Fifty-Sixth Quarterly Report of Ambient Air Quality Monitoring at Sunshine Canyon Landfill and Van Gogh Elementary School

September 1, 2021 – November 30, 2021

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Background

Continuous monitoring of meteorological and air quality parameters began at the Sunshine Canyon Landfill (Landfill site) and at Van Gogh Elementary School (Community site) in the nearby community of Granada Hills in fall 2007. At these sites, the following are measured: particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), wind speed (WS) and wind direction (WD), and black carbon (BC), as a surrogate for diesel particulate matter (DPM). The collected data are validated and evaluated for completeness quarterly. Monitoring is conducted to fulfill stipulations in the City of Los Angeles' Conditions of Approval for the expansion of the landfill.[1] Similar conditions cover the County of Los Angeles' portion of the landfill.[2]

PM_{10} concentrations are compared with federal and state PM_{10} standards. When PM_{10} concentrations are above the standard (i.e., an exceedance), additional comparisons are made with the historical, regional, and annual ambient PM_{10} concentrations. The PM_{10} and BC data are analyzed annually to characterize the impact of landfill operations on ambient air quality as observed at the Community site by quantifying PM_{10} and BC concentrations and exceedances and comparing concentrations between the Landfill and Community sites. A more in-depth analysis is performed for the annual report.

The validated hourly data and a summary of the analytical results and field operations are reported to the Planning Department of the City of Los Angeles and to the Los Angeles County Department of Regional Planning. This Fifty-Sixth Quarterly Report summarizes the September 2021–November 2021 (2021 fall quarter) monitoring results from the fifteenth year of continuous data collection.

Statistics

For this quarter, the percent data capture for hourly PM_{10} was 99.9% at the Landfill site and 93.4% at the Community site. Of the captured PM_{10} data, approximately 3.4% were invalidated at the Landfill site, and 0.2% were invalidated at the Community site. None of the PM_{10} data were deemed suspect at either the Landfill site or the Community site.

Hourly BC data capture was 99.7% at the Landfill site and 99.2% at the Community site. Of the captured hourly BC data, < 1.0% (0.05%) of data were deemed invalid at the Landfill site and 9.0% of

[1] Section C.10.a of Ordinance No. 172,933.
[2] County Condition 81.

data were deemed invalid at the Community site. Of the captured hourly BC data, 3.1% were deemed suspect at the Landfill site, and 7.3% were deemed suspect at the Community site.

During this quarter, the state 24-hr PM_{10} standard (50 µg/m^3) was exceeded on 80% of days (71 days out of the valid 89 days of the quarter) at the Landfill site and 2% of days at the Community site (1 day out of the valid 84 days of the quarter). The federal 24-hr PM_{10} standard (150 µg/m^3) was exceeded on 4% of days (3 days out of the valid 89 days of the quarter) at the Landfill site, and on 2% of days (1 day out of the valid 84 days of the quarter) at the Community site for this quarter. In the fall 2021 quarter, the 24-hr average BC concentration was 0.63 µg/m^3 at the Landfill site and 0.55 µg/m^3 at the Community site. Both sites exhibited ranges of 24-hr average BC concentrations on the low end among the 14 monitored fall quarters (2008–2021), and both sites showed a decrease in concentrations from the previous fall quarter (2020).

1. Introduction

This report summarizes data completeness, ambient particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) concentrations, average and maximum ambient black carbon (BC, a surrogate for diesel particulate matter [DPM] concentrations), instrument flow rate verification (quality control) data, and field operations for the quarterly period of September 1, 2021, through November 30, 2021. The collected data are validated and evaluated quarterly for completeness. This is the fifteenth year that continuous data were collected in the fall from continuous monitors at the Sunshine Canyon Landfill site (previously called the Berm site) and the Van Gogh Elementary School Community site. The monitoring site locations are shown in **Figure 1**. PM_{10} is measured with a beta attenuation monitor (BAM), and BC is measured with an Aethalometer. The Sunshine Canyon Landfill North monitoring site shown in Figure 1 was installed in December 2015 and decommissioned on May 31, 2017.

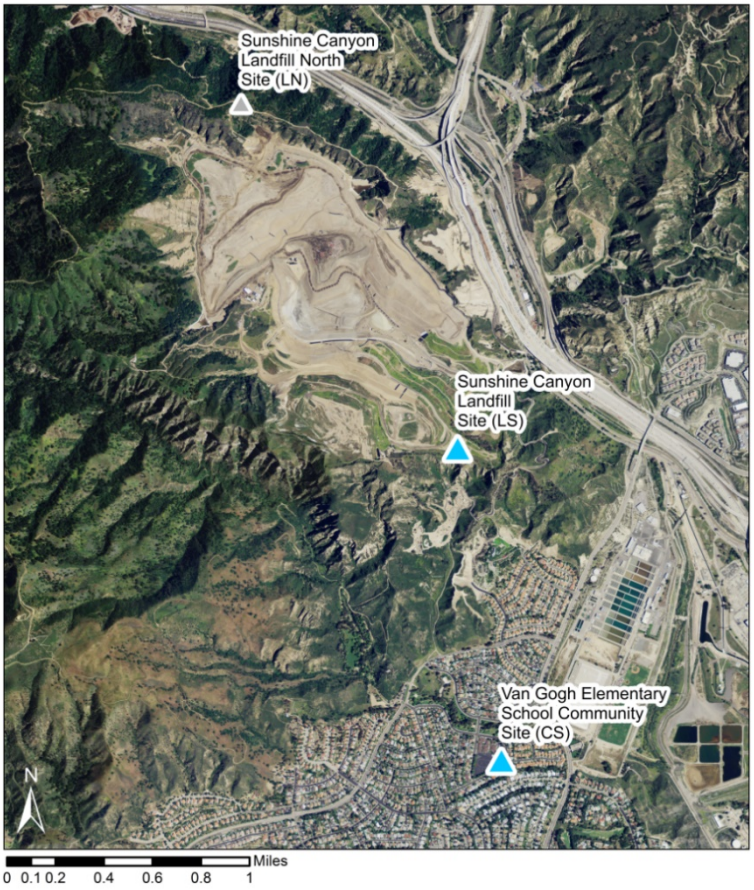

Figure 1. View of Sunshine Canyon Landfill and the surrounding monitoring stations (blue triangles): Sunshine Canyon Landfill site and Community site. The Sunshine Canyon Landfill North site (gray triangle) collected data from December 1, 2015, through May 31, 2017, and has since been decommissioned.

Monitoring is conducted to fulfill stipulations in the City of Los Angeles' Conditions of Approval for the expansion of the landfill.[3] Similar conditions cover the County of Los Angeles' portion of the landfill.[4]

[3] Section C.10.a of Ordinance No. 172,933.
[4] County Condition 81.

2. Data Completeness

Completeness statistics for all measured variables during the 2021 fall quarter are shown in Table 1. Data deemed as suspect are included in subsequent analyses (e.g., regional comparisons), while invalid data are not. The percent data capture for PM_{10} was 99.9% at the Landfill site and 93.4% at the Community site. Approximately 3.4% and 0.2% of the captured PM_{10} data were invalidated at the Landfill and Community sites, respectively. No hourly PM_{10} values were deemed suspect at either of the monitoring sites in this quarter.

Table 1. Data completeness statistics for hourly PM_{10}, hourly BC, and 1-min wind speed and wind direction data for the 2021 fall quarter monitoring period.

Monitoring Location	Dates	Data Capture (%)[a]			Data Valid or Suspect (%)[b]			Data Suspect (%)[c]		
		PM_{10}	BC	WS/ WD	PM_{10}	BC	WS/ WD	PM_{10}	BC	WS/WD
Sunshine Canyon Landfill	09/01/21-11/30/21	99.9	99.7	100.0	96.6	99.95	94.3	0.0	3.1	< 0.01
Community Site	09/01/21-11/30/21	93.4	99.2	100.0	99.8	91.0	98.3	0.0	7.3	0.0

[a] Data Capture is the number of collected data values divided by the total number of expected data intervals during the date range indicated in the "Dates" column (e.g., for the raw BC 1-hr data, 24 data values per day are expected), multiplied by 100.
[b] Data Valid or Suspect is the number of data values that are either valid or suspect divided by the number of captured data values, multiplied by 100.
[c] Data Suspect is the number of data values labeled as suspect divided by the number of captured data values, multiplied by 100.

Hourly BC data capture was 99.7% at the Landfill site and 99.2% at the Community site. Less than 1.0% (0.05%) of data were deemed invalid at the Landfill site, and 9.0% of data were deemed invalid at the Community site. At the Landfill site, 3.1% of hourly BC data were deemed suspect; at the Community site, 7.3% hourly BC data were deemed suspect.

The wind data capture percentages were 100.0% at both the Landfill site and the Community site. Among those captured data, approximately 5.7% of the data were invalidated at the Landfill site, with less than 0.1% deemed suspect; at the Community site, 1.7% of the data were invalidated, with none deemed suspect.

3. PM_{10} Exceedances

The federal and state PM_{10} exceedances for the fall quarter of the baseline year (2002), the fall quarters of the previous 13 years (2008–2020), and the current fall quarter (2021) are summarized in Table 2. In this quarter, the State PM_{10} standard of 50 µg/m^3 was exceeded on 80% of days (71 days) at the Landfill site and on 2% of days (1 day) at the Community site. These are the highest percentages of state PM_{10} exceedances for the fall quarters on record at the Landfill site. However, this is tied for the second lowest percentage of state PM_{10} exceedances for the fall quarters at the Community site.

Table 2. Number of exceedances of federal and state 24-hr PM_{10} standards during the fall quarters of the baseline year (2002) and years from 2008 to 2021. In the "Federal 24-hr" column, the values are number of exceedances and the date(s) on which those exceedances occurred. In the "State 24-hr" column, the values are number of exceedances/total days on which valid 24-hr averages were measured, and the percentage of exceedances out of the total number of days on which valid 24-hr average PM_{10} concentrations were measured. The most recent fall quarter is shown in **bold**.

Site	Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
			Federal 24-hr 150 µg/m^3	State 24-hr 50 µg/m^3
Sunshine Canyon Landfill	09/01/02–11/30/02	Baseline Year	0	51/77 (66%)
	09/01/08–11/30/08	2008 Fall	1 (10/09/08)	12/73 (16%)
	09/01/09–11/30/09	2009 Fall	1 (10/27/09)	78/89 (19%)
	09/01/10–11/30/10	2010 Fall	0	8/86 (9%)
	09/01/11–11/30/11	2011 Fall	1 (11/02/11)	20/89 (22%)
	09/01/12–11/30/12	2012 Fall	1 (10/26/12)	9/85 (11%)
	09/01/13–11/30/13	2013 Fall	1 (10/04/13)	14/89 (16%)
	09/01/14–11/30/14	2014 Fall	0	5/91 (5%)
	09/01/15–11/30/15	2015 Fall	0	10/86 (12%)
	09/01/16–11/30/16	2016 Fall	1 (11/27/16)	12/48 (25%)
	09/01/17–11/30/17	2017 Fall	3 (10/09/17, 10/24/17, 11/21/17)	27/87 (32%)
	09/01/18–11/30/18	2018 Fall	1 (11/8/2018)	14/89 (16%)
	09/01/19–11/30/19	2019 Fall	5 (10/25/19, 10/31/19, 11/16/19, 11/25/19, 11/26/19)	39/74 (53%)
	09/01/20–11/30/20	2020 Fall	4 (09/09/20, 10/16/20, 10/26/20, 11/26/20)	67/91 (74%)
	09/01/21–11/30/21	**2021 Fall**	**3 (09/23/21, 10/11/21, 11/25/21)**	**71/89 (80%)**

Site	Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
			Federal 24-hr 150 µg/m^3	State 24-hr 50 µg/m^3
Sunshine Canyon Landfill North	09/01/16–11/30/16	2016 Fall	0	13/35 (37%)
Community Site	09/01/02–11/30/02	Baseline Year	0	8/33 (24%)
	09/01/08–11/30/08	2008 Fall	0	12/90 (13%)
	09/01/09–11/30/09	2009 Fall	1 (10/27/2009)	11/78 (14%)
	09/01/10–11/30/10	2010 Fall	0	7/91 (8%)
	09/01/11–11/30/11	2011 Fall	0	11/88 (13%)
	09/01/12–11/30/12	2012 Fall	0	5/90 (6%)
	09/01/13–11/30/13	2013 Fall	0	7/85 (8%)
	09/01/14–11/30/14	2014 Fall	0	0/91 (0%)
	09/01/15–11/30/15	2015 Fall	0	0/90 (0%)
	09/01/16–11/30/16	2016 Fall	0	1/50 (2%)
	09/01/17–11/30/17	2017 Fall	0	4/92 (5%)
	09/01/18–11/30/18	2018 Fall	0	2/88 (3%)
	09/01/19–11/30/19	2019 Fall	3 (10/10/19, 10/11/19, 10/30/19)	17/90 (19%)
	09/01/20–11/30/20	2020 Fall	0	11/90 (13%)
	09/01/21–11/30/21	**2021 Fall**	**1 (10/11/21)**	**1/84 (2%)**

The federal 24-hr PM_{10} standard (150 µg/m^3) was exceeded on 3 days at the Landfill site, and on 1 day at the Community site. The Landfill site saw the highest number of 24-hr PM_{10} federal exceedance days this quarter among the 15 fall quarters of PM_{10} measurements, including the baseline year (2001-2002). Figures 2 through 4 show 24-hr PM_{10} concentrations at sites across the Los Angeles/southern California region on the days when the federal 24-hr PM_{10} standard was exceeded at the Landfill site and/or the Community site.

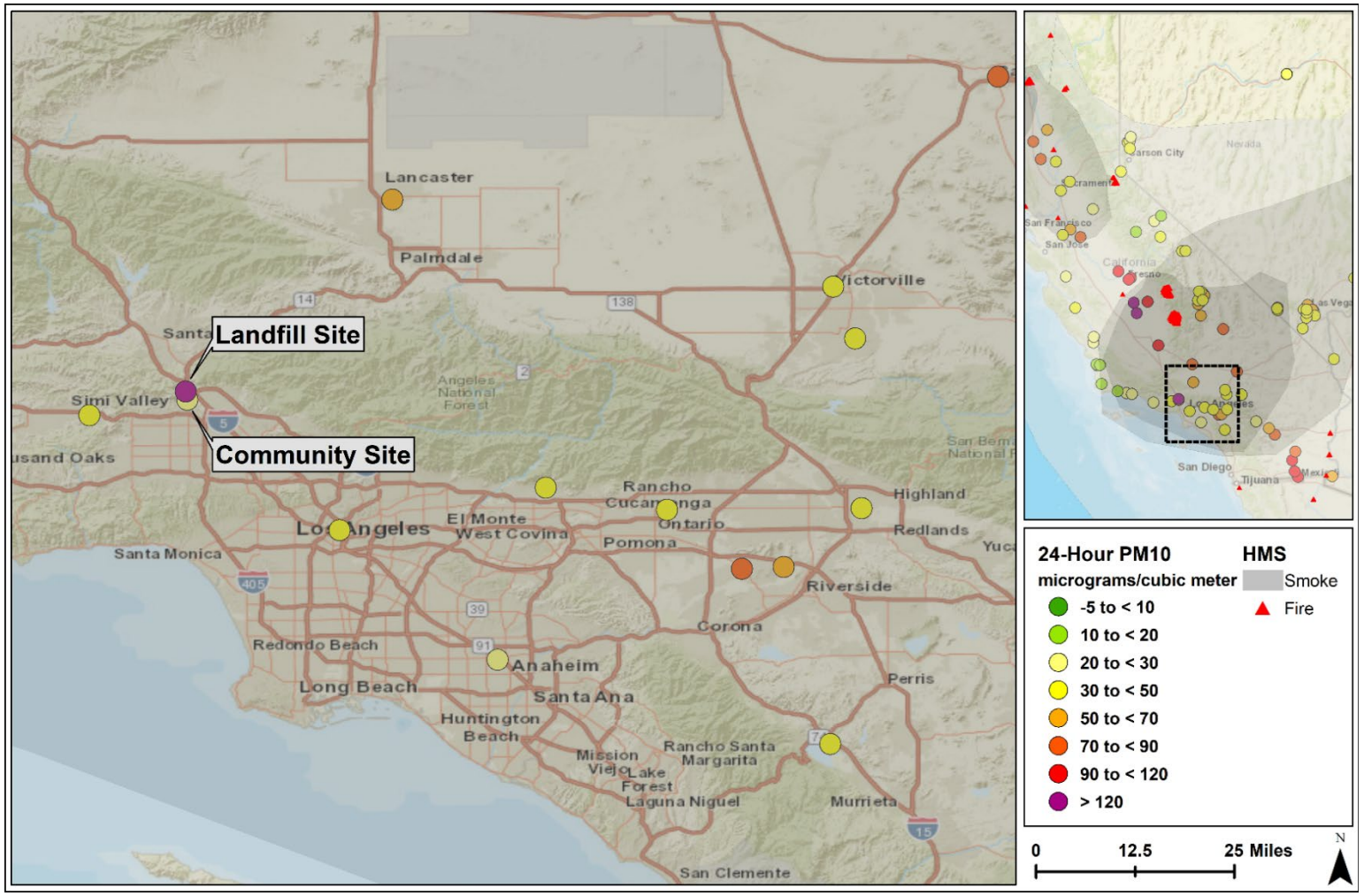

Figure 2. PM_{10} concentrations at sites across the Los Angeles area on September 23, 2021. Colors correspond to 24-hr PM_{10} concentrations in $\mu g/m^3$. Note: no other sites (within the left map domain) recorded 24-hr PM_{10} concentrations above the federal standard. Red triangles depict locations of the active wildfire hotspot events on this day, and grey boundaries represent HMS smoke plumes.

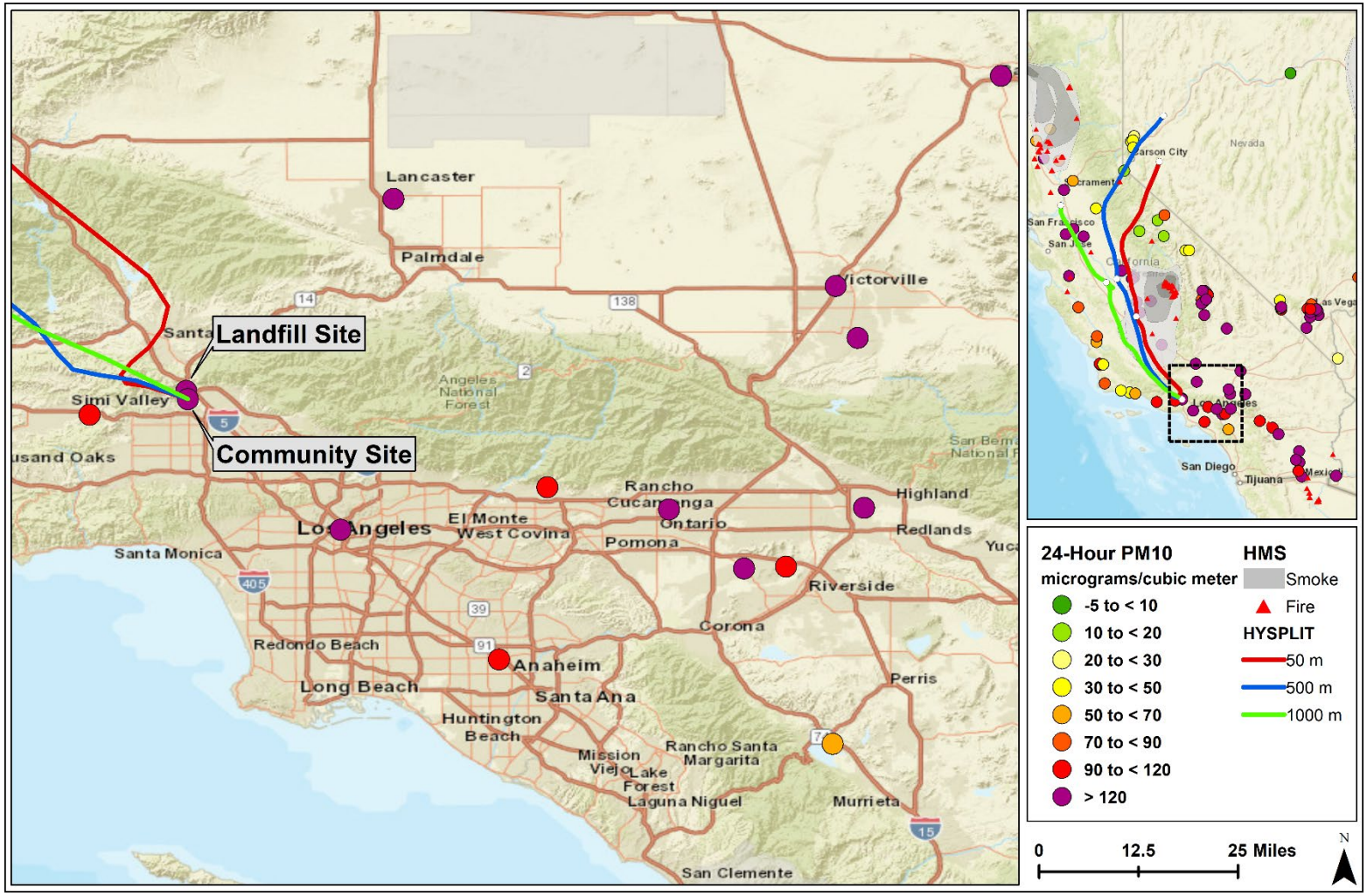

Figure 3. PM_{10} concentrations at sites across the Los Angeles area on October 11, 2021. Colors correspond to 24-hr PM_{10} concentrations in µg/m3. The NOAA HYSPLIT trajectory model is used to model wind flow at three different heights: 50 meters (red line), 500 meters (blue line), and 1,000 meters (green line) above ground from the Community site at the time of maximum hourly PM_{10} concentrations. Note: several sites (within the left map domain and southern California) recorded 24-hr PM_{10} concentrations above the federal standard. Red triangles depict locations of the active wildfire hotspot events on this day, and grey boundaries represent HMS smoke plumes.

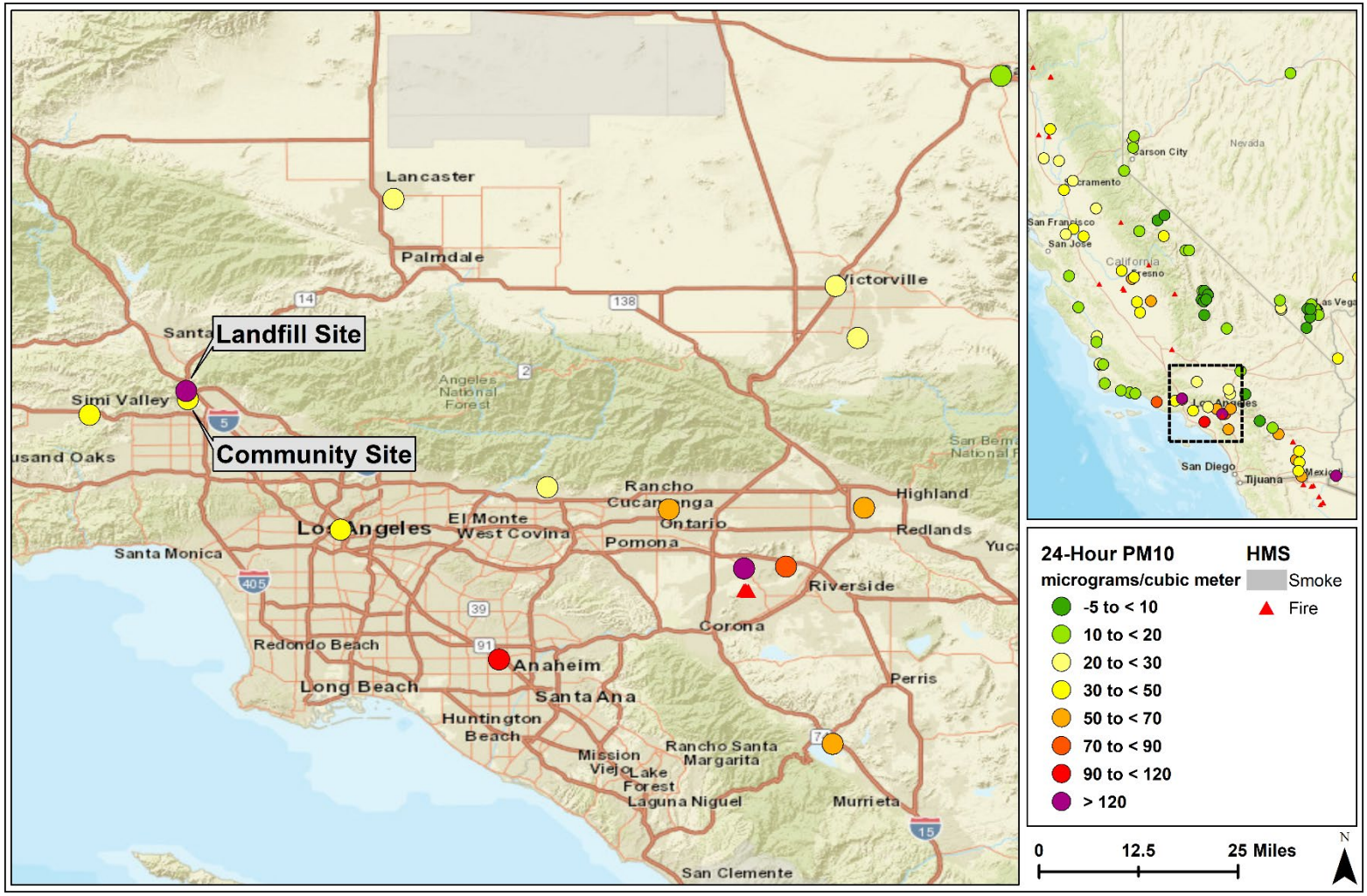

Figure 4. PM_{10} concentrations at sites across the Los Angeles area on November 25, 2021. Colors correspond to 24-hr PM_{10} concentrations in $\mu g/m^3$. Note: one other site (within the left map domain) recorded 24-hr PM_{10} concentrations above the federal standard. There was no detectable wildfire smoke within this map domain on this day.

Although there was substantial wildfire activity causing widespread smoke in southern California on September 23, 2021 (Figure 2), no other site within the left map domain exceeded the federal 24-hr PM_{10} standard. However, it is difficult to determine if wildfire smoke had no impact on PM_{10} concentrations at the Landfill site on this day because it likely affected air quality throughout southern California. As shown in Figure 3, 24-hr PM_{10} concentrations measured at several sites across the southern California area, including the Landfill and Community sites, on October 11, 2021, exceeded the federal 24-hr PM_{10} standard. Wildfire activity within the area was likely the main cause of this region-wide PM_{10} event; back trajectories indicate transport from wildfire smoke-laden central California to the Community site by noon (12:00 PM PDT) on October 11. However, many sites outside of the smoke areas also experienced elevated 24-hr PM_{10} concentrations; therefore, it is difficult to quantify the impact landfill activities had on the Landfill site. Conversely, federal exceedances occurring at the Landfill site on November 25 were nearly distinctive within the Los Angeles area. The Landfill site concentrations were 6.3 times higher than concentrations measured at the Community site on November 25 (concentrations at the Community site did not exceed the State PM_{10} standard on November 25). We assume that landfill activity played a key role in the November 25 federal exceedance; however, the level of uncertainty in quantifying landfill contributions to neighborhood-scale pollutant concentrations remains high without the presence of an upwind landfill monitoring site.

4. Average and Maximum Black Carbon and PM_{10} Concentrations

Although no federal or state standards exist for BC concentrations in ambient air, BC is a measurable component of ambient air that correlates well with DPM. Because of growing evidence that DPM is associated with several negative health effects, BC is often measured in an attempt to quantify the relative amounts of DPM in ambient air. Findings from the Multiple Air Toxics Exposure Study IV (MATES IV), conducted by the South Coast Air Quality Management District (SCAQMD), found DPM to be the most important toxic air pollutant contributing to negative health impacts in the Los Angeles basin (South Coast Air Quality Management District, 2015).

BC is measured by an Aethalometer, which passes air through a filter tape trapping the suspended particles. Light-absorbing particles attenuate a light beam projected through the deposit. The buildup of BC on the air sampling tape causes an artifact that affects the accuracy of the measured concentration (Drinovec et al., 2015; Allen, 2014), subjecting aethalometers to a saturation effect. Instrument response is dampened with heavier loading (i.e., higher concentrations) of BC aerosol. This artifact can cause BC concentration readings to be lower than the true concentration. However, mathematical methods to correct the BC concentration values are available and widely used. All the reported BC values to date from the Landfill, Landfill North, and Community sites have been adjusted in this report to compensate for this tape saturation effect; this compensation was not performed in quarterly reports prior to the 29th Quarterly Report (winter 2015). Because the compensation process changes the reported concentration, and because uncompensated values were used in previous reports, prior-year BC concentrations shown in this report do not match concentrations reported prior to the 29th Quarterly Report. All BC data shown in this Quarterly Report have been compensated, with the exception of unavailable data from the baseline year.

The 24-hr average and maximum compensated BC concentrations collected during the 2021 fall quarter, the compensated BC data from the fall quarters of the 13 previous years, and the uncompensated data from the baseline year are provided in Table 3. The 2021 fall quarter 24-hr BC concentration average at the Landfill site is higher than all of the previous fall quarters since the 2014 fall quarter, except the 2020 fall quarter. At the Community site, the 2021 fall quarter 24-hr BC concentration average is lower than in the 2020 fall quarter, but still higher than the previous quarters since 2017.

Table 3. 24-hr BC concentrations for the fall quarter of the baseline year (2002) and each year from 2008 to 2021. Uncompensated BC values are reported for the 2002 fall quarter. The most recent fall quarter is shown in **bold**.

Site	Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
			Average 24-Hr	Maximum 24-Hr
Sunshine Canyon Landfill	09/01/02–11/30/02	Baseline Year	1.26*	2.83*
	09/01/08–11/30/08	2008 Fall	1.47	2.88
	09/01/09–11/30/09	2009 Fall	1.21	3.45
	09/01/10–11/30/10	2010 Fall	0.87	2.74
	09/01/11–11/30/11	2011 Fall	1.07	2.71
	09/01/12–11/30/12	2012 Fall	0.95	2.63
	09/01/13–11/30/13	2013 Fall	0.92	2.32
	09/01/14–11/30/14	2014 Fall	0.81	2.42
	09/01/15–11/30/15	2015 Fall	0.48	1.17
	09/01/16–11/30/16	2016 Fall	0.59	1.64
	09/01/17–11/30/17	2017 Fall	0.54	1.30
	09/01/18–11/30/18	2018 Fall	0.55	1.43
	09/01/19–11/30/19	2019 Fall	0.51	1.62
	09/01/20–11/30/20	2020 Fall	0.75	1.90
	09/01/21–11/30/21	**2021 Fall**	**0.63**	**1.83**
Sunshine Canyon Landfill North	06/01/16–08/31/16	2016 Fall	0.64	1.95
Community Site	09/01/02–11/30/02	Baseline Year	1.31*	2.92*
	09/01/08–11/30/08	2008 Fall	0.86	6.15
	09/01/09–11/30/09	2009 Fall	1.00	3.23
	09/01/10–11/30/10	2010 Fall	0.80	2.47
	09/01/11–11/30/11	2011 Fall	0.95	2.55
	09/01/12–11/30/12	2012 Fall	0.77	2.07
	09/01/13–11/30/13	2013 Fall	0.57	1.63
	09/01/14–11/30/14	2014 Fall	0.83	1.98
	09/01/15–11/30/15	2015 Fall	0.64	1.68

Site	Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
			Average 24-Hr	Maximum 24-Hr
	09/01/16–11/30/16	2016 Fall	0.64	1.54
	09/01/17–11/30/17	2017 Fall	0.46	1.22
	09/01/18–11/30/18	2018 Fall	0.57	1.55
	09/01/19–11/30/19	2019 Fall	0.48	1.88
	09/01/20–11/30/20	2020 Fall	0.68	2.05
	09/01/21–11/30/21	**2021 Fall**	**0.55**	**1.51**

[a] Uncompensated BC values.
[b] Data taken from the secondary Aethalometer between April 20 and May 24, 2019, were used without corrections.

Distributions of 24-hour average PM_{10} and BC data from fall quarters of 2008 through 2021 (presented as notched box-whisker plots[5]), and percentile trends for these metrics, are shown in Figures 5 through 8.

[5] A notched box-whisker plot shows the entire distribution of concentrations for each year. Each box illustrates the 25th (lower box extent), 50th (median, midline), and 75th (upper box extent) percentiles. The extent of the box indicates the interquartile range (IQR), where 50% of the data lie. The whiskers indicate values that are up to 1.5 times the IQR from the 25th or 75th percentile. Data outside of the IQR are referred to as "outliers" and are plotted individually. The boxes are notched (narrowed) at the median and return to full width at the 95% lower- and upper-confidence interval values (i.e., the extents of the notches indicate the range in which the median falls with 95% confidence). If the notches of any two boxes do not overlap, there is strong evidence that the medians are statistically different at the 95% confidence level.

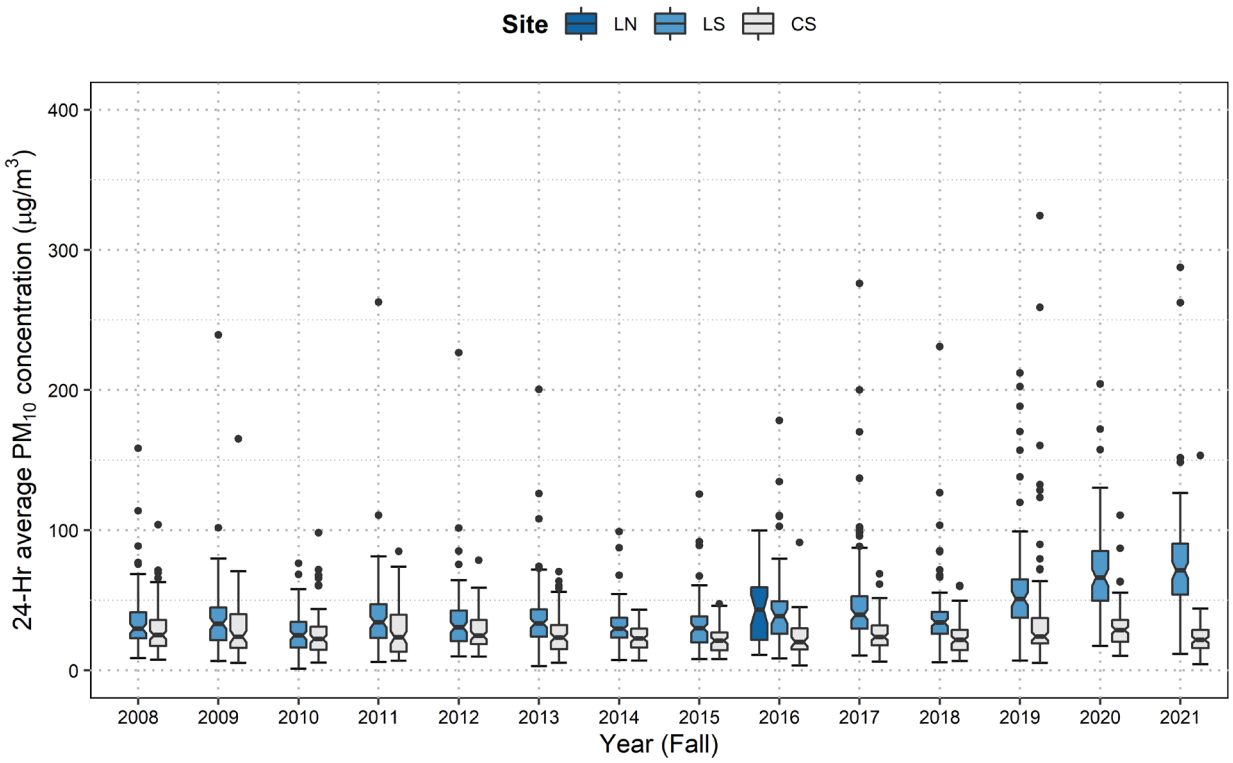

Figure 5. Distribution of 24-hr average PM_{10} concentrations at the Sunshine Canyon Landfill North site, Landfill site, and Community site during fall (September-November) quarters from 2008 to 2021.

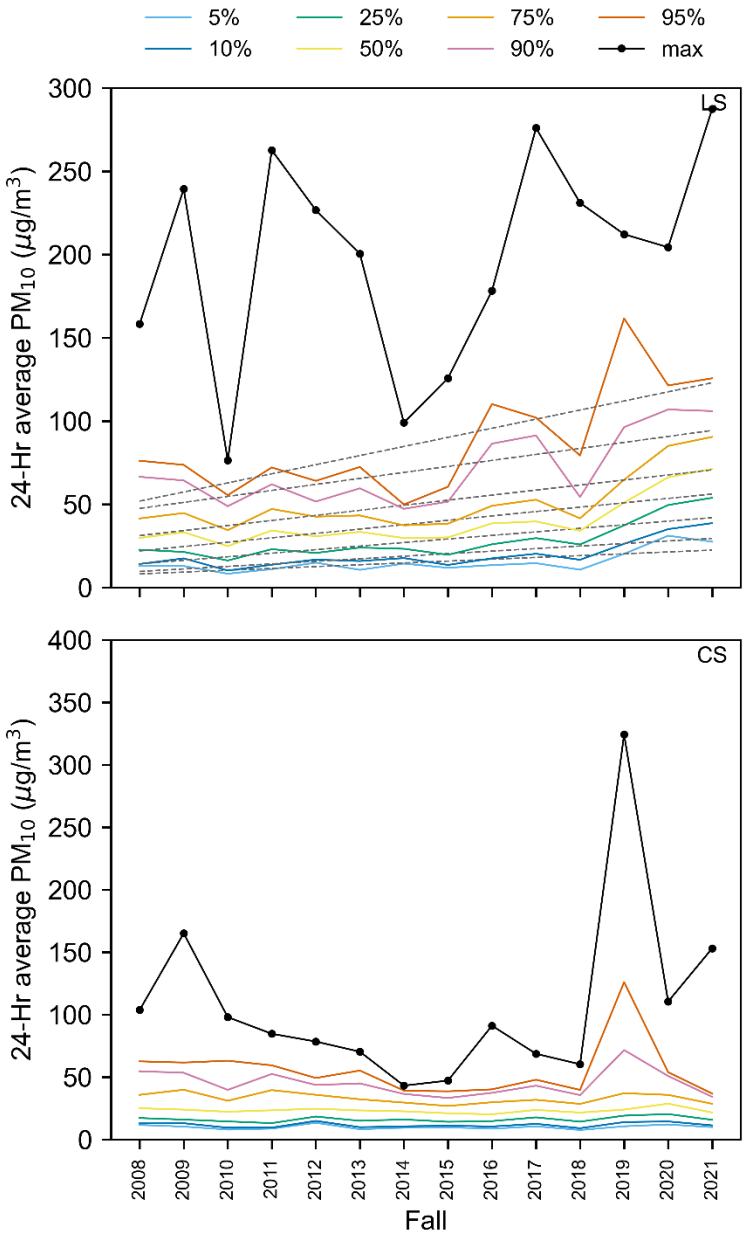

Figure 6. Trends of 24-hr average PM_{10} maxima and percentiles at the Sunshine Canyon Landfill site (top) and Community site (bottom) during fall (September-November) quarters from 2008 to 2021. The colored dashed lines denote statistically significant decreasing linear trends. Statistical significance was defined at the 95% confidence level (*p-value* ≤ 0.05).

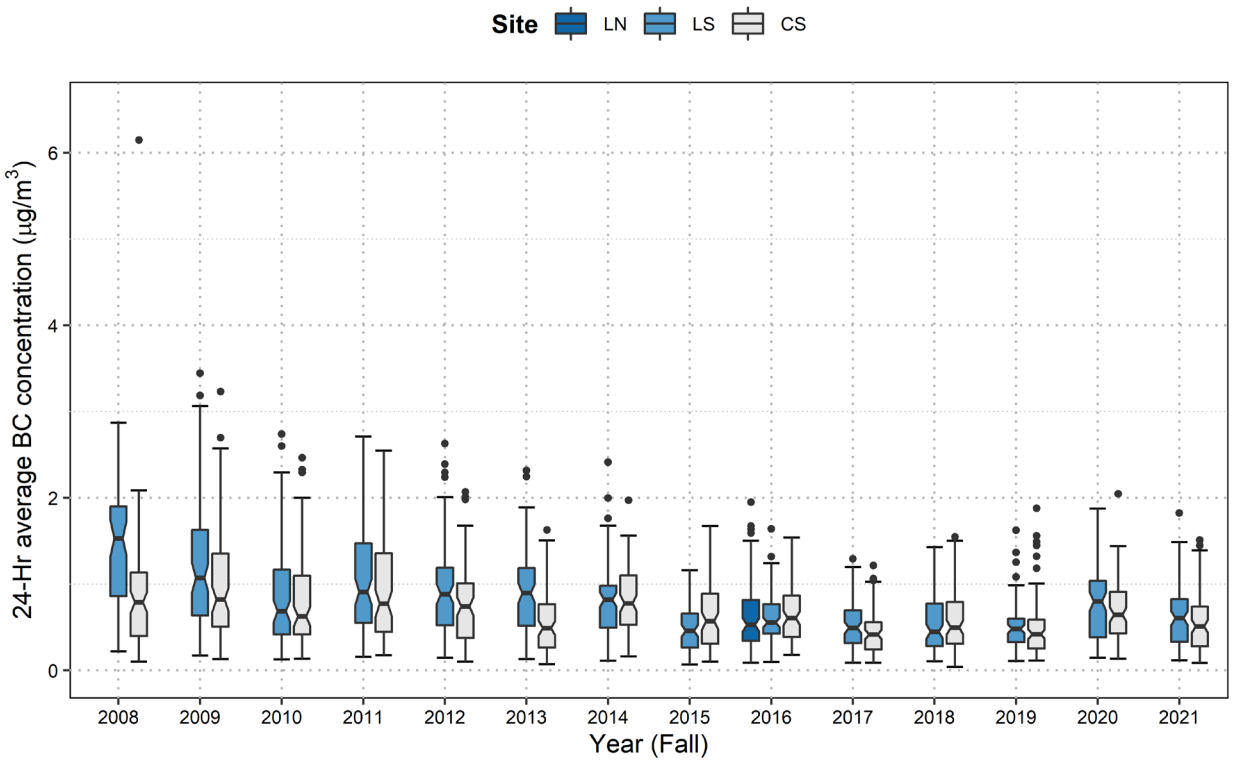

Figure 7. Distribution of 24-hr average BC concentrations at the Sunshine Canyon Landfill North site, Landfill site, and Community site during fall (September-November) quarters from 2008 to 2021.

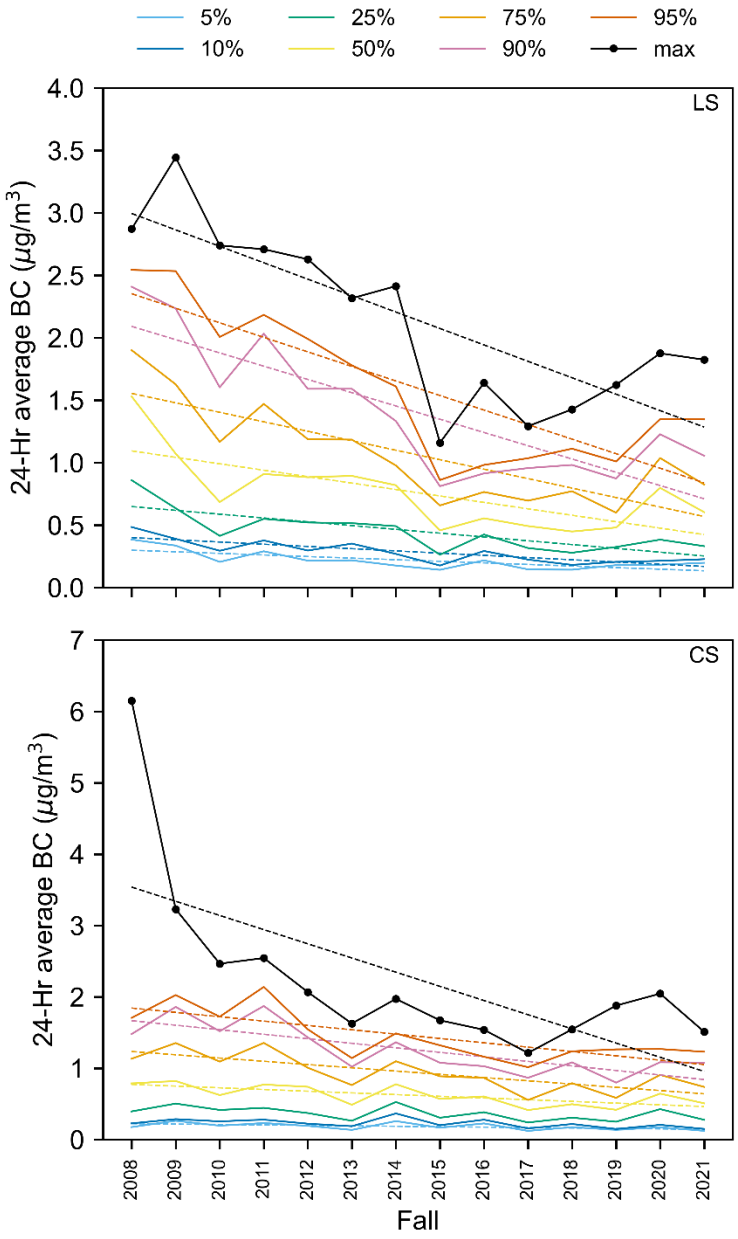

Figure 8. Trends of 24-hr average BC maxima and percentiles at the Sunshine Canyon Landfill site (top) and Community site (bottom) during fall (September-November) quarters from 2008 to 2021. The colored dashed lines denote statistically significant decreasing linear trends. Statistical significance was defined at the 95% confidence level (*p-value* ≤ 0.05).

At this time of year, the median 24-average PM_{10} concentrations measured at the Community site are usually lower than those measured at the Landfill site (Figure 5). This remained true in the 2021 fall quarter. As indicated by the non-overlapping notches (and the entire interquartile range) in the box-whisker plot, the difference between the median 24-hour PM_{10} concentrations at the Community and the Landfill sites is statistically significant. At the Landfill site, there is a statistically

significant increasing trend in all of the 24-hr average percentiles, but not in the maximum (Figure 6). All percentiles except the 5th and 90th percentiles of the 24-hr average PM_{10} concentration at the Landfill site have increased since the 2020 fall quarter. At the Community site, there is not a statistically significant trend for all the 24-hr average PM_{10} percentiles or maximum value; all percentiles of the 2021 fall quarter are lower than their counterparts in the 2020 fall quarter. However, the maximum 24-hr average PM_{10} concentration of the 2021 fall quarter at the Community site is higher than the previous year, but still lower than the 2019 fall quarter.

During the fall quarters, the median 24-hr average BC concentrations are not usually significantly different between the Landfill and the Community sites, as indicated by overlapping notches in the box-whisker plot (Figure 7). In the fall 2021 quarter, the median 24-hr average BC concentration at the Landfill site was not statistically higher than at the Community site. There is some year-to-year variability in median 24-hr average BC concentrations over the 14 recorded consecutive years, but the range of 24-hr average BC values has generally decreased over time at both monitoring sites. In the fall 2021 quarter, both the Landfill site and the Community site saw lower median 24-hr average BC concentrations than in the previous fall quarter.

There is a statistically significant decreasing trend in all percentiles and the maximum 24-hr average BC concentrations at the Landfill site during fall quarters over the observational record (Figure 8). Only the 5th and 10th percentiles of the 24-hr average BC concentrations at the Landfill site are higher in the fall 2021 quarter than the previous fall quarter. At the Community site, there is a statistically significant declining trend in fall quarter 24-hr BC concentrations at all percentiles except the 10th and 25th, and the 24-hr maximum BC over the 14 recorded consecutive years; all percentiles of 24-hr BC and 24-hr maximum BC were lower in the 2021 fall quarter than in the previous one. There were no statistically significant increasing trends in the maxima or percentiles.

5. Field Operations

Tables 4 and 5 list dates and major tasks associated with visits to the Landfill site and the Community site during the 2021 fall quarter.

Table 4. Landfill monitoring site (visits, field maintenance, and operations.

Date of Site Visit	Description of Work
09/07/2021	Collected PM_{10} and BC data Restarted Aethalometer Cleaned roller on Aethalometer – found indication of moisture on tape Cleaned roller, vane, and nozzle on BAM Performed flow test on BAM and Aethalometer
10/01/2021	Replaced BAM tape
10/04/2021	Restarted the router after communications failure
10/13/2021	Replaced Cell antenna and antenna cable
10/21/2021	Collected PM_{10} and BC data Restarted Aethalometer Performed flow test on Aethalometer
11/16/2021	Installed new MP70 4G router
12/02/2021[a]	Collected PM_{10} and BC data Restarted PC and DRDAS applications Restarted BAM instrument

[a] The next site visit that occurred after the current quarter is included in this report. The information from this site visit is used to assess the quality of the last portion of data from the current quarter.

Table 5. Community site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
10/21/2021	Computer running Envidas is still out for repair

Aethalometer and BAM flow rates measured with a National Institute of Standards and Technology (NIST)-traceable flow standard are shown in Table 6. BAM flow rates are volumetric (i.e., they depend on local temperature and pressure), and Aethalometer flow rates are at standard temperature and pressure. The target flow rate of the BAM is 16.7 liters per minute (lpm) volumetric to meet the

10-micron particle cut point of the inlet, with an acceptable range of 16.0 lpm to 17.3 lpm. The Aethalometer has no particle size cut point.

Table 6. Flow rates for the BAM PM_{10} and Aethalometer BC monitors at the Landfill and Community sites. "Ref." is the Reference and "Aeth." is the Aethalometer.

Location	Date	Flow Rate (lpm)					
		As Found		As Left		As Found	
		BAM	Ref.	BAM	Ref.	Aeth.	Ref.
Sunshine Canyon Landfill (LS)	09/07/2021	16.7	16.7	16.84	16.7	4	4.15
	10/21/2021	16.7	16.7	NA	NA	NA	NA

[a] The next site visit that occurred after the current quarter is included in this report. The information from this site visit is used to assess the quality of the last portion of data from the current quarter.

6. References

Allen G. (2014) Analysis of spatial and temporal trends of black carbon in Boston. Report prepared by Northeast States for Coordinated Air Use Management (NESCAUM), Boston, MA, January. Available at http://www.nescaum.org/documents/analysis-of-spatial-and-temporal-trends-of-black-carbon-in-boston/nescaum-boston-bc-final-rept-2014.pdf/.

Drinovec L., Močnik G., Zotter P., Prévôt A.S.H., Ruckstuhl C., Coz E., Rupakheti M., Sciare J., Müller T., Wiedensohler A., and Hansen A.D.A. (2015) The "dual-spot" Aethalometer: an improved measurement of aerosol black carbon with real-time loading compensation. *Atmospheric Measurement Techniques*, 8, 1965-1979, doi: 10.5194/amt-8-1965-2015. Available at http://www.atmos-meas-tech.net/8/1965/2015/amt-8-1965-2015.pdf.

South Coast Air Quality Management District (2015) Multiple Air Toxics Exposure Study in the South Coast Air Basin: MATES IV. Final report, August. Available at http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7.