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

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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/m³	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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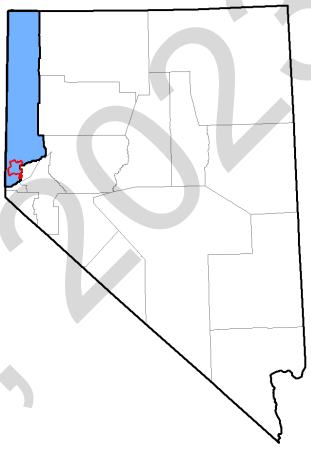
2.0 Conceptual Model

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.

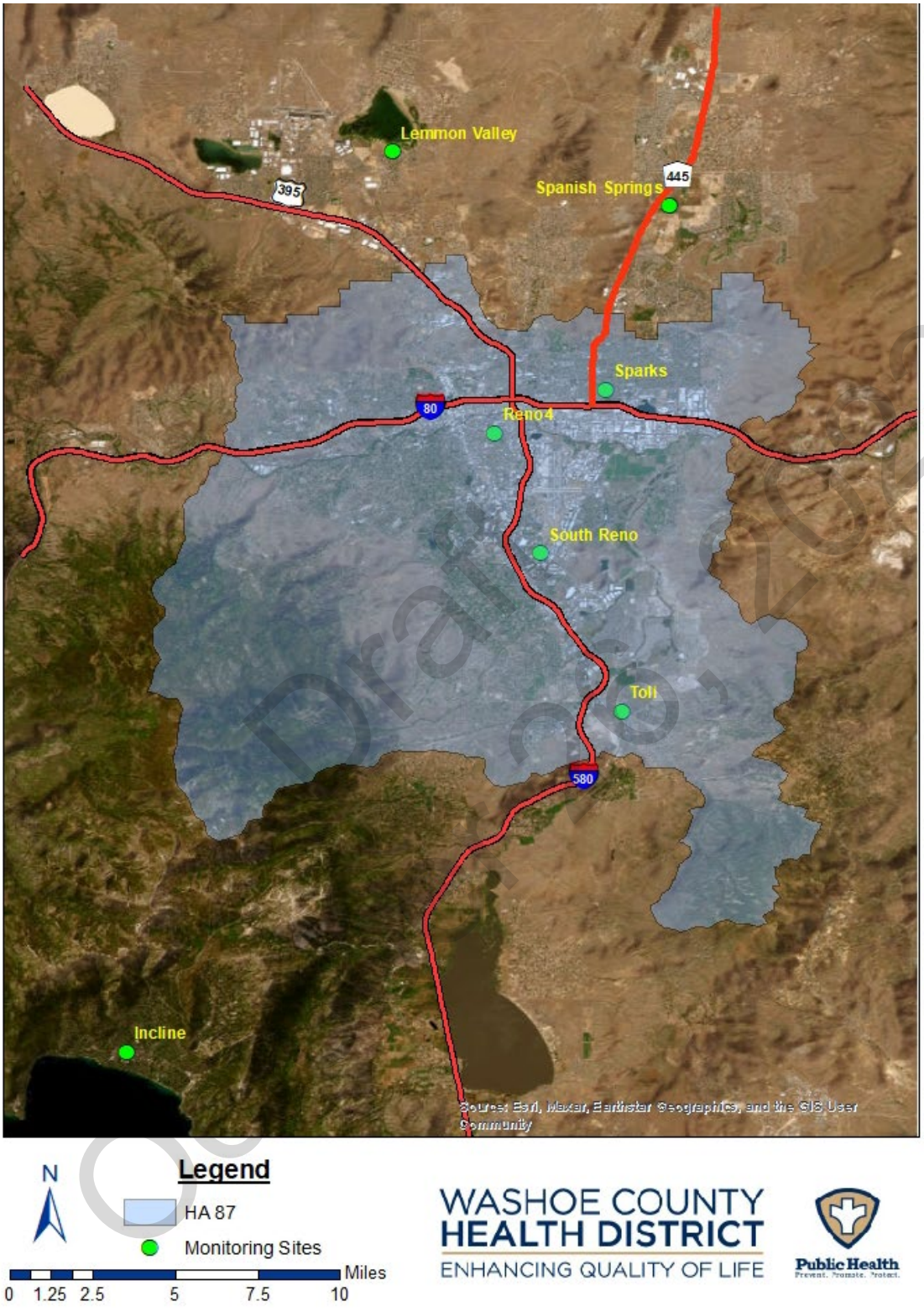
2.2 Overview of Monitoring Network

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

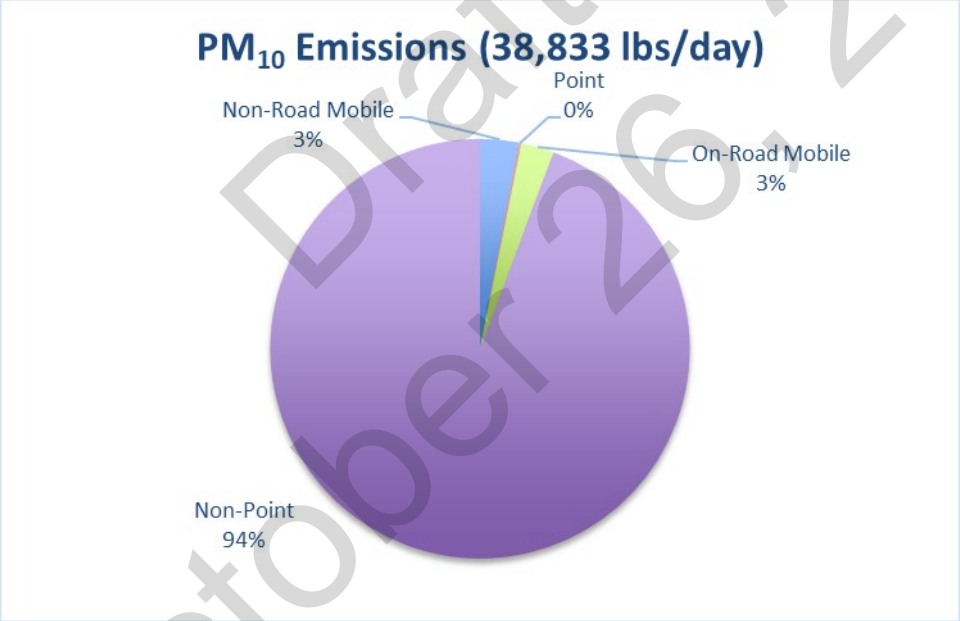


The AQMD's ambient air monitoring network meets the minimum monitoring requirements for all criteria pollutants pursuant to Title 40, Part 58 of the Code of Federal Regulations (CFR), Appendix D. Washoe County's monitoring network is reviewed annually pursuant to 40 CFR 58.10 to ensure the network meets 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.

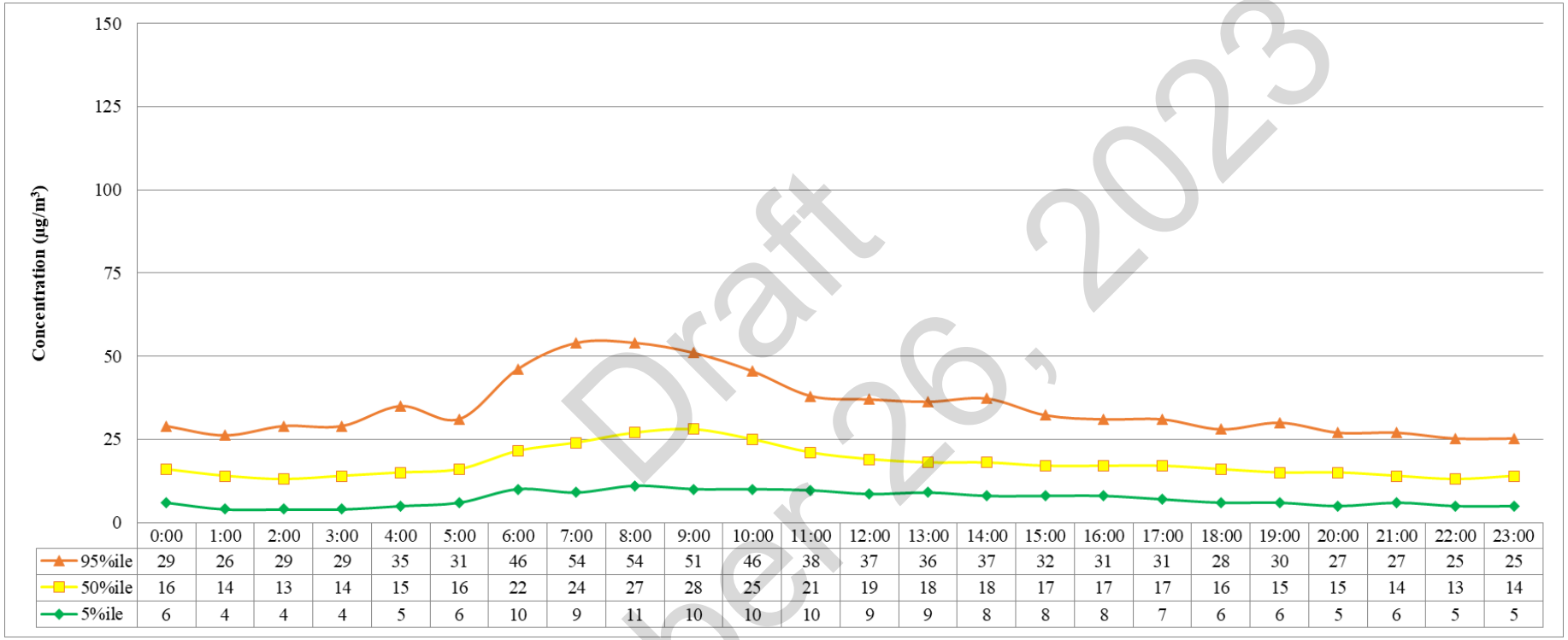
1. October through March: Ambient PM_{10} concentrations are relatively high during the colder months because some Washoe County residents utilize wood-burning devices for heat. Additionally, PM_{10} concentrations can increase after snowstorms due to local street sanding and sweeping. The Truckee Meadows 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 µg/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.

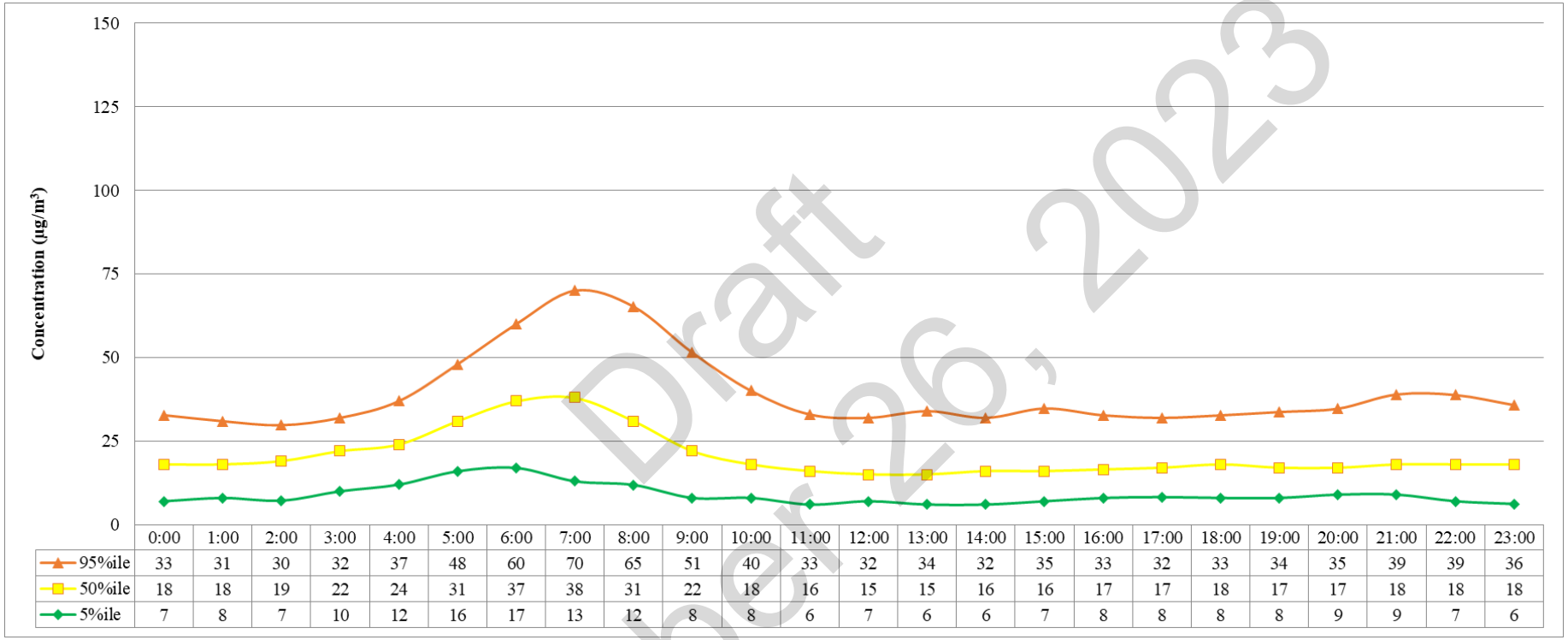
The wildfire events that have caused exceedances have occurred in the July through September period. For the purpose of this demonstration, it is worthwhile to evaluate the diurnal pattern of PM_{10} concentrations during this time period. Figure 2-4 and Figure 2-5 below shows the 2016-2020 PM_{10} diurnal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

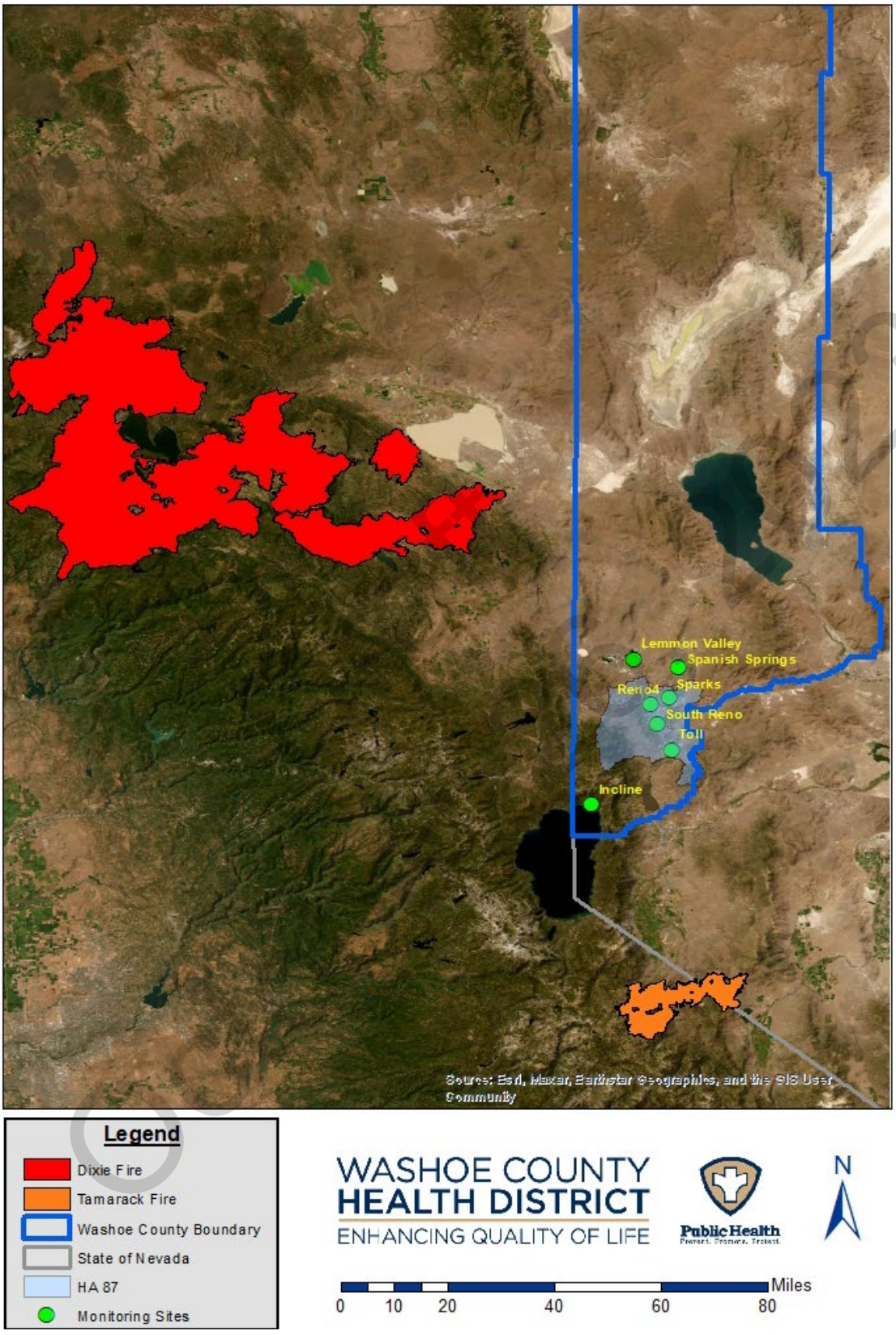
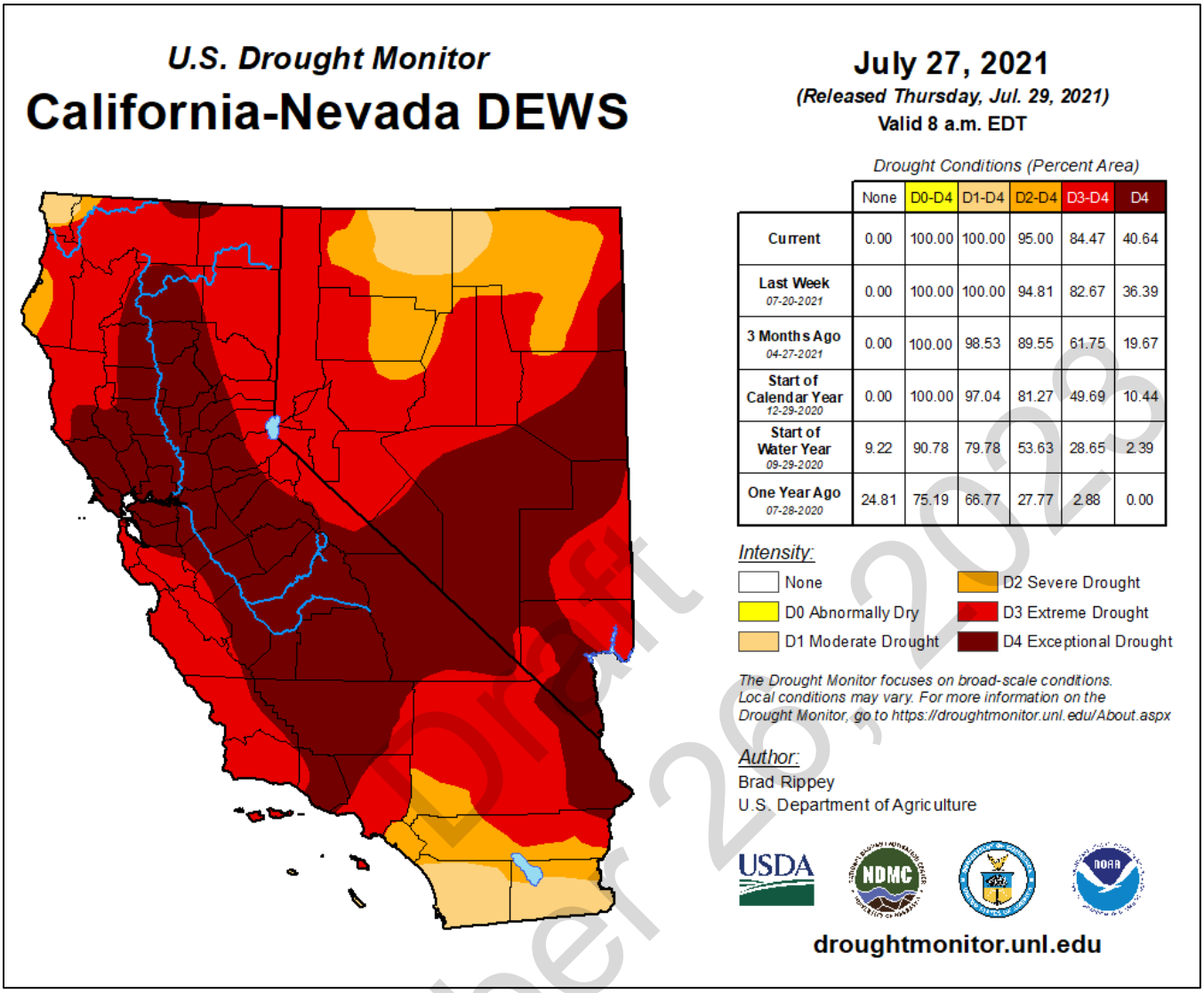


Figure 2-7: The Drought Conditions at the Time of the Tamarack and Dixie Fires



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.

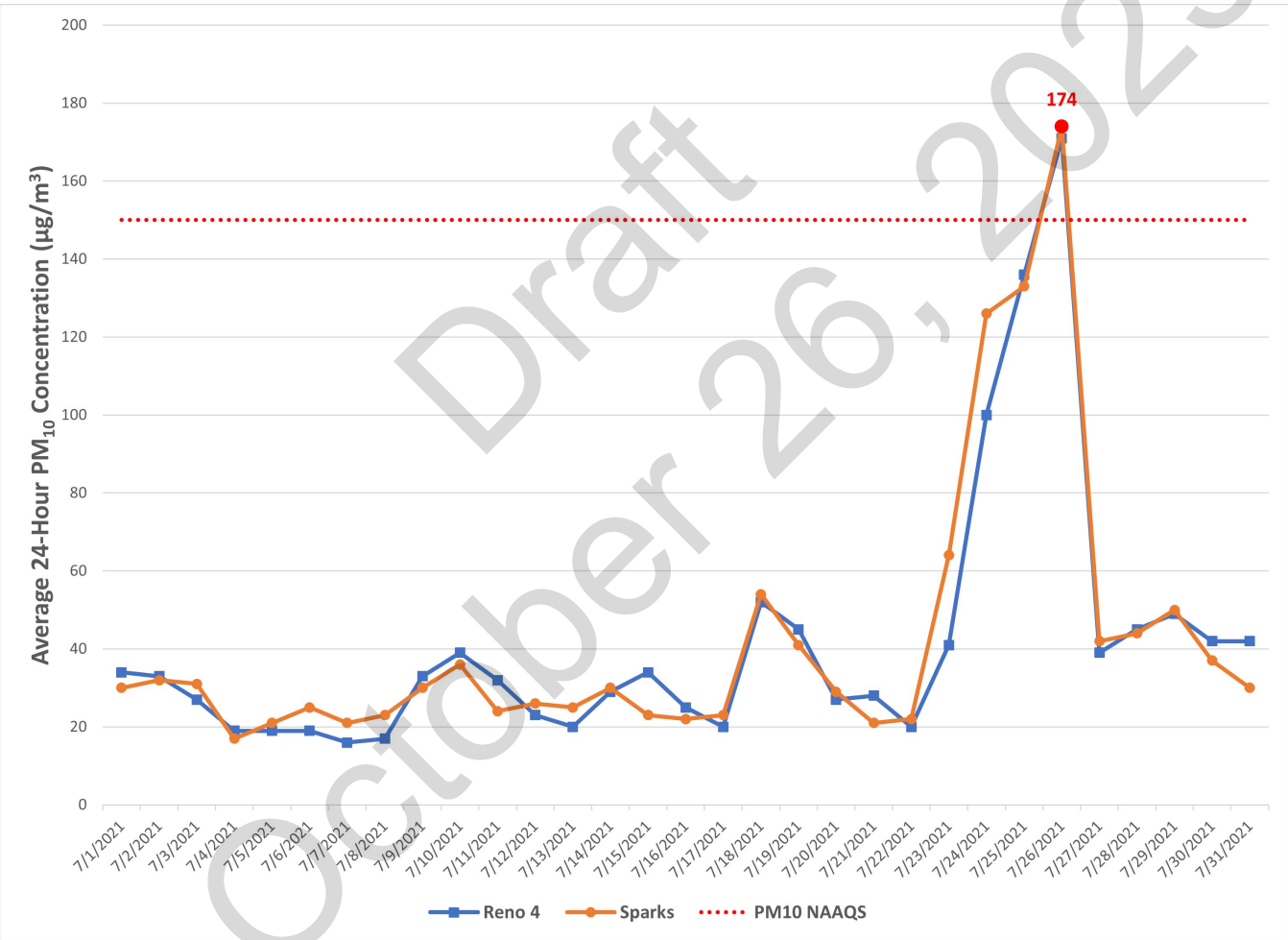
Table 2-3: PM_{10} Data Requested to be Excluded

Monitoring Site (AQS ID)	7/26/2021
Reno4 (AQS ID: 32-031-0031-81102-2)	171 µg/m³
Sparks (AQS ID: 32-031-1005-81102-4)	174 µg/m³

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/m³ on July 22, 2021. As smoke entered the region, the 24-hour average rose drastically to a peak of 171µg/m³ 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/m³ on July 22, 2021. The 24-hour average at Sparks also quickly increased to a peak of 174µg/m³ 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

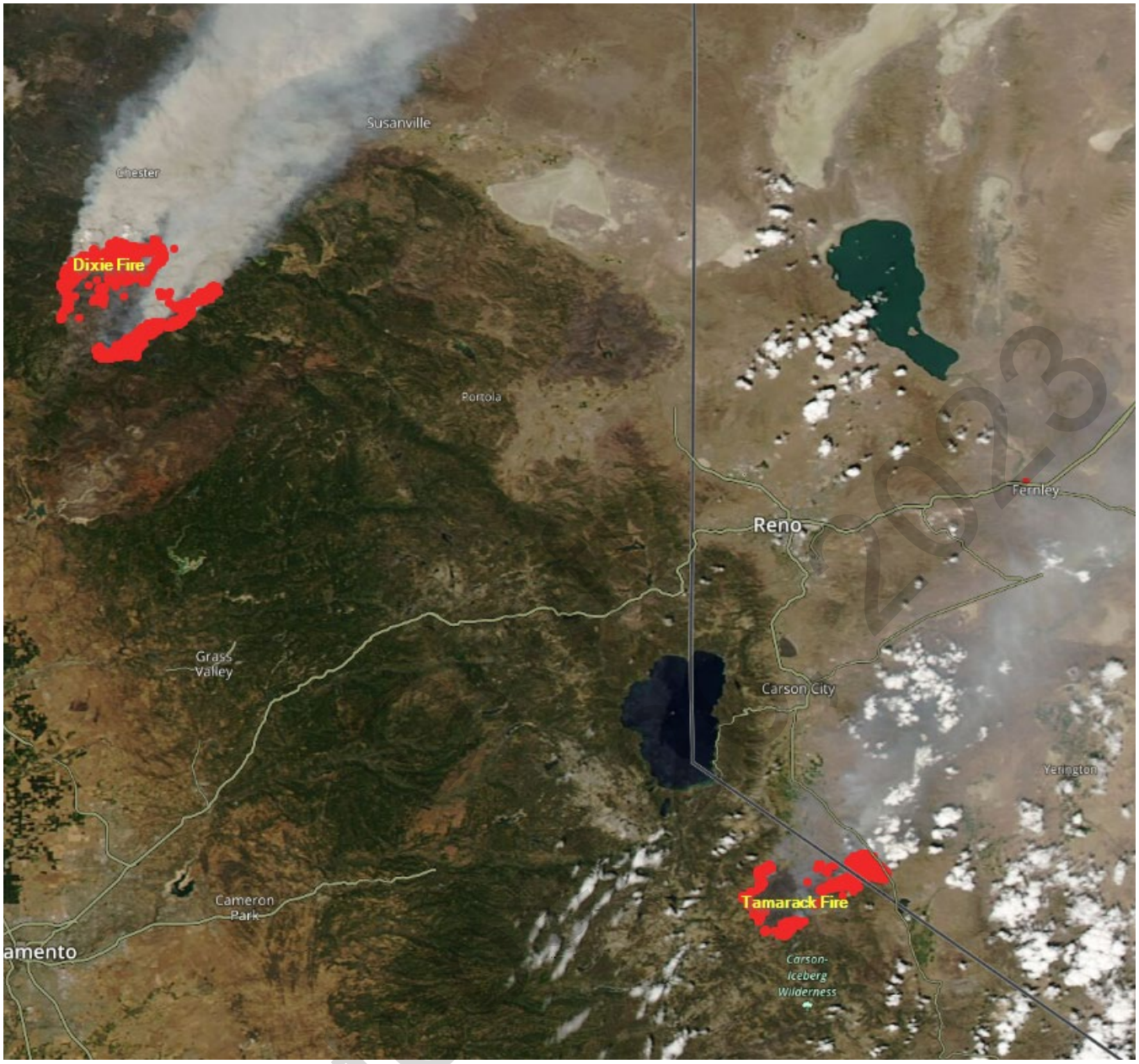


Figure 2-10: Satellite Imagery from July 26, 2021

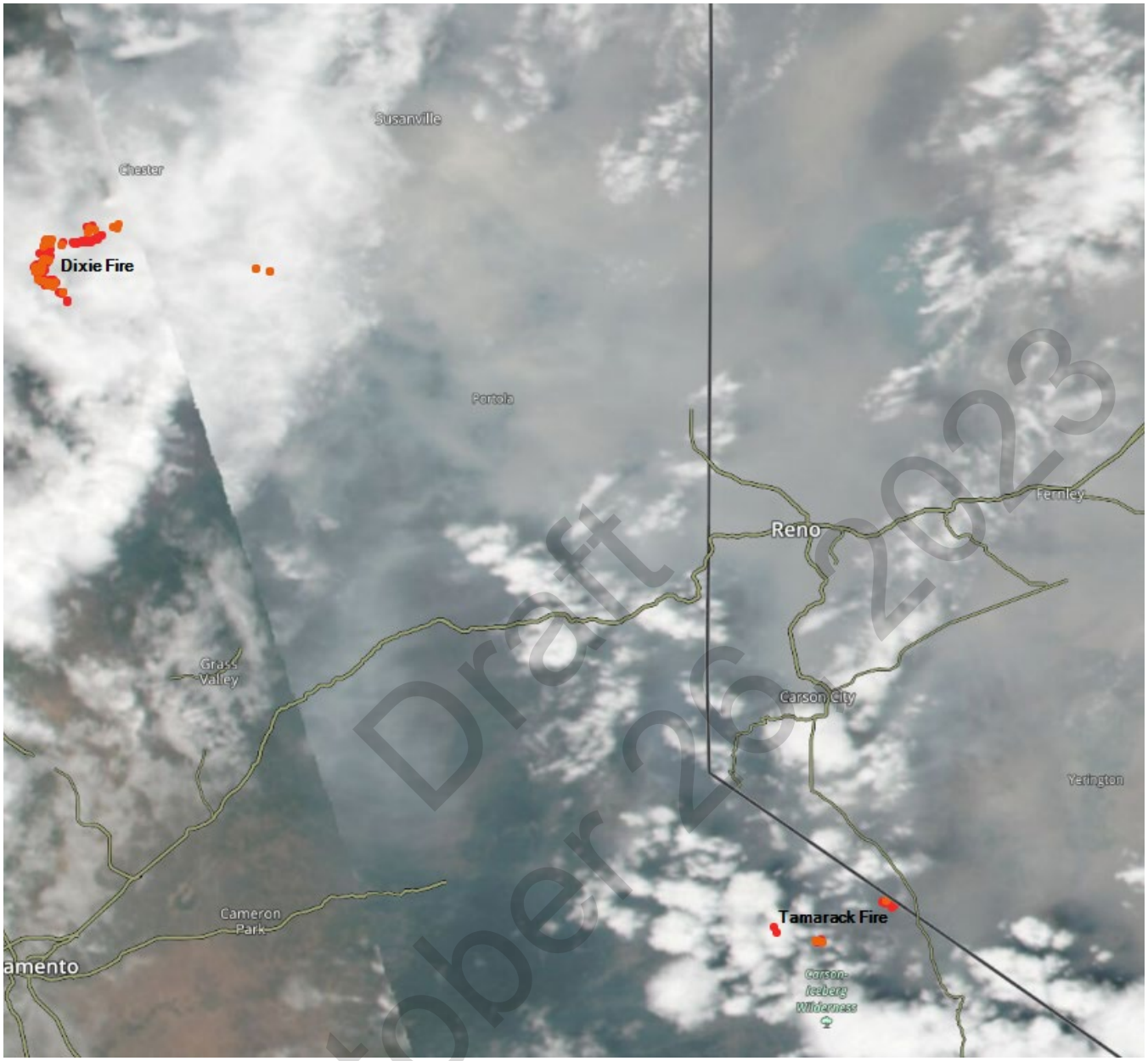


Figure 2-11: Satellite Imagery from July 28, 2021

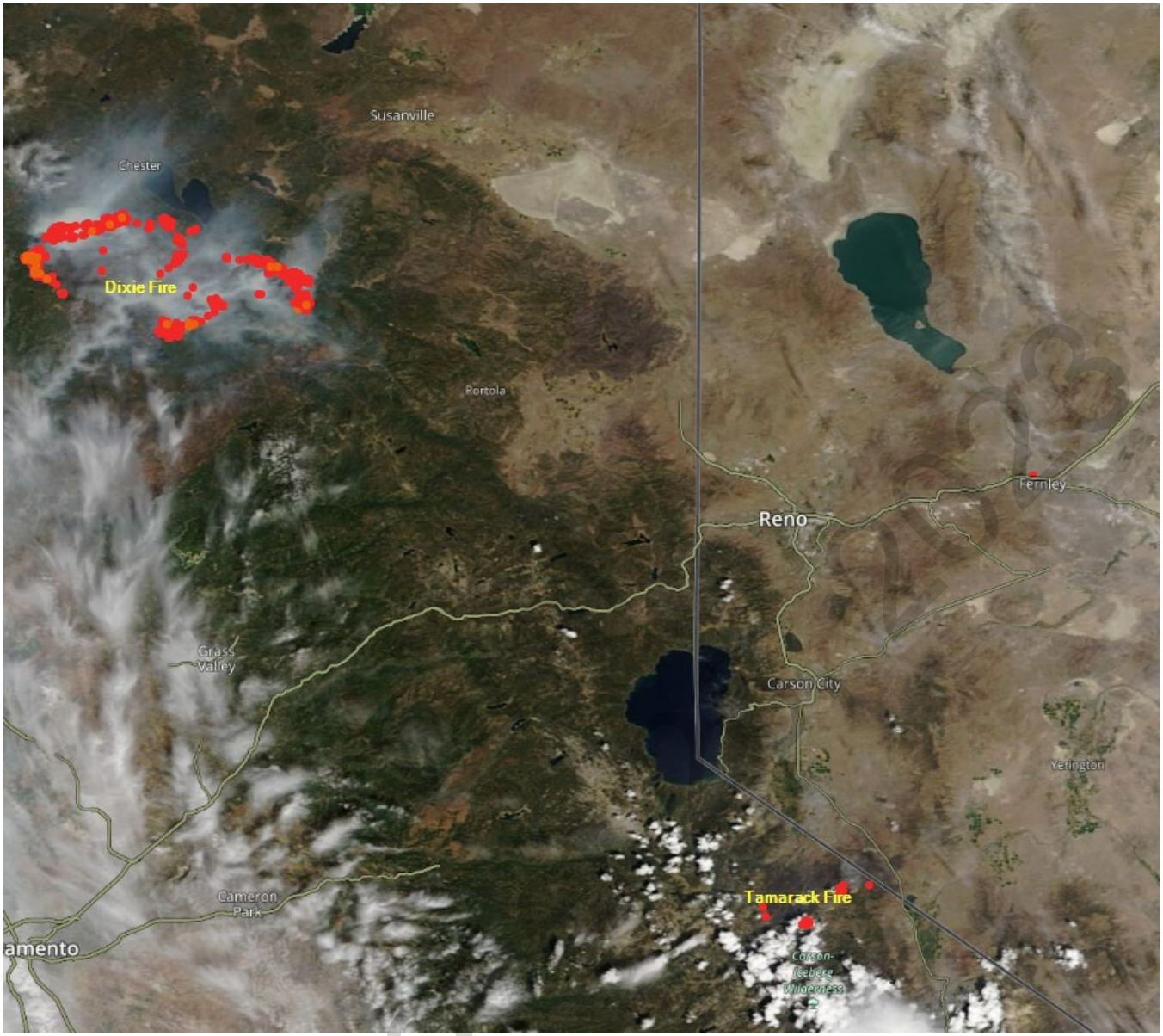


Figure 2-12: Daily Weather Maps for July 22, 2021

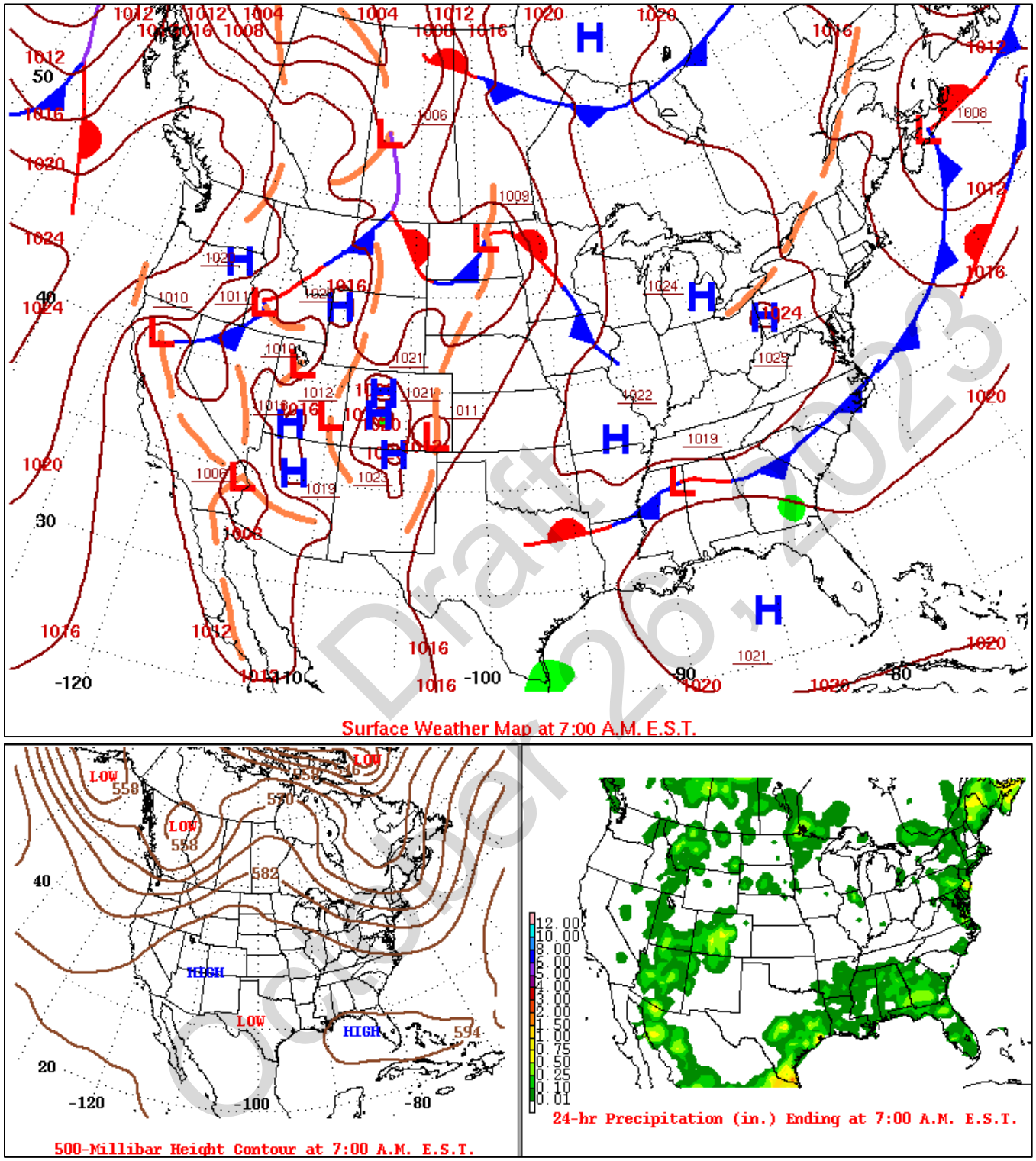


Figure 2-13: Daily Weather Maps for July 26, 2021

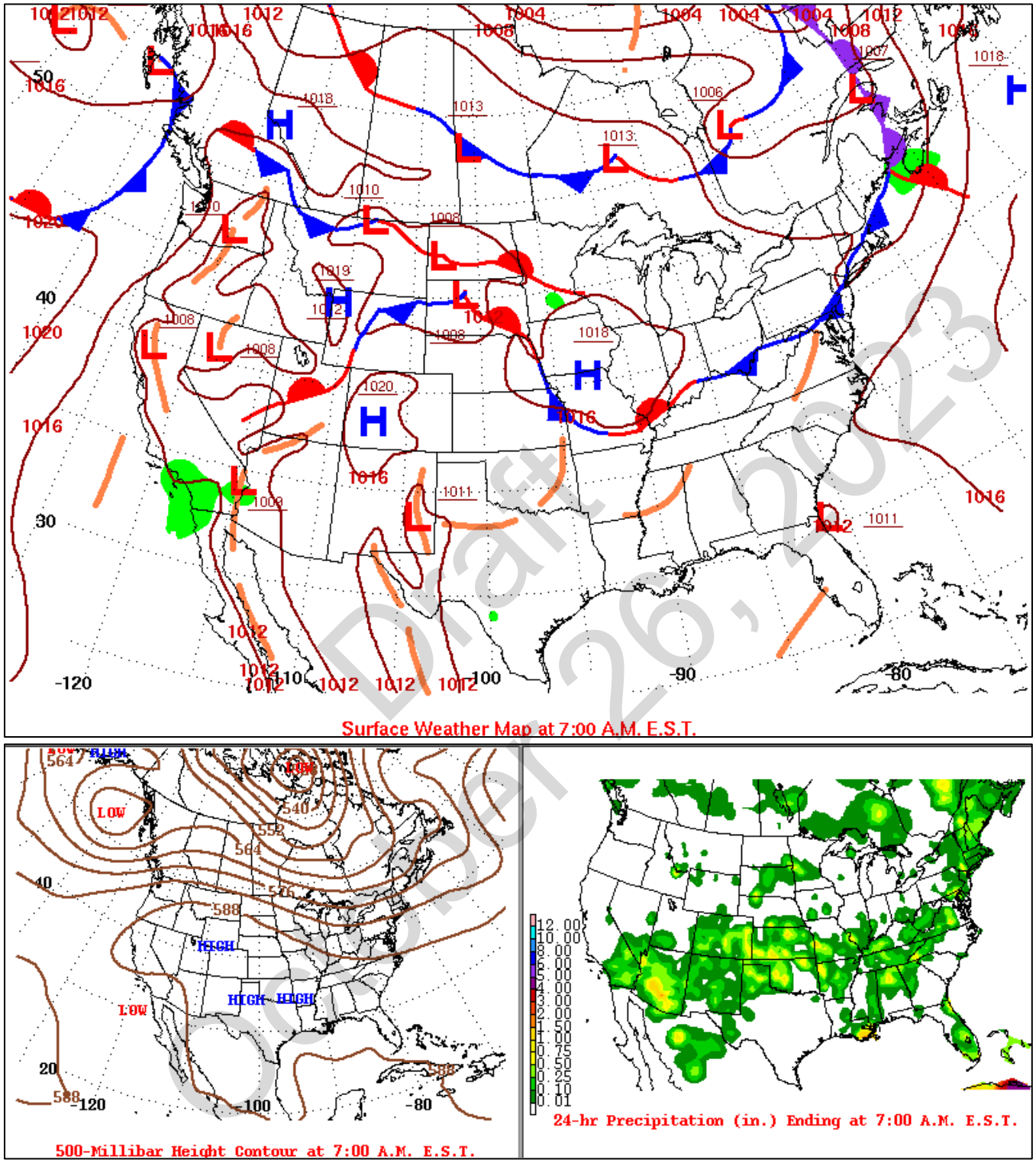
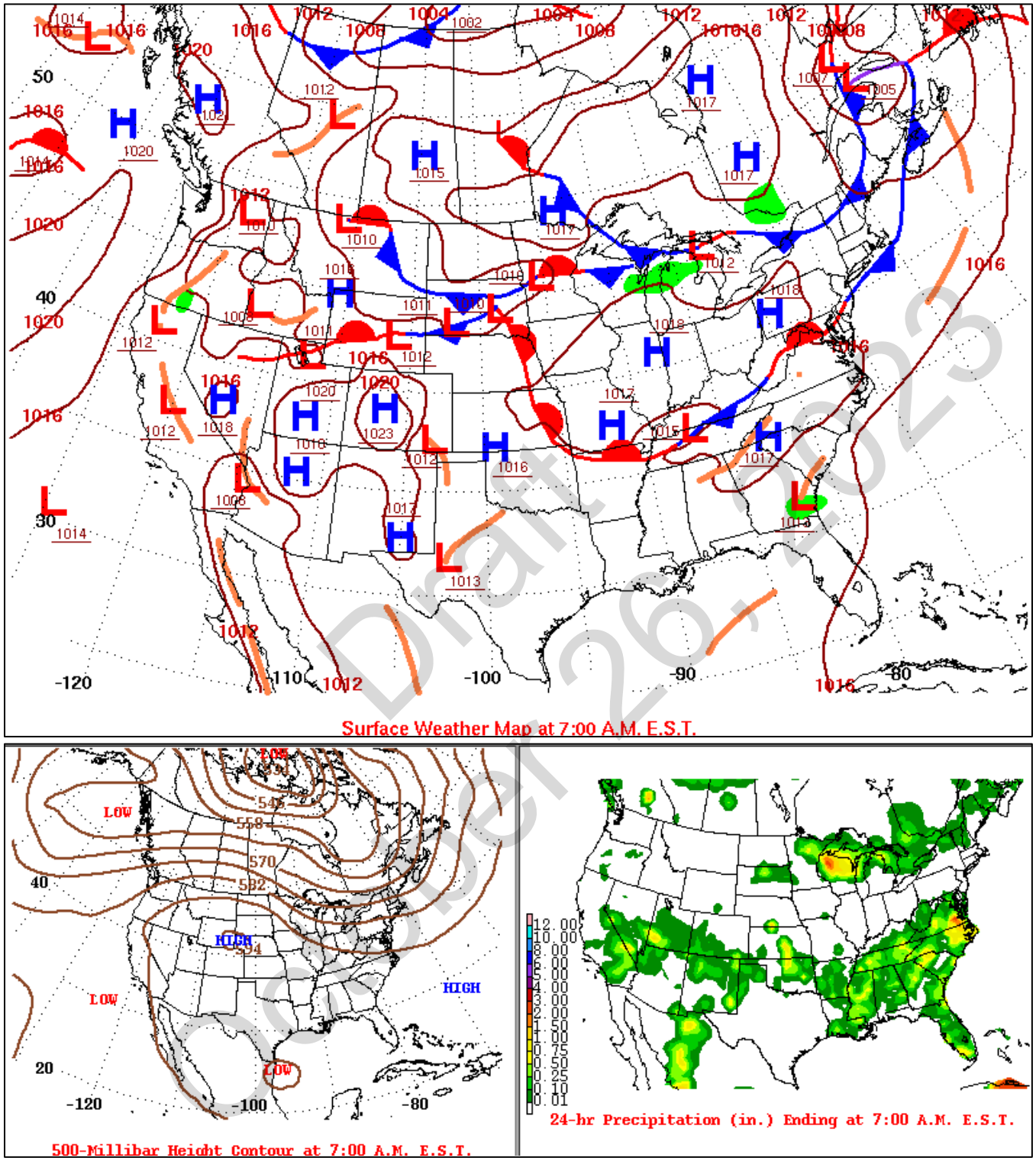


Figure 2-14: Daily Weather Maps for July 27, 2021



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

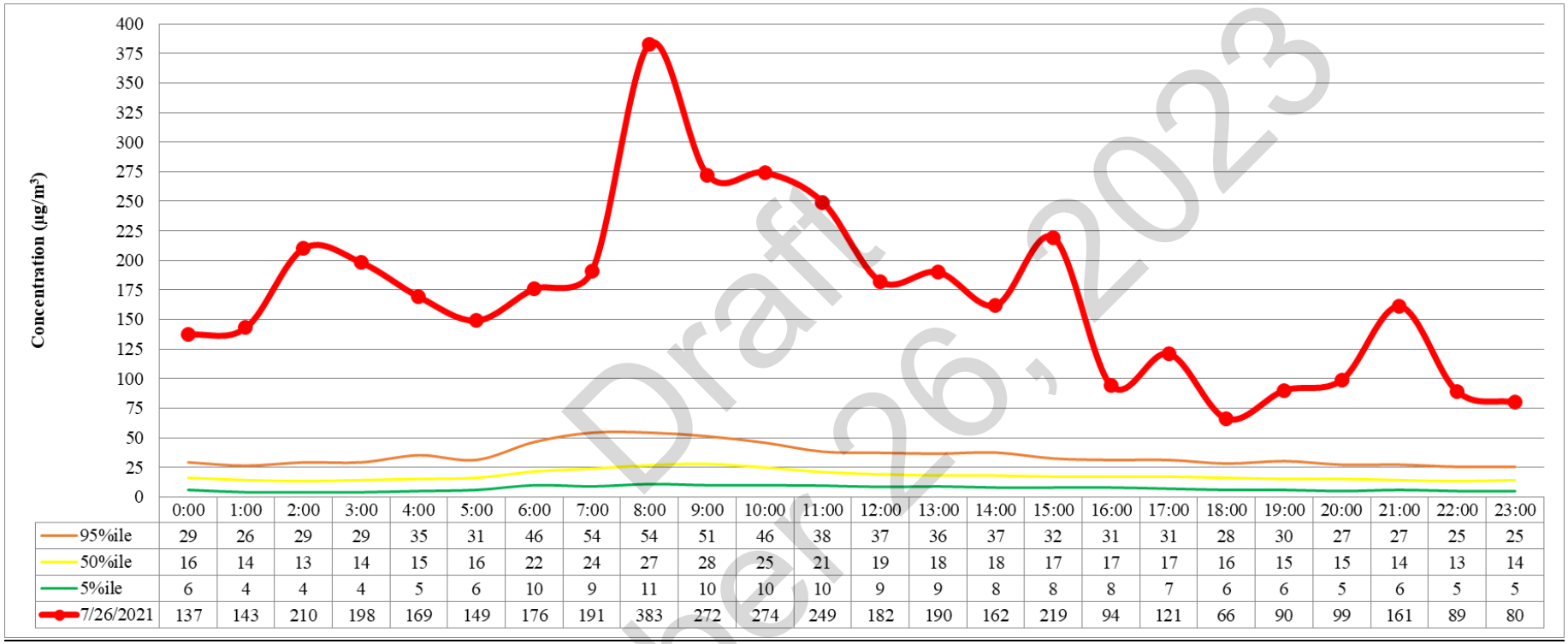
Date	Tamarack Fire Growth (Acres)	Dixie Fire Growth (Acres)	Tamarack Fire PM_{10} Emissions (Tons)	Dixie Fire PM_{10} Emissions (Tons)	Total PM_{10} Emissions (Tons)
July 22, 2021	8,288	63,520	10,434.82	32,121.22	42,556.04
July 23, 2021	6,735	13,859	8,479.55	7,008.31	15,487.86
July 24, 2021	1,592	9,336	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.

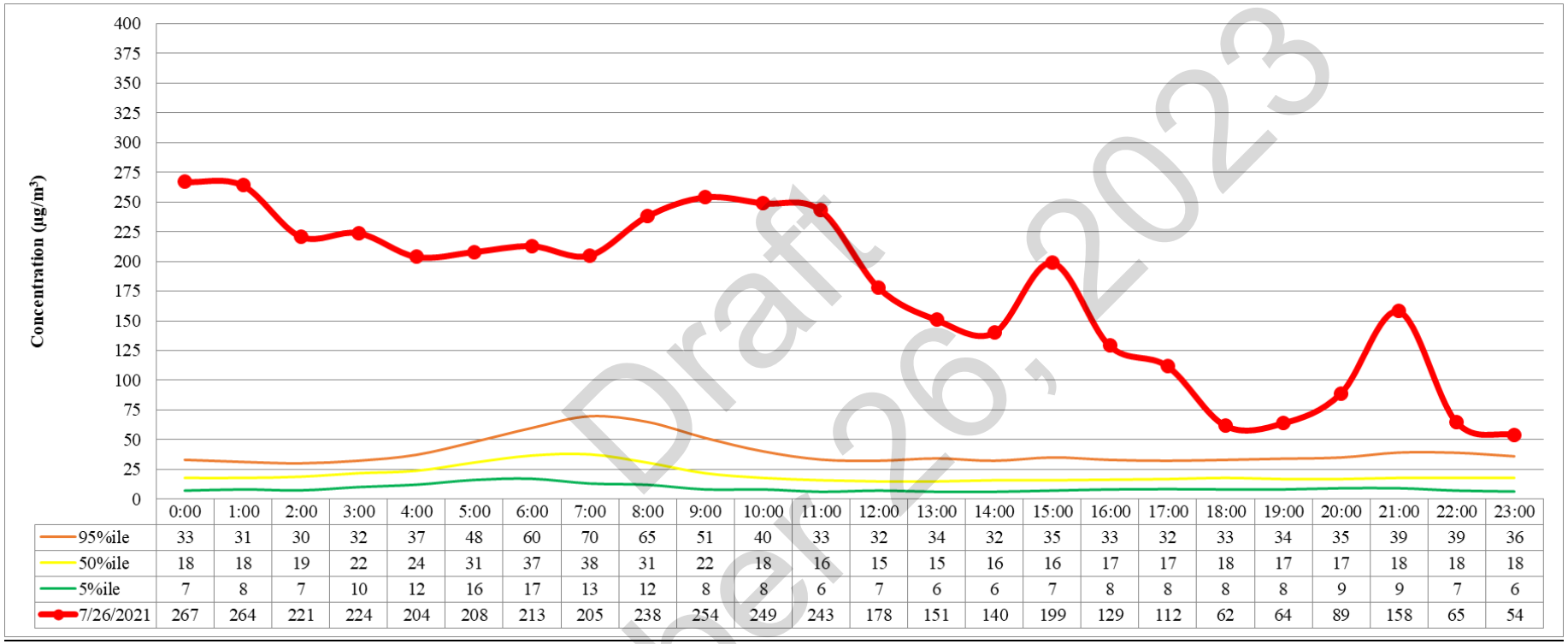
As can be seen in Figure 4-1 and Figure 4-2 below, the hourly PM_{10} concentrations at both Reno4 and Sparks on the day of the exceedance are much higher than what would be expected based on historical concentrations. All hourly concentrations were orders of magnitude higher than what would be expected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



	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
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

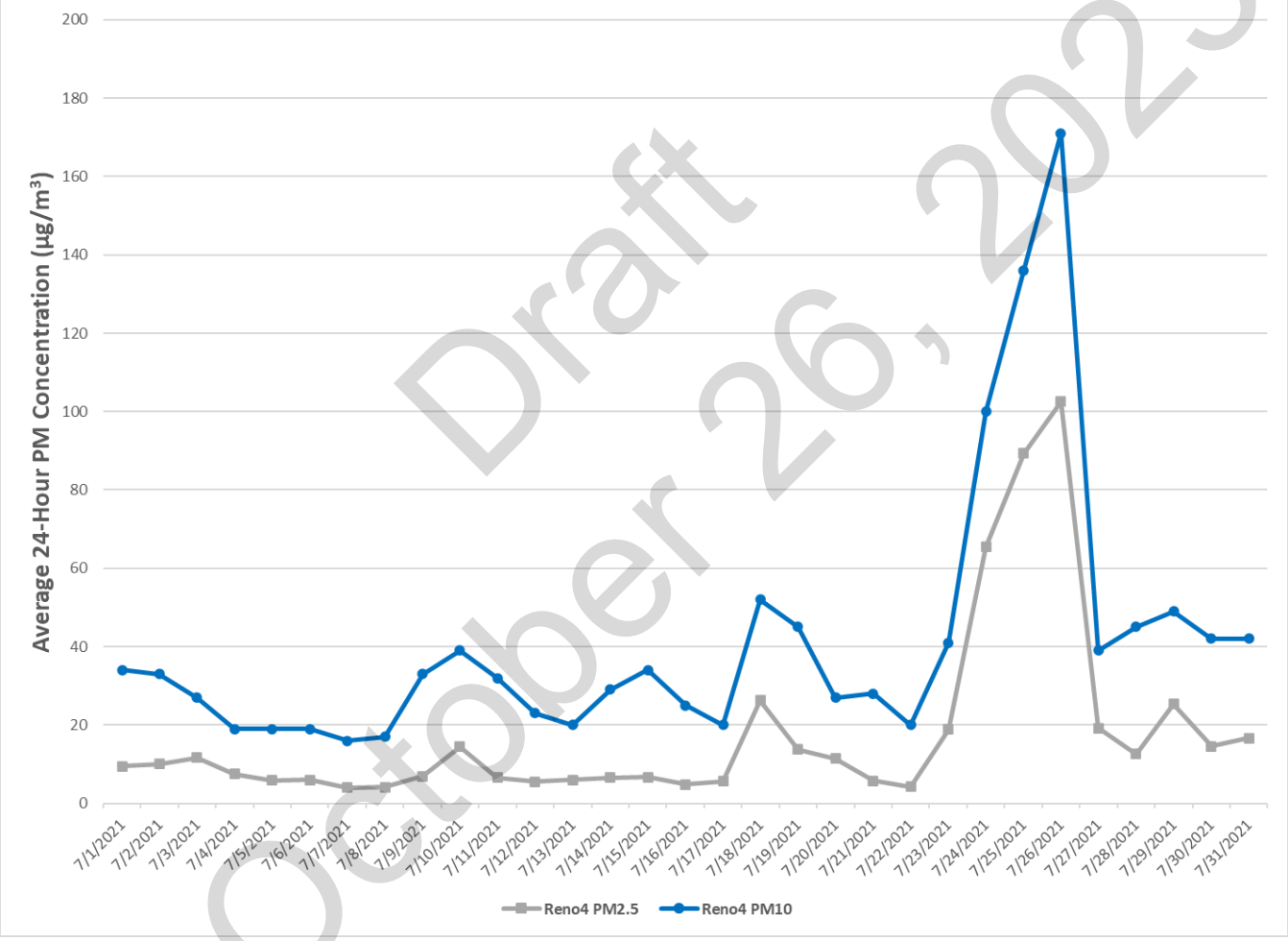
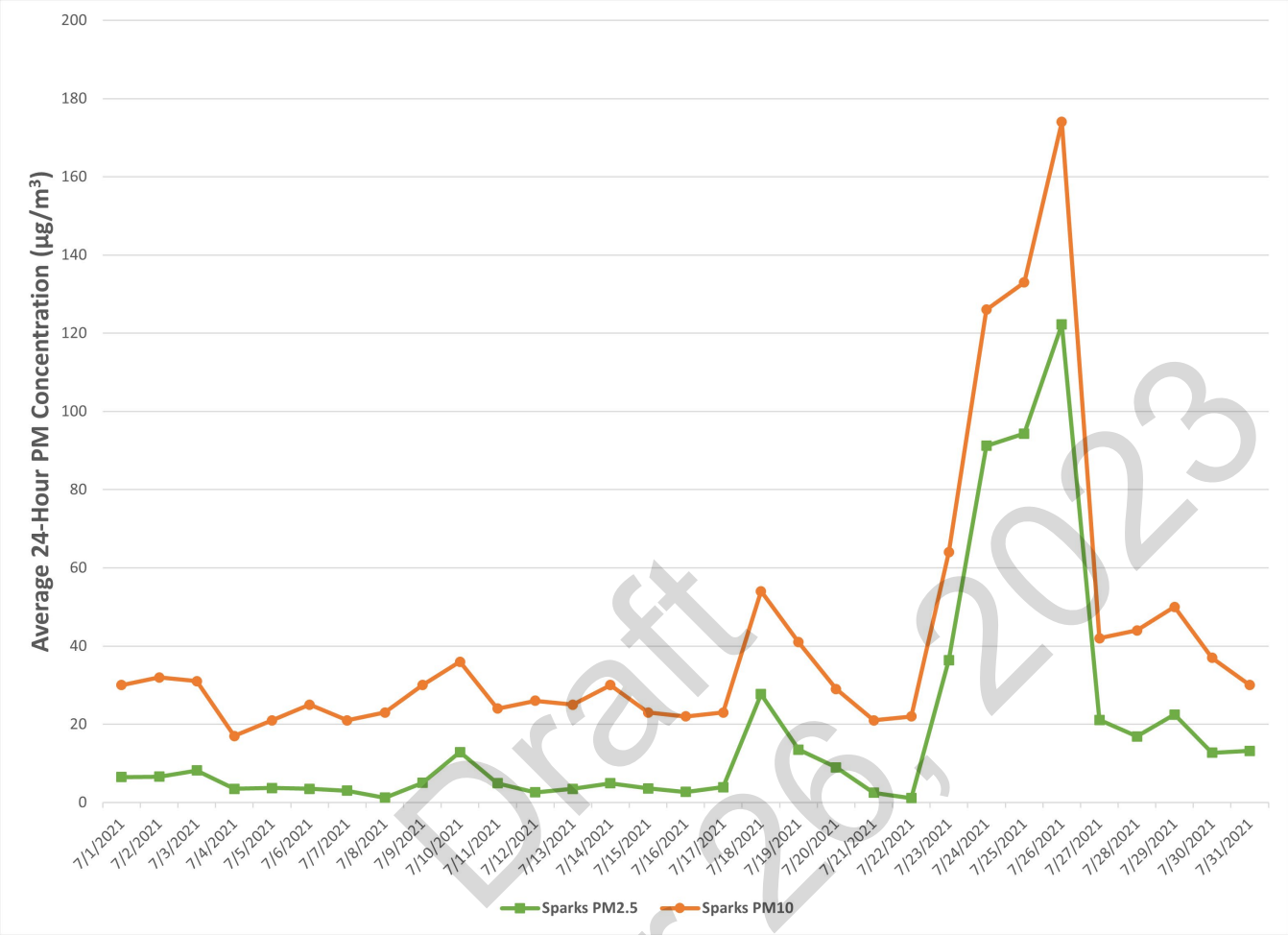


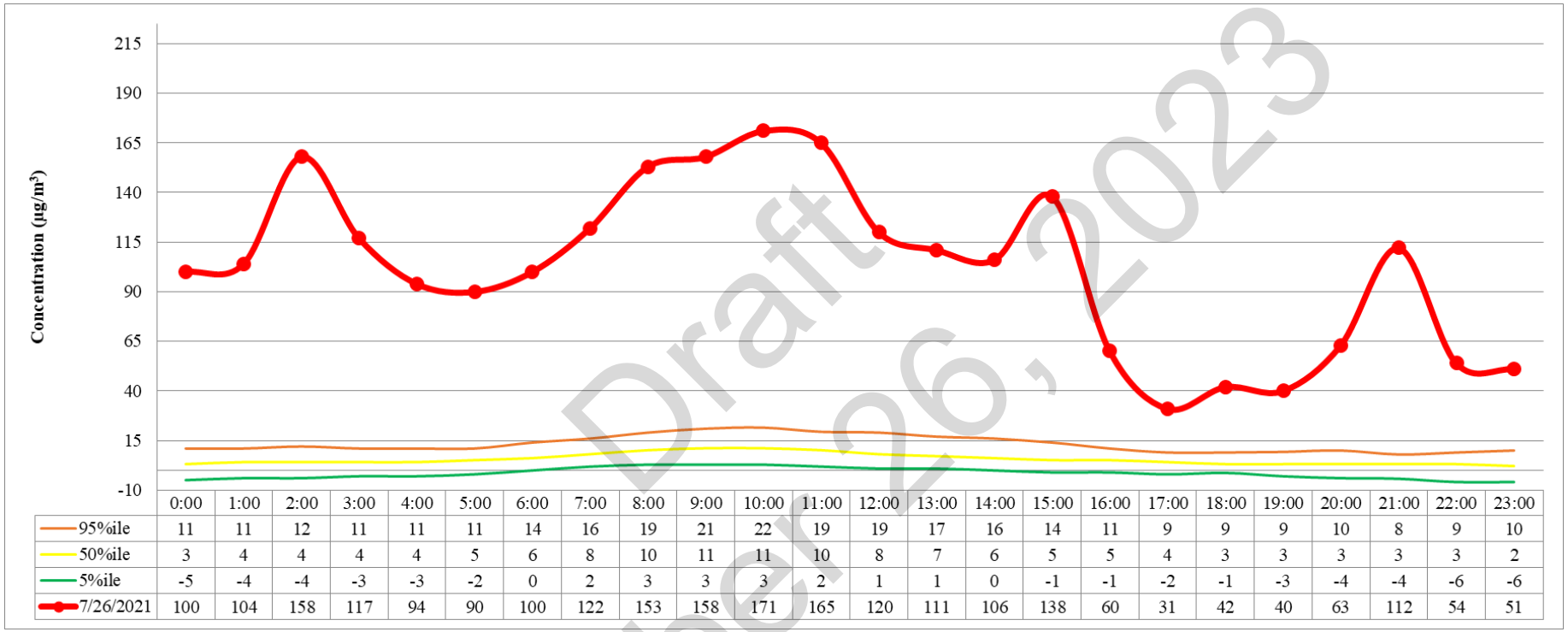
Figure 4-4: 24-hour $PM_{2.5}$ and PM_{10} Concentrations at Sparks in July 2021



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.

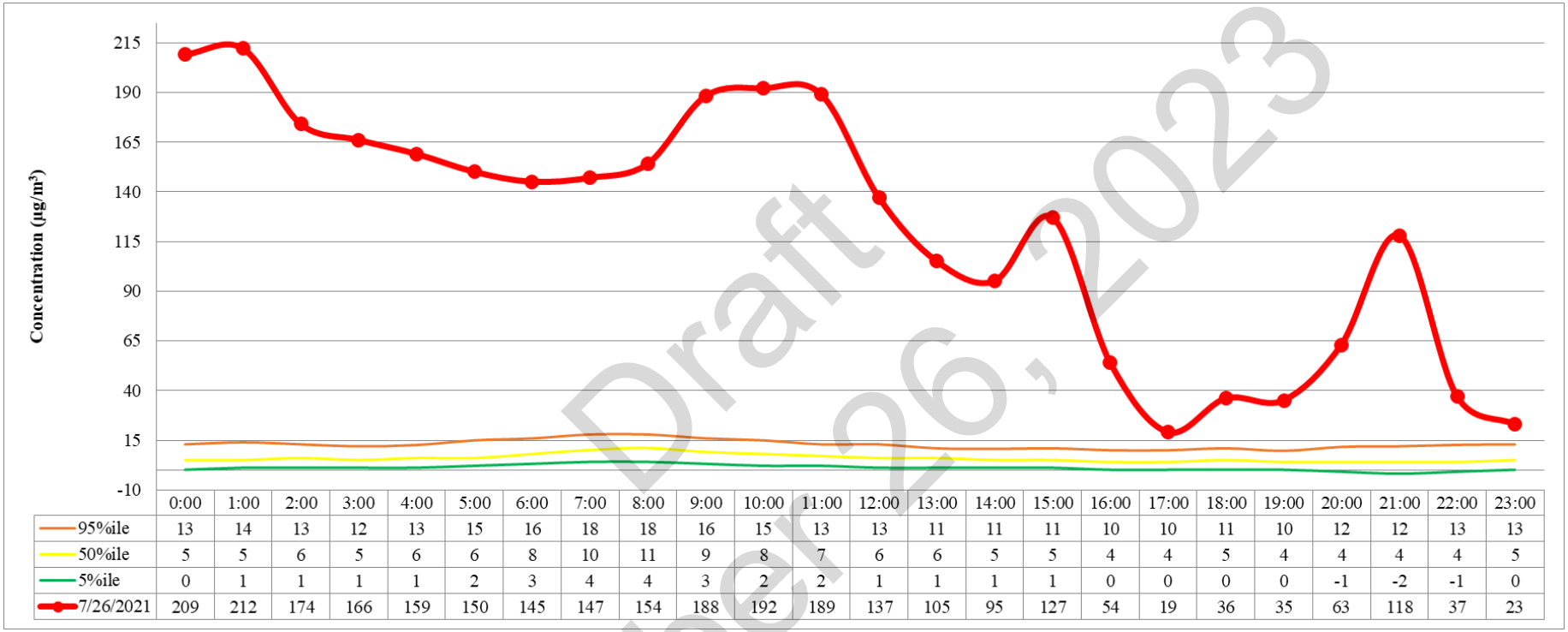
As can be seen in Figure 4-5 and 4-6 below, every hour of the exceedance was multiple times higher than what would be expected (50th percentile) and still much higher than the 95th percentile of the data set.

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

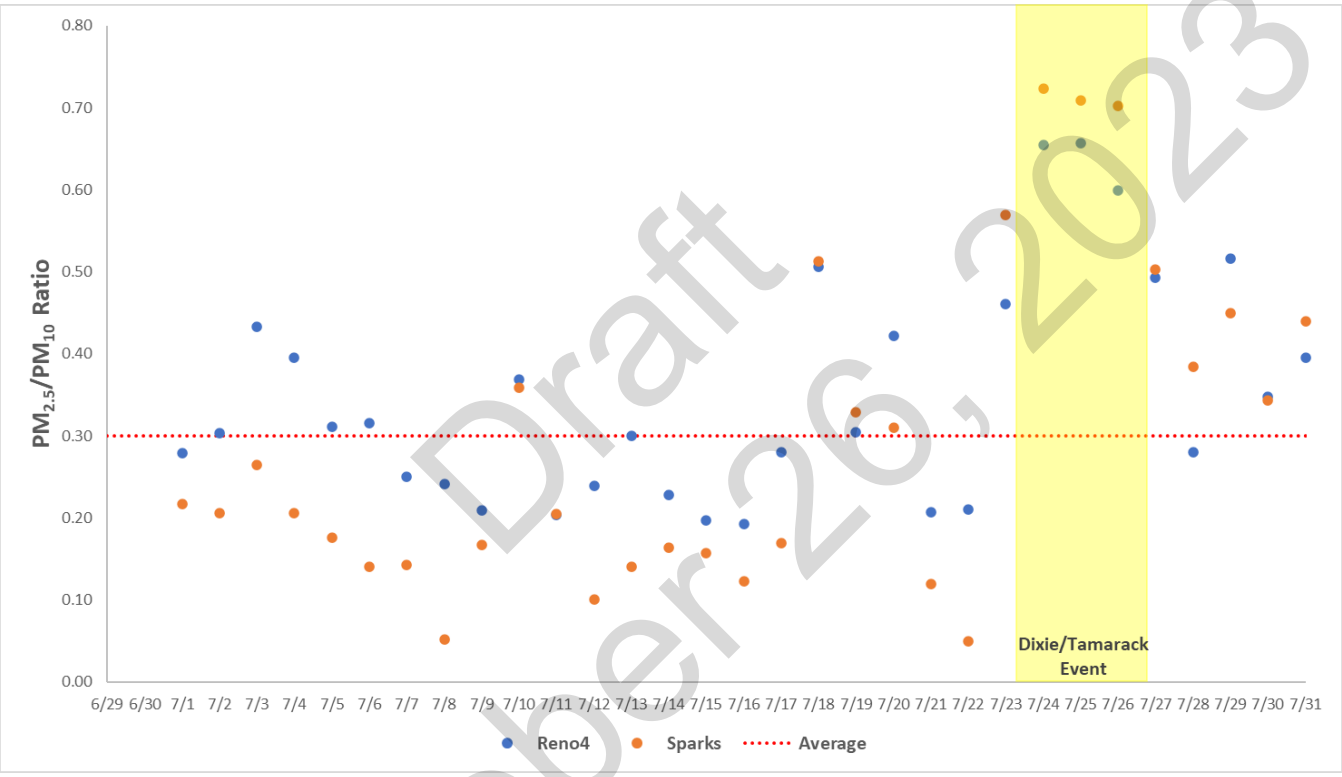
Reno4			
	24-hour Average (µg/m³)		
Date	$PM_{2.5}$	PM_{10}	$PM_{2.5}/PM_{10}$
7/22/2021	4.2	20	0.21
7/23/2021	18.9	41	0.46
7/24/2021	65.5	100	0.66
7/25/2021	89.3	136	0.66
7/26/2021	102.5	171	0.60
7/27/2021	19.2	39	0.49
7/28/2021	12.6	45	0.28

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

Sparks			
	24-hour Average (µg/m³)		
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.[1] 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.

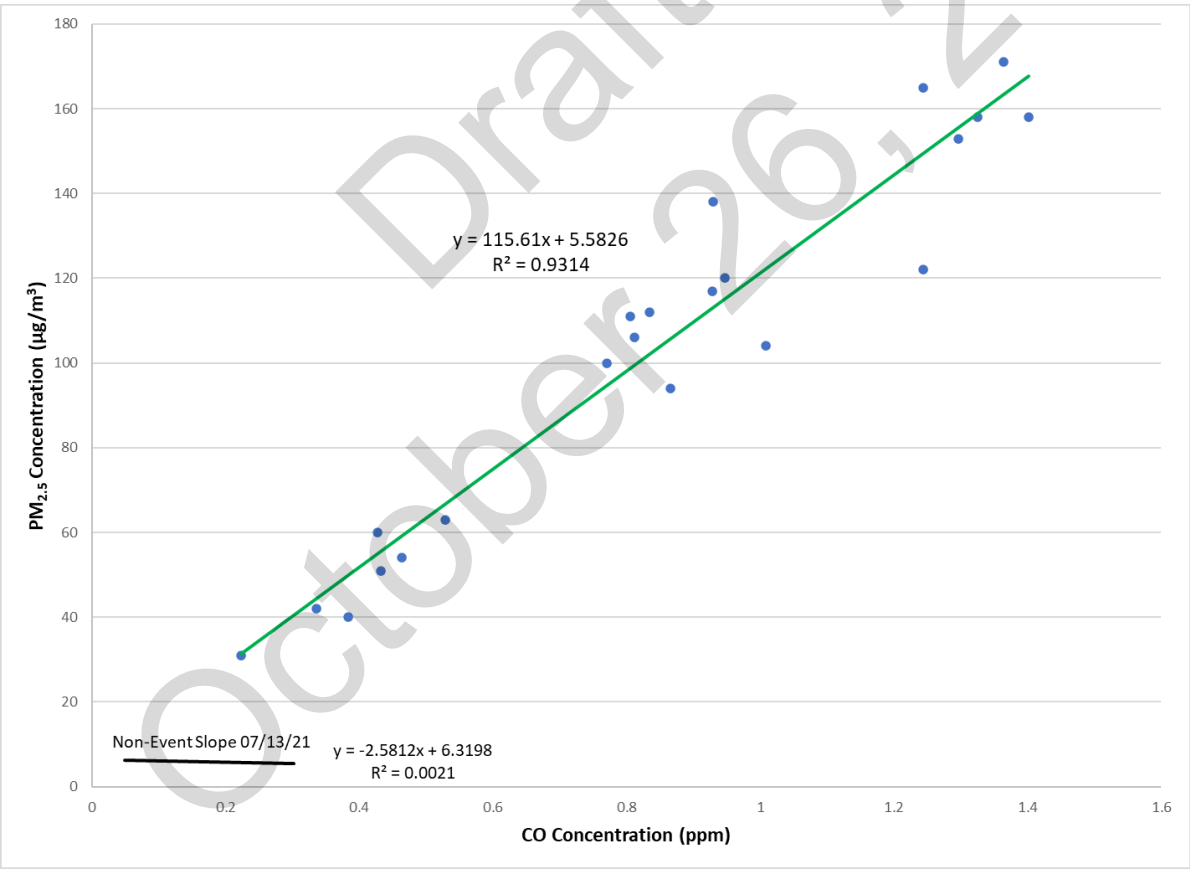
Non-Event Slopes (July 13, 2021)

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

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

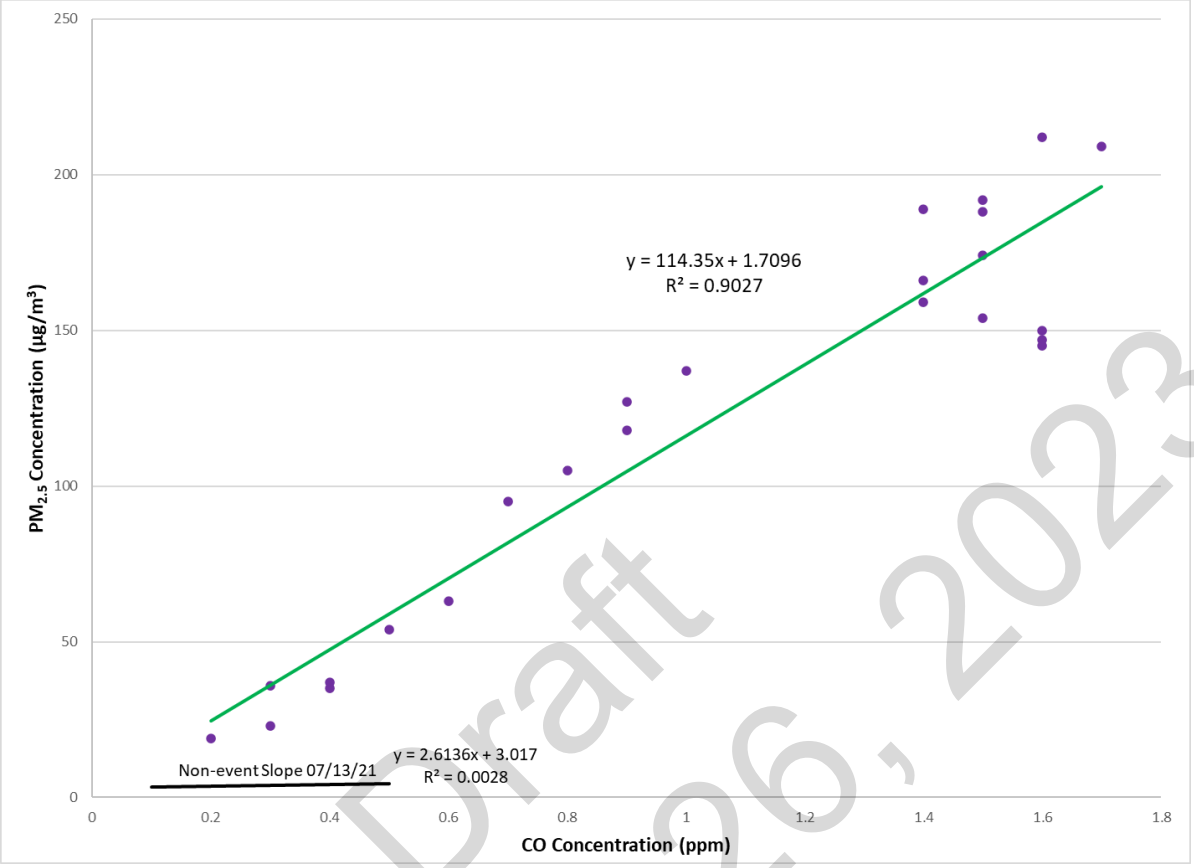
As can be seen in Figure 4-8 and Figure 4-9, a strong correlation was found on the day of the exceedance between $PM_{2.5}$ and CO concentrations at both Reno4 and Sparks. The coefficient of determination for Reno4 and Sparks is 0.9314 and 0.9027, respectively. This signals a presence of wildfire smoke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

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



[1] 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.

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



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

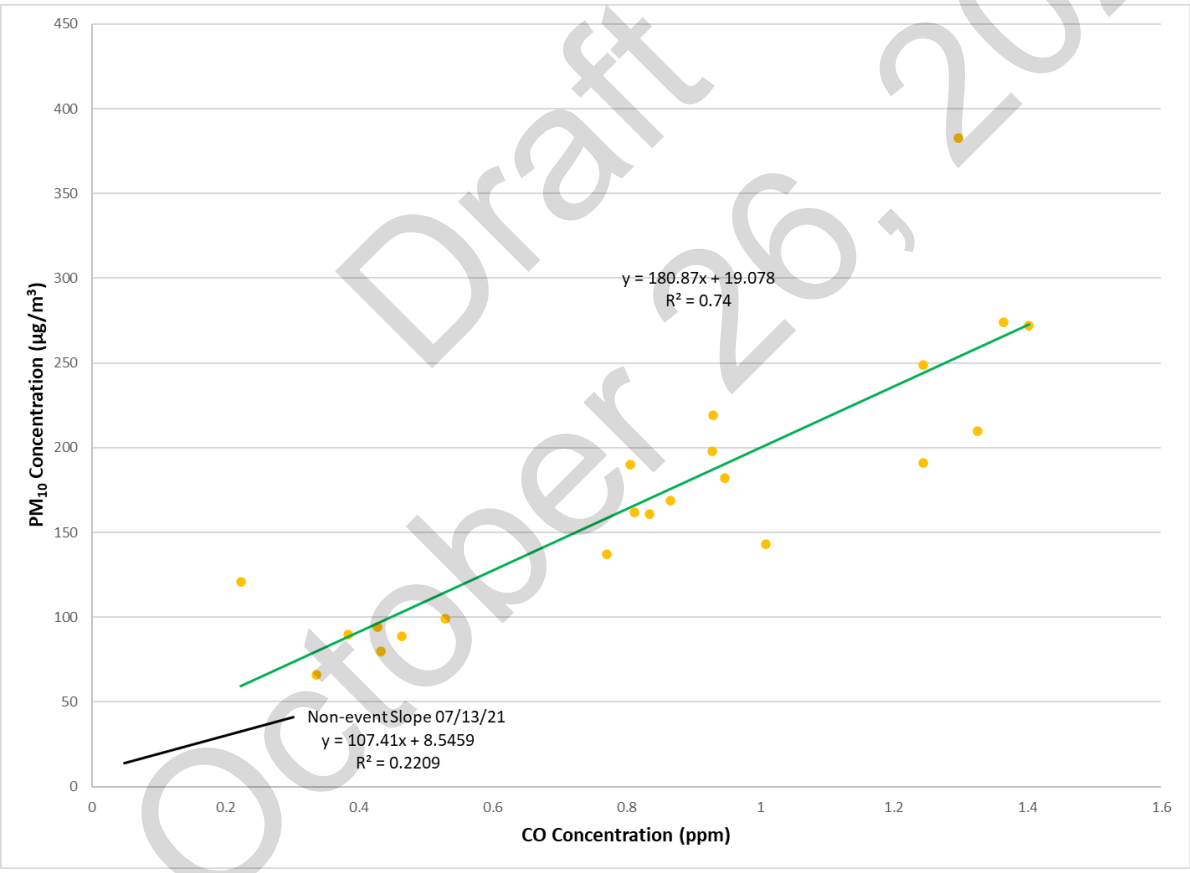
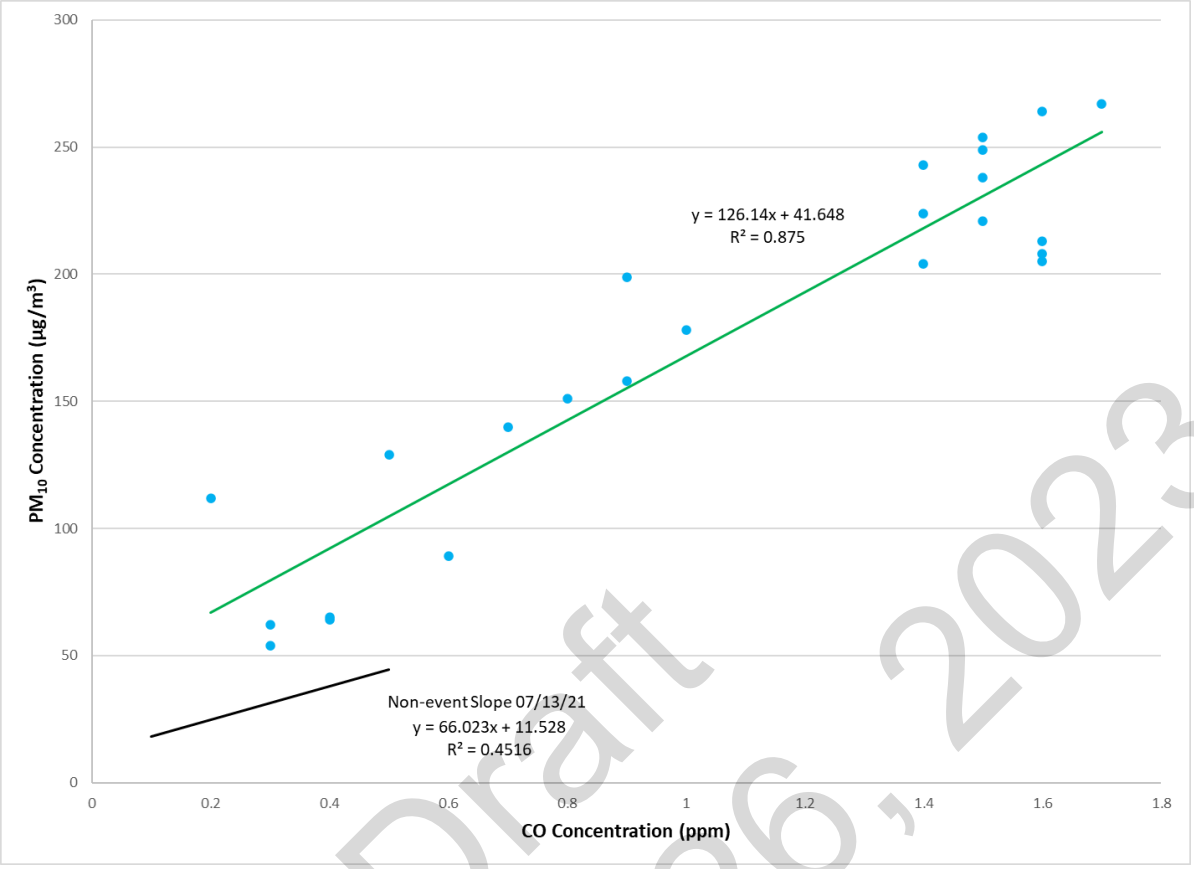


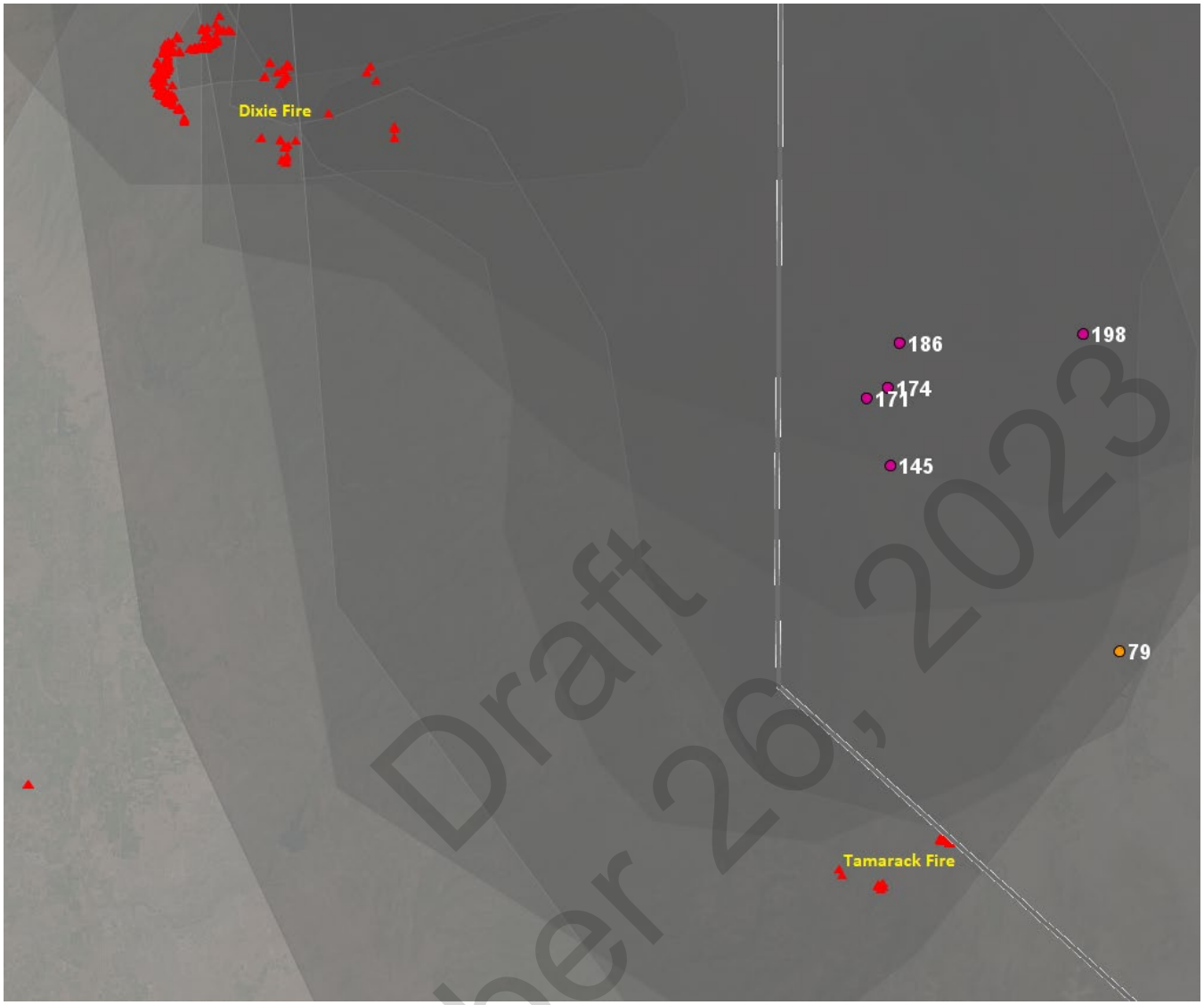
Figure 4-11: Hourly PM_{10}/CO at Sparks on July 26, 2021



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

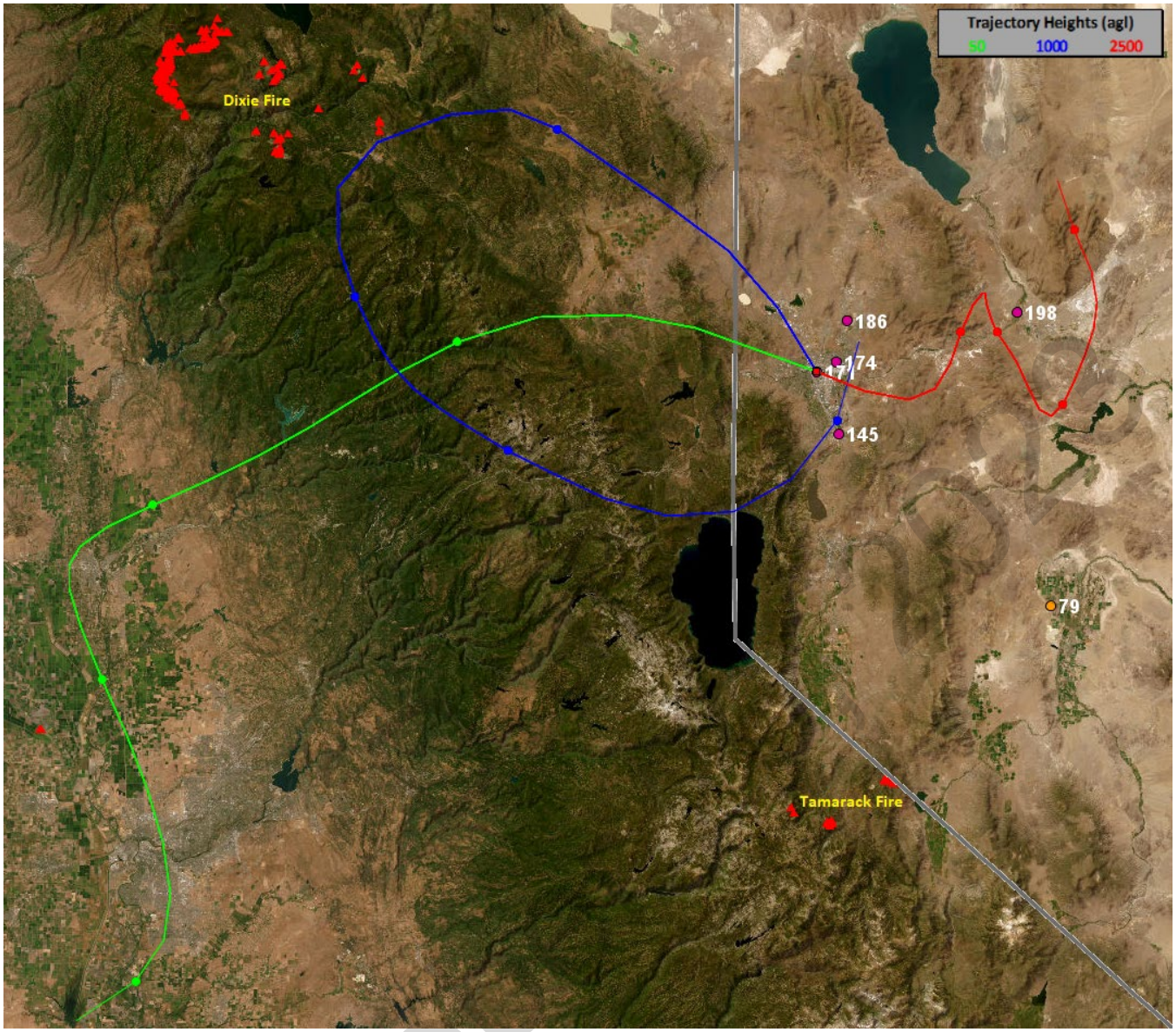


Figure 4-14: Backward Trajectory from Sparks starting July 26, 2021 at 0000 PST

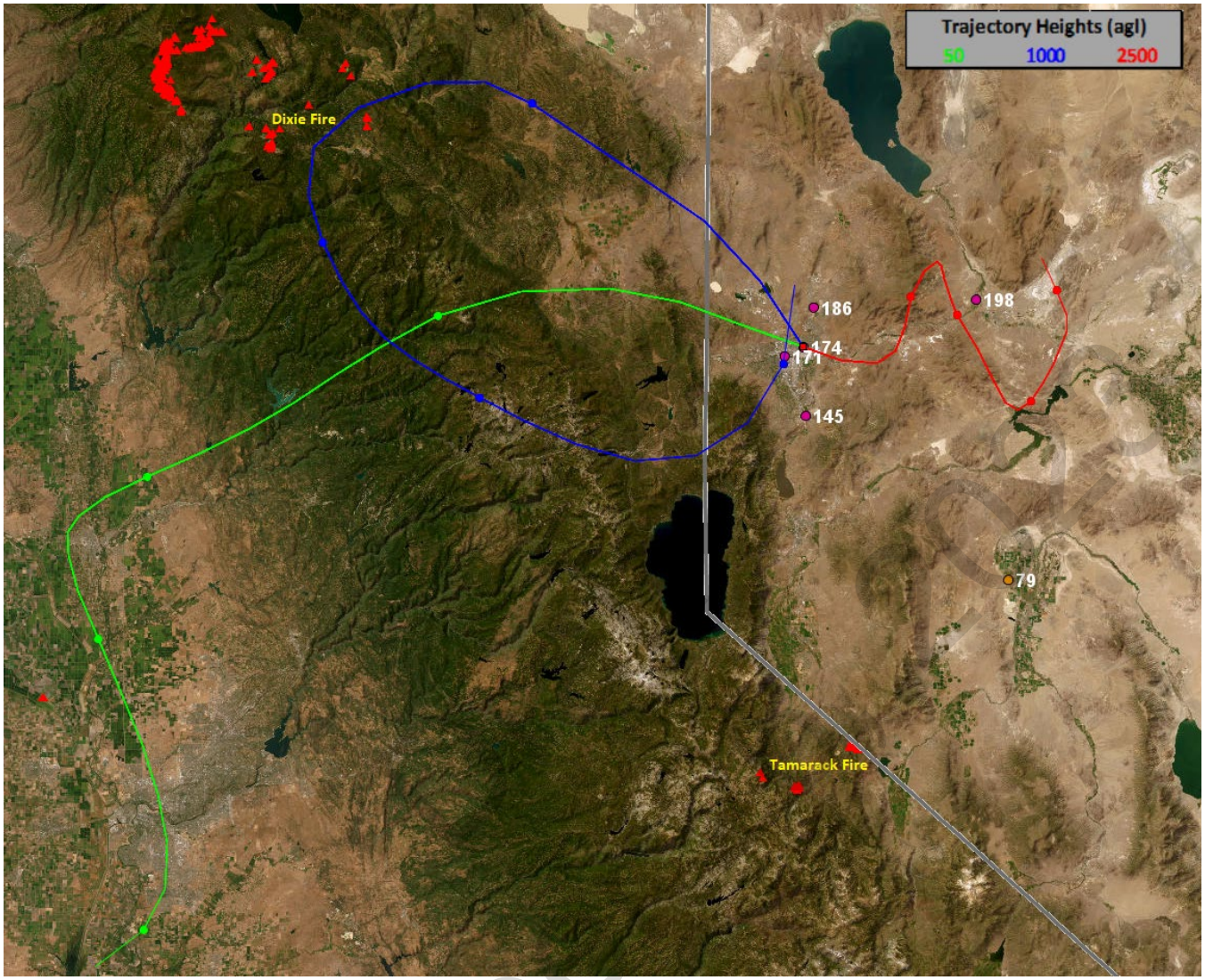


Figure 4-15: Backward Trajectory from Reno4 starting July 27, 2021 at 0000 PST

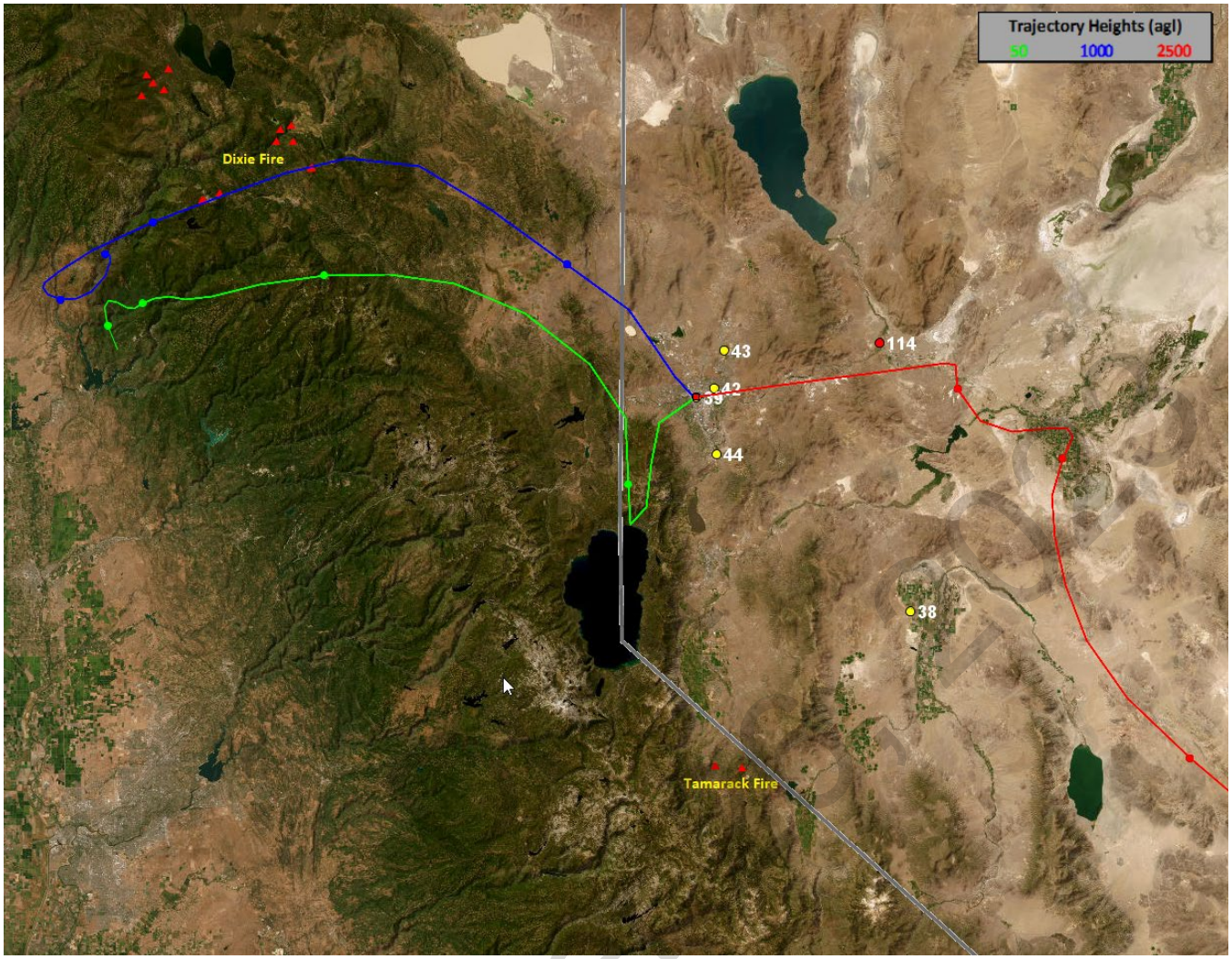
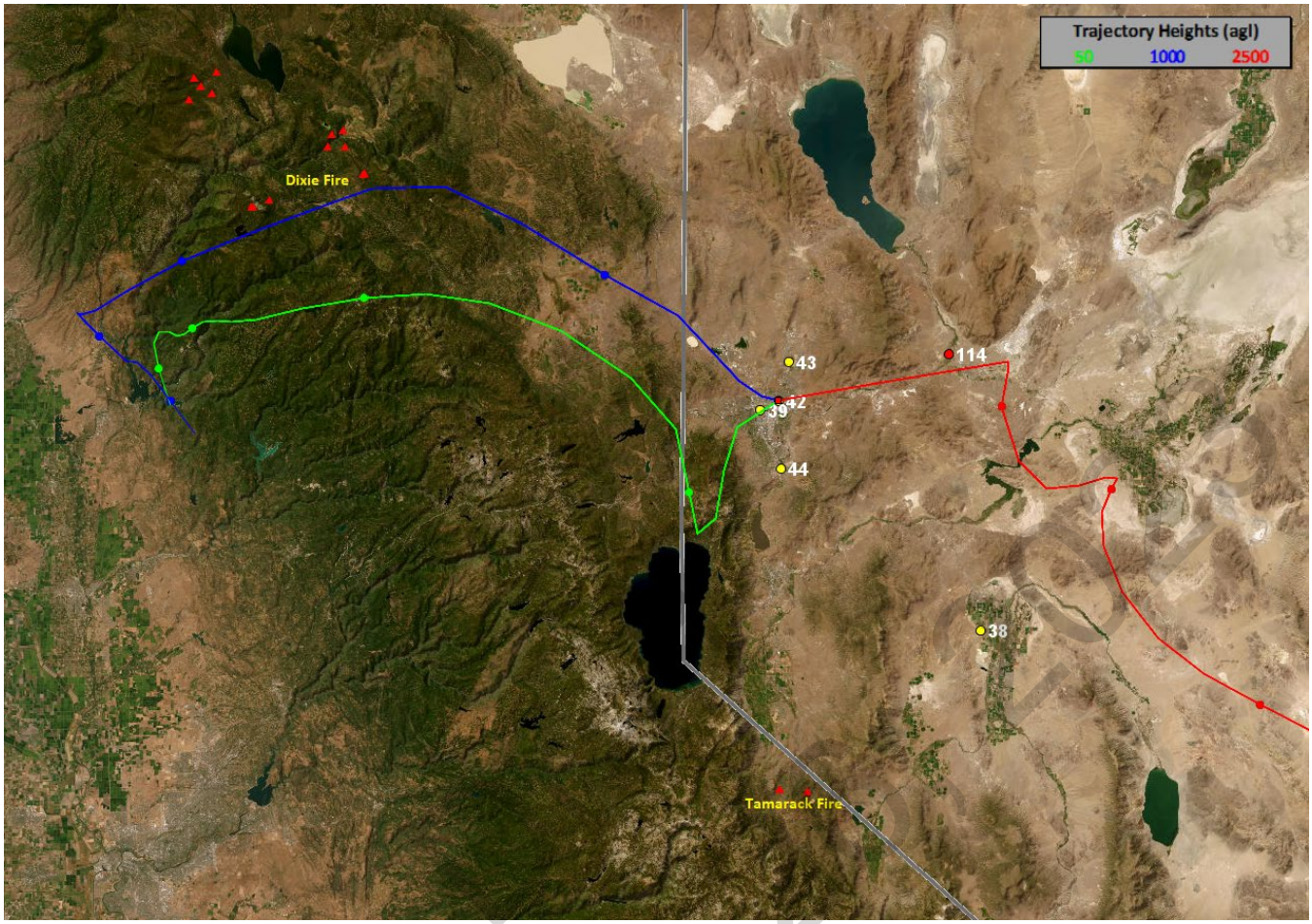


Figure 4-16: Backward Trajectory from Sparks starting July 27, 2021 at 0000 PST



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

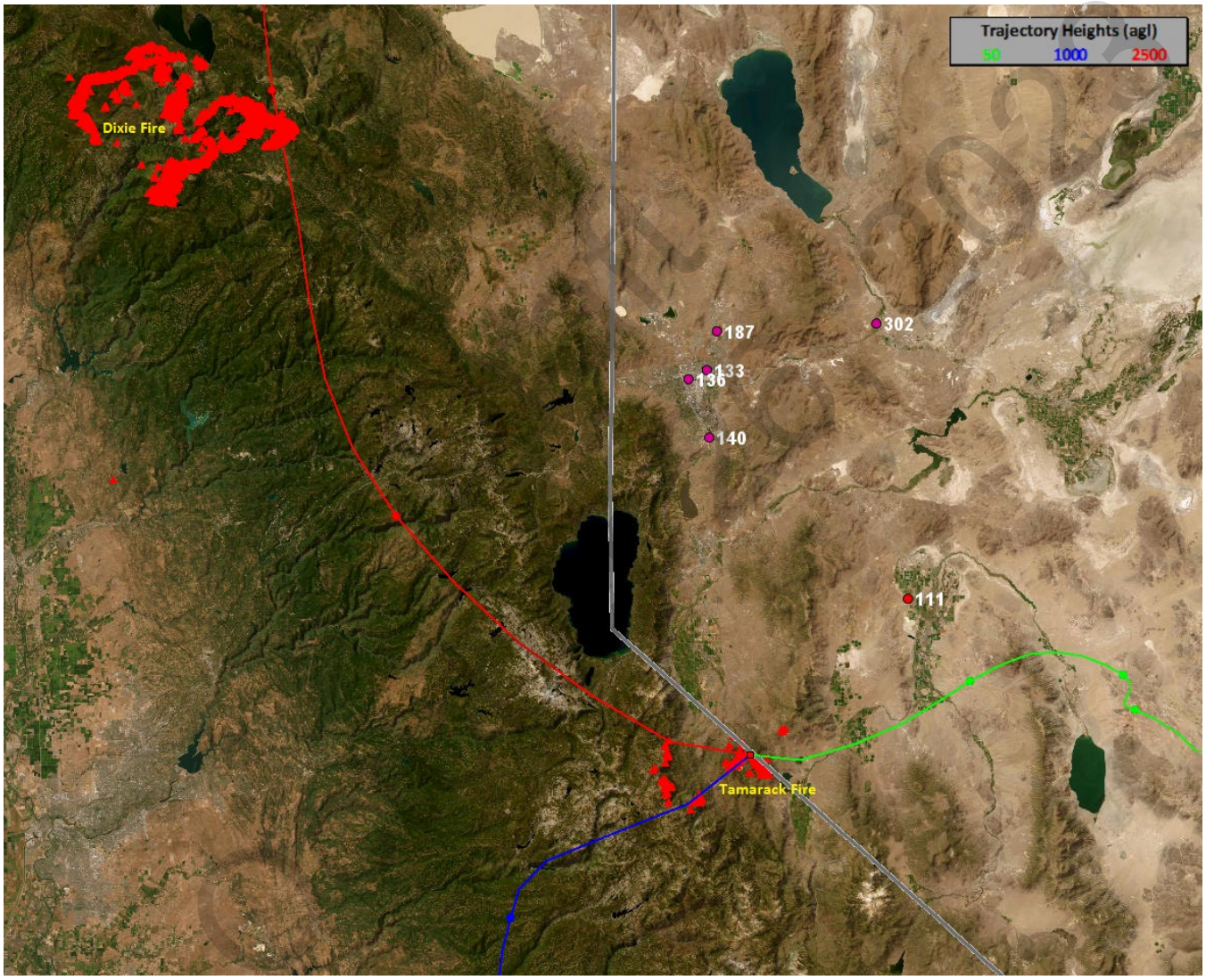


Figure 4-18: Forward Trajectory from Dixie Fire starting July 25, 2021 at 0000 PST

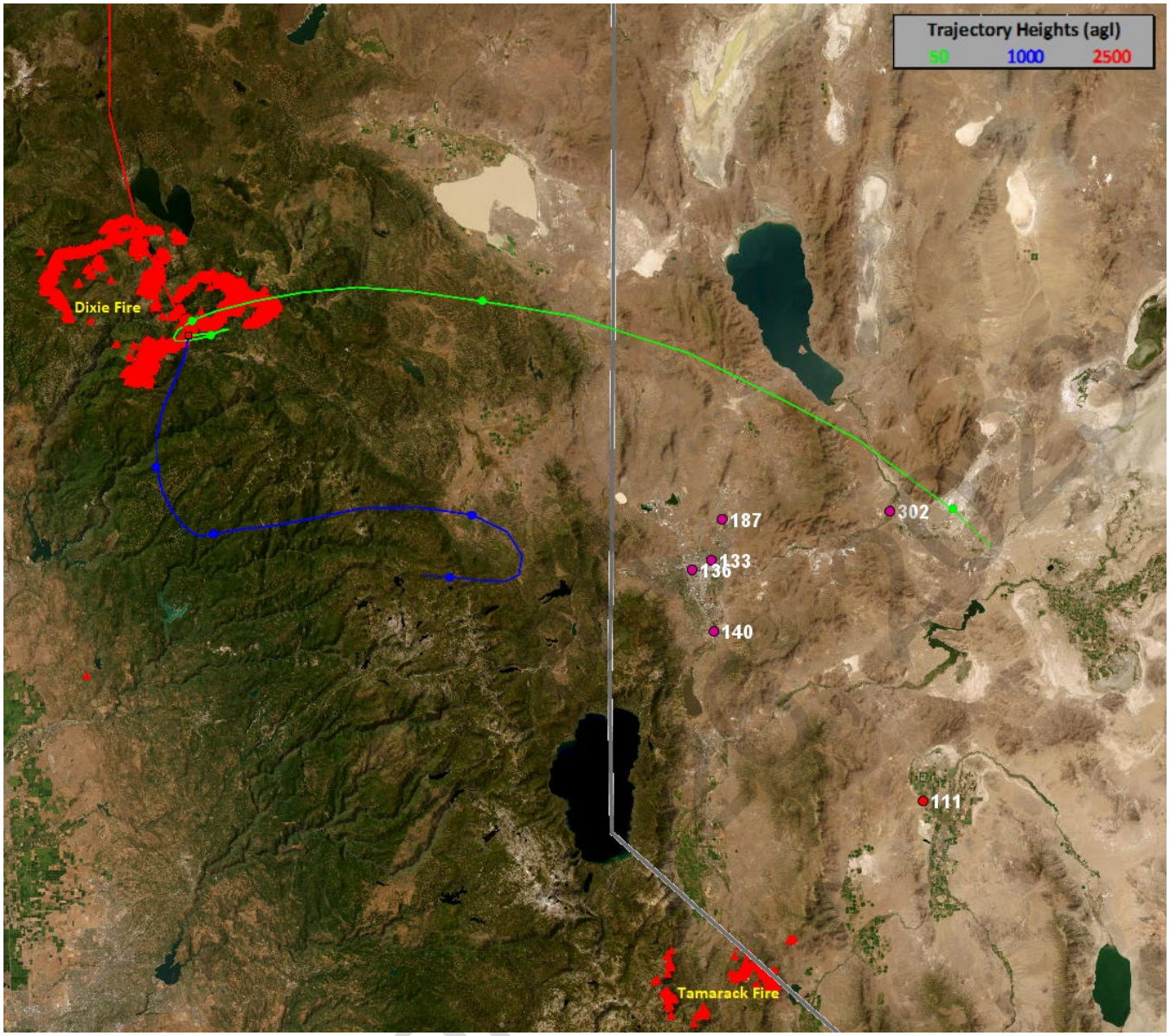


Figure 4-19: Forward Trajectory from Tamarack Fire starting July 26, 2021 at 0000 PST

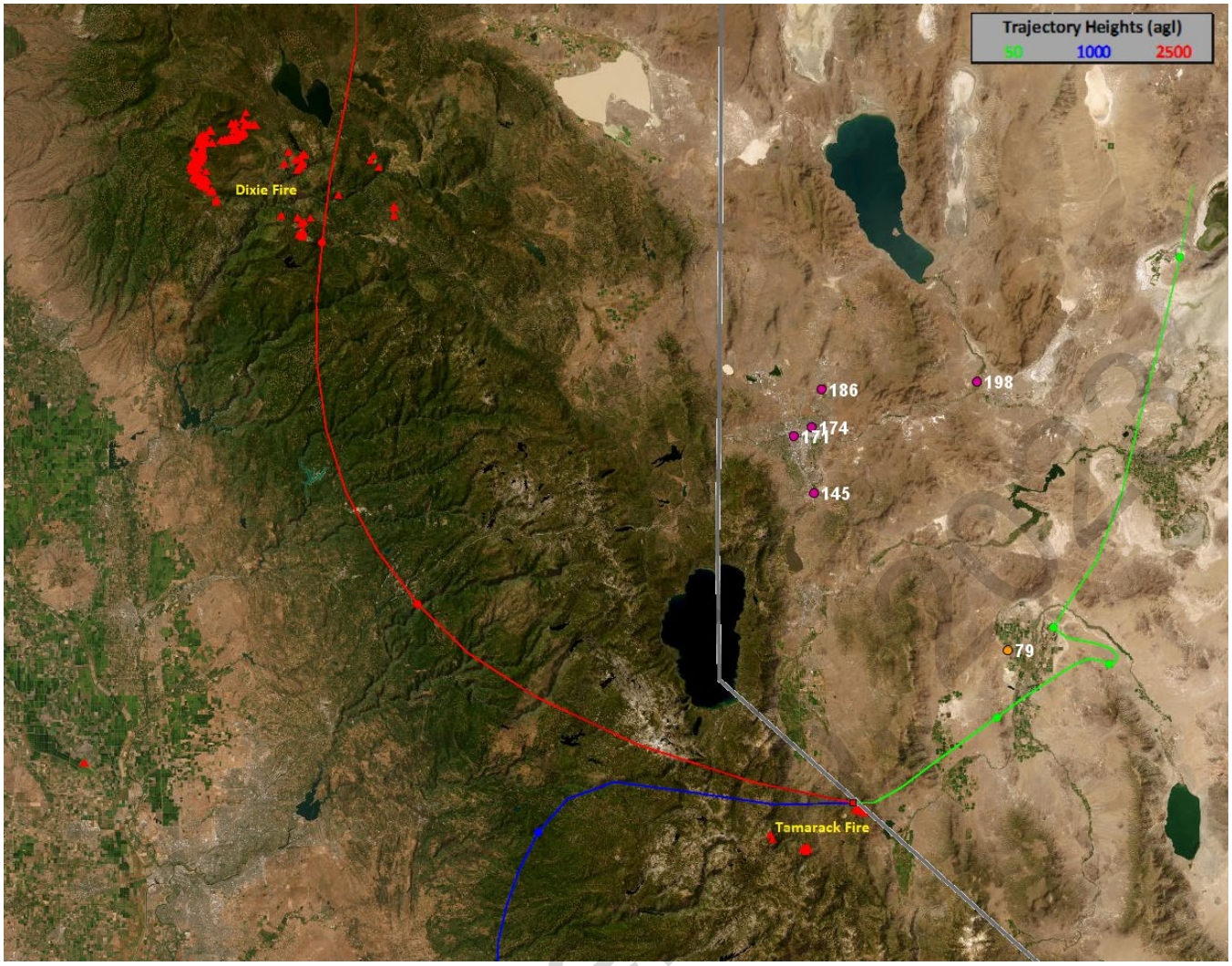
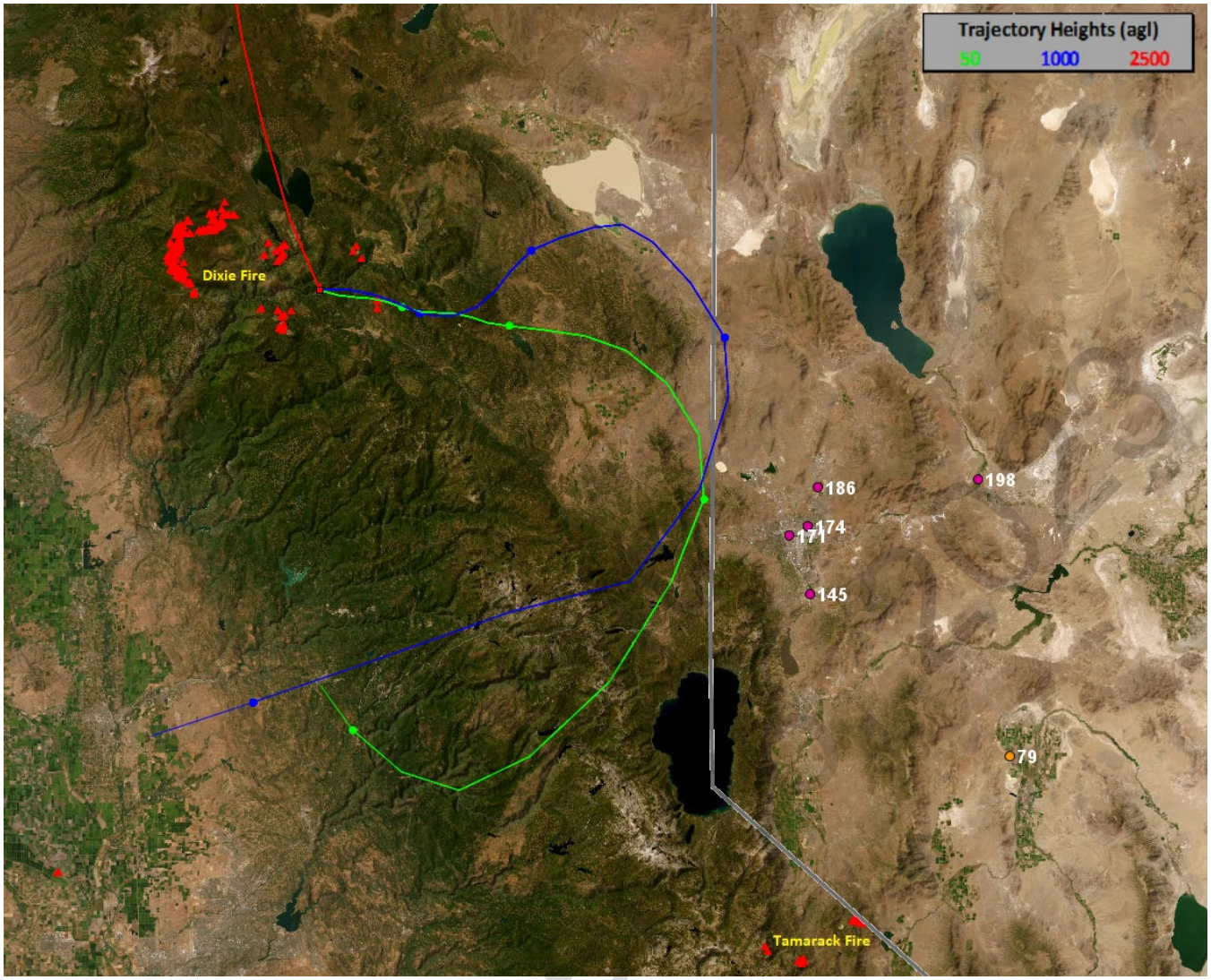


Figure 4-20: Forward Trajectory from Dixie Fire starting July 26, 2021 at 0000 PST



4.4.3 Trajectory Analysis Explanation

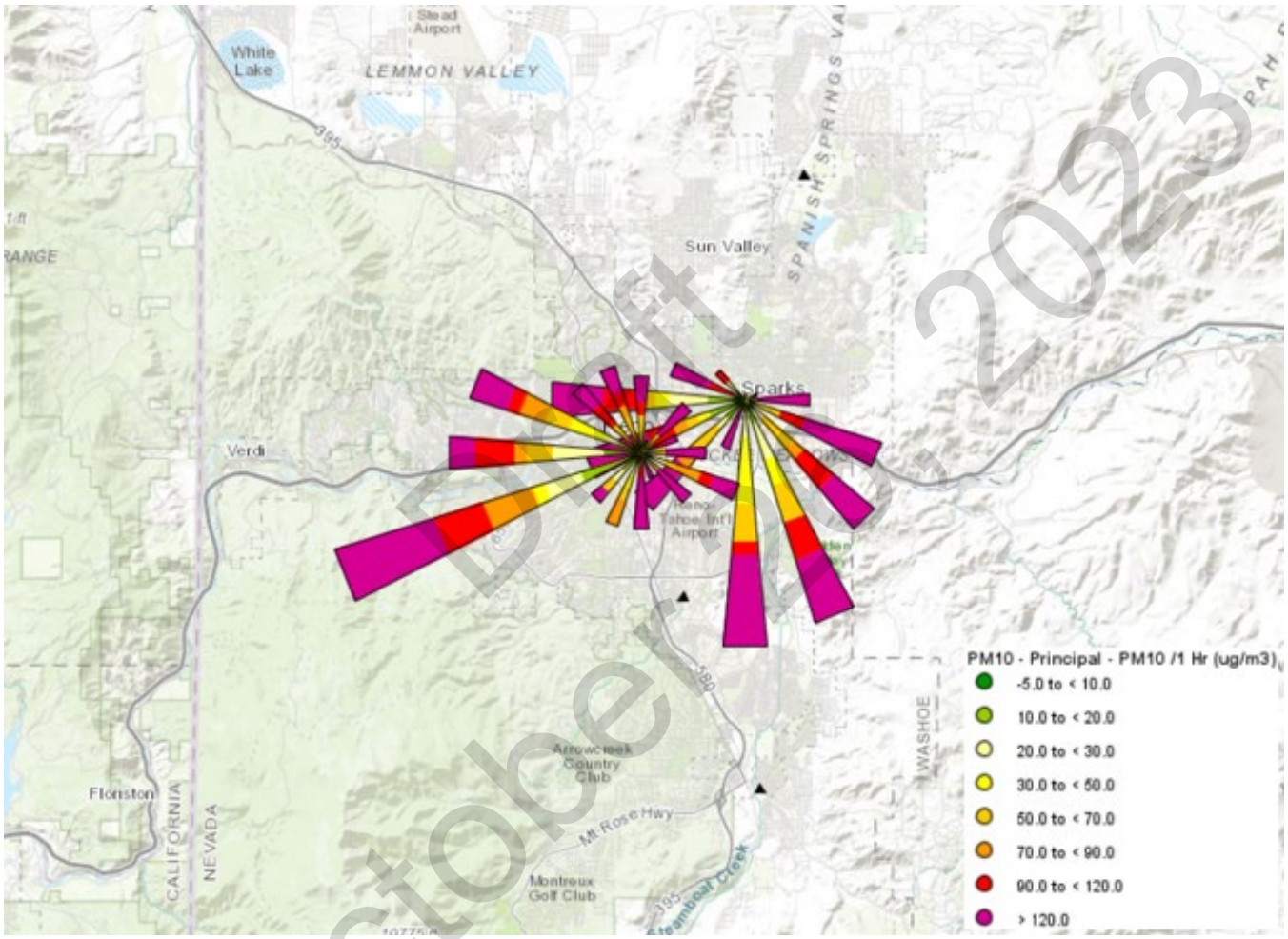
The methodology behind this section is to bracket the day of the exceedance with forward and backward HYSPLITs. A forward trajectory was completed for July 25 and July 26, 2021 to accurately depict the characteristics of the wildfire smoke that would have affected HA 87 on the day of the exceedance.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

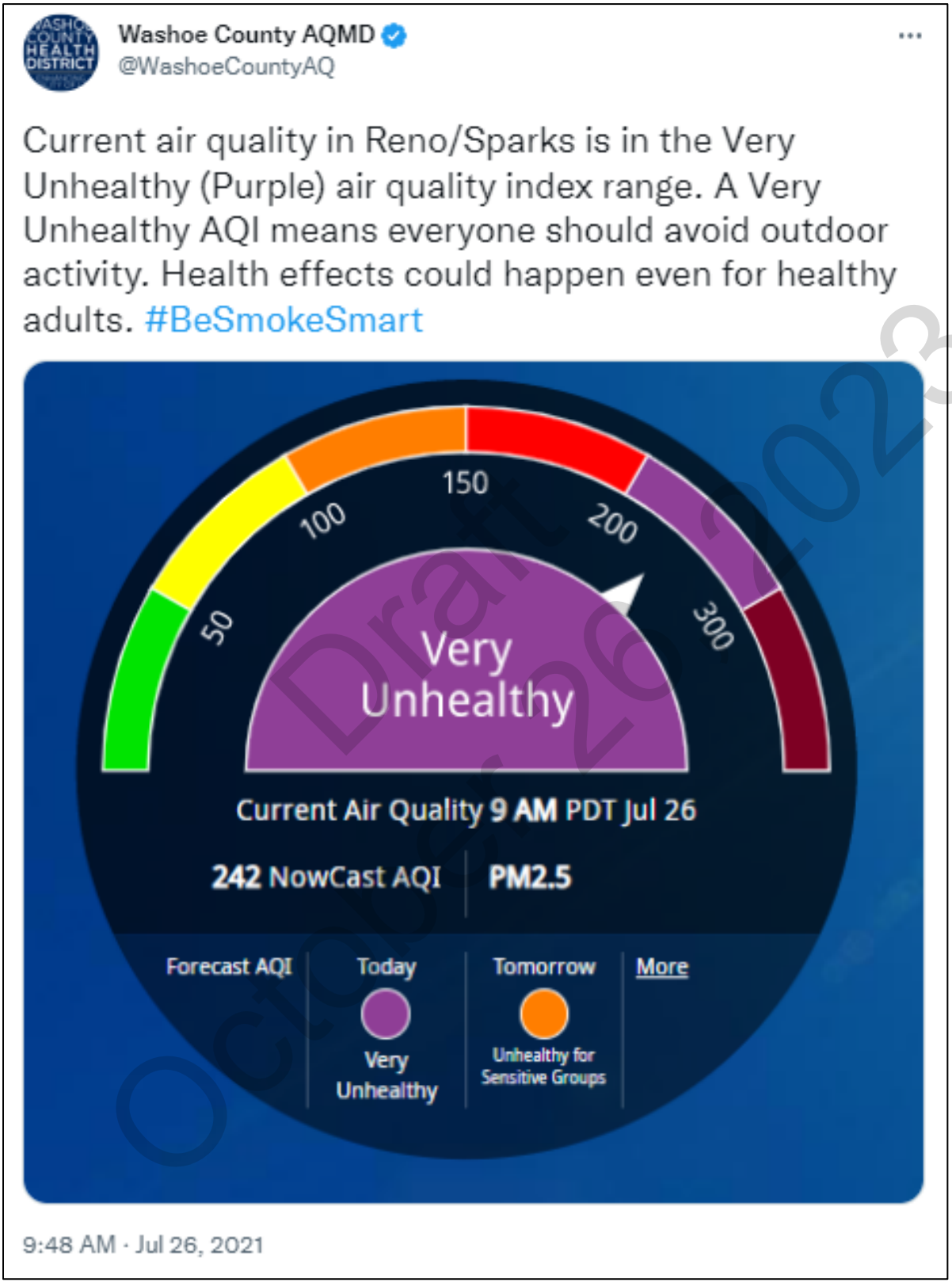


Figure 6-2: Air Quality Forecast Issued on the day of the Exceedance

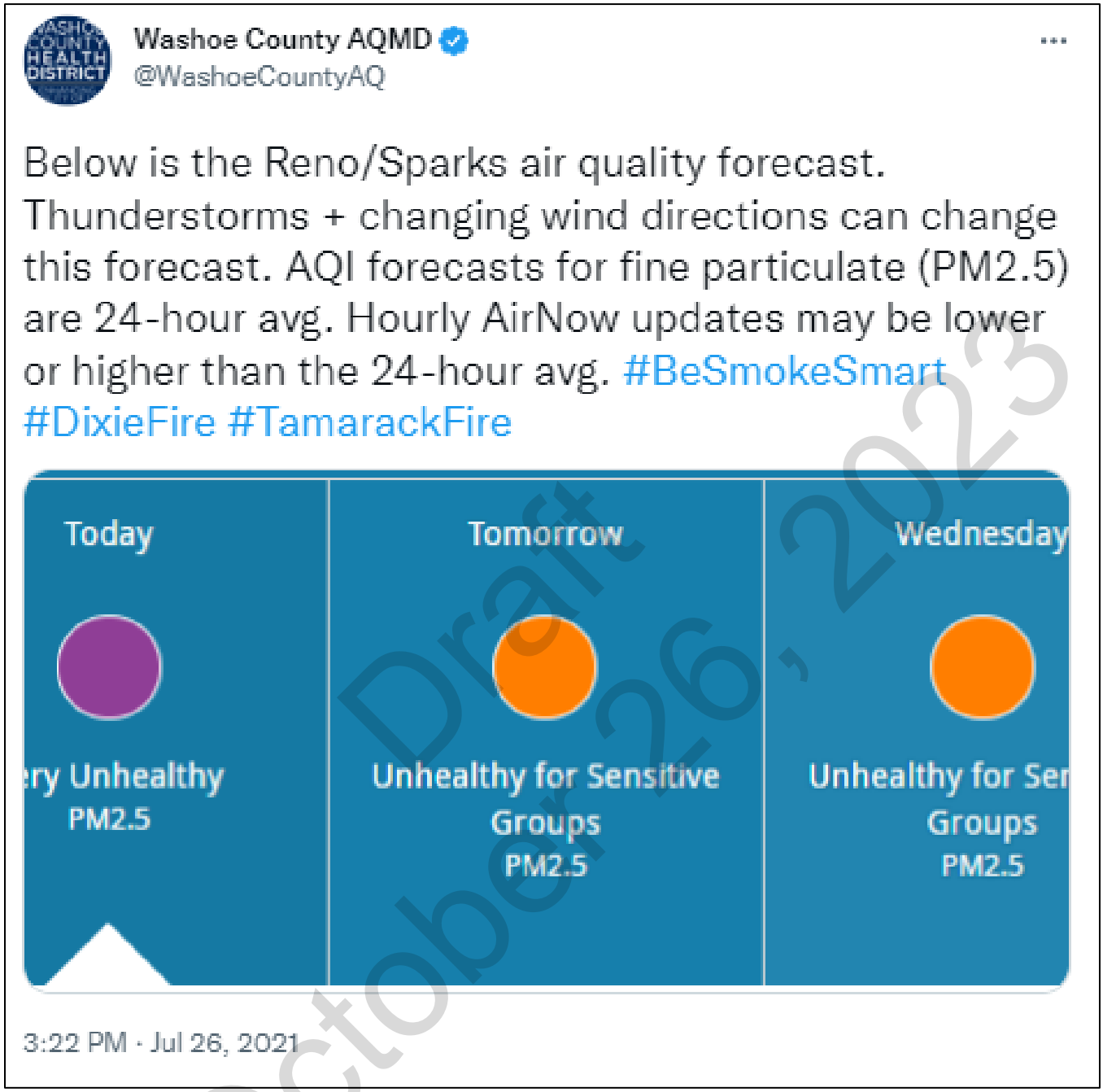


Figure 6-3: Be Smoke Smart Social Media Post from the day of the Exceedance

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 A

Public Comment Plan

Public Comment Period

This Exceptional Event Demonstration was available for public inspection from October 26 to November 26, 2023 at the AQMD website (OurCleanAir.com). AQMD issued a press release on October 26, 2023 to inform the public of the comment period. The press release provides a web link to the draft demonstration and explains how to submit written comments during the comment period. A hardcopy of the plan was also available at the AQMD office. All comments received during this inspection period are outlined below, along with the press release.

Appendix B

Exceptional Event Initial Notification

Initial Notification of Potential Exceptional Event Information Summary for PM_{10}

Submitting Agency: Washoe County Health District Air Quality Management Division
Agency Contact: Daniel Inouye, Branch Chief
Date Submitted: July 1, 2022
Applicable NAAQS: 1987 PM_{10}
Affected Regulatory Decision[1]: None
Area Name/Designation Status: Truckee Meadows Hydrographic Basin 87 PM_{10} Maintenance Area
Design Value Period: 2019-2021

Table A(1): Information specific to each flagged monitor day that may be submitted to EPA in support of the affected regulatory decision listed above

Date(s) of Event(s)	Type of Event (high wind, volcano, wildfires/prescribed fire, other[2])	AQS Flags	Monitor AQS IDs (and POCs)	Monitor Names	24-hour average Exceedance Concentration ($\mu g/m^3$)	Notes (e.g. event name, links to other events)
07/24/2021	Wildfires	IT	32-031-1007-81102-1	Spanish Springs	173	
07/25/2021	Wildfires	IT	32-031-1007-81102-1	Spanish Springs	187	
07/26/2021	Wildfires	IT	32-031-1007-81102-1 32-031-1005-81102-4 32-031-0031-81102-2	Spanish Springs Sparks Reno4	186 174 171	
08/06/2021	Wildfires	IT	32-031-0025-81102-2	Toll	156	
08/07/2021	Wildfires	IT	32-031-0031-81102-2 32-031-1005-81102-4 32-031-1007-81102-1	Reno4 Sparks Spanish Springs	198 163 162	
08/16/2021	Wildfires	IT	32-031-1007-81102-1	Spanish Springs	197	
08/17/2021	Wildfires	IT	32-031-0025-81102-2	Toll	161	
08/20/2021	Wildfires	IT	32-031-0025-81102-2	Toll	176	
08/21/2021	Wildfires	IT	32-031-0025-81102-2 32-031-0031-81102-2 32-031-1007-81102-1 32-031-1005-81102-4	Toll Reno4 Spanish Springs Sparks	204 200 195 190	
08/22/2021	Wildfires	IT	32-031-0025-81102-2 32-031-0031-81102-2	Toll Reno4	261 210	
08/23/2021	Wildfires	IT	32-031-0025-81102-2 32-031-0031-81102-2 32-031-1005-81102-4 32-031-1007-81102-1	Toll Reno4 Sparks Spanish Springs	319 304 214 187	
08/24/2021	Wildfires	IT	32-031-0025-81102-2 32-031-0031-81102-2 32-031-1005-81102-4	Toll Reno4 Sparks	284 233 168	
08/25/2021	Wildfires	IT	32-031-0025-81102-2 32-031-0031-81102-2	Toll Reno4	211 164	
08/26/2021	Wildfires	IT	32-031-0025-81102-2	Toll	174	

[1] designation, classification, attainment determination, attainment date extension, or finding of SIP inadequacy leading to SIP call

[2] Provide additional information for types of event described as "other"

Table B(1): Violating Monitors Information

Monitor (AQS ID and POC)	Design Value (without EPA concurrence on any of the events listed in table A above)	Design Value (with EPA concurrence on all events listed in table A above)
32-031-1007-81102-1 32-031-0025-81102-2 32-031-1005-81102-4 32-031-0031-81102-2	4.0 expected exceedances 4.0 expected exceedances 2.7 expected exceedances 2.7 expected exceedances	1.7 expected exceedances

Table C(1): Summary of Maximum Design Value (DV) Monitor Information

	Design Value	Design Value Monitor (AQS ID and POC)	Comment(s)
Maximum DV monitor (AQS ID and POC) **without EPA concurrence** on any of the events listed in table A above	4.0 expected exceedances 4.0 expected exceedances	32-031-1007-81102-1 32-031-0025-81102-2	Includes exceptional event data from 2020 that has not been concurred.
Maximum DV monitor (AQS ID and POC) **with EPA concurrence** on all events listed in table A above	1.7 expected exceedances	32-031-1007-81102-1	Includes exceptional event data from 2020 that has not been concurred.

Table D(1): List of any monitors (AQS ID and POC) within planning area with invalid design values (e.g. due to data incompleteness)

Monitor (AQS ID and POC)	Comment
---	---

Appendix C

2021 Data Certification Letter

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

April 26, 2022

Gwen Yoshimura
Manager, Air Quality Analysis Office
U.S. EPA, Region 9
75 Hawthorne Street, Mail Stop AIR-7
San Francisco, CA 94105

Re: CY2021 Ambient Air Monitoring Data Certification

Dear Ms. Yoshimura:

Attached please find a copy of the Washoe County Health District, Air Quality Management Division's (AQMD) AQS AMP600 Data Certification Report and AMP450NC Quick Look summary report for ambient air monitoring data for all State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitors (SPMs) which meet criteria in 40 CFR 58 Appendix A operated from January 1 to December 31, 2021. Included is data from Federal Reference Method (FRM) and Federal Equivalent Method (FEM) monitors for CO, NO_2, ozone, PM_{10}, $PM_{10-2.5}$, $PM_{2.5}$, and SO_2 (hourly and 5-minute average data).

This letter certifies that the ambient concentration data and the quality assurance data are completely submitted to AQS, and the ambient data are accurate to the best of my knowledge taking into consideration the quality assurance findings.

Please contact Mr. Daniel Timmons or me at (775) 784-7200 with any questions or concerns.

Sincerely,

Francisco Vega

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

Attachments

cc: Fletcher Clover, Air Quality Analysis Office, U.S. EPA, Region 9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: BAA

QUICKLOOK ALL PARAMETERS

Report Request ID: 2005956

Report Code: AMP450NC

Apr. 4, 2022

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	32	031		86101							
	32	031		42401	2						

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
ALL			

AGENCY SELECTIONS

Washoe County District Health Department

SELECTED OPTIONS

Option Type	Option Value
EVENTS PROCESSING	EXCLUDE REGIONALLY CONCURRED EVENTS
AGENCY ROLE	PQAO
MERGE PDF FILES	YES

SORT ORDER

Order	Column
1	STATE_CODE
2	COUNTY_CODE
3	SITE_ID
4	PARAMETER_CODE
5	POC
6	DATES
7	EDT_ID

SCR GROUP SELECTIONS

Washoe Co,NV

DATE CRITERIA

Start Date	End Date
2021	2021

APPLICABLE STANDARDS

Standard Description
CO 8-hour 1971
Lead 3-Month 2009
Lead 3-Month PM10 Surrogate 2009
Lead Quarterly 1978
NO2 Annual 1971
Ozone 8-hour 2015
PM10 24-hour 2006
PM25 24-hour 2012
SO2 1-hour 2010

EXCEPTIONAL DATA TYPES

EDT	DESCRIPTION
0	NO EVENTS
1	EVENTS EXCLUDED
2	EVENTS INCLUDED
5	EVENTS WITH CONCURRENCE EXCLUDED

Parameter	Unit	POC	PQAO	Year	Meth	# Obs	1st Max Value	2nd Max Value	3rd Max Value	4th Max Value	Arith. Mean	Duration	Cert& Eval	EDT
Site ID: 32-031-0025 City: Reno	County: Washoe						Address: 684A STATE ROUTE 341, RENO NV 89521							
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	1	1138	2021	185	8524	881.0	602.0	586.0	563.0	13.46	1 HOUR		5
Site ID: 32-031-0031 City: Reno	County: Washoe						Address: 1260-A Stewart St.							
42401 Sulfur dioxide	Parts per billion	2	1138	2021	600	98036	8.8	7.1	5.6	4.7	.25	5 MINUTE		0
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	1	1138	2021	000	118	56.1	51.5	43.1	37.0	14.27	24 HOUR		5
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	2	1138	2021	185	8581	488.0	434.0	387.0	311.0	14.99	1 HOUR		5
Site ID: 32-031-1005 City: Sparks	County: Washoe						Address: 750 4TH ST, SPARKS, NV 89431							
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	1	1138	2021	185	8592	425.0	354.0	330.0	305.0	14.58	1 HOUR		5
Site ID: 32-031-1007 City: Sparks	County: Washoe						Address: 7200 Pyramid Hwy, Sparks, NV, 89441							
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	1	1138	2021	185	8618	709.0	707.0	495.0	370.0	9.74	1 HOUR		5

Note: The * indicates that the mean does not satisfy summary criteria.

QUICKLOOK ALL PARAMETERS

Apr. 4, 2022

METHODS USED IN THIS REPORT

PARAMETER	METHOD CODE	COLLECTION METHOD	ANALYSIS METHOD
42401	600	Instrumental	Ultraviolet Fluorescence API 100 EU
86101	000	MULTIPLE METHODS	MULTIPLE METHODS
86101	185	Met One BAM-1020 System	Paired Beta Difference

Note: The * indicates that the mean does not satisfy summary criteria.

QUICKLOOK ALL PARAMETERS

Apr. 4, 2022

PQAOS USED IN THIS REPORT

PQAO	AGENCY DESCRIPTION
1138	Washoe County District Health Department

Note: The * indicates that the mean does not satisfy summary criteria.

CERTIFICATION EVALUATION AND CONCURRENCE FLAG MEANINGS

FLAG	MEANING
M	The monitoring organization has revised data from this monitor since the most recent certification letter received from the state.
N	The certifying agency has submitted the certification letter and required summary reports, but the certifying agency and/or EPA has determined that issues regarding the quality of the ambient concentration data cannot be resolved due to data completeness, the lack of performed quality assurance checks or the results of uncertainty statistics shown in the AMP255 report or the certification and quality assurance report.
S	The certifying agency has submitted the certification letter and required summary reports. A value of "S" conveys no Regional assessment regarding data quality per se. This flag will remain until the Region provides an "N" or "Y" concurrence flag.
U	Uncertified. The certifying agency did not submit a required certification letter and summary reports for this monitor even though the due date has passed, or the state's certification letter specifically did not apply the certification to this monitor.
X	Certification is not required by 40 CFR 58.15 and no conditions apply to be the basis for assigning another flag value
Y	The certifying agency has submitted a certification letter, and EPA has no unresolved reservations about data quality (after reviewing the letter, the attached summary reports, the amount of quality assurance data submitted to AQS, the quality statistics, and the highest reported concentrations).

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: BAA

CERTIFICATION EVALUATION AND CONCURRENCE

Report Request ID: 2014498

Report Code: AMP600

Apr. 26, 2022

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	32										

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA			

AGENCY SELECTIONS

Washoe County District Health Department

SELECTED OPTIONS

Option Type	Option Value
MERGE PDF FILES	YES
AGENCY ROLE	CERTIFYING

DATE CRITERIA

Start Date	End Date
2021	2021

Data Evaluation and Concurrence Report Summary

Certification Year: 2021
Certifying Agency (CA): Washoe County District Health Department (1138)

Pollutants in Report:

Parameter Name	Code	Monitors Evaluated	Monitors Recommended for Concurrence by AQS	Monitors NOT Recommended for Concurrence by AQS
Carbon monoxide	42101	2	2	0
Nitrogen dioxide (NO2)	42602	1	1	0
Ozone	44201	7	7	0
PM10 Total 0-10um STP	81102	4	4	0
PM2.5 - Local Conditions	88101	5	5	0
Sulfur dioxide	42401	1	1	0

PQAOs in Report:

PQAO Name	PQAO Code	TSA Date
Washoe County District Health Department	1138	08/15/19

Summary of 'N' flags for all pollutants:

PQAO	Parameter Code	AQS Site-ID	POC	AQS Recommended Flag	Cert. Agency Recommended Flag	Reason for AQS Recommendation

Signature of Monitoring Organization Representative: Francisca Vega

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2021
Certifying Agency Code Washoe County District Health Department (1138)
Parameter Carbon monoxide (42101) (ppm)
PQAO Name Washoe County District Health Department (1138)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
1	2.84708	Y

AQS Site ID	POC	Monitor Type	Routine Data						One Point Quality Check			Annual PE		NPAP		QAPP Appr.	Concur. Flag		
			Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria		Aqs Rec Flag	CA Rec Flag	Epa Concur
32-031-0031	1	SLAMS	0.274	0.032	2.437	0	0	97	2.66	+/-2.11	100	- 0.04	100	2.85	Y	Y	Y	Y	S
32-031-1005	1	SLAMS	0.387	0.000	2.200	0	0	99	1.08	+/-0.61	100	1.94	100		Y	Y	Y	Y	S

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2021
Certifying Agency Code Washoe County District Health Department (1138)
Parameter Nitrogen dioxide (NO2) (42602) (ppb)
PQAO Name Washoe County District Health Department (1138)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
0	8.18765	Y

AQS Site ID	POC	Monitor Type	Routine Data						One Point Quality Check			Annual PE		NPAP			Concur. Flag		
			Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria	QAPP Appr.	Aqs Rec Flag	CA Rec Flag	Epa Concur
32-031-0031	1	SLAMS	11.8	0.1	54.6		0	97	4.08	+/-3.40	100	- 1.60	100	8.19	Y	Y	Y	Y	S

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2021
Certifying Agency Code Washoe County District Health Department (1138)
Parameter Ozone (44201) (ppm)
PQAO Name Washoe County District Health Department (1138)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
1	3.05318	Y

			Routine Data						One Point Quality Check			Annual PE		NPAP			Concur. Flag		
AQS Site ID	POC	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria	QAPP Appr.	Aqs Rec Flag	CA Rec Flag	Epa Concur
32-031-0020	1	SLAMS	0.052	0.006	0.102	0	0	99	1.98	+/-1.65	100	2.96	100		Y	Y	Y	Y	S
32-031-0025	1	SLAMS	0.051	0.013	0.096	0	0	99	1.77	+/-1.23	100	0.25	100		Y	Y	Y	Y	S
32-031-0031	1	SLAMS	0.051	0.009	0.099	0	0	96	1.61	+/-1.65	100	1.63	100	3.05	Y	Y	Y	Y	S
32-031-1005	1	SLAMS	0.051	0.015	0.100	0	0	99	1.62	+/-1.28	100	- 0.25	100		Y	Y	Y	Y	S
32-031-1007	1	SLAMS	0.049	0.017	0.100	0	0	99	1.72	+/-1.57	100	0.71	100		Y	Y	Y	Y	S
32-031-2002	1	SLAMS	0.053	0.029	0.093	0	0	95	5.01	+/-3.55	100	3.29	100		Y	Y	Y	Y	S
32-031-2009	1	SLAMS	0.053	0.022	0.096	0	0	98	2.01	+/-1.57	100	1.31	100		Y	Y	Y	Y	S

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2021
Certifying Agency Code Washoe County District Health Department (1138)
Parameter Sulfur dioxide (42401) (ppb)
PQAO Name Washoe County District Health Department (1138)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
0	2.92973	Y

AQS Site ID	POC	Monitor Type	Routine Data						One Point Quality Check			Annual PE		NPAP			Concur. Flag		
			Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria	QAPP Appr.	Aqs Rec Flag	CA Rec Flag	Epa Concur
32-031-0031	1	SLAMS	0.2	- 0.6	3.6		0	97	4.06	+/-3.20	100	- 3.74	100	2.93	Y	Y	Y	Y	S

Data Evaluation and Concurrence Report for Particulate Matter

Certifying Year: 2021
Certifying Agency: Washoe County District Health Department (1138)

Parameter: PM10 Total 0-10um STP (81102) CONTINUOUS
PQAO Name: Washoe County District Health Department (1138)
Quality Assurance Project Plan Approval Date: 12/12/2019

Monitors Summaries

			Routine Data (ug/m3)						Flow Rate Verification		Flow Rate Audit			Concurrence Flag		
AQS Site ID	POC	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias	% Complete	Bias	% Complete	QAPP Appr.	AQS Rec Flag	CA Rec Flag	EPA Concur
32-031-0025	2	SLAMS	28.45	-4.0	985.0		0	97	+/-0.48	100	+0.16	100	Y	Y	Y	S
32-031-0031	2	SLAMS	31.36	-1.0	597.0		0	98	+/-0.44	100	+0.41	100	Y	Y	Y	S
32-031-1005	4	SLAMS	30.48	-5.0	552.0		0	98	+/-0.44	100	+0.17	100	Y	Y	Y	S
32-031-1007	1	SLAMS	24.53	-2.0	985.0		0	98	+/-0.69	100	+0.52	100	Y	Y	Y	S

Parameter: PM2.5 - Local Conditions (88101)
PQAO Name: Washoe County District Health Department (1138)
Quality Assurance Project Plan Approval Date: 12/12/2019

Collocation Summary

Method	# Sites	# Sites Req	# Sites Collocated	% Collocated	CV Est	CV UB	Criteria Met?
170	4	1	1	100	10.03	11.08	Y

PEP Summary

# Methods	# Audited Methods	# PEP Required	# PEP Submitted	% Complete	Bias	Criteria Met?
1	1	5	3	60	-3.18	Y

Monitors Summaries

				Routine Data (ug/m3)						Flow Rate Audit		Collocation			PEP PQAO	QAPP	Concurrence Flag		
AQS Site ID	POC	Method	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias	% Complete	CV	% Complete	PQAO Crit. Met	Crit. Met	Appr.	AQS Rec Flag	CA Rec Flag	EPA Concur
32-031-0025	1	170	SLAMS	11.17	-8.0	375.0		0	98	+0.57	100			Y	Y	Y	Y	Y	S
32-031-0031	1	545/ 142	SLAMS	12.16	.6	218.9		0	97	-0.95	100			Y	Y	Y	Y	Y	S
32-031-0031	2	170	SLAMS	12.59	-7.0	312.0		0	98	-0.58	100	11.08	100	Y	Y	Y	Y	Y	S
32-031-1005	1	170	SLAMS	12.10	-7.0	278.0		0	99	-0.43	100			Y	Y	Y	Y	Y	S
32-031-1007	1	170	SLAMS	11.59	-3.0	364.0		0	99	+0.29	100			Y	Y	Y	Y	Y	S

Data Concurrence and Evaluation Report for Lead

Appendix D

AQS Report Showing RT Flags Applied

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: BAA

RAW DATA QUALIFIER REPORT

Report Request ID: 2106602 Report Code: AMP360 May. 17, 2023

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	32	031	0031	81102	2						
	32	031	1005	81102	4						

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA			

SELECTED OPTIONS

Option Type	Option Value
MERGE PDF FILES	YES
AGENCY ROLE	PQAO
CONCURRENCE STATUS	All Data (Concurred and Non-concurred)
QUALIFIER TYPES	ALL QUALFIER TYPES
QUALIFIER COUNTS BY MONITOR	YES
QUALIFIER CODE	All QUALIFIER CODES

SCR GROUP SELECTIONS

Washoe Co,NV

DATE CRITERIA

Start Date	End Date
2021 07 26	2021 07 26

United States Environmental Protection Agency

Air Quality System

Raw Data Qualifier Report (v 1.1)

Report Date: May. 17, 2023

Parameter: PM10 Total 0-10um STP (81102)

Standard Units: Micrograms/cubic meter (25 C) (001)

Monitor Key / Site Address	Sample Date-Time	Value	Sample Qualifier Code	Description	Action Date	NAAQS Standard	Concurrence Ind	Concurrence Date
32-031-0031-81102-2	2021-07-26 00:00	137	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 01:00	143	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 02:00	210	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 03:00	198	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 04:00	169	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 05:00	149	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 06:00	176	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 07:00	191	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 08:00	383	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 09:00	272	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 10:00	274	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 11:00	249	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 12:00	182	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 13:00	190	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 14:00	162	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 15:00	219	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 16:00	94	RT	Wildfire-U. S.	2021-11-16			

Parameter: PM10 Total 0-10um STP (81102)
Standard Units: Micrograms/cubic meter (25 C) (001)

Monitor Key / Site Address	Sample Date-Time	Sample Value	Code	Description	Action Date	NAAQS Standard	Concurrence Ind	Concurrence Date
32-031-0031-81102-2	2021-07-26 16:00	94	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 17:00	121	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 18:00	66	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 19:00	90	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 20:00	99	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 21:00	161	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 22:00	89	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-0031-81102-2	2021-07-26 23:00	80	RT	Wildfire-U. S.	2021-11-16			
1260-A Stewart St.	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			

Monitor Qualifier Counts: RT Wildfire-U. S. **Count: 24**

Monitor Key / Site Address	Sample Date-Time	Sample Value	Qualifier Code	Description	Action Date	NAAQS Standard	Concurrence Ind	Concurrence Date
32-031-1005-81102-4	2021-07-26 00:00	267	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 01:00	264	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 02:00	221	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 03:00	224	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 04:00	204	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			

United States Environmental Protection Agency
Air Quality System
Raw Data Qualifier Report (v 1.1)

Report Date: May. 17, 2023

Parameter: PM10 Total 0-10um STP (81102)
Standard Units: Micrograms/cubic meter (25 C) (001)

Monitor Key / Site Address	Sample Date-Time	Sample Value	Code	Description	Action Date	NAAQS Standard	Concurrence Ind	Concurrence Date
32-031-1005-81102-4	2021-07-26 05:00	208	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 06:00	213	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 07:00	205	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 08:00	238	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 09:00	254	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 10:00	249	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 11:00	243	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 12:00	178	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 13:00	151	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 14:00	140	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 15:00	199	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			

Parameter: PM10 Total 0-10um STP (81102)
Standard Units: Micrograms/cubic meter (25 C) (001)

Monitor Key / Site Address	Sample Date-Time	Sample Value	Code	Description	Action Date	NAAQS Standard	Concurrence Ind	Concurrence Date
32-031-1005-81102-4	2021-07-26 16:00	129	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 17:00	112	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 18:00	62	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 19:00	64	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 20:00	89	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 21:00	158	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 22:00	65	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			
32-031-1005-81102-4	2021-07-26 23:00	54	RT	Wildfire-U. S.	2021-11-16			
750 4TH ST, SPARKS, NV 89431	**Event:**			Dixie and Tamarack Wildfires	2023-05-16			

Monitor Qualifier Counts: RT Wildfire-U. S. **Count: 24**

All Qualifiers Utilized:

Qualifier Code:	Qualifier Description:	Qualifier Count:
RT	Wildfire-U. S.	48