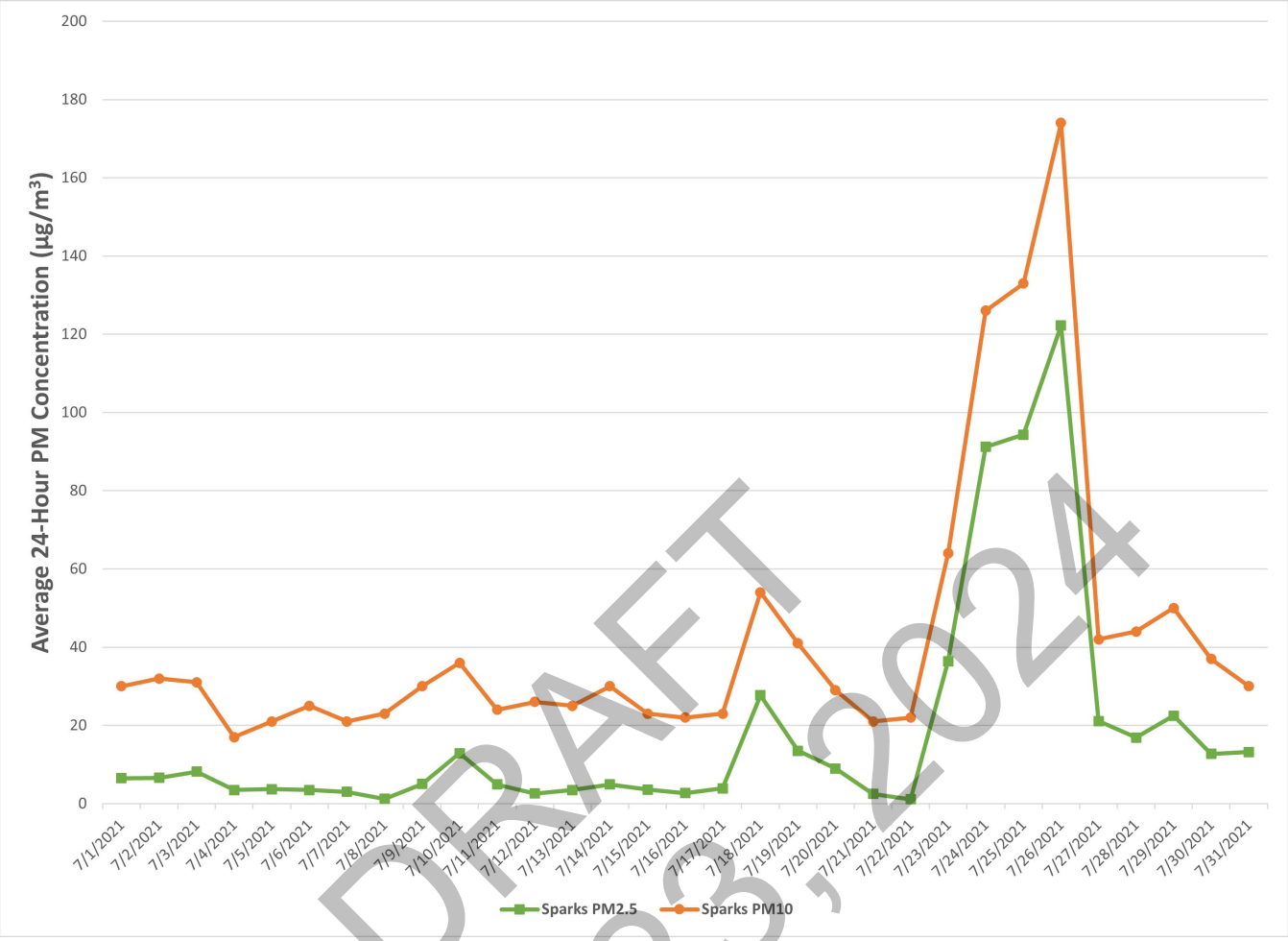


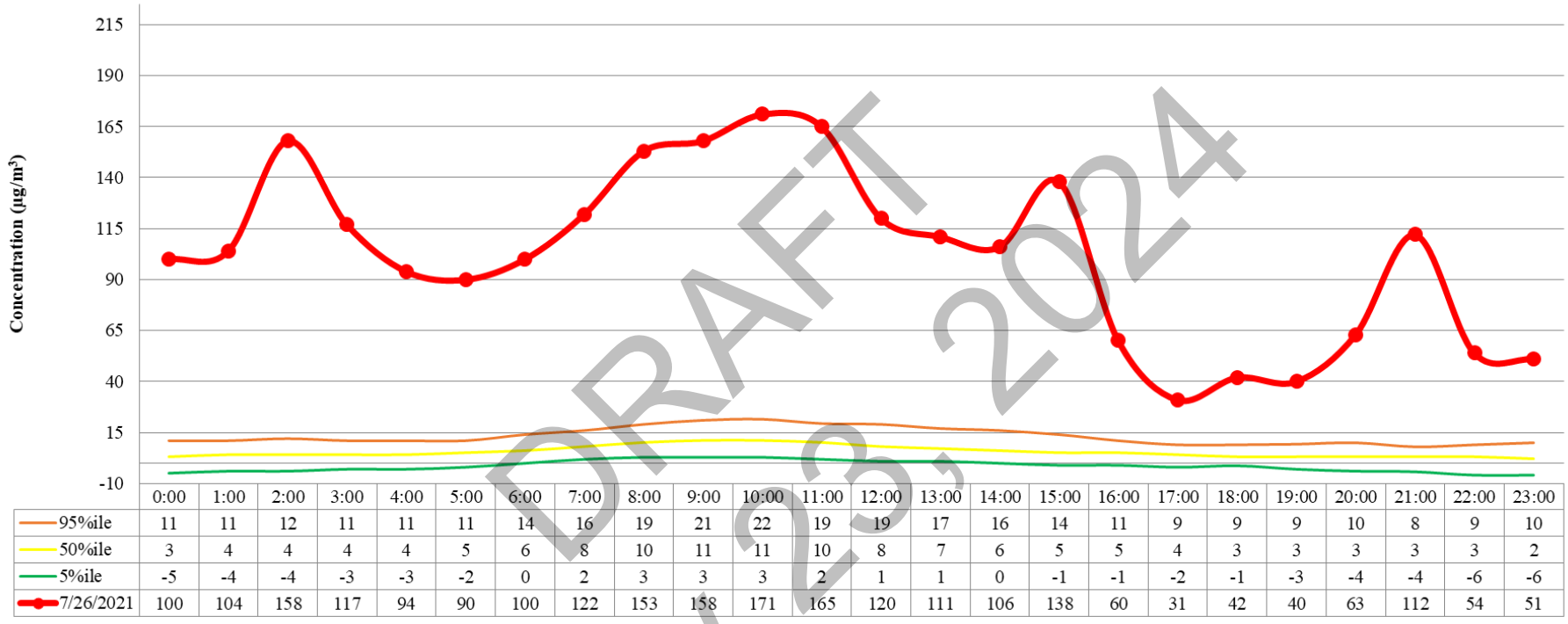
Figure 4-4: 24-hour $PM_{2.5}$ and PM_{10} Concentrations at Sparks in July 2021



Similar to PM_{10}, AQMD also completed a diurnal pattern analysis for $PM_{2.5}$. Each hour on the exceedance day was compared to the 5th percentile, 50th percentile, and 95th percentile of historical hourly concentrations. The historical concentrations were from the five-year period from 2016-2020 in the wildfire season of July-September. This analysis was done at both the Reno4 and Sparks $PM_{2.5}$ monitors. For the Reno4 historical $PM_{2.5}$ concentrations of 2016, 2017, 2018, and 2019, Reno3 data was used to add to Reno4's 2020 data.

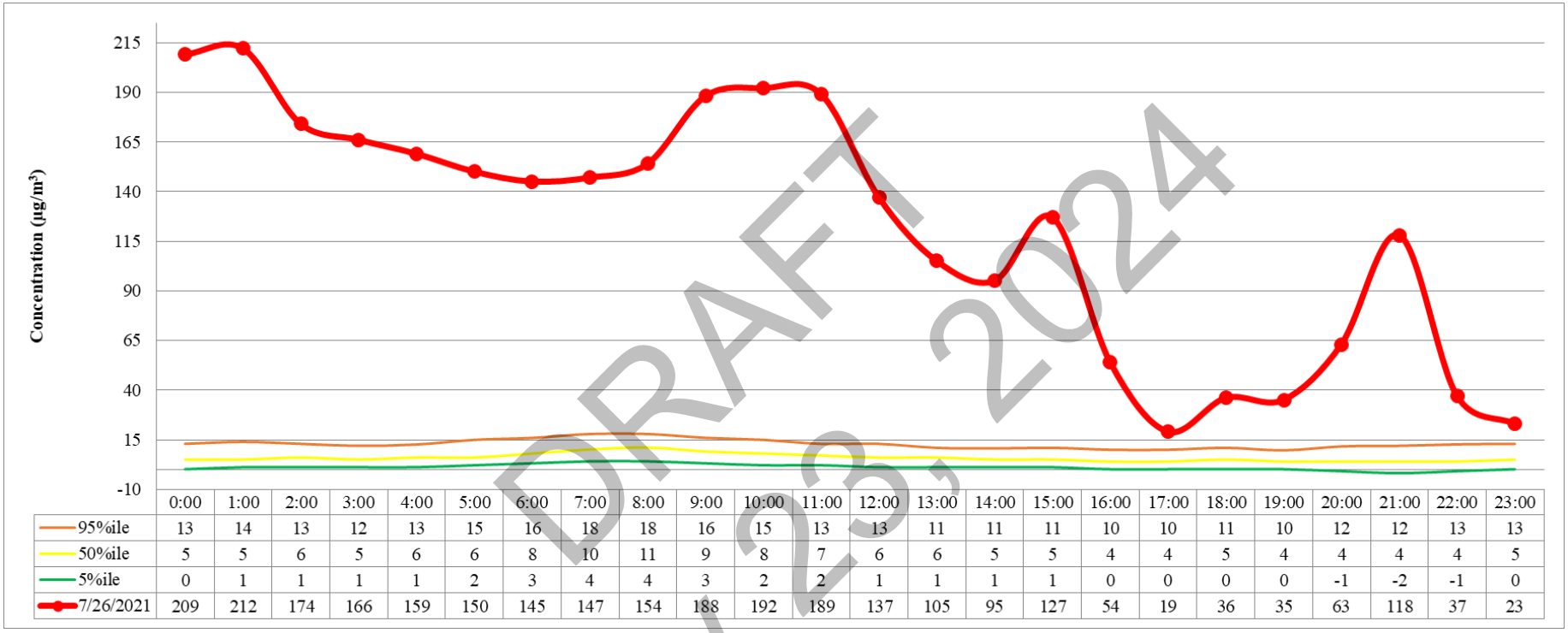
As can be seen in Figure 4-5 and 4-6 below, every hour of the exceedance was multiple times higher than what would be expected (50th percentile) and still much higher than the 95th percentile of the data set.

Figure 4-5: 2016-2020 $PM_{2.5}$ Diurnal Pattern Comparison to Exceedance at Reno4



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
95%ile	11	11	12	11	11	11	14	16	19	21	22	19	19	17	16	14	11	9	9	9	10	8	9	10
50%ile	3	4	4	4	4	5	6	8	10	11	11	10	8	7	6	5	5	4	3	3	3	3	3	2
5%ile	-5	-4	-4	-3	-3	-2	0	2	3	3	3	2	1	1	0	-1	-1	-2	-1	-3	-4	-4	-6	-6
7/26/2021	100	104	158	117	94	90	100	122	153	158	171	165	120	111	106	138	60	31	42	40	63	112	54	51

Figure 4-6: 2016-2020 $PM_{2.5}$ Diurnal Pattern Comparison to Exceedance at Sparks



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
95%ile	13	14	13	12	13	15	16	18	18	16	15	13	13	11	11	11	10	10	11	10	12	12	13	13
50%ile	5	5	6	5	6	6	8	10	11	9	8	7	6	6	5	5	4	4	5	4	4	4	4	5
5%ile	0	1	1	1	1	2	3	4	4	3	2	2	1	1	1	1	0	0	0	0	-1	-2	-1	0
7/26/2021	209	212	174	166	159	150	145	147	154	188	192	189	137	105	95	127	54	19	36	35	63	118	37	23

4.3.2 $PM_{2.5}/PM_{10}$ Ratio

One method for determining whether the elevated PM_{10} concentrations were caused by wildfire smoke is by analyzing the ratio of $PM_{2.5}$ to PM_{10}. If a higher fraction of the PM_{10} is made up of $PM_{2.5}$, this is indicative that smoke is present in the region. A lower $PM_{2.5}/PM_{10}$ ratio would mean that more of the particulate is larger than 2.5 microns and is most likely of a geologic origin. As can be seen in Table 4-2 and Table 4-3, the $PM_{2.5}/PM_{10}$ ratio at Reno4 and Sparks started to increase between July 22 and July 23, 2021. The day of the exceedance is highlighted in yellow and shows an elevated ratio compared to when the monitors were not affected by the wildfire smoke on July 22 and July 28 of 2021.

Table 4-2: $PM_{2.5}/PM_{10}$ Ratios at Reno4

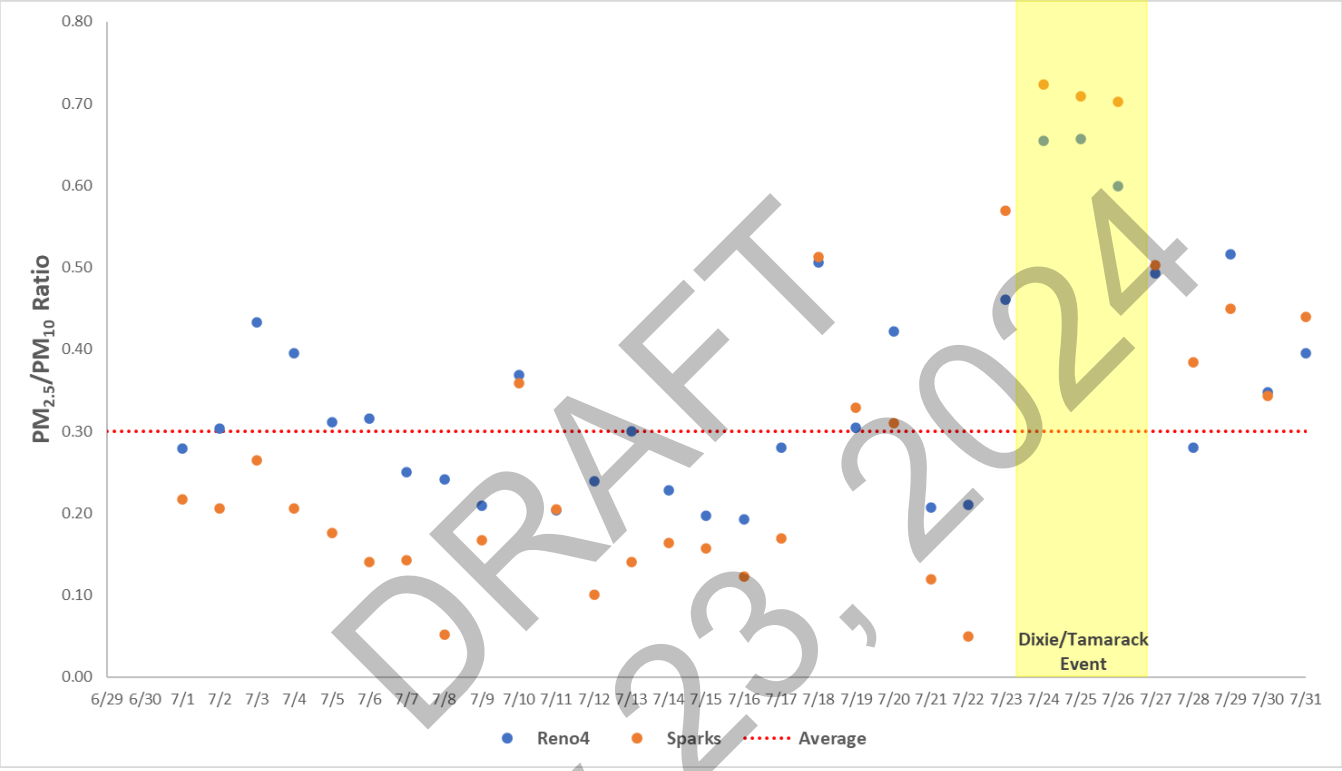
Reno4			
	24-hour Average ($\mu g/m^3$)		
Date	$PM_{2.5}$	PM_{10}	$PM_{2.5}/PM_{10}$
7/22/2021	4.2	20	0.21
7/23/2021	18.9	41	0.46
7/24/2021	65.5	100	0.66
7/25/2021	89.3	136	0.66
7/26/2021	102.5	171	0.60
7/27/2021	19.2	39	0.49
7/28/2021	12.6	45	0.28

Table 4-3: $PM_{2.5}/PM_{10}$ Ratios at Sparks

Sparks			
	24-hour Average ($\mu g/m^3$)		
Date	$PM_{2.5}$	PM_{10}	$PM_{2.5}/PM_{10}$
7/22/2021	1.1	22	0.05
7/23/2021	36.4	64	0.57
7/24/2021	91.2	126	0.72
7/25/2021	94.3	133	0.71
7/26/2021	122.2	174	0.70
7/27/2021	21.1	42	0.50
7/28/2021	16.9	44	0.38

The $PM_{2.5}/PM_{10}$ ratio during the Dixie/Tamarack event was much higher than the rest of July 2021 and what would be expected on a typical summer day. AQMD determined what a typical summertime $PM_{2.5}/PM_{10}$ ratio would be by finding the regional average ratio during July-September between 2016 and 2020. The regional average ratio is the average of the Reno4 and Sparks $PM_{2.5}/PM_{10}$ ratios. The $PM_{2.5}/PM_{10}$ ratio that could be expected when not influenced by wildfire smoke or other events is 0.30. The ratio on the day of the exceedance was 0.60 and 0.70 at Reno4 and Sparks respectively. The ratio was approximately twice what would be expected, thus supporting AQMD's position that the exceedance was caused by wildfire smoke. Figure 4-7 illustrates this.

Figure 4-7: $PM_{2.5}/PM_{10}$ Ratios throughout July 2021



4.3.3 $PM_{2.5}$/CO Ratio

It has been documented that ambient $PM_{2.5}$ and CO concentrations are correlated in the presence of wildfire smoke in urban areas.[4] AQMD completed a linear regression analysis that compared the $PM_{2.5}$ and CO concentrations at the Reno4 and Sparks monitoring sites on the day of the exceedance. This information was then compared to a linear regression analysis completed for a non-event day on July 13, 2021. The equation and coefficient of determination (R^2) that resulted from the linear regression on the non-event day is shown below.

Non-Event Slopes (July 13, 2021)

Reno4: $y = -2.5812x + 6.3198$ $\quad R^2 = 0.0021$

Sparks: $y = 2.6136x + 3.017$ $\quad R^2 = 0.0028$

As can be seen in Figure 4-8 and Figure 4-9, a strong correlation was found on the day of the exceedance between $PM_{2.5}$ and CO concentrations at both Reno4 and Sparks. The coefficient of determination for Reno4 and Sparks is 0.9314 and 0.9027, respectively. This signals a presence of wildfire smoke on the day of the exceedance.

Figure 4-8: Hourly $PM_{2.5}$/CO at Reno4 on July 26, 2021

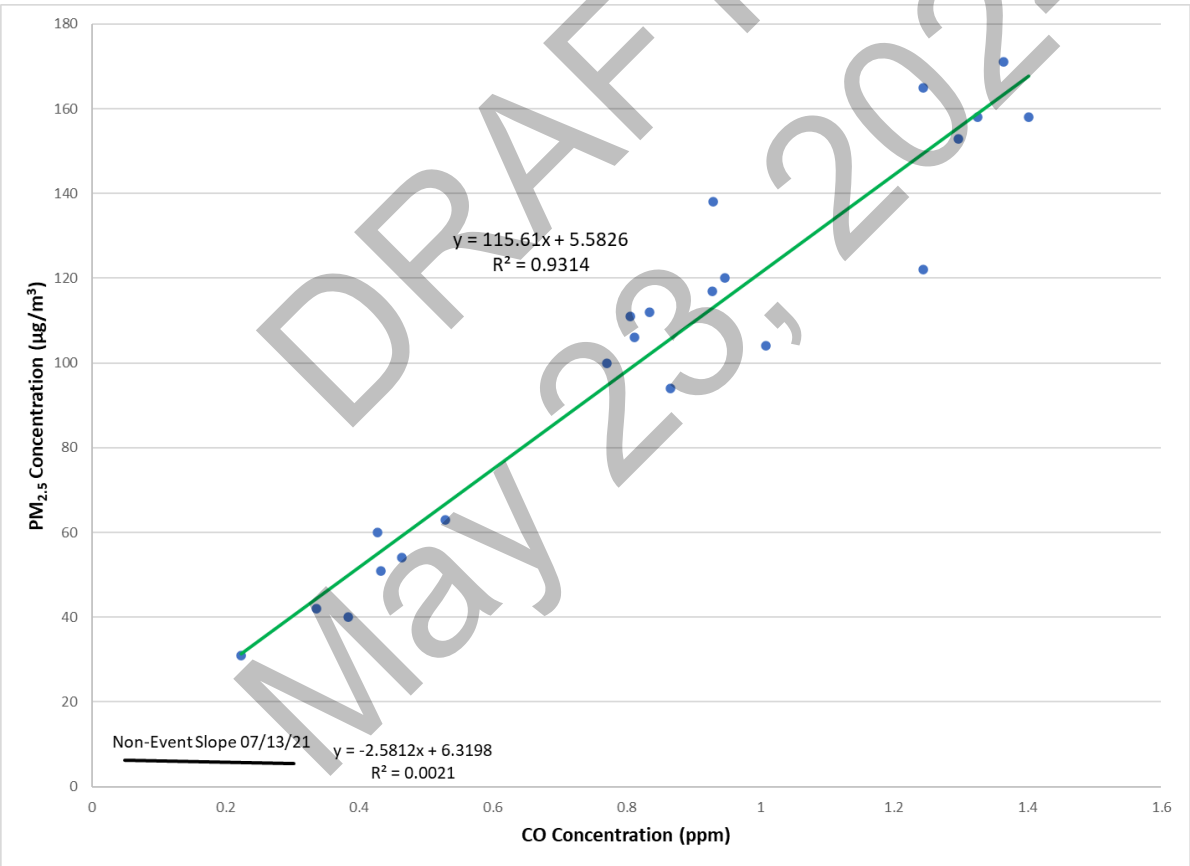
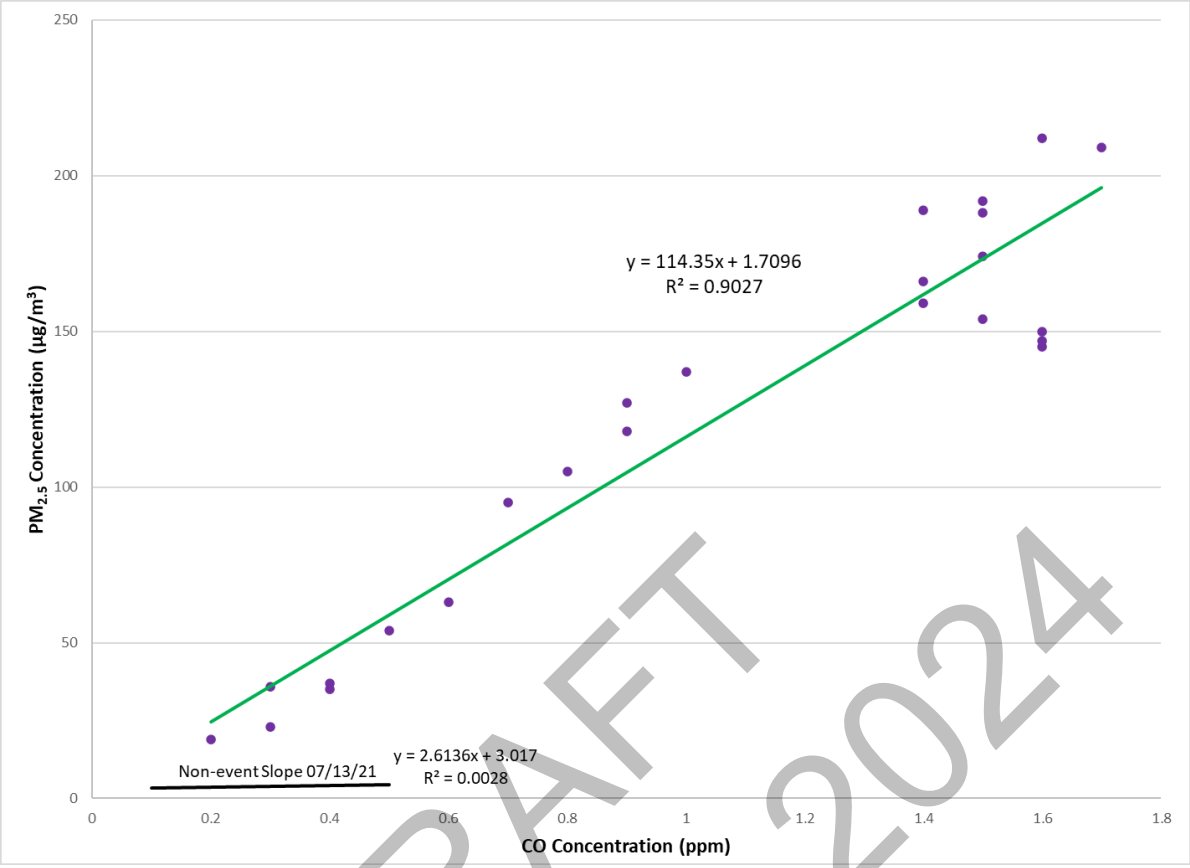


Figure 4-9: Hourly $PM_{2.5}$/CO at Sparks on July 26, 2021

[4] Jaffe, D. A., Schnieder, B., and Inouye, D.: Technical note: Use of $PM_{2.5}$ to CO ratio as an indicator of wildfire smoke in urban areas, Atmos. Chem. Phys., 22, 12695–12704, https://doi.org/10.5194/acp-22-12695-2022, 2022.



4.3.4 PM_{10}/CO Ratio

When an area is impacted by wildfire smoke, the CO and PM_{10} concentrations should also be correlated, although not as strongly correlated as CO and $PM_{2.5}$. Similar to section 4.3.3, a linear regression analysis was completed with CO and PM_{10} data on the day of the exceedance and compared to a non-event day on July 13, 2021. The equation and coefficient of determination that resulted from the linear regression on the non-event day is shown below.

Non-Event Slopes (July 13, 2021)

Reno4: $y = 107.41x + 8.5459$ $R^2 = 0.2209$

Sparks: $y = 66.023x + 11.528$ $R^2 = 0.4516$

As can be seen in Figure 4-10 and 4-11, a strong correlation was also found between CO and PM_{10} at the Reno4 and Sparks monitoring stations on the day of the exceedance. The coefficient of determination for Reno4 and Sparks was 0.74 and 0.875, respectively. This also signals the presence of wildfire smoke in the region on the day of the exceedance.

Figure 4-10: Hourly PM_{10}/CO at Reno4 on July 26, 2021

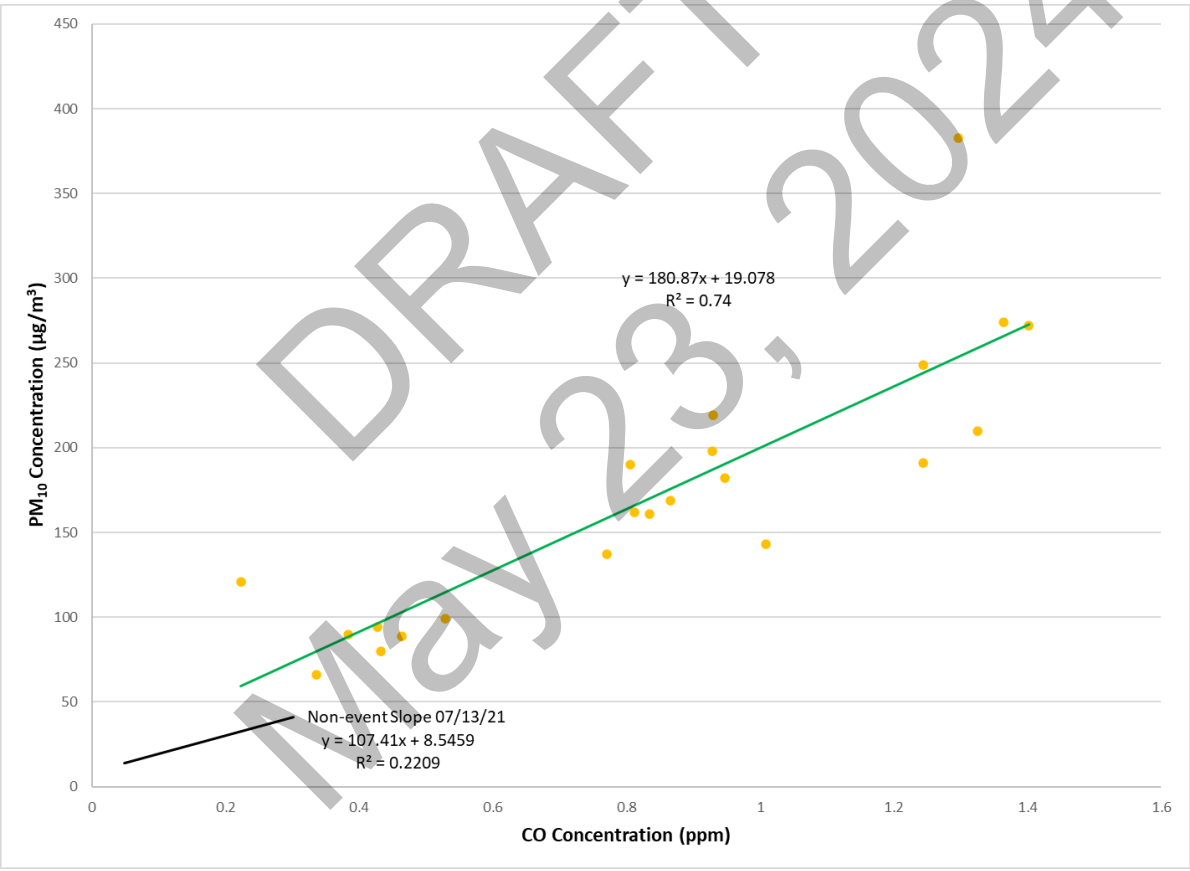
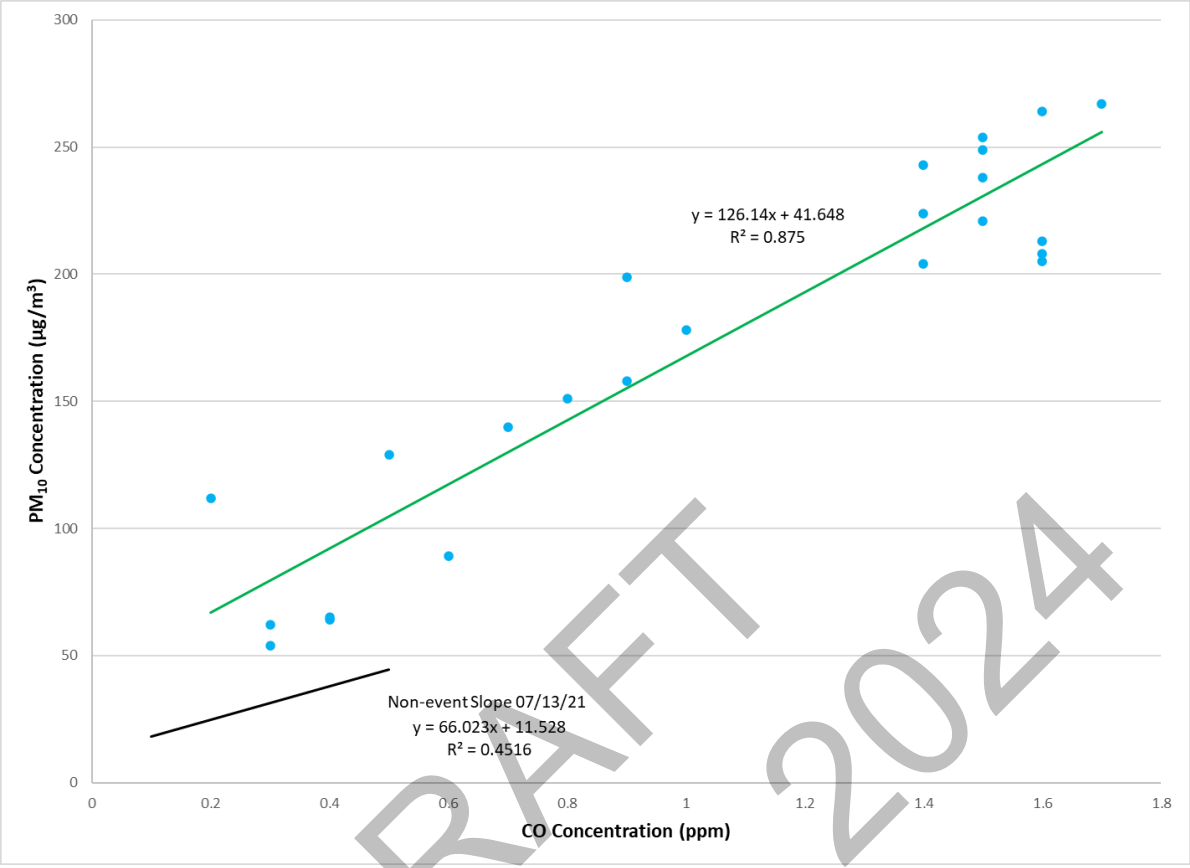


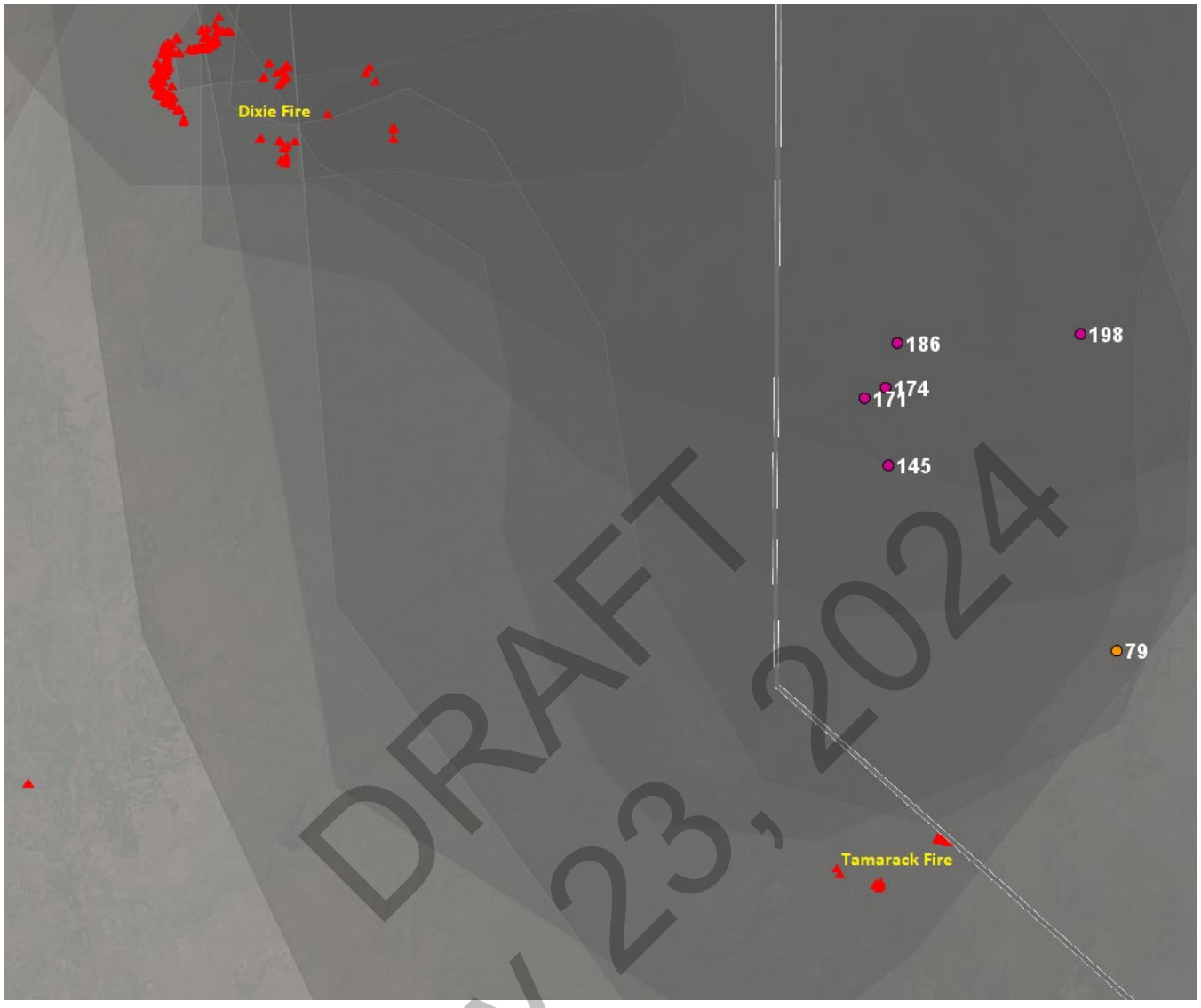
Figure 4-11: Hourly PM_{10}/CO at Sparks on July 26, 2021



4.4 Trajectory Analysis

A trajectory analysis was completed for the event using the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model to compute simple air parcel trajectories and determine where the smoke originated from. The HYSPLIT model's calculation method is a hybrid between the Lagrangian approach, which uses a moving frame of reference as the air parcels move from their initial location, and the Eulerian approach, which uses a fixed three-dimensional grid as a frame of reference. The trajectory models in this section were created with the EPA AirNow-Tech Navigator page and the HYSPLIT model was provided by NOAA's Air Resources Laboratory. The model used the North American Mesoscale Model (NAM) 12-kilometer domain. Each HYSPLIT was completed at 50, 1000, and 2500 meters above ground level (agl). These values were chosen to best illustrate the dynamics of the air mass that affected the Washoe County region before and during the day of the exceedance. According to NWS-Reno, 50 meters agl is a good proxy for boundary layer height in the region. The HYSPLIT figures below include the "HMS Fire" layer which shows the location of each fire but does not include the "HMS Smoke" layer because the dense smoke during those times makes the locations in the figure indiscernible. This is illustrated in Figure 4-12. Additionally, each figure includes the 24-hour, midnight to midnight average PM_{10} concentration in $\mu g/m^3$ for each air monitoring site in the region.

Figure 4-12: AirNow-Tech Navigator with HMS Smoke Layer from July 26, 2021



4.4.1 Monitoring Site Analysis – Backward Trajectory

In order to accurately understand where the affected airmass originated from, AQMD completed 24-hour backward trajectory HYSPLIT models from the affected PM_{10} monitors at Reno4 and Sparks. In the figures below, the green line denotes 50 meters agl, the blue line denotes 1000 meters agl, and the red line denotes 2500 meters agl. The points on each line denote 6-hour increments. Because this section is for backward trajectory HYSPLIT models, the first point on the line would denote 6-hours before the start time of the model.

Figure 4-13: Backward Trajectory from Reno4 starting July 26, 2021 at 0000 PST

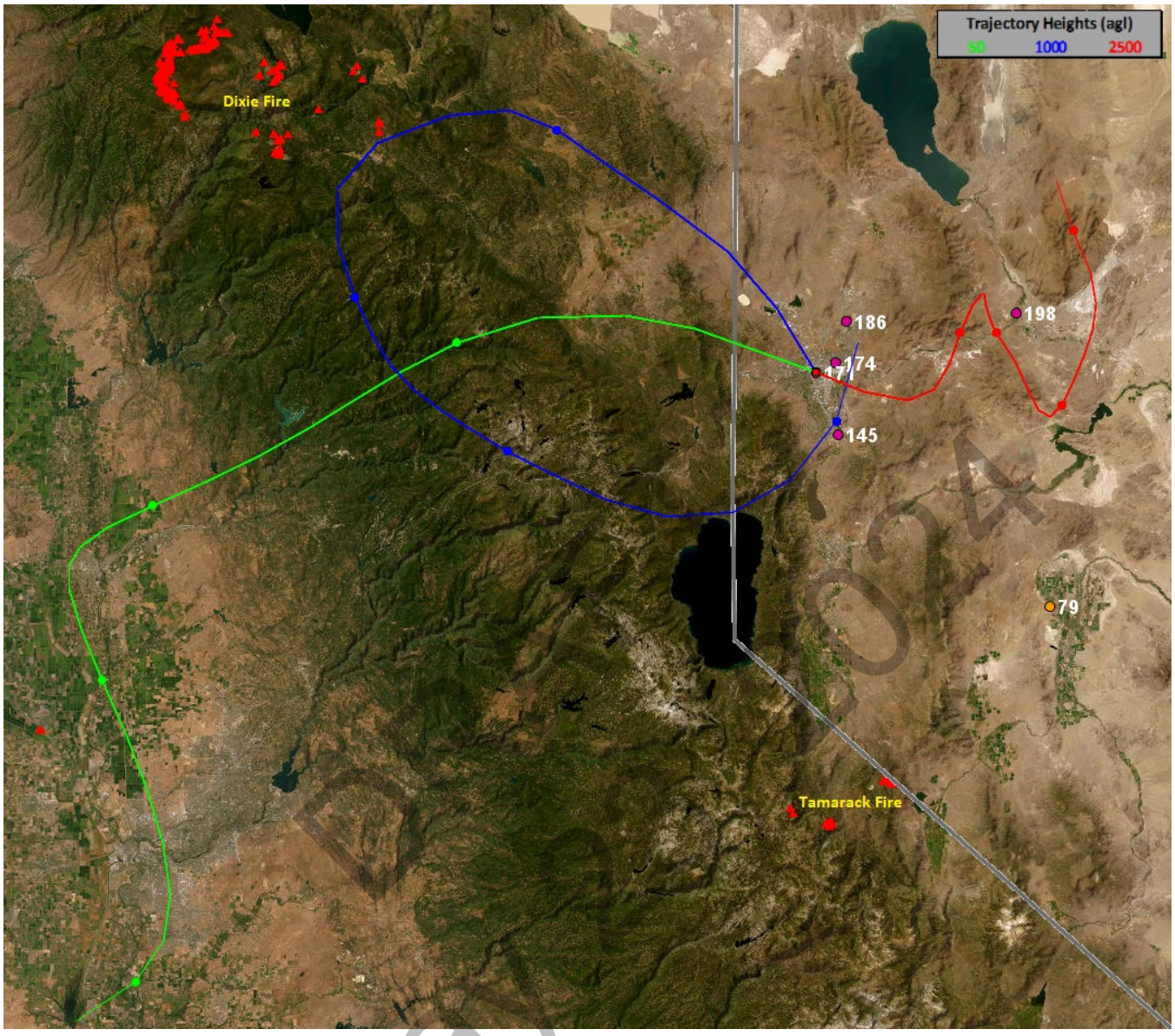


Figure 4-14: Backward Trajectory from Sparks starting July 26, 2021 at 0000 PST

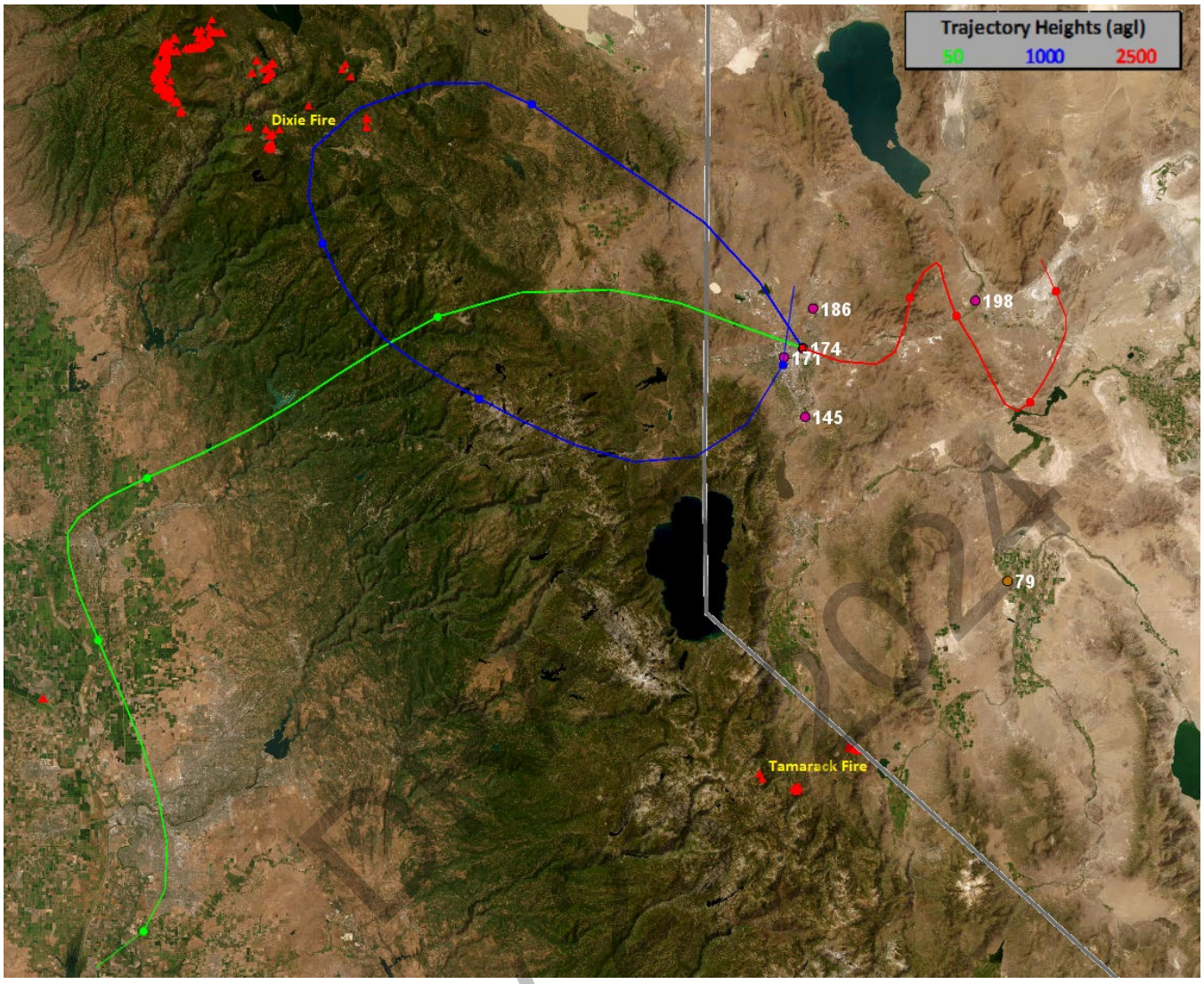


Figure 4-15: Backward Trajectory from Reno4 starting July 27, 2021 at 0000 PST

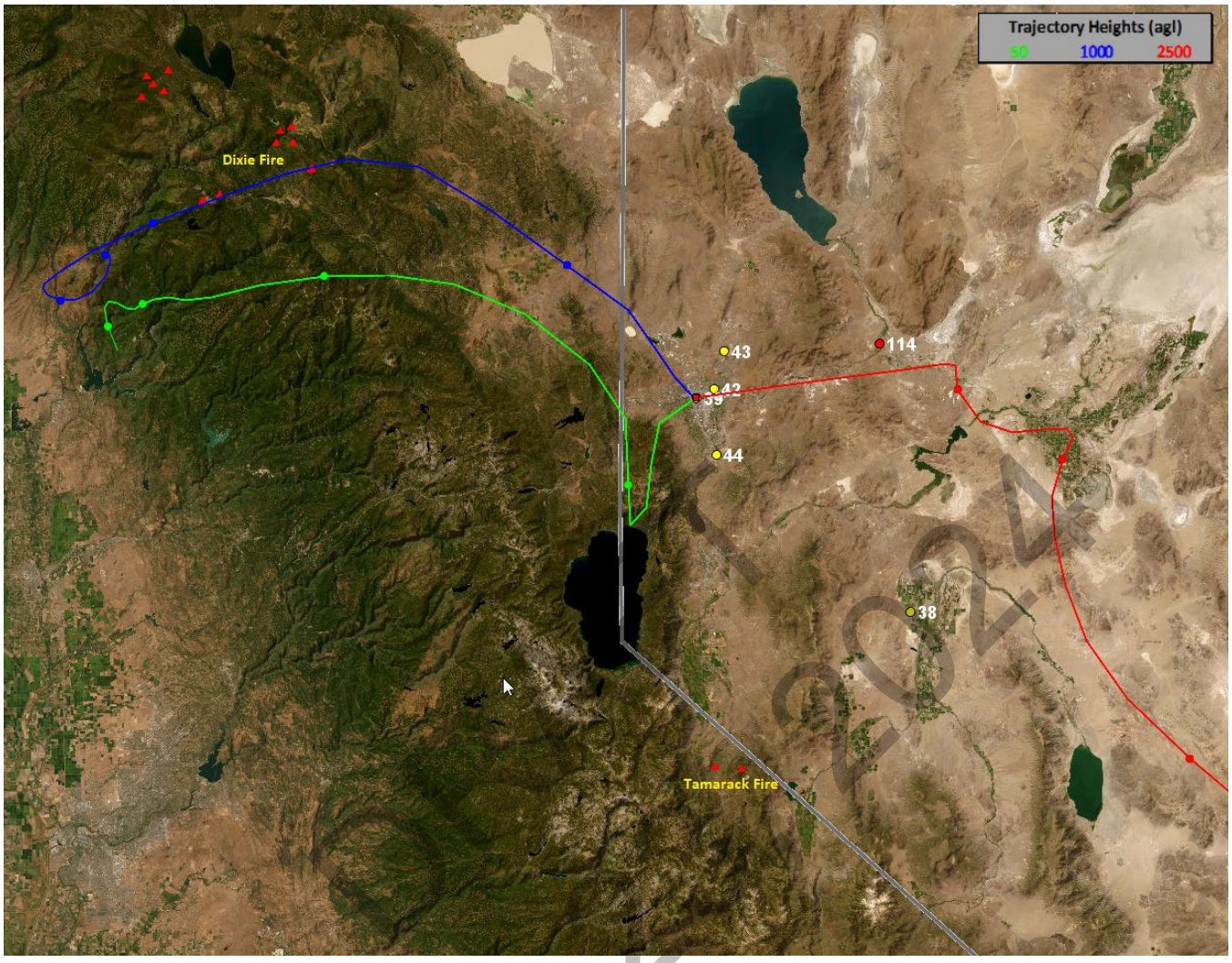
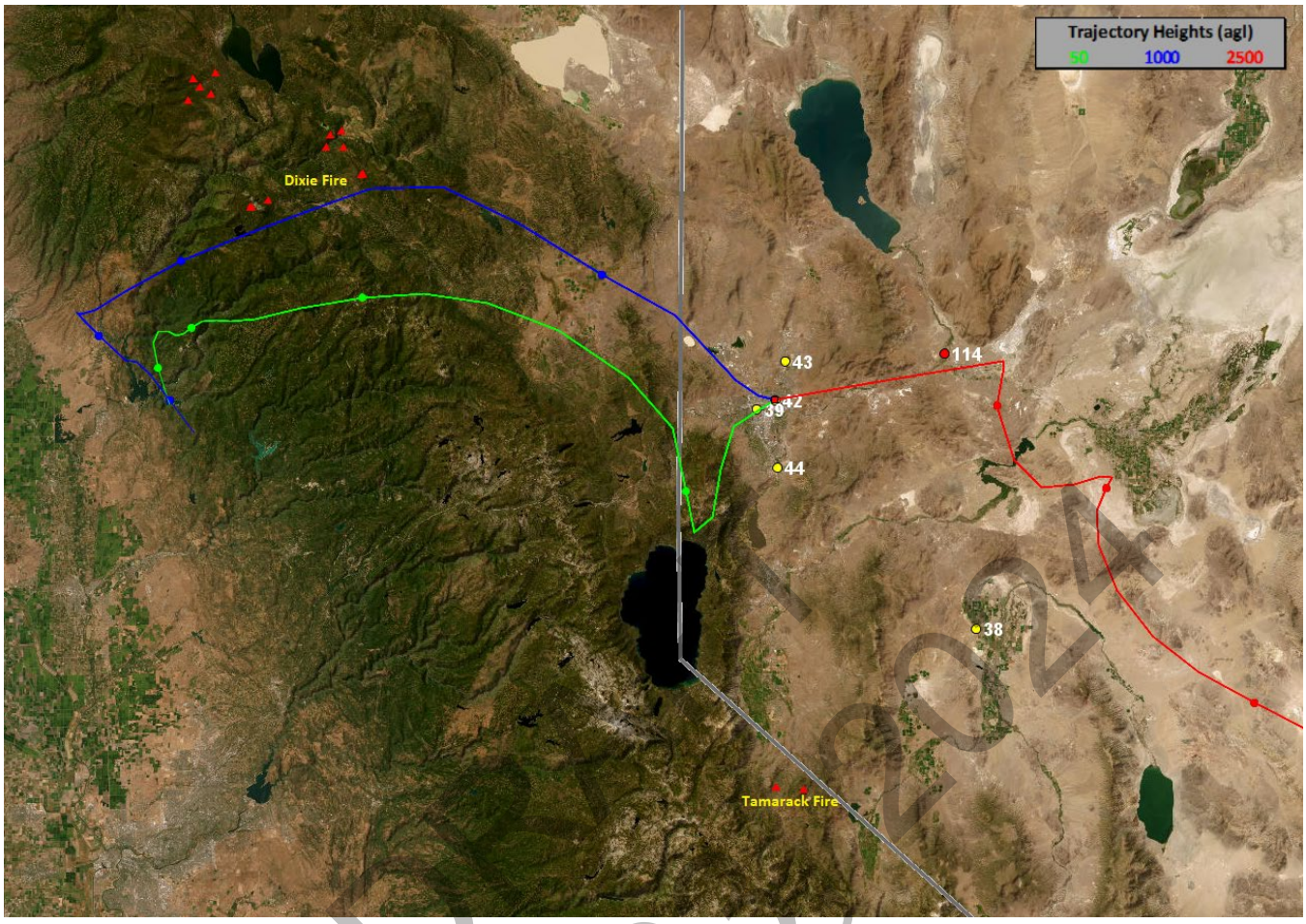


Figure 4-16: Backward Trajectory from Sparks starting July 27, 2021 at 0000 PST



4.4.2 Source Analysis – Forward Trajectory

In order to fully understand where smoke emissions from each fire moved prior to and on the day of the exceedance, an emissions source analysis was done which included 24-hour forward trajectory HYSPLIT models from both the Tamarack and Dixie fires. In the figures below, the green line denotes 50 meters agl, the blue line denotes 1000 meters agl, and the red line denotes 2500 meters agl. The points on each line denote 6-hour increments. Because this section is for forward trajectory HYSPLIT models, the first point on the line would denote 6-hours after the start time of the model.

Figure 4-17: Forward Trajectory from Tamarack Fire starting July 25, 2021 at 0000 PST

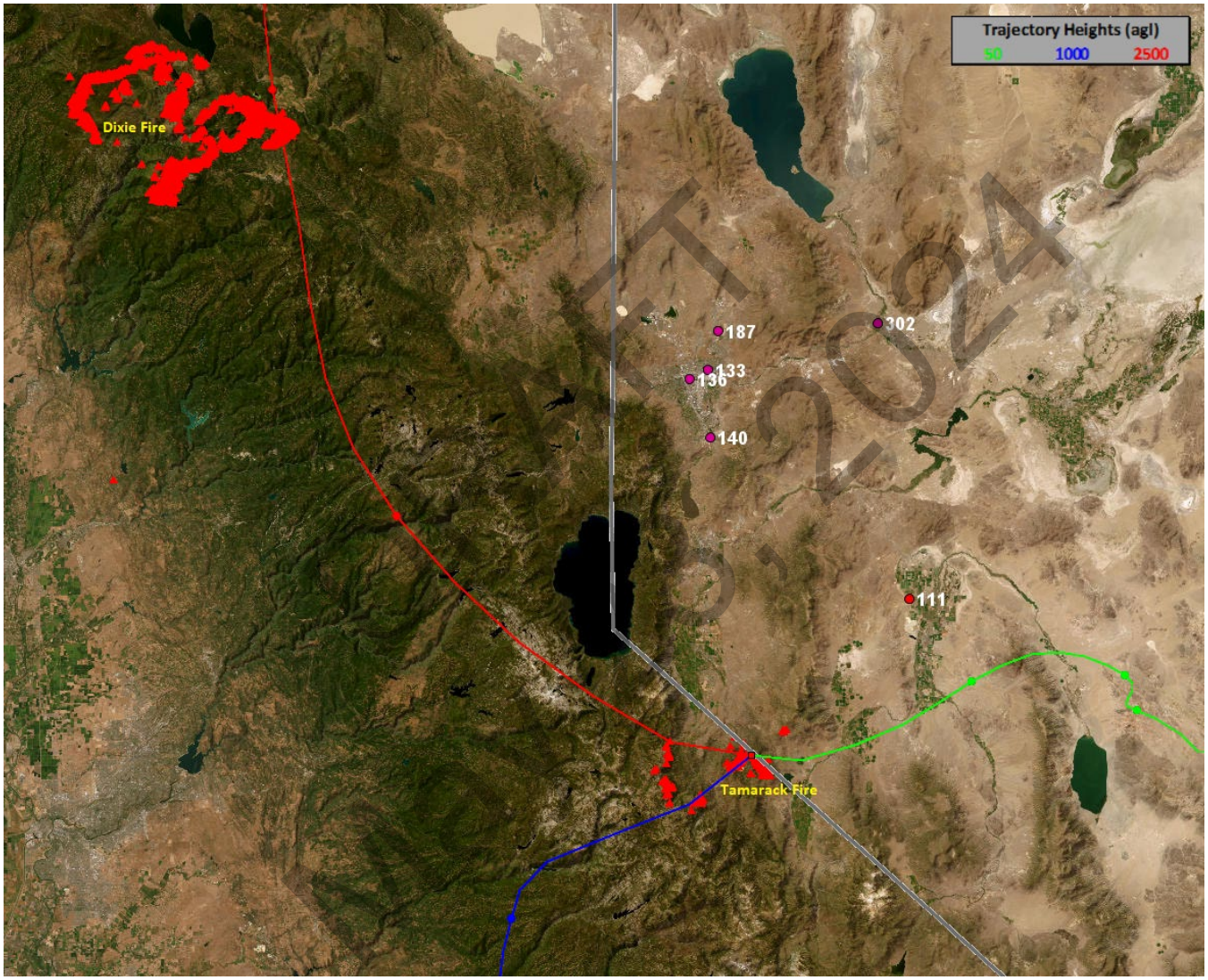


Figure 4-18: Forward Trajectory from Dixie Fire starting July 25, 2021 at 0000 PST

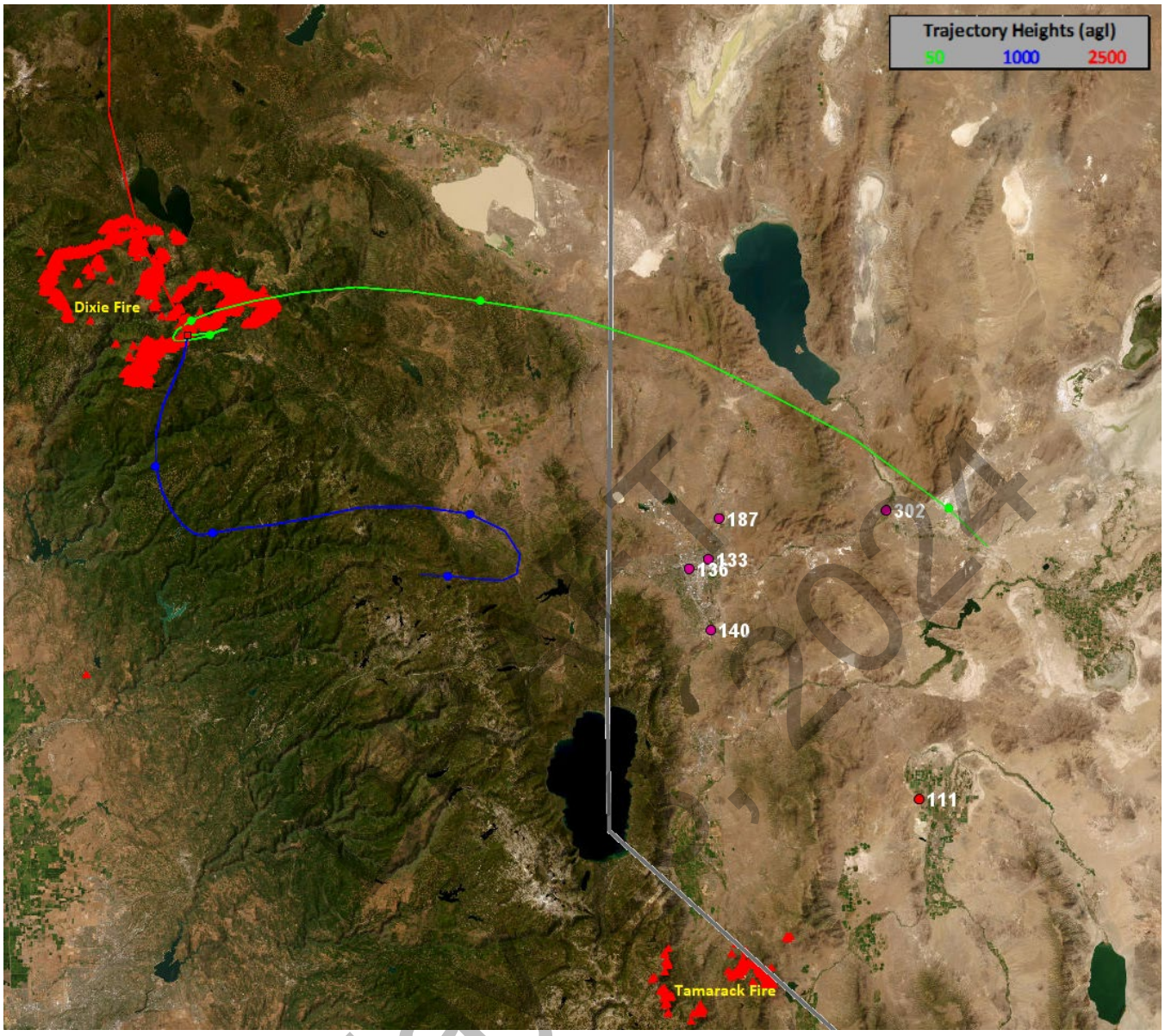


Figure 4-19: Forward Trajectory from Tamarack Fire starting July 26, 2021 at 0000 PST

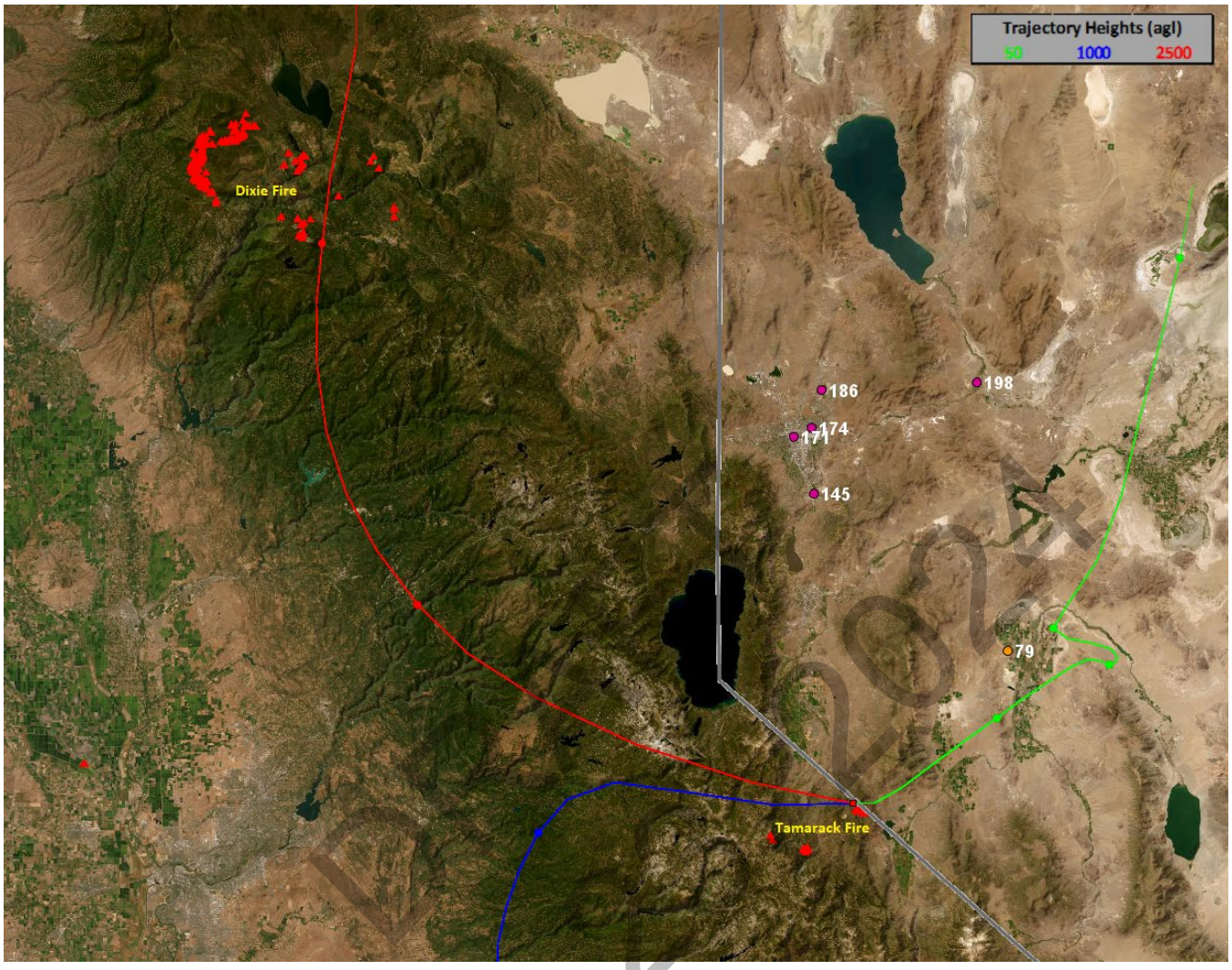
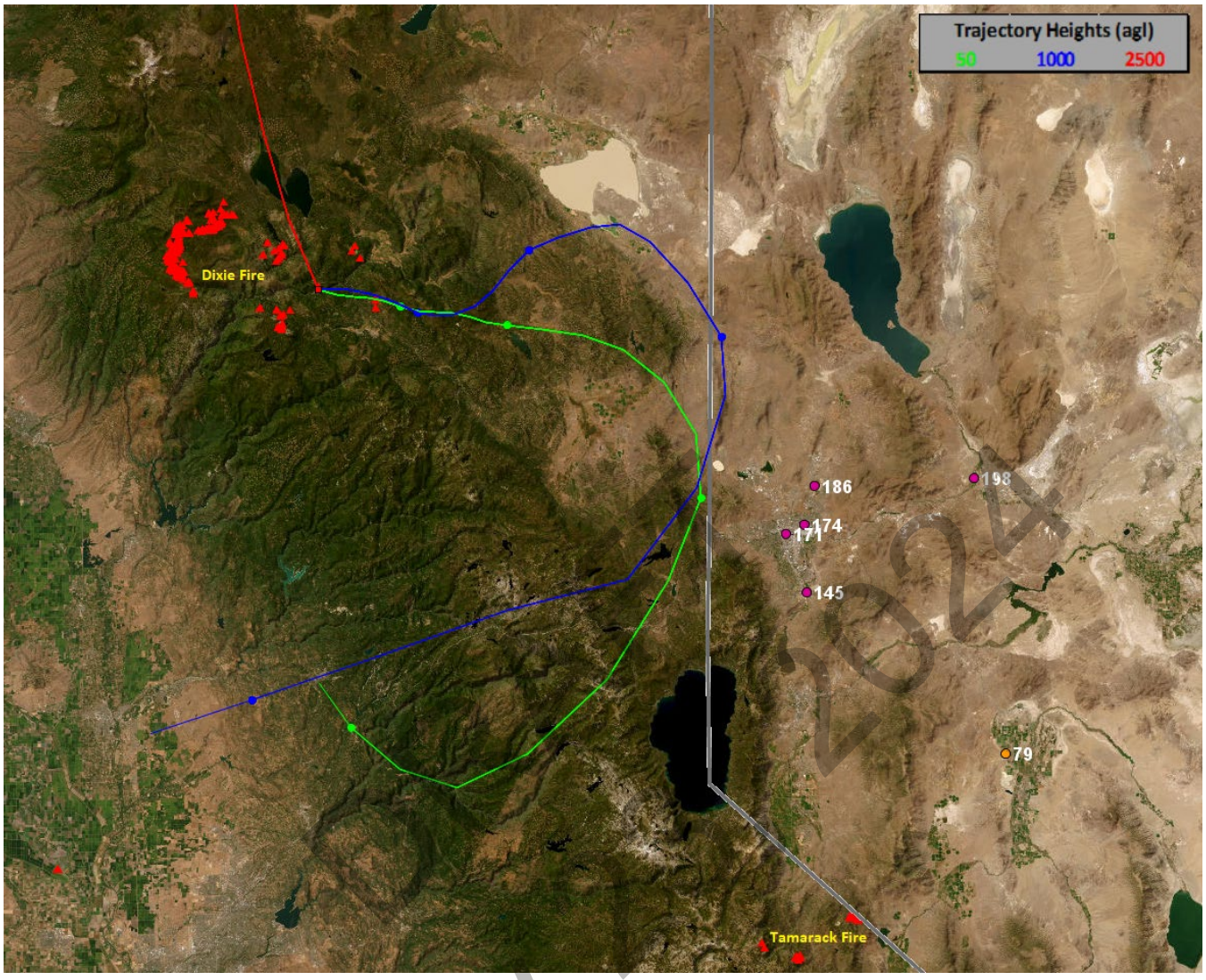


Figure 4-20: Forward Trajectory from Dixie Fire starting July 26, 2021 at 0000 PST



4.4.3 Trajectory Analysis Explanation

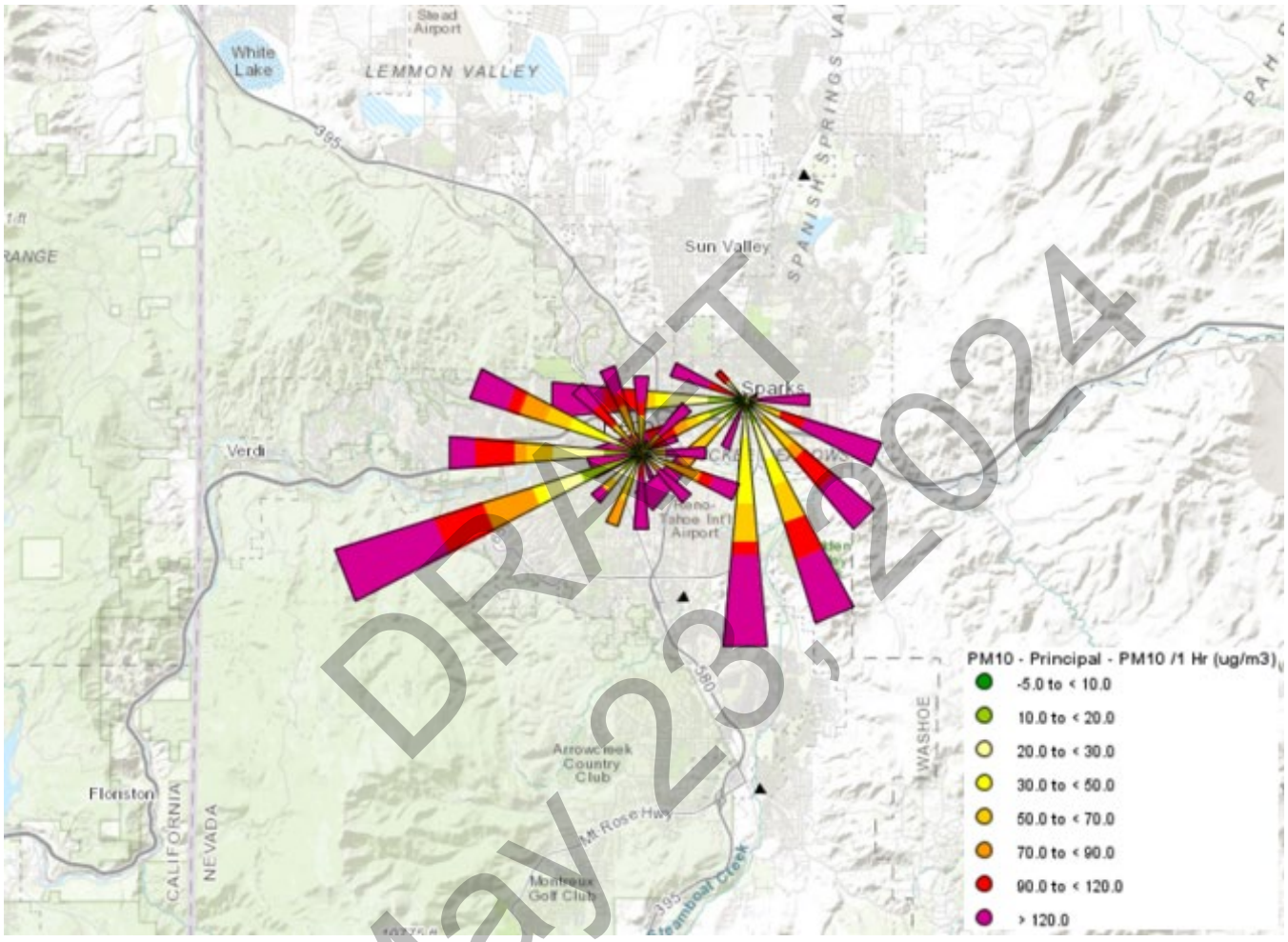
The methodology behind this section is to bracket the day of the exceedance with forward and backward HYSPLITs. A forward trajectory was completed for July 25 and July 26, 2021 to accurately depict the characteristics of the wildfire smoke that would have affected HA 87 on the day of the exceedance. A backward trajectory was completed for July 26 and July 27, 2021 to characterize where the airmass on the day of the exceedance came from.

As can be seen in the backward trajectory section, the airmasses at 50 and 1000 meter agl between July 26 and July 27, 2021 had originated either over the Dixie Fire, or in between the Dixie and Tamarack Fires. As can be seen in the forward trajectory section, the smoke from the Dixie Fire directly impacted HA 87 between July 25 and July 26, 2021. Additionally, the smoke from the Tamarack Fire impacted HA 87, although not as obviously as the Dixie Fire. As can be seen in Figure 4-17 and 4-19, the 2500 meter agl HYSPLIT shows that smoke from the Tamarack Fire was transported North, directly over the Dixie Fire and over the area that the previously mentioned backward HYSPLITs illustrated.

4.5 Pollution Rose Analysis

Using the AirNow-Tech Navigator Rose Tool, wind/pollution roses were generated for Sparks and Reno4 monitoring sites for the days leading to and the day of the exceedance. Hourly PM_{10} and wind direction data was used to create the roses. These show predominantly westerly and southerly wind components that carried Dixie and Tamarack wildfire smoke to Washoe County.

Figure 4-21: PM_{10} Wind/Pollution Rose for Sparks and Reno4 for July 22-26



4.6 Conclusion Showing a Clear Causal Relationship

Section 4.0 of this document demonstrates that the elevated PM_{10} concentrations that led to an exceedance of the primary and secondary 24-hour PM_{10} NAAQS was caused by the Dixie and Tamarack wildfires. The emissions analysis, historical concentration comparison analysis, $PM_{2.5}$ analysis, $PM_{2.5}/PM_{10}$ ratio analysis, $PM_{2.5}/CO$ ratio analysis, PM_{10}/CO ratio analysis, trajectory analysis, and pollution rose analysis all support this premise.

The comparisons and statistical analyses provided in this section of the document supports AQMD's demonstration that the Dixie and Tamarack wildfire events affected air quality in such a way that there exists a clear causal relationship between the specific events and the monitored PM_{10} exceedance on July 26, 2021. Section 4.0 thus satisfies the clear causal relationship criterion as required by the EER and 40 CFR 50.14(c)(3)(iv).

5.0 Natural Event or Human Activity Unlikely to Recur

Section 40 CFR 50.14(c)(3)(iv)(E) requires that an exceptional event be unlikely to recur at a particular location or was a natural event. The Dixie and Tamarack Fires qualify as natural events because human activity played no direct causal role in the start of the fires. A natural event as per 40 CFR 50.1(k) is defined as:

> *40 CFR 50.1(k): Natural event means an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.*

As was mentioned in Section 2.4 of this document, the Tamarack Fire was started by a lightning strike hitting a tree and the Dixie Fire was started by a tree falling on a power transmission line. AQMD sees no direct causal role by human activity, thus qualifying these wildfires as natural events.

6.0 Public Outreach

An important role that AQMD plays during exceptional events that affect air quality is to notify the public of the current air quality, the air quality forecast, and ways to mitigate potential health impacts that are a result of degraded air quality. Examples of this public outreach showing the current air quality and the forecast for the coming days can be seen in Figure 6-1 and Figure 6-2. AQMD has a public education program called “Be Smoke Smart” that informs citizens of the best ways to protect themselves from wildfire smoke. Figure 6-3 shows a social media post on the day of the exceedance with “Be Smoke Smart” information so that people could take the proper precautions.

In order to reach the public, AQMD uses Twitter, Facebook, press releases, and local partners to properly inform citizens. One local partner that is beneficial is National Weather Service (NWS) – Reno. Working together, AQMD and NWS-Reno are able to better reach the public through their respective social media networks. An example of this is shown in Figure 6-4. In addition, AQMD communicates with local news outlets through interviews and press releases. Figure 6-5 shows a press release that was made near the time of the event to inform local news outlets so that they could properly report on the event. This press release in addition to the other outreach actions also fulfills the public notification requirements of the Emergency Episode Plan and the $PM_{2.5}$ Mitigation Plan.

Figure 6-1: Public Notification of Poor Air Quality on the day of the Exceedance

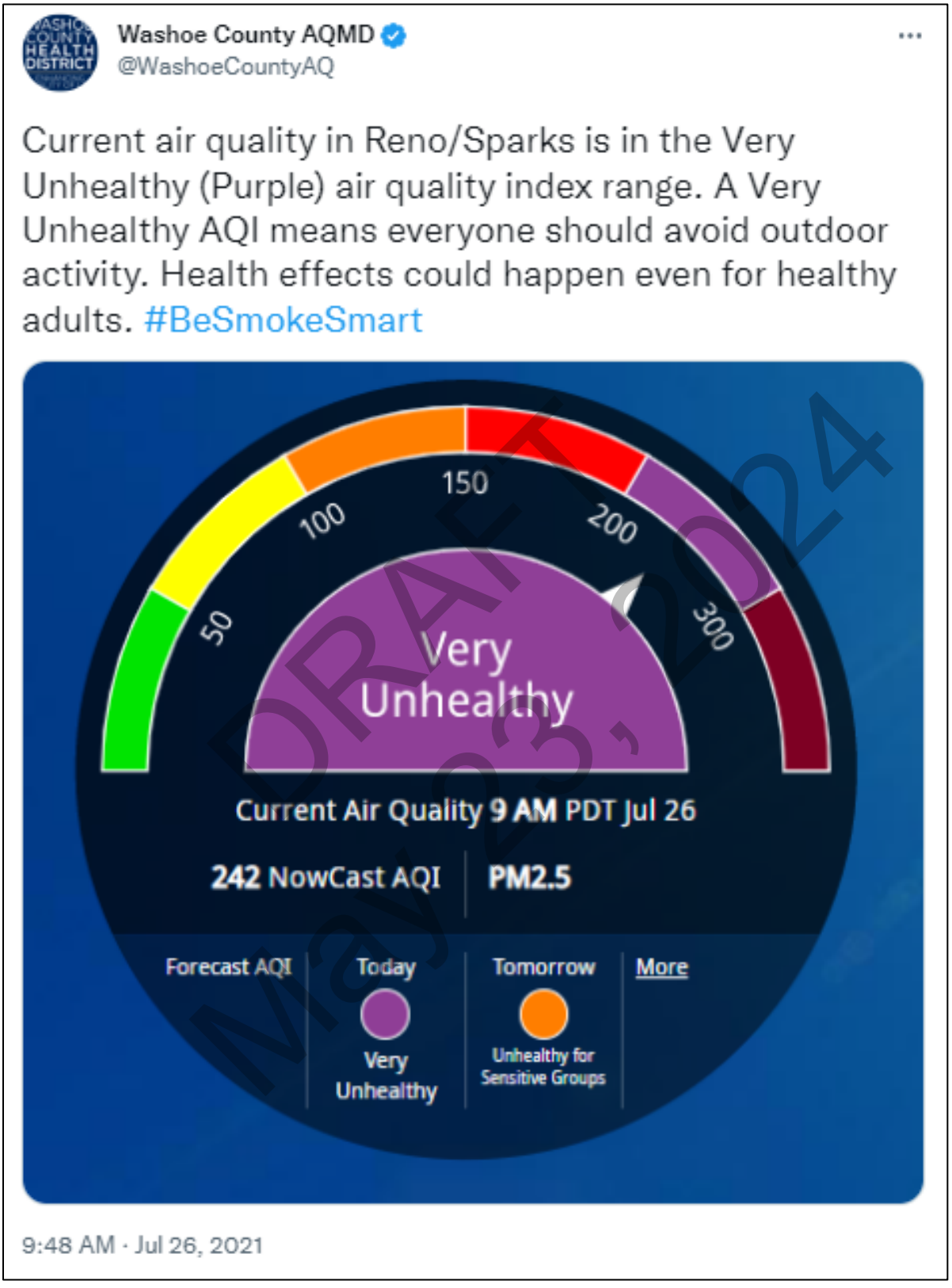


Figure 6-2: Air Quality Forecast Issued on the day of the Exceedance

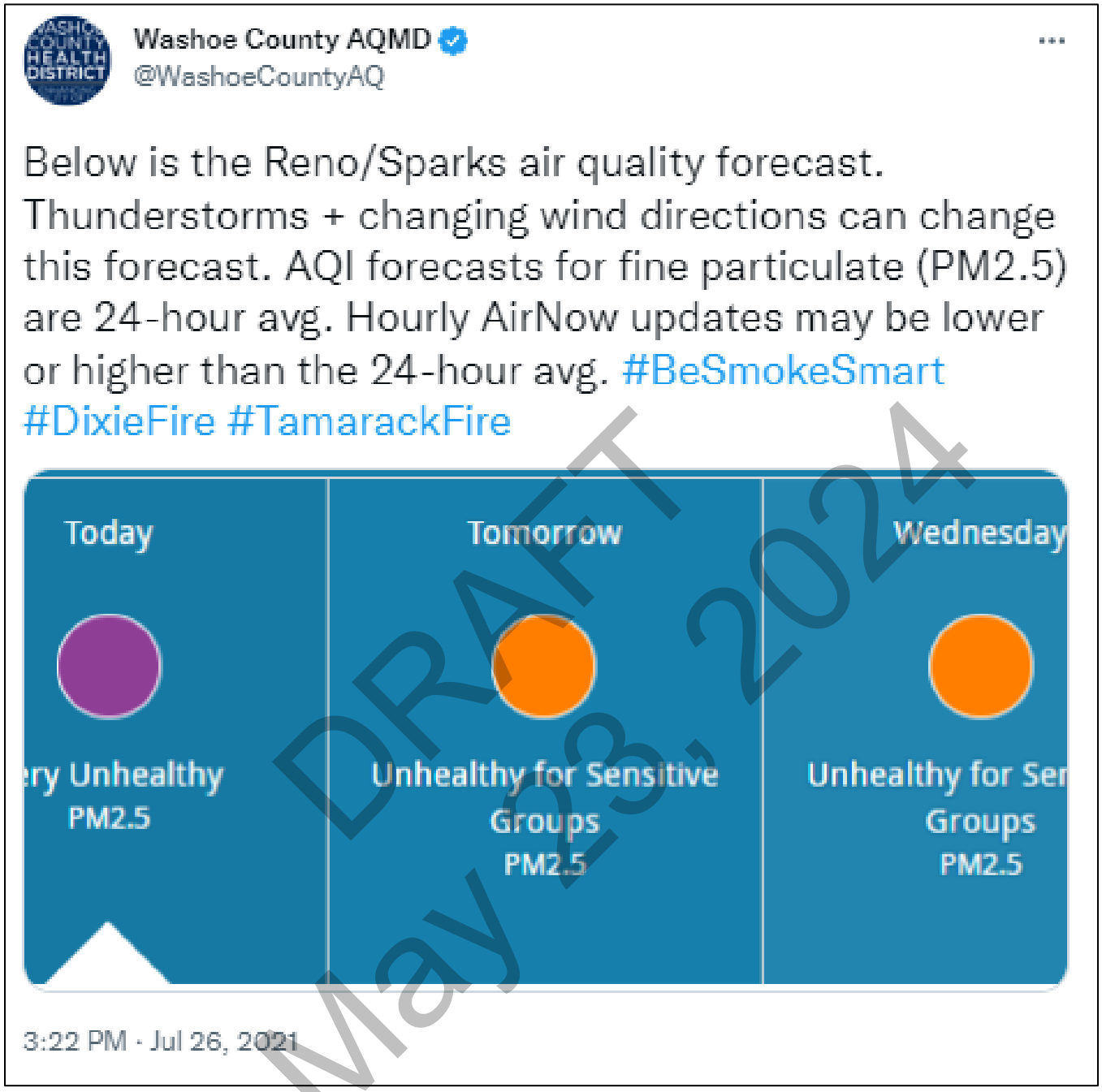


Figure 6-3: Be Smoke Smart Social Media Post from the day of the Exceedance

Figure 6-4: NWS-Reno Post that was Retweeted by AQMD

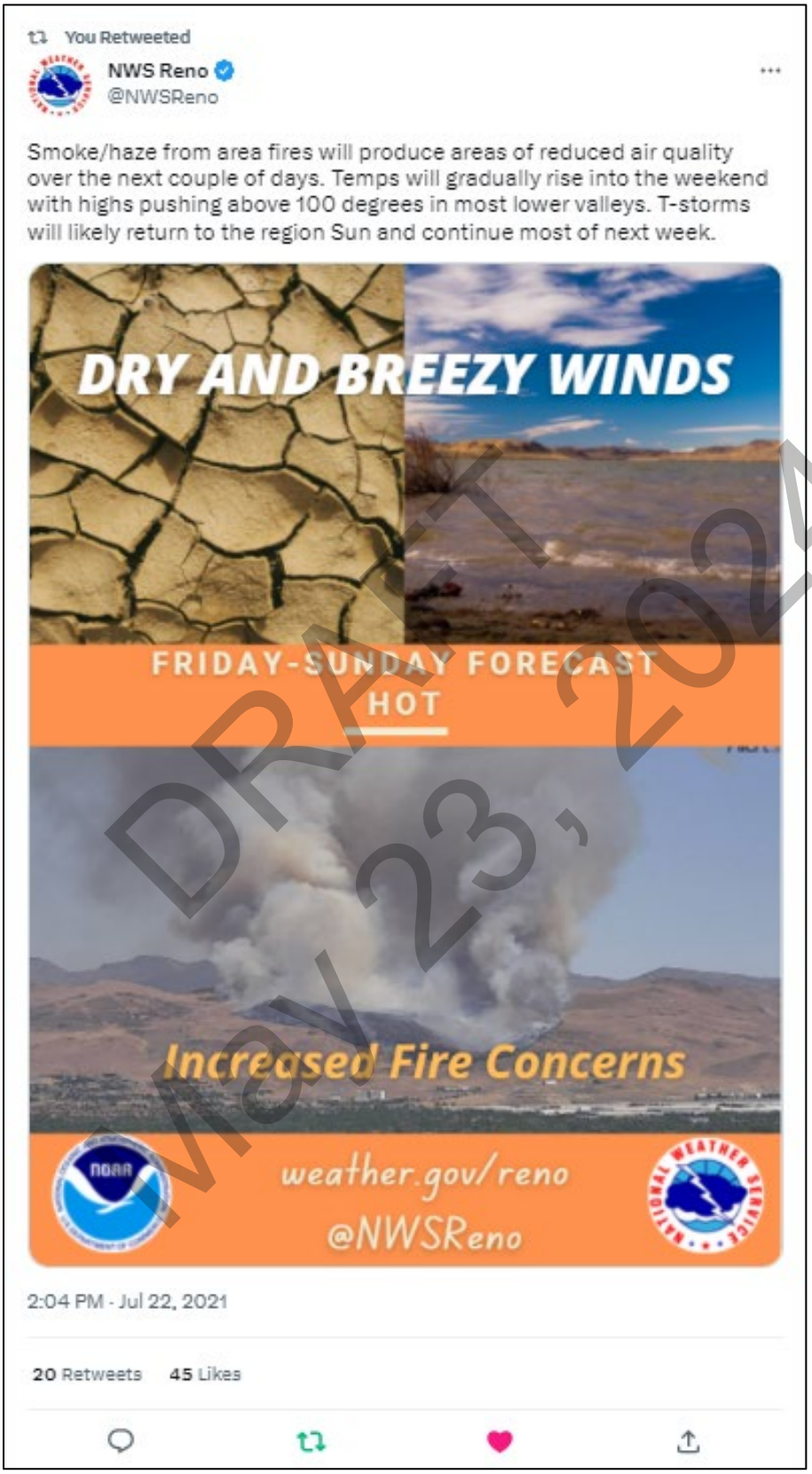


Figure 6-5: Press Release from AQMD During Exceptional Event

UPDATE: HEALTH DISTRICT UPGRADES AIR POLLUTION WARNING TO STAGE 2

by Scott Oxarart | Jul 23, 2021

July 24, 2021, 9 a.m. PST Update: The previous version of this release indicated a Stage 1 Alert was issued. That alert has been terminated and upgraded to a Stage 2 Warning.

Reno/Sparks, Nev. July 24, 2021 – The Washoe County Health District – Air Quality Management Division (AQMD) has issued a Stage 2 Air Pollution Warning due to smoke from area wildfires. The Stage 1 alert issued on Friday, July 23, has been terminated. Air quality in the Reno-Sparks area could reach the "Very Unhealthy" and "Hazardous" ranges at times Saturday and Sunday.

The Stage 2 warning means that all residents should stay indoors and reduce activity levels due to the susceptibility of increased health risks. The Reno-Sparks area will be impacted by this warning with significant smoke expected in the North Valleys and Spanish Springs.

This is just the second time AQMD has issued a Stage 2 warning (last time Sept. 13, 2020). The main wildfires contributing to the poor air quality continue to be the Dixie, Fly and Tamarack fires.

To see current air quality in Reno-Sparks, click here; for information on what the air quality index colors mean, click here.

7.0 Conclusions and Recommendations

The Tamarack Fire was started on July 4, 2021 when a lightning strike hit a single tree in the Humboldt-Toiyabe National Forest, approximately 60 miles south of the Truckee Meadows. The Dixie Fire was ignited on July 13, 2021 when a tree fell on a power line in Plumas National Forest, approximately 90 miles northwest of the Truckee Meadows. Both fires emitted large quantities of PM_{10} emissions which eventually led to a PM_{10} exceedance at the Reno4 and Sparks PM_{10} monitors on July 26, 2021. The 2021 Dixie/Tamarack Fire EE Demonstration supports the criteria for an exceptional event detailed in the 2016 Exceptional Events Rule. Specifically, the documentation used the following evidence to demonstrate the exceptional event:

- ambient air monitoring data
- statistical analyses of the monitoring data compared to historical concentrations
- analyses of wildfire smoke emissions
- satellite imagery (visible and detected smoke)
- narratives from the National Oceanic and Atmospheric Administration and National Weather Service (Reno)
- HYSPLIT trajectory analyses
- social and traditional media posts

This EE Demonstration clearly demonstrates justification for exclusion of data for July 26, 2021, due to an exceptional event under 40 CFR 50.14(c)(3)(iv). The 2021 Dixie/Tamarack Fire EE Demonstration has provided evidence that:

1. Emissions from a wildfire event caused a PM_{10} exceedance at the Reno4 and Sparks monitor;
2. The event affected air quality in such a way that there exists a clear causal relationship between the event and the exceedance on July 26, 2021.
3. Event-influenced concentrations were unusual and above normal historical concentrations;
4. The event was a wildfire and a natural event predominately occurring on wildland; and
5. The event was not reasonably controllable or preventable.

The AQMD recommends that EPA Region 9 concur with the 2021 Dixie/Tamarack Fire EE Demonstration and exclude data from the Reno4 and Sparks PM_{10} monitor for July 26, 2021 from comparison to the NAAQS.

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

Please contact Matt McCarthy for
questions or comments at
mmccarthy@nnph.org

Appendix H

Network Modifications for PM10 Completed in Accordance with 40 CFR 58.14 During the First 10-Year Maintenance Period

WASHOE COUNTY
HEALTH DISTRICT
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March 5, 2015

Meredith Kurpius
Manager, Air Quality Analysis Office
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street, AIR-7
San Francisco, CA 94105

Subject: Proposed Modification to the Washoe County Health District, Air Quality Management Division Ambient Air Monitoring Network

Dear Ms. Kurpius:

Pursuant to 40 CFR 58.14, the Washoe County Health District, Air Quality Management Division (AQMD) requests review and approval for a modification to the existing ambient air monitoring network. The AQMD is proposing to:

1. Closure of the Galletti SLAMS (AQS ID 32-031-0022) including discontinuation of all monitors (CO, PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, and meteorology); and
2. Initiate a Special Purpose Monitor (SPM) for 18 months and establishing a State and Local Air Monitoring Stations (SLAMS) in the Spanish Springs area of southern Washoe County to monitor Ozone, PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, and meteorology.

In November 2014, the Nevada Department of Transportation (NDOT) informed the AQMD of an emergency paving project requiring the Galletti SLAMS to be removed its current location. Final quality assurance verifications were conducted during the week of November 17, 2014. CO and PM data through the final verifications will be submitted to AQS. Data capture will not meet 75 percent for the October-December 2014 reporting period. As of March 1, 2015, the emergency paving project has not been completed. NDOT's paving project and reconfiguration will make it extremely difficult to return to Galletti's original location.

The proposed modifications are consistent with the AQMD 2010 Network Assessment and 2014 Annual Network Plan. Attached are data demonstrations (Appendices A, B, C) and an Excel spreadsheet (Network Modification Request (2015-03-05).xlsx) to support AQMD's proposal to close Galletti. Additional case-by-case justifications for the closure of Galletti include proximity to trees and NDOT's "dirt pile" operation. PM_{10} and $PM_{2.5}$ concentrations were impacted by the American/Rim (2013) and King (2014) Fires. These data are flagged in AQS with either Informational or Request to Exclude flags. An Exceptional Events Demonstration for the American/Rim Fires was submitted to EPA Region IX in 2014. A demonstration for the King Fire is expected to be submitted in Fall 2015.

If you require additional information, feel free to contact me or Mr. Craig Petersen at (775) 784-7200.

Sincerely,

Daniel Inouye

Daniel Inouye
Monitoring and Planning Branch Chief

cc: Katherine Hoag, EPA Region IX
Craig Petersen, AQMD
Jennifer Budge, Washoe County Regional Parks and Open Space

Attachment A

40 CFR 58.14(c)(1) Criteria Test for the Galletti SLAMS with and without 2013 American/Rim Fires Exceptional Events

		5 Year Maximums with EE (2009-13)												
		Year 1	Year 2	Year 3	Year 4	Year 5	Ave Max							
Parameter	Averaging Times	2009	2010	2011	2012	2013	2009-13	Std. Dev. *s*	Student's *t* value (90% confidence)	Number of Data Values (*n*)	90% Upper CI	NAAQS	80% NAAQS	Test
CO (ppm)	1-hr	3.1	2.7	2.8	2.9	2.6	2.82	0.19	2.13	5	3.0	35	28.0	PASS
CO (ppm)	8-hr	2.6	2.3	1.9	2.1	2.2	2.22	0.26	2.13	5	2.5	9	7.2	PASS
PM10 (ug/m3)	24-hr	91	87	113	77	131	99.80	21.84	2.13	5	120.6	150	120.0	FAIL
PM2.5 (ug/m3)	24-hr					100.2	100.20	#DIV/0!	2.13	5	#DIV/0!	35	28.0	#DIV/0!
PM2.5 (ug/m3)	Annual					11.5	11.50	#DIV/0!	2.13	5	#DIV/0!	12	9.6	#DIV/0!

		5 Year Maximums without EE (2009-13)												
		Year 1	Year 2	Year 3	Year 4	Year 5	Ave Max							
Parameter	Averaging Times	2009	2010	2011	2012	2013	2009-13	Std. Dev. *s*	Student's *t* value (90% confidence)	Number of Data Values (*n*)	90% Upper CI	NAAQS	80% NAAQS	Test
CO (ppm)	1-hr	3.1	2.7	2.8	2.9	2.6	2.82	0.19	2.13	5	3.0	35	28.0	PASS
CO (ppm)	8-hr	2.6	2.3	1.9	2.1	2.2	2.22	0.26	2.13	5	2.5	9	7.2	PASS
PM10 (ug/m3)	24-hr	91	87	113	77	117	97.00	17.26	2.13	5	113.4	150	120.0	PASS
PM2.5 (ug/m3)	24-hr					33.8	33.80	#DIV/0!	2.13	5	#DIV/0!	35	28.0	#DIV/0!
PM2.5 (ug/m3)	Annual					9.5	9.50	#DIV/0!	2.13	5	#DIV/0!	12	9.6	#DIV/0!

Attachment B

Closure of the Galletti SLAMS including discontinuing CO, PM_{10}, $PM_{2.5}$, and $PM_{10-2.5}$ monitoring

Carbon Monoxide

Discontinuation of CO monitoring is based on criteria in 40 CFR 58.14(c)(1), including the points below.

1. The monitor has shown attainment during the previous five years (2009-2013), specifically:
    a. The monitor has never exceeded the 1-hour NAAQS of 35 ppm, and
    b. The monitor last exceeded the 8-hour NAAQS in 1991.
2. The monitor has a probability of less than 10 percent of exceeding 80 percent of the current 1-hour and 8-hour NAAQS.

Table 1
40 CFR 58.14(c)(1) Criteria Test
(2009-13)

Averaging Time	90% Upper CI (ppm)	80% of NAAQS (ppm)	Criteria Met?
1-hour	3.0	28.0	Yes
8-hour	2.5	7.2	Yes

3. The monitor is not required in the:
    a. EPA approved CO maintenance plan, nor
    b. Second-ten year maintenance plan submitted to EPA on November 7, 2014.
4. The monitor is not the only CO monitor in the Truckee Meadows CO maintenance area. CO monitoring will continue at four stations, including the Reno3 (32-031-0016) and Sparks (32-031-1005) stations which are approximately 1.5 miles west and 2.1 miles east respectively, of the Galletti SLAMS.
5. The requirements of Appendix D will continue to be met.
6. In addition, EPA identified trees that affect the monitor's spatial scale (See Technical System Audit Report (September 4-6, 2013) August 2014, Finding 5).

PM_{10}

Discontinuation of PM_{10} monitoring is based on criteria in 40 CFR 58.14(c), specifically the case-by-case criteria and including the points below.

1. The monitor has shown attainment during the previous five years (2009-2013), specifically the monitor last exceeded the 24-hour NAAQS in 2005. (Note: One PM_{10} exceedance occurred in 2014 from the King Fire. An Exceptional Events Demonstration is expected to be submitted to EPA Region IX in Fall 2015.)
2. The monitor does not have a probability of less than 10 percent of exceeding 80 percent of the current 24-hour NAAQS of 150 $\mu g/m^3$. However, the monitor will pass this test if 154 $\mu g/m^3$ is used as the NAAQS. The monitor will also pass if Informationally flagged data from the 2013 American/Rim Fires are excluded from this test.

Table 2
40 CFR 58.14(c)(1) Criteria Test
(2009-13)

	90% Upper CI ($\mu g/m^3$)	80% of NAAQS ($\mu g/m^3$)	Criteria Met?
24-hour	120.6	120.0	No

3. The monitor is not required in the:
    a. "Serious" PM_{10} Attainment Plan submitted to EPA on August 5, 2002, , nor
    b. Redesignation Request and Maintenance Plan submitted to EPA on November 7, 2014.
4. The monitor is not the only PM_{10} monitor in the Truckee Meadows PM_{10} non-attainment area. PM_{10} monitoring will continue at five stations, including the Reno3 (32-031-0016) and Sparks (32-031-1005) stations which are approximately 1.5 miles west and 2.1 miles east respectively, of the Galletti SLAMS.
5. Closure of the Galletti SLAMS is a recommendation in the 2010 Network Assessment.
6. The requirements of Appendix D will continue to be met.
7. In addition, EPA identified trees and a minor PM source that affect the monitor's spatial scale (See Technical System Audit Report (September 4-6, 2013) August 2014, Findings 5 and 6).
8. In conjunction with the proposed Spanish Springs SPM/SLAMS, the overall balance of the PM network Area Served and Population Served distributions will be improved.

$\underline{PM_{2.5}}$

Discontinuation of $PM_{2.5}$ monitoring is based on criteria in 40 CFR 58.14(c), specifically the case-by-case criteria and including the points below.

1. The monitor began sampling in 2013 and does not have a valid design value to compare against the 24-hour and annual $PM_{2.5}$ NAAQS. (Note: $PM_{2.5}$ concentrations were impacted by the American/Rim (2013) and King (2014) Fires. These data are flagged in AQS with either Informational or Request to Exclude flags. An Exceptional Events Demonstration for the American/Rim Fires was submitted to EPA Region IX in 2014. A Demonstration for the King Fire is expected to be submitted in Fall 2015.)
2. All geographic areas of Washoe County are currently designated as "Unclassifiable/Attainment" for the 24-hour and annual $PM_{2.5}$ NAAQS, therefore the monitor is not required in any attainment nor maintenance plan.
3. The monitor is not the only $PM_{2.5}$ monitor in the Truckee Meadows. $PM_{2.5}$ monitoring will continue at two stations, including the Reno3 (32-031-0016) and Sparks (32-031-1005) stations which are approximately 1.5 miles west and 2.1 miles east respectively, of the Galletti SLAMS.
4. Closure of the Galletti SLAMS is a recommendation in the 2010 Network Assessment.
5. The requirements of Appendix D will continue to be met.
6. EPA identified trees and a minor PM source that affects the monitor's spatial scale (See Technical System Audit Report (September 4-6, 2013) August 2014, Findings 5 and 6).
7. In conjunction with the proposed Spanish Springs SPM/SLAMS, the overall balance of the PM network Area Served and Population Served distributions will be improved.

Attachment C

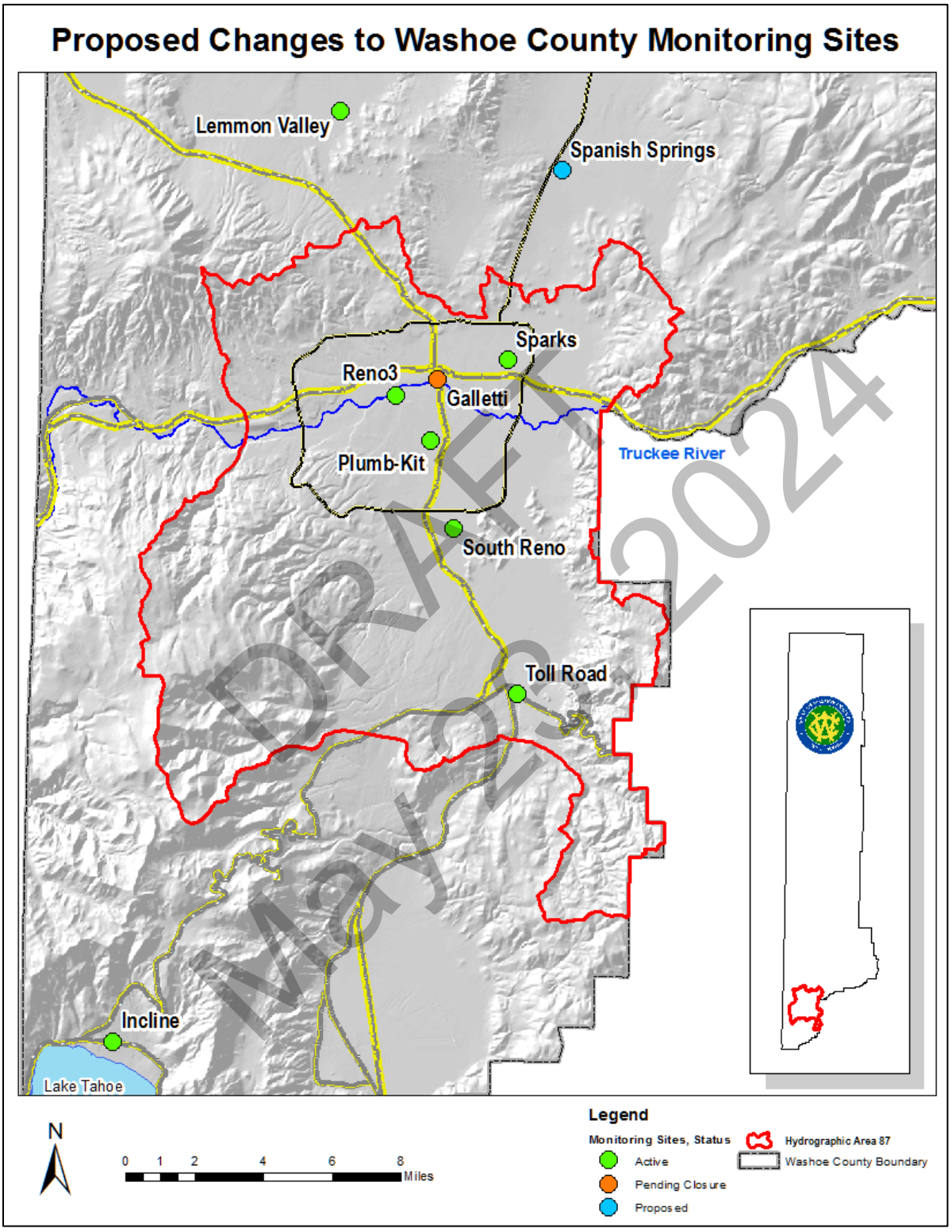
Initiation of an SPM/SLAMS in Spanish Springs to monitor Ozone, PM_{10}, $PM_{2.5}$, $PM_{10-2.5,}$ and Meteorology

Initiation of an SPM/SLAMS in the Spanish Springs area (Lazy 5 Regional Park)

Initiating a SPM/SLAMS station to monitor Ozone, PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, and Meteorology is based on 40 CFR 58.14(b). The AQMD is requesting approval of the Spanish Springs SPM/SLAMS to be in conjunction with closure of the Galletti SLAMS. The points below support the AQMD request.

1. An SPM/SLAMS station in the Spanish Springs area is a recommendation in the 2010 Network Assessment.
2. In conjunction with the proposed Galletti SLAMS closure, the overall balance of the PM network Area Served and Population Served distributions will be improved.
3. In conjunction with the proposed Galletti SLAMS closure, the AQMD will maintain staffing and budgetary capacity. This is consistent with the "Zero-Sum Game" - "Monitoring Network Assessments: Best Practices and Lessons Learned" presented at the 2014 National Ambient Air Monitoring Conference.
4. AQMD has received preliminary approval from the Washoe County Regional Parks and Open Space Department to establish an SPM/SLAMS at the Lazy 5 Regional Park in Spanish Springs. AQMD is researching other requirements (i.e., Parks Commission approval, availability of power, right of entry, etc.).
5. The proposed location will not prohibit any planned future development included in the Lazy 5 Park Master Plan.

Figure 1


Proposed Changes to Washoe County Monitoring Sites
Lemmon Valley
Spanish Springs
Sparks
Reno3
Galletti
Plumb-Kit
Truckee River
South Reno
Toll Road
Incline
Lake Tahoe
DRAFT May 23 2024
N
0 1 2 4 6 8
Miles
Legend
Monitoring Sites, Status
Active
Pending Closure
Proposed
Hydrographic Area 87
Washoe County Boundary

Proposed Spanish Springs SPM/SLAMS
Detailed Site Information

Site Name:	Spanish Springs
AQS ID:	31-031-xxxx
Geographical coordinates:	39° 37.287’ N, 119° 43.124’ W
Location:	North side of Lazy 5 Regional Park
Street address:	7200 Pyramid Way Sparks, NV 89436
County:	Washoe
Distance to road:	460 meters to Pyramid Hwy
Traffic count:	10,033 AADT (2011-2013) (NDOT ATR 0311032 - SR445, 0.375 miles north of Sunset Spring Road)
Groundcover:	Paved / Vegetated
Representative area:	Reno-Sparks MSA

Figure 2
Proposed Spanish Springs Monitoring Station (looking north)

Proposed Spanish Springs SPM/SLAMS

	PM_{10}	$PM_{2.5}$	$PM_{10-2.5}$	Ozone
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	Met One BAM 1020	Met One BAM 1020	Met One BAM 1020	TAPI T400
Analysis method	Beta Attenuation	Beta Attenuation	Beta Attenuation	UV Photometry
Method code	122	170	185	087
Parameter code	81102 & 85101	88101	86101	44201
Parameter occurrence code	1	1	1	1
Start date	07/01/15 (est)	07/01/15 (est)	07/01/15 (est)	07/01/15 (est)
Operation schedule	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year
Monitoring objective(s)	NAAQS comparison	NAAQS comparison	Research Support	NAAQS comparison
Probe height	4.8 meters	4.8 meters	4.8 meters	4.0 meters
Height of obstruction not on roof	14.5 meters	14.5 meters	14.5 meters	14.5 meters
Distance:				
from obstructions not on roof	30.5 meters	30.5 meters	30.5 meters	30.5 meters
from obstructions on roof	n/a	n/a	n/a	n/a
from trees				
to furnace or incinerator flue	n/a	n/a	n/a	n/a
between collocated monitors	n/a	n/a	n/a	n/a
from supporting structure	2.0 meters	2.0 meters	2.0 meters	1.2 meters
Flow rate	16.7 l/min	16.7 l/min	16.7 l/min	720-880 cc/min
Unrestricted airflow	360 degrees	360 degrees	360 degrees	360 degrees
Probe material	n/a	n/a	n/a	Teflon
Residence time	n/a	n/a	n/a	13 seconds
Proposed modifications within the next 18 months?				
Is the monitor suitable for comparison against the annual $PM_{2.5}$ NAAQS?	n/a	Yes	n/a	n/a
Frequency of:				
flow rate verification for manual samplers audit (PM)	n/a	n/a	n/a	n/a
flow rate verification for automated analyzers audit (PM)	Bi-weekly verifications and quarterly audits	Bi-weekly verifications and quarterly audits	Bi-weekly verifications and quarterly audits	n/a
one-point QC check (gaseous)	n/a	n/a	n/a	Bi-weekly (3 point)

Figure 3
Proposed Spanish Springs Monitoring Station
Fence and Shelter Footprint

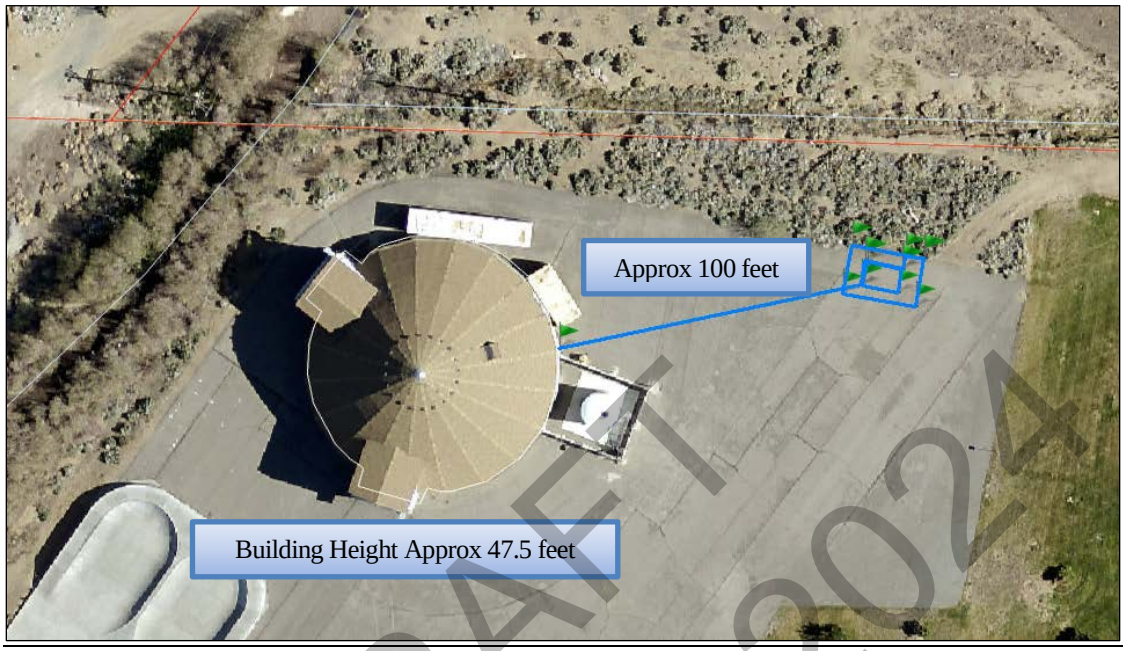


Figure 4
Proposed Spanish Springs Monitoring Station
Distance to Roadway

Figure 5
Proposed Spanish Springs Monitoring Station
Air Monitoring Shelter Description

Monitoring Station

1. Sani-Hut built shelter, 8’ x 12’, skid mounted.
2. 10 meter, T-135 telescoping Aluma Tower with building brackets (no guy wiring).
3. 100A, single-phase 120V/240V overhead power service.
4. Black iron security fence, 16’ x 24’ perimeter, 8’ in height, ¾” square pressed point picket top.

Instrumentation (inside shelter)

1. Teledyne-API T400 ozone analyzer.
2. Met One BAM 1020 continuous PM_{10} monitor.
3. Met One BAM 1020 continuous $PM_{2.5}$ monitor.
4. ESC 8832 data logger.

Instrumentation (on tower)

1. Met One 50.5H sonic anemometer.
2. YSI 700 ambient temperature sensor.

Instrumentation (on roof)

1. Met One BAM 1020 PM_{10} inlet.
2. Met One BAM 1020 $PM_{2.5}$ inlet.
3. Avant Wireless broadband antenna.

Interior Heating/Cooling

1. Baseboard heater.
2. Window mounted A/C unit.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

APR 22 2015

Mr. Daniel Inouye
Chief, Monitoring and Planning
Air Quality Management Division
Washoe County Health District
P.O. Box 11130
Reno, Nevada 89520-0027

Dear Mr. Inouye:

This letter is in response to your March 5, 2015 request for approval for the discontinuation of SLAMS (State or Local Air Monitoring Station) CO, PM_{10}, $PM_{2.5}$, and $PM_{10-2.5}$ monitoring at the Galletti site (AQS ID 32-031-0022) and for the initiation of a new SLAMS in the Spanish Springs area. Washoe County Health District Air Quality Management Division (Washoe County AQMD) proposed the relocation of the entire Galletti monitoring site in its Ambient Air Monitoring Network Plan submitted to the U.S. Environmental Protection Agency (EPA) in July 2014 (page 8). The plan was available for public inspection prior to its submittal to EPA and received no public comments on this proposed monitoring network change. EPA did not act on the request as part of the network plan approval, as the network plan did not contain sufficient information.

As noted in Washoe County AQMD's request, the Galletti site was forced to close in late 2014 due to an emergency paving project undertaken by the Nevada Department of Transportation. In addition, there are trees within 10 meters of monitor inlets and probes at the Galletti site, which does not conform to 40 CFR §58 Appendix E siting. This siting issue was a finding in EPA's technical systems audit of Washoe County AQMD in September 2013. EPA also recommended that Washoe County AQMD evaluate the appropriate spatial scale for PM measurements given the presence of a nearby minor particulate matter source. Washoe County AQMD has been unable to resolve these 40 CFR 5§8 Appendix E siting issues at the existing site.

The CO, PM_{10}, $PM_{2.5}$, and $PM_{10-2.5}$ monitors at the Galletti site are not specifically required by an attainment or maintenance plan and Washoe County will continue to meet the minimum required SLAMS sites as described in 40 CFR §58, Appendix D for each of these pollutants after this site is closed. Washoe County AQMD will also continue to monitor for $PM_{2.5}$ at two SLAMS, for PM_{10} at five SLAMS, and for CO at four SLAMS. All three pollutants will continue to be monitored at Reno3 (32-031-0016) and Sparks (32-031-1005) which are approximately 1.5 miles west and 2.1 miles east, respectively, of the Galletti site.

Per 40 CFR §58.14, monitoring agencies are required to obtain EPA approval for the discontinuation of SLAMS monitors. Washoe County AQMD's statistical analysis, based on 2009-2013, demonstrates that there is a less than 10 percent probability of exceeding 80 percent of any CO NAAQS (National Ambient Air Quality Standards) at this site during the next three

years (2014-2016). 2014 concentrations continue to show low values, with a maximum one-hour concentration of 2.8 parts per million. EPA approves the closure for CO at Galletti in accordance with 40 CFR §58.14(c)(l).

Washoe County AQMD's statistical analysis for PM_{10} demonstrates, using the annual maximum 24-hour concentrations from 2009-2013, that there is just over a 10 percent probability of exceeding 80 percent of the PM_{10} NAAQS at this site during the next three years (2014-2016). The 90 percent confidence interval (CI) associated with a 10 percent probability of exceeding 80 percent of any PM_{10} NAAQS is 120.0 $\mu g/m^3$, and the 2009-2013 time period has a CI of 120.6 $\mu g/m^3$. If the days in 2013 that are flagged as exceptional events due to the American and Rim Fires are removed from the dataset, the 2009-2013 data demonstrate that there is a less than 10 percent probability of exceeding 80 percent of the PM_{10} NAAQS. Also, the statistical analysis of 2008-2012 data meets the criteria for having less than a 10 percent probability of exceeding 80 percent of the PM_{10} NAAQS, with a CI of 103.7 $\mu g/m^3$.

Since the $PM_{2.5}$ monitor at Galletti ran from January 2013 through mid-November 2014, there is not enough historical information to evaluate the closure under 40 CFR §58.14(c)(l). Since insufficient data are available to calculate a single design value, the annual mean and 98th percentiles were compared between Galletti and the $PM_{2.5}$ monitor at Sparks (32-031-1005). As previously noted, Sparks is 2.1 miles east of the Galletti site. Based on 2013 and preliminary 2014 data, the annual means are higher at Sparks than at Galletti, and the preliminary 2014 98th percentiles are higher at Sparks than at Galletti. The 2013 98th percentiles at Sparks and Galleti are similar (38.2 $\mu g/m^3$ and 41.1 $\mu g/m^3$ respectively) and are higher at Sparks than at Galletti when flagged exceptional events due to the American and Rim fires are excluded.

While EPA has not concurred on the Galletti PM_{10} and $PM_{2.5}$ flagged exceptional events on 2013 data, the American/Rim fires burned a total of 284,754 acres of forest from August through October 2013 in the Sierra Nevada Mountains, upwind of the Reno area. These fires resulted in elevated $PM_{2.5}$ and PM_{10} concentrations above what is usually observed in August and September without the contribution of fire emissions, and the effects they had on air quality in California and Nevada were widely discussed in the news. Finally, these wildfires affected air quality similarly at the Sparks, Galletti and Reno3 sites. Given these factors, that Washoe County APCD has already been forced to close the site, and that the existing site has significant siting issues that Washoe County APCD has been unable to resolve, EPA approves the closure for PM_{10} at Galletti in accordance with 40 CFR §58.14(c)(l), and approves the closure of the $PM_{2.5}$ monitor at Galletti on a case-by-case basis per 40 CFR §58.14(c). EPA also approves the discontinuation of meteorology measurements and of reporting $PM_{10-2.5}$ data from this location, neither of which were required.

EPA has also reviewed the new site proposal for Spanish Springs. According to the information presented, the new site will operate as a SPM for 18 months and then is expected to be converted to a SLAMS. The proposed location meets siting requirements and improves Washoe County AQMD's overall network coverage. The addition of a site in Spanish Springs was also a recommendation in Washoe County AQMD's 2010 Network Assessment. Per 40 CFR §58.14(b), EPA approves the new Spanish Springs site for Ozone, PM_{10}, $PM_{2.5}$, and $PM_{10-2.5}$, as a SPM for 18 months and then expected conversion to a SLAMS.

Please include these network modifications and EPA's approval in your next annual network plan. If you have any questions, please contact me at (415) 947-4534 or Katherine Hoag (Hoag.Katherine@epa.gov) at (415) 972-3970.

Sincerely,

Meredith Kurpius
Manager, Air Quality Analysis Office

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

June 30, 2017

Meredith Kurpius
Manager, Air Quality Analysis Office
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, AIR-7
San Francisco, CA 94105

Subject: Proposed Modifications to the Washoe County Health District, Air Quality Management Division Ambient Air Monitoring Network

Dear Ms. Kurpius:

Pursuant to 40 CFR 58.14, the Washoe County Health District, Air Quality Management Division (AQMD) requests review and approval for two modifications to the existing ambient air monitoring network. The AQMD is proposing to:

1. Discontinue PM_{10} monitoring at the South Reno SLAMS (AQS ID 32-031-0020) effective December 31, 2017; and
2. Discontinue PM_{10} monitoring and a complete site closure at the Plumb-Kit SLAMS (AQS ID 32-031-0030) effective December 31, 2017.

The proposed modifications are consistent with the AQMD's most recent Network Assessment (2015) and/or Annual Network Plan (2017). Attached are demonstrations to support AQMD's proposal to discontinue PM_{10} monitoring at the South Reno and Plumb-Kit SLAMS. Approval of these requests will also build capacity to operate and maintain two new monitoring stations - Spanish Springs and West Reno. The Spanish Springs SPM (AQS ID 32-031-1007) has been submitting data to AQS since January 1, 2017. AQMD is actively reviewing potential monitoring locations in West Reno. A separate network modification request will be submitted when a specific location in West Reno is secured.

If you require additional information, feel free to contact Mr. Craig Petersen or me at (775) 784-7200.

Sincerely,

Daniel Inouye

Daniel Inouye
Monitoring and Planning Branch Chief

cc: Anna Mebust, EPA Region 9
Craig Petersen, AQMD

Attachment A
Discontinuation of PM_{10} monitoring at the South Reno SLAMS (AQS ID 32-031-0020)

Discontinuation of PM_{10} monitoring is based on criteria in 40 CFR 58.14(c)(1), including the points below.

1. The monitor has shown attainment during the previous five years (2012-16), specifically:
   a. The monitor has not exceeded nor violated the 24-hour NAAQS of 150 $\mu g/m^3$.
2. The monitor has a probability of less than 10 percent of exceeding 80 percent of the current 24-hour NAAQS.[1]

		5 Year Maximums (2012-16)												
		Year 1	Year 2	Year 3	Year 4	Year 5	Ave Max							
Parameter ($\mu g/m^3$)	Averaging Time	2012	2013	2014	2015	2016	2012-16	Std. Dev.	Student's *t* value (90% confidence)	Number of Data Values (*n*)	90% Upper CI	NAAQS	80% of NAAQS	Test
PM_{10} including EE[1]	24-hr	61	133	106	100	62	92.40	30.83	2.13	5	121.8	150	120	FAIL
PM_{10} excluding EE[1]	24-hr	61	80	70	100	62	74.60	16.12	2.13	5	90.0	150	120	PASS

3. The monitor is not required in the PM_{10} maintenance plan effective January 7, 2016 (80 FR 76232, December 8, 2015).
4. The monitor is located in the Truckee Meadows PM_{10} maintenance area. PM_{10} monitoring will continue at three stations in the maintenance area - Reno3 NCore (32-031-0016), Sparks SLAMS (32-031-1005), and Toll SLAMS (32-031-0025).
5. Discontinuation of PM_{10} monitoring is listed in the most recent Network Assessment (2015) and ANP (2017).
6. The requirements of 40 CFR 58, Appendix D will continue to be met.

[1] Rim and American Fires (2013) and King Fire (2014) Exceptional Events

Attachment B
Discontinuation of PM_{10} monitoring and complete site closure at the Plumb-Kit SLAMS (AQS ID 32-031-0025)

Discontinuation of PM_{10} monitoring and complete site closure is based on criteria in 40 CFR 58.14(c)(1), including the points below.

1. The monitor has shown attainment during the previous five years (2012-16), specifically:
   a. The monitor has not exceeded nor violated the 24-hour NAAQS of 150 $\mu g/m^3$.
2. The monitor has a probability of less than 10 percent of exceeding 80 percent of the current 24-hour NAAQS.[2]

		5 Year Maximums (2012-16)												
		Year 1	Year 2	Year 3	Year 4	Year 5	Ave Max							
Parameter ($\mu g/m^3$)	Averaging Time	2012	2013	2014	2015	2016	2012-16	Std. Dev.	Student's *t* value (90% confidence)	Number of Data Values (*n*)	90% Upper CI	NAAQS	80% of NAAQS	Test
PM_{10} including EE[2]	24-hr	92	127	136	70	80	101.00	29.09	2.13	5	128.7	150	120	FAIL
PM_{10} excluding EE[2]	24-hr	92	113	89	70	80	88.80	16.02	2.13	5	104.1	150	120	PASS

3. The monitor is not required in the PM_{10} maintenance plan effective January 7, 2016 (80 FR 76232, December 8, 2015).
4. The monitor is located in the Truckee Meadows PM_{10} maintenance area. PM_{10} monitoring will continue at three stations in the maintenance area - Reno3 NCore (32-031-0016), Sparks SLAMS (32-031-1005), and Toll SLAMS (32-031-0025).
5. Discontinuation of PM_{10} monitoring and complete site closure is listed in the most recent ANP (2017).
6. The requirements of 40 CFR 58, Appendix D will continue to be met.

[2] Rim and American Fires (2013) and King Fire (2014) Exceptional Events

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DEC 19 2017

Mr. Daniel K. Inouye
Chief, Monitoring and Planning Branch
Air Quality Management Division
Washoe County Health District
P.O. Box 11130
Reno, Nevada 89520-0027

Dear Mr. Inouye:

This letter provides the Environmental Protection Agency's (EPA's) review and approval for the Washoe County Health District's (WCHD's) closure of the Federal Reference Method (FRM) PM_{10} SLAMS monitor reporting parameter code 81102 data to parameter occurrence code (POC) 1 at Reno3 (AQS ID: 32-031-0016-81102-1). This letter also approves the discontinuation of the PM_{10} State or Local Air Monitoring Station (SLAMS) monitors at South Reno (AQS ID: 32-031-0020) and Plumb-Kit (AQS ID: 32-031-0030). On June 30, 2017 and December 8, 2017, WCHD sent letters to EPA describing these network changes.

Per 40 CFR 58.14, monitoring agencies are required to obtain EPA approval for the discontinuation of SLAMS monitors. Discontinuation of these monitors was specifically reviewed under 40 CR 58.14(c), which states that requests for discontinuation "may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a [National Ambient Air Quality Standard (NAAQS)] and if the requirements of appendix D to this part, if any, continue to be met."

The Reno3 PM_{10} FRM has been operating since 1988 and has been used to provide PM_{coarse} measurements since 2009 to fulfill requirements for National Core (NCore) multipollutant monitoring stations. In 2013, WCHD began reporting regulatory PM_{10} data from a continuous Federal Equivalent Method (FEM) to POC 2 at Reno3 in addition to the FRM. A comparison of 24-hour PM_{10} concentrations measured between 2013 and 2016 at Reno3 shows that the FRM and FEM are very highly correlated ($R^2 = 0.9704$) and that the FEM provides PM_{10} data of comparable concentrations to the FRM, with a slope of 0.9808. WCHD is requesting closure of the PM_{10} POC 1 FRM data reporting to parameter code 88102. WCHD will continue to operate the FRM instrument for PM_{coarse} and report PM_{10} data from the FRM in local conditions (parameter code 85101), and will continue to report PM_{10} data to parameter code 81102 from the FEM for comparison with the 1987 24-hour PM_{10} NAAQS. This analysis shows that discontinuation of data reporting from the FRM would not compromise data collection at Reno3 needed for implementation of the 1987 24-hour PM_{10} NAAQS; discontinuation also will not prevent WCHD from meeting 40 CFR 58 Appendix D requirements.

In evaluating the request to discontinue PM_{10} monitoring at South Reno and Plumb-Kit, EPA analyzed PM_{10} data associated with the five most recently available design values (2012 – 2016 design values, encompassing data from 2010 – 2016) for both sites and throughout the WCHD PM_{10} network. WCHD started monitoring for PM_{10} using a manual method instrument at South Reno and Plumb-Kit in 1988 and 2006, respectively. In 2010, both sites sampled on a 1-in-6 day schedule. In 2011, WCHD transitioned from manual to continuous PM_{10} instruments at both sites. Due to this transition, both sites have invalid PM_{10} design values in AQS for 2012 and 2013. Based on certified data submitted to AQS, both the South Reno and Plumb-Kit sites were in attainment of the 1987 24-hour PM_{10} NAAQS from 2014-2016, with valid PM_{10} design values of 0.0. Neither site measured an exceedance of the 1987 24-hour PM_{10} NAAQS at any point during 2010-2016.

There were five total PM_{10} monitoring sites operating in Washoe County at the end of 2016, all of which were located within the Truckee Meadows PM_{10} maintenance area. The 2016 design value site in the Truckee Meadows maintenance area is Toll (AQS ID: 32-031-0025), with a design value of 0.3. A comparison of 2012-2016 data from South Reno and Toll on days where at least one of those monitors measured a concentration above 80% of the NAAQS shows that Toll measured higher concentrations than South Reno on four out of four such days; a similar comparison between Plumb-Kit and Toll shows that Toll measured higher concentrations than Plumb-Kit on four out of six such days. Preliminary data currently available for a portion of 2017 is consistent with the trends previously discussed. Based on these analyses, discontinuance of these monitors does not compromise data collection needed for implementation of the 1987 24-hour PM_{10} NAAQS and will not prevent WCHD from meeting 40 CFR 58 Appendix D requirements.

Therefore, EPA approves WCHD's discontinuation of the Reno3 PM_{10} FRM SLAMS monitor reporting parameter code 81102 data to POC 1, and discontinuation of the South Reno and Plumb-Kit PM_{10} SLAMS monitors on a case-by-case basis per 40 CFR 58.14(c). Please include these network modifications and EPA's approval in your next annual network plan.

If there are any questions regarding this letter, please feel free to contact me at (415) 947-4134 or Anna Mebust of my staff at (415) 972-3265.

Sincerely,

Gwen Yoshimura, Manager
Air Quality Analysis Office

cc (via email): Craig Peterson, WCHD

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

January 27, 2020

Gwen Yoshimura
Manager, Air Quality Analysis Office
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, AIR-7
San Francisco, CA 94105

Subject: Proposed Modification to the Washoe County Health District, Air Quality Management Division Ambient Air Monitoring Network

Dear Ms. Yoshimura:

The Washoe County Health District, Air Quality Management Division (AQMD) is requesting approval from the U.S. Environmental Protection Agency (EPA) to relocate the AQMD's SLAMS/NCore monitoring station (AQS ID 32-031-0016, Reno3) and retain the same AQS ID. According to 40 CFR 58.14 (6):

> *A SLAMS monitor not eligible for removal under any of the criteria in paragraphs (c)(1) through (c)(5) of this section may be moved to a nearby location with the same scale of representation if logistical problems beyond the State's control make it impossible to continue operation at its current site.*

The AQMD operated and maintained the Reno3 station from November 2001 to December 2019. It has been classified as an NCore site since December 2010. Reno3 was located on property owned by the City of Reno (COR). In 2019, the COR sold the property for development of low-income and market-rate multi-family housing. Operation of a SLAMS/NCore monitoring station was not compatible with this project.

The proposed replacement site (Reno4) is approximately 1.12 km to the east southeast of the Reno3 site. It is in the playground area of Libby Booth Elementary School. The AQMD did not receive enough lead time to conduct parallel monitoring at Reno3 and Reno4. Air monitoring equipment was relocated from Reno3 to Reno4 in December 2019. QA audits were performed of the monitors prior to relocating the equipment. Data loss for nearly all parameters was less than one day.

The Reno3 and Reno4 sites are both in Hydrographic Area 87 (Truckee Meadows), share similar topographic features, share similar meteorological patterns, and are at similar elevations (approximately 24 feet difference). Detailed information regarding Reno4, including obstacles and traffic counts, is included in Attachment 1 (Detailed Site Information).

The AQMD is requesting that EPA approve Reno4 as an NCore site and to continue to use the same AQS ID (32-031-0016) as Reno3.

Feel free to contact Mr. Daniel Inouye or me at 775-784-7200 if I can be of further assistance.

Sincerely,

Francisco Vega, P.E., MBA
Director, Air Quality Management Division
Washoe County Health District

cc: Randall Chang, EPA Region 9

Attachment 1

Detailed Site Information

Proposed Reno4 NCore Detailed Site Information

Proposed site name:	Reno4
Proposed AQS ID:	32-031-0016
Geographical coordinates:	39º 31.316'N, 119º 47.724'W
Elevation:	4,461'
Assessor's Parcel Number:	013-042-01
Owner:	Washoe County School District Board
Location:	North edge of Libby Booth Elementary School property
Street address:	1450 Stewart Street Reno, NV 89502
County:	Washoe
Distance to road:	10 meters to Stewart Street 150 meters to Yori Ave
Traffic count: **(See additional counts in Table 3)**	<900 Approximate AADT (NDOT Estimate - Stewart Street) 1,033 AADT (2016-2018) (NDOT ATR 0310886 - Yori Ave, 165 ft N of Stewart St)
Groundcover:	Paved / Decomposed Granite
Representative area:	Reno-Sparks MSA

Figure 1
Reno4 Air Monitoring Station

High-Level Station and Analyzer Information

Monitoring Station

1. 8’ x 20’ converted shipping container built by Quick Space.
2. 10 meter, T-135 telescoping Aluma Tower with building brackets (no guy wiring).
3. 200A, single-phase 120V/240V underground power service.

Instrumentation (inside shelter)

1. Teledyne-API 100EU trace-level SO2 analyzer.
2. Teledyne-API 200EU trace-level NO2/NO/NOx analyzer.
3. Teledyne-API 200EU/NOy trace-level NO2/NO/NOy analyzer.
4. Teledyne-API 300EU trace-level CO analyzer.
5. Teledyne-API 400E ozone analyzer.
6. Teledyne-API T700U Dilution Calibrator
7. Teledyne-API 701H Zero Air Generator
8. Met One BAM 1020 continuous PM10 monitor.
9. Met One BAM 1020 continuous PM2.5 monitor.
10. Agilaire 8832 data logger.

Instrumentation (on tower)

1. Met One 50.5H sonic anemometer.
2. Teledyne-API 200EU/NOy convertor.

Instrumentation (on roof)

1. Met One BAM 1020 PM10 inlet.
2. Met One BAM 1020 PM2.5 inlet.
3. BGI PQ200 FRM PM2.5 sampler.
4. BGI PQ200 FRM PM10 sampler.
5. Met One 063-1 ambient temperature sensor.
6. Met One 083E relative humidity sensor.
7. Avant Wireless broadband antenna.

Heating/Cooling

1. Mitsubishi 1.5 Ton Two-Zone Mini Split System

Figure 2
Reno3 and Reno4 Air Monitoring Stations

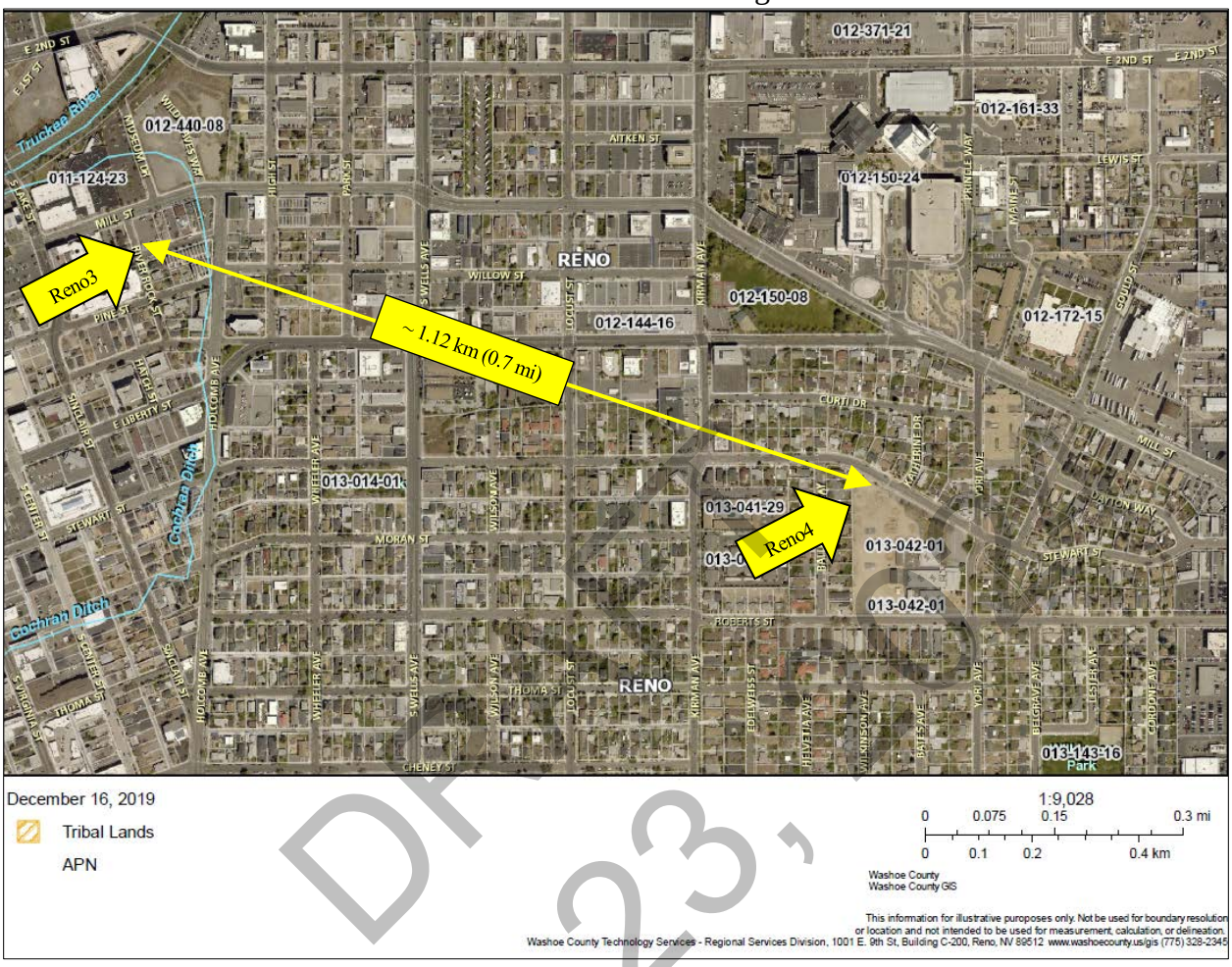


Figure 3
Area Surrounding Reno4 Air Monitoring Station

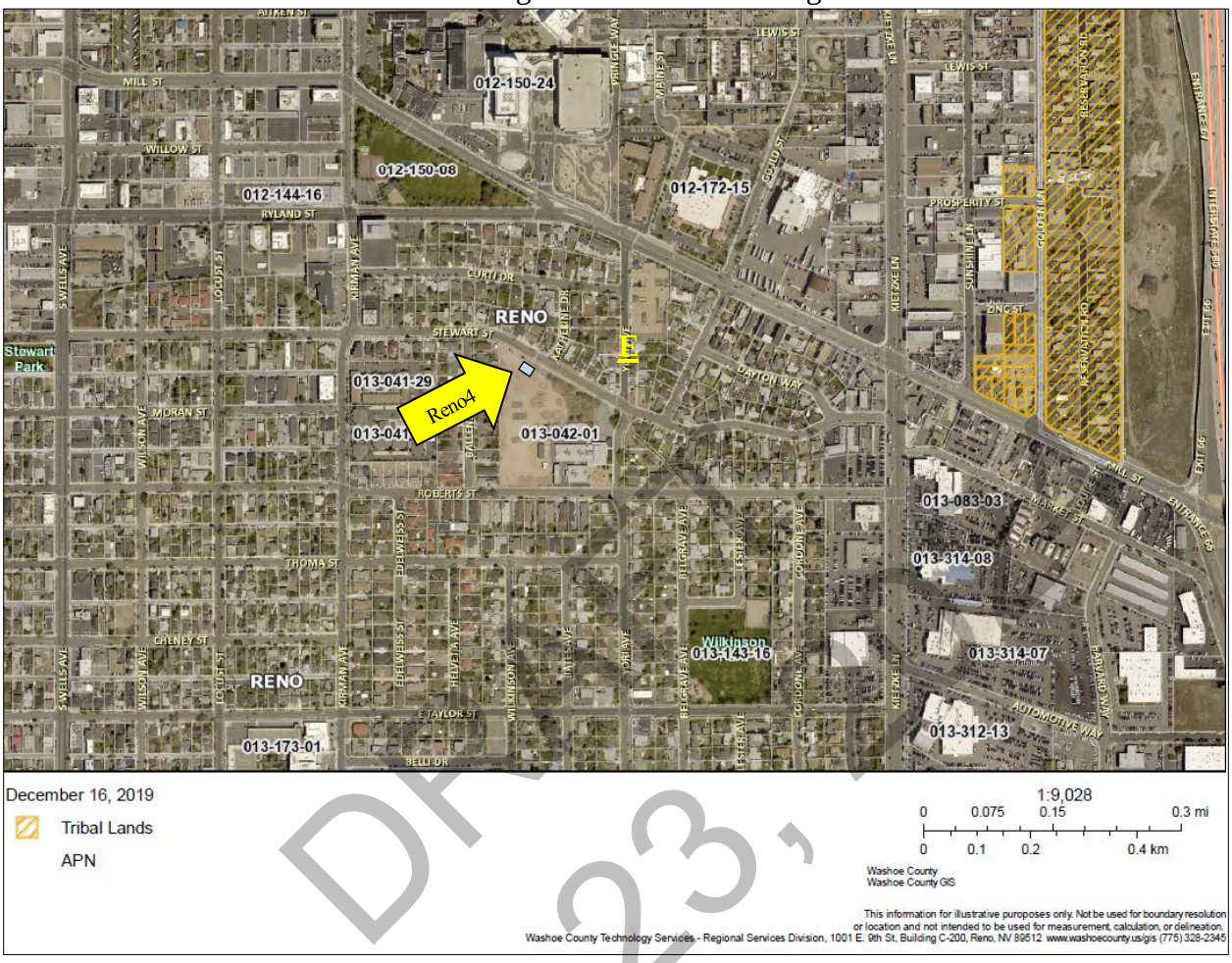


Figure 4
Obstacles and Roadways Immediately Surrounding Reno4 Air Monitoring Station

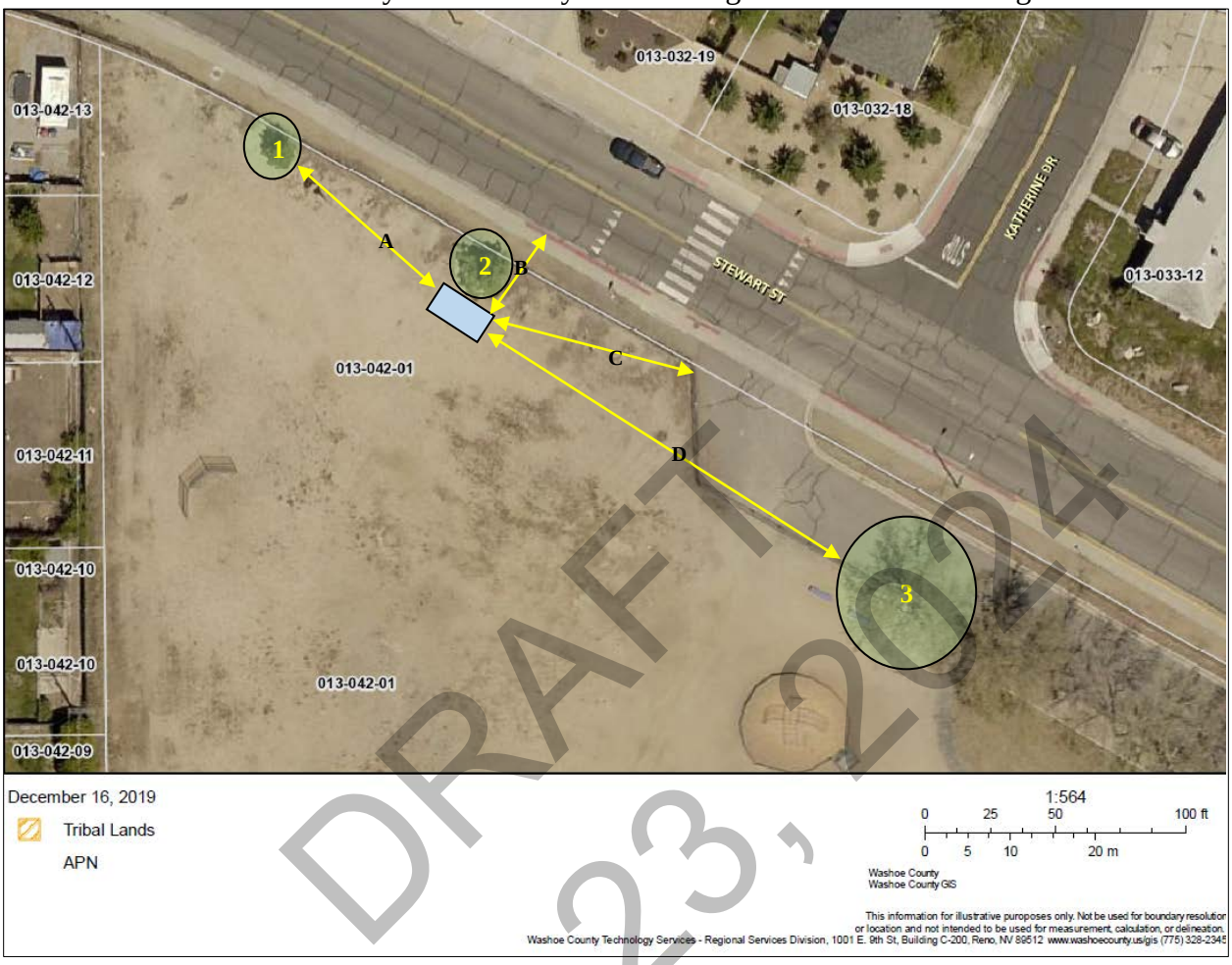


Table 1
Obstacles Surrounding Reno4 Air Monitoring Station
(Refer to Figure 4)

Obstacle Number	Type	~Height (ft)*	Distance to edge of shelter			Notes
			Label	~Distance (ft)	Distance/Height Ratio	
1	Tree	16	A	61.5	3.8	
2	Tree	n/a	n/a	n/a	n/a	Tree removed
3	Tree	52	D	136.5	2.6	

* Measured from ground.

Table 2
Roadways and Traffic Counts Immediately Surrounding Reno4 Air Monitoring Station
(Refer to Figures 3 and 4)

Roadway Name	Type	Distance to edge of shelter (m)	AADT	Notes
Stewart	Local Road	10	<900	See distance "B" in Figure 4. All inlets on top of the shelter will be set back from the edge and at least 10 m from Stewart. AADT is NDOT estimate.
n/a	Bus Loading Lane	19.1		See distance "C" in Figure 3.
Yori	Local Road	150	1,033	See label "E" east northeast of Reno4 station in Figure 3. This is the nearest NDOT maintained ATR

Figure 5
Additional NDOT ATR's

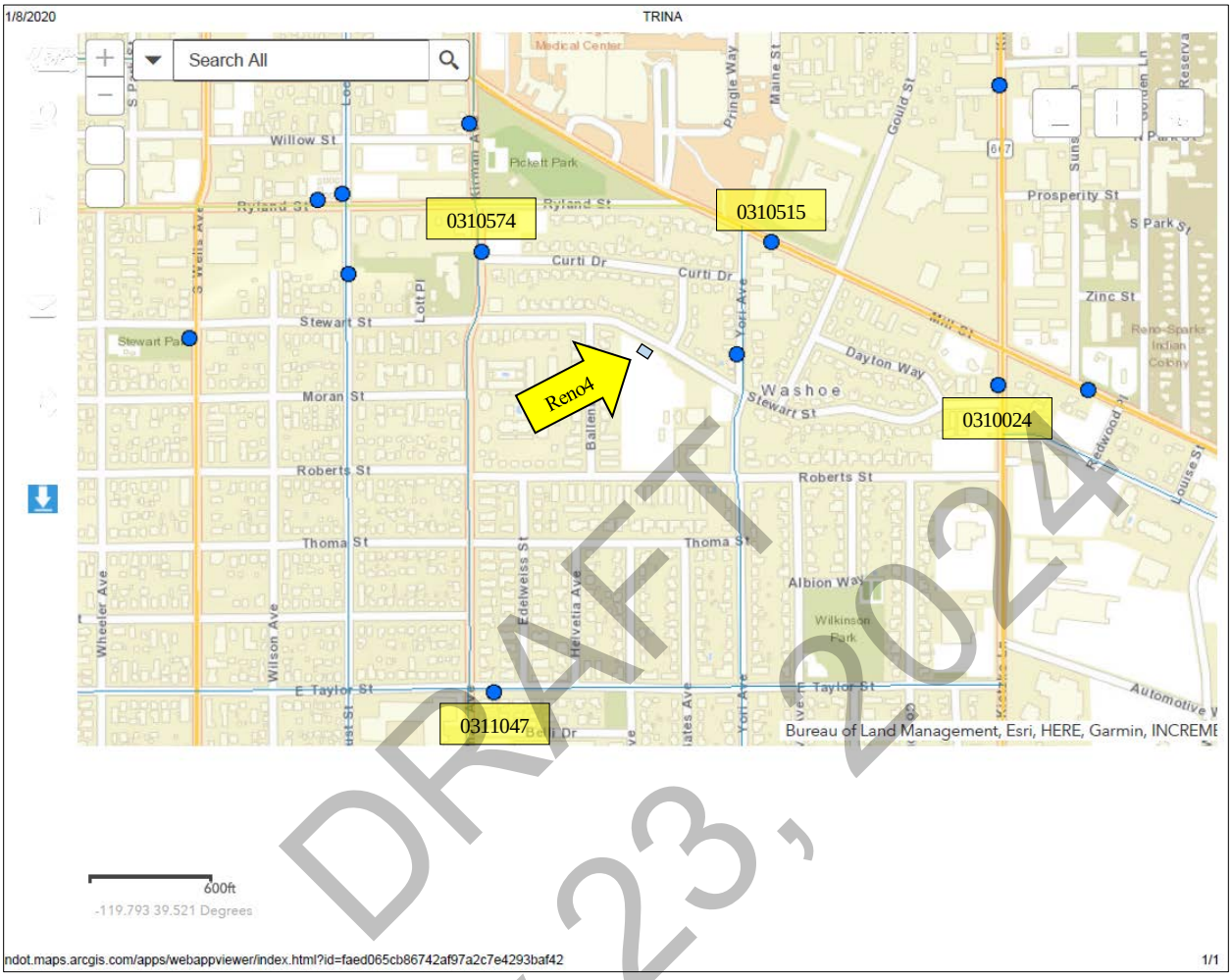


Table 3
Additional Traffic Counts

ATR ID	2016	2017	2018	3-year Ave (2016-2018)	Approximate distance to Reno4 (km)
0310024	22,000	25,000	17,600	21,533	0.54
0310515	17,000	17,800	17,900	17,557	0.25
0310574	2,600	2,500	2,450	2,517	0.28
0311047	2,000	32,100	2,200	2,100	0.56

Automatic Traffic Recorder (ATR) Source: Nevada Department of Transportation Traffic Information Division (https://www.nevadadot.com/doing-business/about-ndot/ndot-divisions/planning/traffic-information)

Figure 6
Looking North from the Probe

Figure 7
Looking Northeast from the Probe

Figure 8
Looking East from the Probe

Figure 9
Looking Southeast from the Probe

Figure 10
Looking South from the Probe

Figure 11
Looking Southwest from the Probe

Figure 12
Looking West from the Probe

Figure 13
Looking Northwest from the Probe

Proposed Reno4 NCore Station Analyzers

Pollutant, POC	PM_{10}, 2	$PM_{2.5}$, 3	$PM_{10-2.5}$, 2	$PM_{2.5}$ Speciation, 1
Primary / QA Collocated / Other	Primary	Primary	Primary	Primary
Parameter code	81102 & 85101	88101	86101	88502
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	Research Support	Research Support
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	NCore	CSN STN, NCore
Instrument manufacturer / model	Met One BAM 1020	Met One BAM 1020	Met One BAM 1020 Coarse Pair	Met One SASS; URG 3000N
Method code	122	170	185	SASS: 810 URG: 870
FRM / FEM / ARM / Other	FEM	FEM	FEM	Other
Collecting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Analytical Lab	n/a	n/a	n/a	AMEC Foster Wheeler
Reporting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	December 2010	December 2010	December 2010	November 2001
Current sampling frequency	Continuous	Continuous	Continuous	1:3
Required sampling frequency	n/a	n/a	n/a	1:3
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height	5.2 meters	5.1 meters	5.1 meters	SASS: 4.9 meters URG: 5.1 meters
Distance from supporting structure	2.2 meters	2.1 meters	2.1 meters	SASS: 1.8 meters URG: 2.1 meters
Distance from obstructions on roof	n/a	n/a	n/a	n/a
Distance from obstructions not on roof	None	None	None	None
Distance from nearest road	11.6 meters	11.6 meters	11.6 meters	SASS: 10.4 meters URG: 10.4 meters
Distance from trees (see Figure 4, obstacle 3)	42.0 meters	43.2 meters	42.0 meters	SASS: 44.7 meters URG: 46.0 meters
Distance to furnace or incinerator flue	n/a	n/a	n/a	n/a
Distance between collocated monitors	n/a	1.04 meters	n/a	n/a
For low volume PM instruments, is any PM instrument within 1 meter?	No	No	No	No
For high volume PM instruments, is any PM instrument within 2 meters?	n/a	n/a	n/a	n/a
Unrestricted airflow	360 degrees	360 degrees	360 degrees	360 degrees
Probe material	n/a	n/a	n/a	n/a
Residence time	n/a	n/a	n/a	n/a
Proposed modifications within the next 18 months?	None	None	None	None
Is it suitable for comparison against the annual $PM_{2.5}$ NAAQS?	n/a	Yes	n/a	No
Frequency of flow rate verification for manual samplers (PM)	n/a	n/a	n/a	Monthly verifications and quarterly audits
Frequency of flow rate verification for automated analyzers (PM)	Bi-weekly verifications and quarterly audits	Bi-weekly verifications and quarterly audits	Bi-weekly verifications and quarterly audits	n/a
Frequency of one-point QC check (gaseous)	n/a	n/a	n/a	n/a
Date of annual performance evaluation (gaseous & meteorological)	n/a	n/a	n/a	n/a
Date of two semi-annual flow rate audits (PM)				

Proposed Reno4 NCore Station Analyzers (continued)

Pollutant, POC	PM_{10}, 1	$PM_{2.5}$, 1	$PM_{10-2.5}$, 1	Trace CO, 1
Primary / QA Collocated / Other	Other	QA Collocated	Other	n/a
Parameter code	81102 & 85101	88101	86101	42101
Basic monitoring objective(s)	Research Support	NAAQS comparison	Research Support	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	NCore	NCore
Instrument manufacturer / model	BGI PQ200	BGI PQ200	BGI PQ200 coarse pair	TAPI 300EU
Method code	125	142	173	593
FRM / FEM / ARM / Other	FRM	FRM	FRM	FRM
Collecting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Analytical Lab	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	n/a
Reporting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	April 1988	January 1999	March 2009	December 2010
Current sampling frequency	1:3	1:3	1:3	Continuous
Required sampling frequency	1:3	1:3	1:3	n/a
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height	5.0 meters	5.0 meters	5.0 meters	5.1 meters
Distance from supporting structure	2.0 meters	2.0 meters	2.0 meters	2.1 meters
Distance from obstructions on roof	n/a	n/a	n/a	n/a
Distance from obstructions not on roof	None	None	None	None
Distance from nearest road	10.4 meters	10.4 meters	10.4 meters	12.5 meters
Distance from trees (see Figure 4, obstacle 3)	42.0 meters	43.2 meters	42.0 meters	45.7 meters
Distance to furnace or incinerator flue	n/a	n/a	n/a	n/a
Distance between collocated monitors	n/a	1.2 meters	n/a	n/a
For low volume PM instruments, is any PM instrument within 1 meter?	No	No	No	n/a
For high volume PM instruments, is any PM instrument within 2 meters?	n/a	n/a	n/a	n/a
Unrestricted airflow	360 degrees	360 degrees	360 degrees	360 degrees
Probe material	n/a	n/a	n/a	Teflon
Residence time	n/a	n/a	n/a	4 seconds
Proposed modifications within the next 18 months?	None	None	None	None
Is it suitable for comparison against the annual $PM_{2.5}$ NAAQS?	n/a	Yes	n/a	n/a
Frequency of flow rate verification for manual samplers (PM)	Monthly verifications and quarterly audits	Monthly verifications and quarterly audits	Monthly verifications and quarterly audits	n/a
Frequency of flow rate verification for automated analyzers (PM)	n/a	n/a	n/a	n/a
Frequency of one-point QC check (gaseous)	n/a	n/a	n/a	Weekly
Date of annual performance evaluation (gaseous & meteorological)	n/a	n/a	n/a	
Date of two semi-annual flow rate audits (PM)				n/a

Proposed Reno4 NCore Station Analyzers (continued)

Pollutant, POC	O_3, 1	Trace NO, 1	Trace NO_2, 1	Trace NO_X, 1
Primary / QA Collocated / Other	n/a	Primary	Primary	Primary
Parameter code	44201	42602	42602	42602
Basic monitoring objective(s)	NAAQS comparison	Research Support	NAAQS comparison	Research Support
Site type(s)	Highest Concentration	Population Exposure	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	NCore	NCore
Instrument manufacturer / model	TAPI 400E	TAPI 200EU	TAPI 200EU	TAPI 200EU
Method code	087	099	099	099
FRM / FEM / ARM / Other	FEM	FRM	FRM	FRM
Collecting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Analytical Lab	n/a	n/a	n/a	n/a
Reporting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	January 1983	November 2001	November 2001	November 2001
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	n/a	n/a	n/a	n/a
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height	5.1 meters	5.1 meters	5.1 meters	5.1 meters
Distance from supporting structure	2.1 meters	2.1 meters	2.1 meters	2.1 meters
Distance from obstructions on roof	n/a	n/a	n/a	n/a
Distance from obstructions not on roof	None	None	None	None
Distance from nearest road	12.5 meters	12.5 meters	12.5 meters	12.5 meters
Distance from trees (see Figure 4, obstacle 3)	45.7 meters	46.9 meters	46.9 meters	46.9 meters
Distance to furnace or incinerator flue	n/a	n/a	n/a	n/a
Distance between collocated monitors	n/a	n/a	n/a	n/a
For low volume PM instruments, is any PM instrument within 1 meter?	n/a	n/a	n/a	n/a
For high volume PM instruments, is any PM instrument within 2 meters?	n/a	n/a	n/a	n/a
Unrestricted airflow	360 degrees	360 degrees	360 degrees	360 degrees
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	4 seconds	5 seconds	5 seconds	5 seconds
Proposed modifications within the next 18 months?	None	None	None	None
Is it suitable for comparison against the annual $PM_{2.5}$ NAAQS?	n/a	n/a	n/a	n/a
Frequency of flow rate verification for manual samplers (PM)	n/a	n/a	n/a	n/a
Frequency of flow rate verification for automated analyzers (PM)	n/a	n/a	n/a	n/a
Frequency of one-point QC check (gaseous)	Weekly	Weekly (4 point w/ GPT)	Weekly (4 point w/ GPT)	Weekly (4 point w/ GPT)
Date of annual performance evaluation (gaseous & meteorological)				
Date of two semi-annual flow rate audits (PM)	n/a	n/a	n/a	n/a

Proposed Reno4 NCore Station Analyzers (continued)

Pollutant, POC	Trace NO, 1	NO_Y-NO, 1	NO_Y, 1	Trace SO_2, 1
Primary / QA Collocated / Other	n/a	n/a	n/a	n/a
Parameter code	42612	42612	42612	42401
Basic monitoring objective(s)	Research Support	Research Support	Research Support	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	NCore	NCore
Instrument manufacturer / model	TAPI 200EU with 501	TAPI 200EU with 501	TAPI 200EU with 501	TAPI 100EU
Method code	699	699	699	600
FRM / FEM / ARM / Other	Other	Other	Other	FEM
Collecting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Analytical Lab	n/a	n/a	n/a	n/a
Reporting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	December 2010	December 2010	December 2010	December 2010
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	n/a	n/a	n/a	n/a
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height	8.6 meters	8.6 meters	8.6 meters	5.1 meters
Distance from supporting structure	8.6 meters	8.6 meters	8.6 meters	2.1 meters
Distance from obstructions on roof	n/a	n/a	n/a	n/a
Distance from obstructions not on roof	None	None	None	None
Distance from nearest road	11.2 meters	11.2 meters	11.2 meters	12.5 meters
Distance from trees (see Figure 4, obstacle 3)	47.7 meters	47.7 meters	47.7 meters	45.7 meters
Distance to furnace or incinerator flue	n/a	n/a	n/a	n/a
Distance between collocated monitors	n/a	n/a	n/a	n/a
For low volume PM instruments, is any PM instrument within 1 meter?	n/a	n/a	n/a	n/a
For high volume PM instruments, is any PM instrument within 2 meters?	n/a	n/a	n/a	n/a
Unrestricted airflow	360 degrees	360 degrees	360 degrees	360 degrees
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	6 seconds	6 seconds	6 seconds	4 seconds
Proposed modifications within the next 18 months?	None	None	None	None
Is it suitable for comparison against the annual $PM_{2.5}$ NAAQS?	n/a	n/a	n/a	n/a
Frequency of flow rate verification for manual samplers (PM)	n/a	n/a	n/a	n/a
Frequency of flow rate verification for automated analyzers (PM)	n/a	n/a	n/a	n/a
Frequency of one-point QC check (gaseous)	Weekly (4 point w/ GPT)	Weekly (4 point w/ GPT)	Weekly (4 point w/ GPT)	Weekly
Date of annual performance evaluation (gaseous & meteorological)				
Date of two semi-annual flow rate audits (PM)	n/a	n/a	n/a	n/a

Proposed Reno4 NCore Station Analyzers (continued)

Pollutant, POC	Wind Speed, 1	Wind Direction, 1	Ambient Temperature, 1	Relative Humidity, 1
Primary / QA Collocated / Other	n/a	n/a	n/a	n/a
Parameter code	61101 & 61103	61102 & 61104	62101	62201
Basic monitoring objective(s)	Research, Public Information	Research, Public Information	Research, Public Information	Research, Public Information
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	NCore	NCore
Instrument manufacturer / model	Met One 50.5H	Met One 50.5H	Met One 063-1	Met One 083E
Method code	061	061	014	061
FRM / FEM / ARM / Other	n/a	n/a	n/a	n/a
Collecting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Analytical Lab	n/a	n/a	n/a	n/a
Reporting Agency	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD	WCHD - AQMD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	February 2013	February 2013	February 2013	February 2013
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	n/a	n/a	n/a	n/a
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height	9.7 meters	9.7 meters	4.3 meters	4.3 meters
Distance from supporting structure	9.7 meters	9.7 meters	1.2 meters	1.2 meters
Distance from obstructions on roof	n/a	n/a	n/a	n/a
Distance from obstructions not on roof	None	None	None	None
Distance from nearest road	11.7 meters	11.7 meters	12.5 meters	12.5 meters
Distance from trees (see Figure 4, obstacle 3)	47.7 meters	47.7 meters	47.7 meters	47.7 meters
Distance to furnace or incinerator flue	n/a	n/a	n/a	n/a
Distance between collocated monitors	n/a	n/a	n/a	n/a
For low volume PM instruments, is any PM instrument within 1 meter?	n/a	n/a	n/a	n/a
For high volume PM instruments, is any PM instrument within 2 meters?	n/a	n/a	n/a	n/a
Unrestricted airflow	360 degrees	360 degrees	360 degrees	360 degrees
Probe material	n/a	n/a	n/a	n/a
Residence time	n/a	n/a	n/a	n/a
Proposed modifications within the next 18 months?	None	None	None	None
Is it suitable for comparison against the annual $PM_{2.5}$ NAAQS?	n/a	n/a	n/a	n/a
Frequency of flow rate verification for manual samplers (PM)	n/a	n/a	n/a	n/a
Frequency of flow rate verification for automated analyzers (PM)	n/a	n/a	n/a	n/a
Frequency of one-point QC check (gaseous)	n/a	n/a	n/a	n/a
Date of annual performance evaluation (gaseous & meteorological)				
Date of two semi-annual flow rate audits (PM)	n/a	n/a	n/a	n/a

Attachment 2

NCore Site Move Checklist

Table 1
State and Metropolitan Area Information

	State Summary	Existing CBSA for NCore Station	Proposed CBSA for NCore Station
Name	Nevada	Reno, NV	Reno, NV
Population (2018)	3,057,582	464,464	464,464
Annual $PM_{2.5}$ DV (2016-2018)	13 $PM_{2.5}$ sites ranging from 5.1 to 9.4 ug/m^3	7.6 ug/m^3	7.6 ug/m^3
24-hour $PM_{2.5}$ DV (2016-2018)	13 $PM_{2.5}$ sites ranging from 13 to 28 ug/m^3	25 ug/m^3	25 ug/m^3
8-hour Ozone DV (2016-2018)	23 ozone sites ranging from 0.061 to 0.076 ppm	0.071 ppm	0.071 ppm

Population Estimates: State of Nevada, Department of Taxation, Population Statistics and Reports (https://tax.nv.gov/Publications/Population_Statistics_and_Reports/)

Table 2
Site Information

NCore Site Information	Existing NCore Station	Proposed NCore Station
Site Name	Reno3	Reno4
AQS ID	32-031-0016	32-031-0016
Latitude	39º 31.505'N	39º 31.316'N
Longitude	119º 48.463'W	119º 47.724'W
Elevation	4,489'	4,461'
Length of time site has/is operating?	Operated as SLAMS from Nov 2001 to Dec 2019. Also designated as NCore from Dec 2010 to Dec 2019.	January 1, 2020

Table 3
Checklist of Questions

#	Question	AQMD Response
1	Why does the current NCore site have to move?	Reno3 station was on property owned by the City of Reno (COR). The COR sold the property to a private developer in 2019 which ended the interlocal agreement between AQMD and COR.
2	Has the monitoring agency submitted a letter requesting the move?	This transmittal letter and attachments serves as AQMD's formal request.
3	Has the new site been included in the most recent Annual Monitoring Network Plan?	Yes.
4	Were there concerns expressed regarding the new site as a result of the AMNP process?	No.
5	Has the Region reviewed and recommended the new site?	No, See Question 2 above.
6	Was an on-site visit performed by EPA?	Yes, during a Technical System Audit conducted on August 13-15, 2019.
7	Does the new location appear to meet the objectives of NCore such that it can serve as a long-term location to provide representative data for the metropolitan area to use in trends, model evaluation, and tracking metropolitan area statistics?	Yes.
8	Can the new site meet siting criteria?	Yes.
9	Is the new site at neighborhood or urban scale?	Yes, Neighborhood scale.
10	Is the new site away from any large emission sources	Yes.
11	Are there any concerns regarding the recommended new site?	No.
12	Do OAQPS AAMG staff recommend approving new site for NCore?	TBD.