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Ambient Air Quality Monitoring at Sunshine Canyon Landfill and Van Gogh Elementary School

Continuous monitoring of particulate matter, black carbon, wind speed, and wind direction began at the Sunshine Canyon Landfill (Landfill Site) and at Van Gogh Elementary School (Community Site) in Granada Hills in fall 2007. The 3rd monitoring site located at the north end of the landfill was established in April 2026.

These data are used to characterize ambient air pollution concentrations on a neighborhood scale in the context of the Los Angeles Basin and to evaluate the impact of landfill operations on air quality in the community.

Particulate Matter (PM_{10})

PM_{10} is particulate matter less than 10 microns in diameter. A human hair is about 100 micrometers in diameter and is therefore at least 10 times larger. PM_{10} is present in dust, smoke, soot, and dirt. It can be inhaled and drawn into the lungs, causing health problems for some people.

Black Carbon (BC)

BC is a sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuels. Many BC particles are too small to be visible. BC emissions can cause adverse health and climate effects.

Wind

Wind speed (WS) and wind direction (WD) are measured because they can significantly affect when and how far airborne pollutants travel from their sources.


Wind-Blown Dust


Landfill Operations


Dirt Roads


Vehicular Traffic

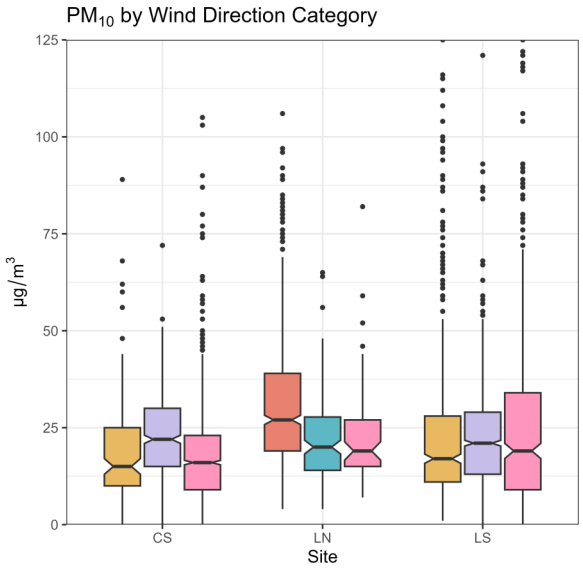

Diesel Engines


Industrial Activities

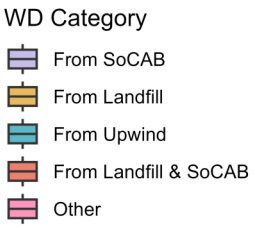
Statistical Summary for the Spring 2026 Quarter

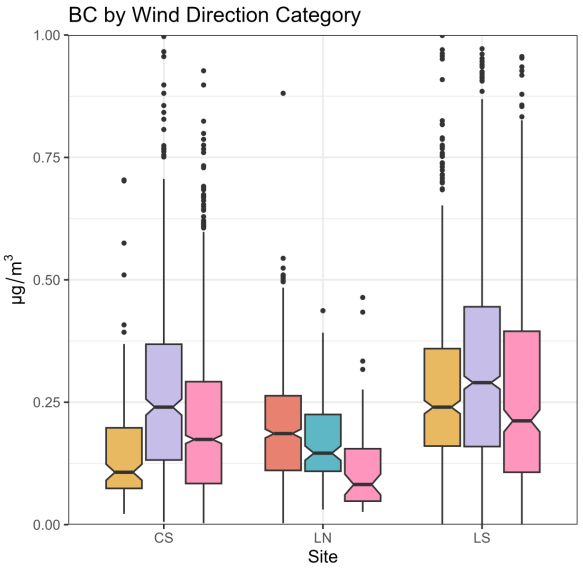
PM_{10} Exceedances

	Federal Exceedances			*State Exceedances*		
	Landfill	**Landfill North**	**Community**	**Landfill**	**Landfill North**	**Community**
Total PM_{10} Spring Quarter Exceedances over 19 Years	16	0	1	333	16	68
Total Exceedances in the 74th Quarter	0	0	0	8	2	0



Source Contributions of PM_{10} and BC Concentrations in the 74th Quarter





Landfill Site

PM_{10}: Higher average concentrations are measured at the Landfill site when the wind is blowing from the SoCAB (southern California Air Basin) and other directions excluding the direction of the landfill. This site sees the highest hourly concentrations, and thus seems to be more susceptible to wind-blown dust.

BC: Higher average concentrations are measured at the Landfill site when the wind is blowing from the SoCAB, followed by the direction of the landfill.

Landfill North Site

PM_{10}: Higher average concentrations are measured at the Landfill North site when the wind is blowing from the south (SoCAB and the direction of the landfill).

BC: Higher average concentrations are measured at the Landfill North site when the wind is blowing from the south (SoCAB, and the direction of the landfill).

Community Site

PM_{10}: Higher average concentrations are measured at the Community site when the wind is blowing from the south (SoCAB), followed by other directions excluding the direction of the landfill.

BC: Higher average concentrations (as well as the high hourly concentrations) are measured at the Community site when the wind is blowing from the SoCAB. Conversely, the lowest concentrations occur when the wind is blowing from landfill.

Data Completeness

	Data Capture			*Valid Data Used for Analysis*		
	PM_{10}	**BC**	**WS and WD**	**PM_{10}**	**BC**	**WS and WD**
Landfill Site	99.64%	99.95%	100%	98.68%	99.95%	100%
Landfill North Site	41.48%	41.76%	41.75%	99.78%	100%	100%
Community Site	99.73%	99.95%	100%	97.96%	99.95%	100%

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

March 1, 2026 – May 31, 2026

Annual Report Prepared for

Planning Department, City of Los Angeles
and
Los Angeles County Department of
Regional Planning

July 2026

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

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Quarterly Report

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Cover photograph shows the aerial view of the Sunshine Canyon Landfill's monitoring sites.

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Acronyms

Acronym	Definition
BAM	beta attenuation mass
BC	black carbon
Community site	Van Gogh Elementary School
DPM	diesel particulate matter
Landfill North site	Sunshine Canyon Landfill North monitoring site
Landfill site	Sunshine Canyon Landfill
lpm	liter per minute
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
WD	wind direction
WS	wind speed

Executive Summary

Background

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

In early April, the re-establishment of the Sunshine Canyon Landfill North (upwind) monitoring site (Landfill North site) was completed. This will serve as a significant improvement to determine landfill contributions to neighborhood-scale pollutant concentrations. The Landfill North monitoring site is located on the northern rim of the landfill boundary and exactly parallel measurements being continuously made at the southern ridge of the landfill and at the Community monitoring site. The addition of the monitoring site will provide insight on how landfill-based emissions of PM_{10} and diesel particulate matter impact air quality in the nearby community.

PM_{10} concentrations are compared with federal and state PM_{10} standards. When PM_{10} concentrations are above the standard (i.e., an exceedance occurs), additional comparisons are made with the historical, regional, and annual ambient PM_{10} concentrations. PM_{10} and BC data are analyzed in an in-depth annual report that characterizes the impacts of landfill operations on ambient air quality as observed at the Community site. This analysis involves quantifying PM_{10} and BC concentrations, identifying exceedances, and comparing concentrations between the Landfill and Community sites.

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 Seventy-Fourth Quarterly Report summarizes the March 1, 2026 – May 31, 2026 (2026 spring quarter) monitoring results from the 18th year of continuous data collection.

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

Statistics

For this quarter, the percentage of hourly PM_{10} data captured was 41.58% at the Landfill North site, 99.64% at the Landfill site, and 99.73% at the Community site. Please note, the Landfill North site became active April 23, 2026, and therefore complete data capture is reduced this quarter. Of the captured PM_{10} data, 0.22% at the Landfill North site, 1.32% at the Landfill site, and 2.04% at the Community site were deemed to be invalid. 40.20% of the data at the Landfill North site, 44.64% of the data at the Landfill site, and 9.49% of the data at the Community site were deemed to be suspect and underwent further review.

The hourly BC data-capture rate was 41.76% at the Landfill North site, 99.95% at the Landfill site, and 99.95% at the Community site. Of the hourly BC data captured, 0.05% at the Landfill site and 0.05% at the Community site were deemed to be invalid, while no data were deemed to be invalid at the Landfill North site. No data at the Landfill North site, Landfill site, or Community site were deemed to be suspect.

The 1-min WS and WD data-capture rate was 100% at the Landfill and Community sites, and 41.75% at the Landfill North site. Of the captured 1-min WS and WD data, none were deemed to be invalid or suspect at either the Landfill North, Landfill, or Community sites.

During this quarter, the state 24-hr PM_{10} standard (i.e., 50 $\mu g/m^3$) was exceeded on 6% of days (2 out of 38 valid days) at the Landfill North site and on 9% of days (8 out of 89 valid days) at the Landfill site; the standard was never exceeded at the Community site. The federal 24-hr PM_{10} standard (i.e., 150 $\mu g/m^3$) was not exceeded at the Landfill North, Landfill, or Community sites. The 24-hr average BC concentration was 0.19 $\mu g/m^3$ at the Landfill North site, 0.32 $\mu g/m^3$ at the Landfill site, and 0.23 $\mu g/m^3$ at the Community site.

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) as a surrogate for diesel particulate matter (DPM) concentrations, instrument flow rate verification (quality control) data, and field operations for the quarterly period between March 1, 2026, and May 31, 2026. The collected data are validated and evaluated quarterly for completeness. Continuous monitors have collected data in the spring for 18 years at the Sunshine Canyon Landfill site (Landfill site; previously called the Berm site; "SBS" in subsequent figures) and the Van Gogh Elementary School Community site (Community site; "VGS" in subsequent figures). Starting April of this quarter, an additional monitoring site was established on the north end of the Sunshine Canyon Landfill property (Landfill North site). The addition of this monitoring site provides significant improvement to determine the contribution landfill-based emissions of PM_{10} and DPM have on air quality in the nearby community. Monitoring site locations are shown in **Figure 1**.

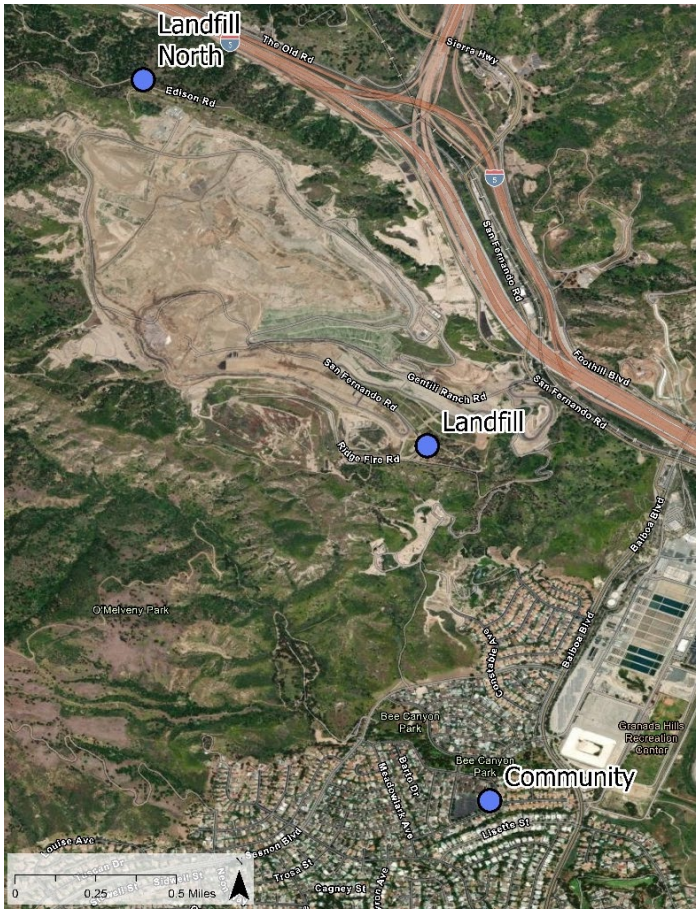

Figure 1. An aerial view of the Sunshine Canyon Landfill, including the Landfill, Community, and newly established Landfill North monitoring sites (blue triangles).

PM_{10} is measured using a beta attenuation mass (BAM) monitor, and BC is measured using an aethalometer (the Magee Scientific Aethalometer AE33 is the dominant instrument for monitoring BC). The Landfill North site ("SBSU" in subsequent figures) shown in Figure 1 was installed in December 2015, decommissioned on May 31, 2017, and was reinstalled on April 23, 2026. The Landfill site was relocated approximately 720 feet to the northwest during the last days of the 2023 summer quarter (August 29–31, 2023) to eliminate the negative impacts of nearby odor misters on the data.

Monitoring is conducted to fulfill stipulations in the City of Los Angeles' Conditions of Approval for 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 2026 spring quarter are listed in **Table 1**. Data deemed to be suspect are included in subsequent analyses (e.g., regional comparisons, if applicable), and invalid data are not included. The percentage of data capture for PM_{10} was 41.48% at the Landfill North site, 99.64% at the Landfill site, and 99.73% at the Community site. Please note, data capture at the Landfill North site is based on an April 23, 2026 start date. Of the captured PM_{10} data, 0.22% at the Landfill North site, 1.32% at the Landfill site, and 2.04% at the Community site were deemed to be invalid. The percentage of hourly PM_{10} values deemed to be suspect was 34.63% at the Landfill North site, 40.92% at the Landfill site, and 9.49% at the Community site.

Table 1. Data completeness statistics for hourly PM_{10}, hourly BC, and 1-min WS and WD data for the 2026 spring quarter monitoring period. Statistics were calculated from April 23, 2026, for the Landfill North site.

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
Landfill North Site	4/23/26 – 5/31/26	41.48	41.76	41.75	99.78	100	100	34.63	0	0
Landfill Site	3/1/26 – 5/31/26	99.64	99.95	100	98.68	99.95	100	40.92	0	0
Community Site	3/1/26 – 5/31/26	99.73	99.95	100	97.96	99.95	100	9.49	0	0

Notes:
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.

The hourly BC data-capture rate was 41.76% at the Landfill North site, 99.95% at the Landfill site, and 99.95% at the Community site. Of the hourly BC data captured, 0.05% at the Landfill site and the Community site were deemed to be invalid, while no data was deemed to be invalid at the Landfill North site. No data at the Landfill North, Landfill, or Community sites were deemed to be suspect.

The wind speed (WS)/wind direction (WD) capture percentage was 41.75% at the Landfill North site, 100% at the Landfill site, and 100% at the Community site, and no data were deemed to be invalid or suspect.

3. PM_{10} Exceedances

Federal and state PM_{10} exceedances for the baseline spring quarter (2002), the previous 18 spring quarters (2008–2025), and the current spring quarter (2026) are summarized in **Table 2** for the Landfill North site, **Table 3** for the Landfill site, and **Table 4** for the Community site. The state standard was exceeded at the Landfill North site on 2 occasions, at the Landfill site on 8 occasions, and was not exceeded at the Community site in the spring quarter.

The federal 24-hr PM_{10} standard (i.e., 150 µg/m^3) was not exceeded at the Landfill North, Landfill, or Community sites during the spring quarter.

Table 2. Number of federal and state 24-hr PM_{10} standard exceedances during spring quarters for 2016–2017 and 2026 at the Landfill North site. Values in the "Federal 24-hr" column are the number of exceedances and the date(s) when those exceedances occurred. Values in the "State 24-hr" column are the number of exceedances and the total number of days on which valid 24-hr averages were measured; the percentage of exceedances (relative to the total number of days with valid concentrations) is also listed. The most recent spring quarter is bolded.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m^3	State 24-hr 50 µg/m^3
3/1/16–5/31/16	2016 Spring	0	5/88 (6%)
3/1/17–5/31/17	2017 Spring	0	9/92 (10%)
3/1/26–5/31/26	**2026 Spring**	**0**	**2/38 (6%)**

Table 3. Number of federal and state 24-hr PM_{10} standard exceedances during spring quarters for the baseline year (2002) and 2008–2026 at the Landfill site. Values in the "Federal 24-hr" column are the number of exceedances and the date(s) when those exceedances occurred. Values in the "State 24-hr" column are the number of exceedances and the total number of days on which valid 24-hr averages were measured; the percentage of exceedances (relative to the total number of days with valid concentrations) is also listed. The most recent spring quarter is bolded.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m³	State 24-hr 50 µg/m³
3/1/02–5/31/02	Baseline Year (2002)	0	21/56 (38%)
3/1/08–5/31/08	2008 Spring	1 (5/21/08)	20/89 (22%)
3/1/09–5/31/09	2009 Spring	1 (5/6/09)	24/89 (27%)
3/1/10–5/31/10	2010 Spring	0	10/90 (11%)
3/1/11–5/31/11	2011 Spring	1 (4/30/11)	8/49 (16%)
3/1/12–5/31/12	2012 Spring	1 (5/22/12)	15/89 (17%)
3/1/13–5/31/13	2013 Spring	2 (3/21/13, 4/8/13)	34/91 (37%)
3/1/14–5/31/14	2014 Spring	0	19/92 (21%)
3/1/15–5/31/15	2015 Spring	0	5/91 (5%)
3/1/16–5/31/16	2016 Spring	0	1/49 (2%)
3/1/17–5/31/17	2017 Spring	6 (3/27/17, 4/20/17, 4/21/17, 4/25/17, 4/27/17, 4/28/17)	26/86 (24%)
3/1/18–5/31/18	2018 Spring	1 (4/12/18)	5/87 (6%)
3/1/19–5/31/19	2019 Spring	1 (4/9/19)	6/87 (7%)
3/1/20–5/31/20	2020 Spring	0	24/72 (34%)
3/1/21–5/31/21	2021 Spring	0	50/88 (57%)
3/1/22–5/31/22	2022 Spring	1 (4/5/22)	51/86 (59%)
3/1/23–5/31/23	2023 Spring	1 (4/19/23)	26/71 (37%)
3/1/24–5/31/24	2024 Spring	0	1/76 (2%)
3/1/25–5/31/25	2025 Spring	0	0/85 (0%)
3/1/26–5/31/26	**2026 Spring**	**0**	**8/89 (9%)**

Table 4. Number of federal and state 24-hr PM_{10} standard exceedances during spring quarters for the baseline year (2002) and 2008–2026 at the Community site. Values in the "Federal 24-hr" column are the number of exceedances and the date(s) when those exceedances occurred. Values in the "State 24-hr" column are the number of exceedances and the total number of days on which valid 24-hr averages were measured; the percentage of exceedances (relative to the total number of days with valid concentrations) is also listed. The most recent spring quarter is bolded.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m³	State 24-hr 50 µg/m³
3/1/02–5/31/02	Baseline Year (2002)	0	17/55 (31%)
3/1/08–5/31/08	2008 Spring	1 (05/21/08)	6/92 (7%)
3/1/09–5/31/09	2009 Spring	0	17/88 (19%)
3/1/10–5/31/10	2010 Spring	0	7/91 (8%)
3/1/11–5/31/11	2011 Spring	0	3/92 (3%)
3/1/12–5/31/12	2012 Spring	0	9/70 (13%)
3/1/13–5/31/13	2013 Spring	0	18/92 (20%)
3/1/14–5/31/14	2014 Spring	0	6/92 (7%)
3/1/15–5/31/15	2015 Spring	0	1/91 (1%)
3/1/16–5/31/16	2016 Spring	0	0/69 (0%)
3/1/17–5/31/17	2017 Spring	0	0/90 (0%)
3/1/18–5/31/18	2018 Spring	0	0/92 (0%)
3/1/19–5/31/19	2019 Spring	0	1/91 (2%)
3/1/20–5/31/20	2020 Spring	0	0/58 (0%)
3/1/21–5/31/21	2021 Spring	0	0/92 (0%)
3/1/22–5/31/22	2022 Spring	0	0/92 (0%)
3/1/23–5/31/23	2023 Spring	0	0/92 (0%)
3/1/24–5/31/24	2024 Spring	0	0/92 (0%)
3/1/25–5/31/25	2025 Spring	0	0/89 (0%)
3/1/26–5/31/26	**2026 Spring**	**0**	**0/92 (0%)**

Figure 2 shows PM_{10} concentrations throughout the most recent spring quarter, while highlighting days for which exceedances occurred. As mentioned above, the state standard was exceeded at the Landfill North site on 2 occasions, at the Landfill site on 8 occasions, and was not exceeded at the Community site in the spring quarter. Data shown in Figure 2 provide insight into the level of

influence and potential impact individual monitoring site exceedance days played on the other monitoring sites. For example, on May 17, 2026, the Landfill site registered a state exceedance with a 24-hr average PM_{10} concentration of 94 µg/m^3. However, the Landfill North and Community site 24-hr average PM_{10} concentration on the same day did not measure above 40 µg/m^3, suggesting an insignificant impact to the north and south of the Landfill site.

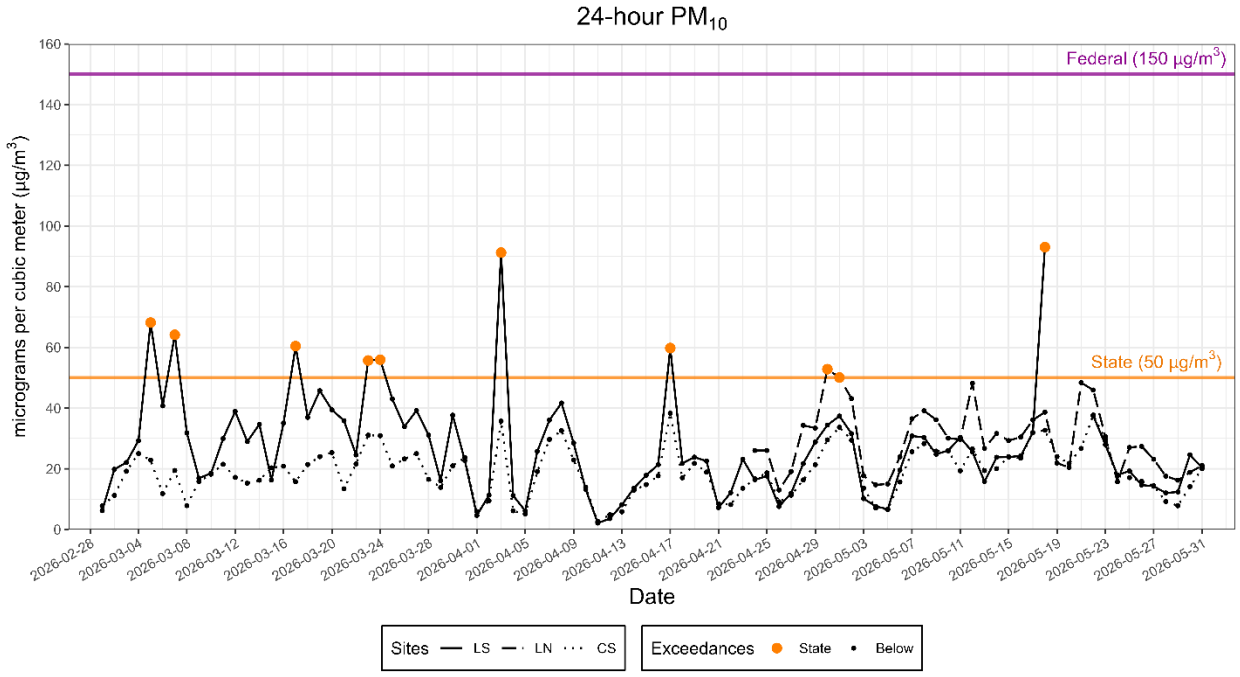

Figure 2. Time series of PM_{10} concentrations for each monitoring site in the spring quarter. Note, the Landfill North site was established on April 23, 2026, and therefore has no data available prior to that date.

To further analyze the impact of landfill contributions on the nearby community during high pollution level events, pollution roses were developed that focus on the exceedance days associated with the Landfill North site (2 days) and the Landfill site (8 days). A pollution rose, illustrated in **Figure 3**, is a wind rose variant used in air quality analysis that combines WD and WS data with pollutant concentration measurements to show which directions pollution is coming from and how strongly. Like a standard wind rose, it's plotted on a circular grid divided into compass directions, with the length of each colored segment representing the frequency of wind blowing from that direction, and the color bands within each segment representing concentration ranges of the pollutant being measured. This makes it a powerful diagnostic tool for identifying upwind emission sources, since a spike in concentrations that consistently aligns with wind coming from one particular direction points toward a source located that way, whereas a diffuse pattern across many directions suggests background or regional contributions rather than a single nearby source.

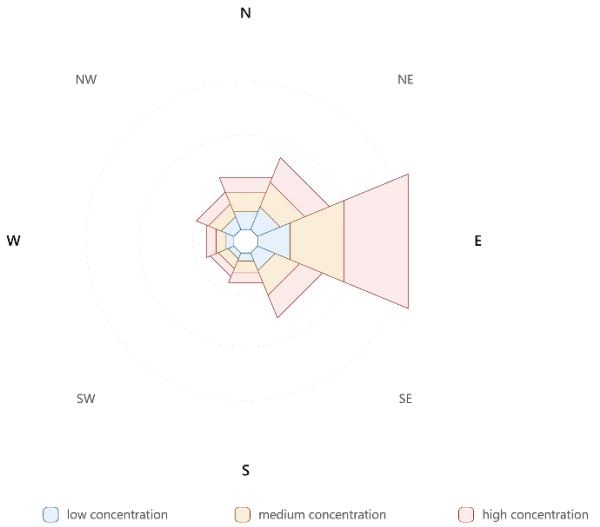

Figure 3. Illustration of a pollution rose.

As shown in **Figure 4,** state exceedance days at the Landfill North site ("LN" in figure) are predominantly characterized by landfill activity, where the wind is blowing from the south/southeast. Roughly 10% of the time winds are from the northwest; however, PM_{10} concentrations are relatively low during this time period. Similarly at the Landfill site ("LS" in figure), landfill activity is the predominate source of PM_{10} as northerly winds are associated with high concentrations over the 8 days in question.

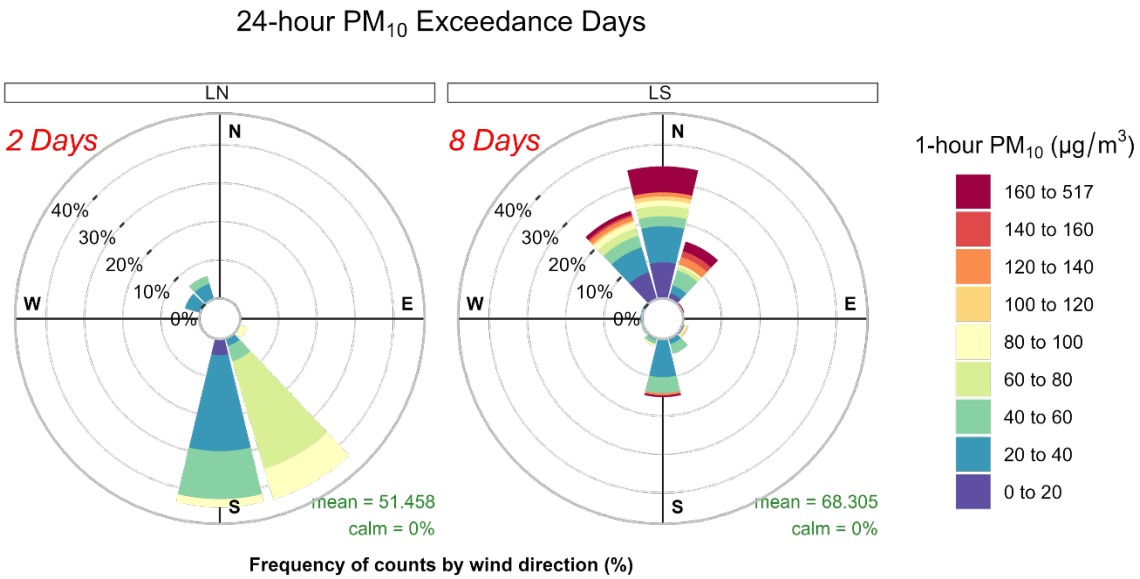

Figure 4. 24-hr PM_{10} exceedance day pollution roses. On the left is the pollution rose for the two exceedance days at the Landfill North site, and on the right is the pollution rose for the eight exceedance days at the Landfill site. Note, there were no exceedance days at the Community site in the spring quarter.

4. Average and Maximum BC 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 to quantify the relative amounts of DPM in ambient air. Findings from the Multiple Air Toxics Exposure Study V conducted by the South Coast Air Quality Management District found DPM to be the most important toxic air pollutant contributing to negative health impacts in the Los Angeles Basin (Nastri et al., 2021).

BC is measured by an aethalometer, which passes air through a filter tape to trap 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 aerosols. 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 reported BC values to date from the 29th Quarterly Report (spring 2015) onwards have been adjusted for the Landfill, Landfill North (when in use), and Community sites. Because the compensation process changes the reported concentrations, and because uncompensated values were used in previous reports, prior-year BC concentrations listed in this report do not match concentrations reported prior to the 29th Quarterly Report. All available BC data listed in this Quarterly Report have been compensated (data were unavailable from the baseline year).

The 24-hr average and maximum compensated BC concentrations collected during the 2026 spring quarter, the compensated BC data from the 17 previous spring quarters, and the uncompensated data from the baseline year are listed in **Table 5** for the Landfill North site, **Table 6** for the Landfill site, and **Table 7** for the Community site.

Table 5. The 24-hr BC concentrations for spring quarters for 2016–2017 and 2026 at the Landfill North site. The most recent spring quarter is bolded.

Quarterly Period	Quarter Name	BC Concentrations (µg/m^3)	
		Average 24-Hr	Maximum 24-Hr
3/1/16–5/31/16	2016 Spring	0.48	1.58
3/1/17–5/31/17	2017 Spring	0.39	0.97
3/1/26–5/31/26	**2026 Spring**	**0.19**	**0.33**

Table 6. The 24-hr BC concentrations for spring quarters from the baseline year (2002) and each year from 2008–2026 at the Landfill site. Uncompensated BC values are reported for the 2002 spring quarter. The most recent spring quarter is bolded.

Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
		Average 24-Hr	Maximum 24-Hr
3/1/02–5/31/02	Baseline Year (2002)	0.72[a]	2.18[a]
3/1/08–5/31/08	2008 Spring	0.80	2.30
3/1/09–5/31/09	2009 Spring	1.01	3.44
3/1/10–5/31/10	2010 Spring	0.64	1.88
3/1/11–5/31/11	2011 Spring	0.62	1.63
3/1/12–5/31/12	2012 Spring	0.65	1.60
3/1/13–5/31/13	2013 Spring	0.84	3.17
3/1/14–5/31/14	2014 Spring	0.64	1.46
3/1/15–5/31/15	2015 Spring	0.50	1.22
3/1/16–5/31/16	2016 Spring	0.50	1.47
3/1/17–5/31/17	2017 Spring	0.47	1.04
3/1/18–5/31/18	2018 Spring	0.45	1.04
3/1/19–5/31/19	2019 Spring	0.32	0.79
3/1/20–5/31/20	2020 Spring	0.32	0.93
3/1/21–5/31/21	2021 Spring	0.41	0.76
3/1/22–5/31/22	2022 Spring	0.40	0.89
3/1/23–5/31/23	2023 Spring	0.37	1.04
3/1/24–5/31/24	2024 Spring	0.31	0.88
3/1/25–5/31/25	2025 Spring	0.28	0.78
3/1/26–5/31/26	**2026 Spring**	**0.32**	**0.82**

Note: a. Uncompensated BC values.

Table 7. The 24-hr BC concentrations for spring quarters from the baseline year (2002) and each year from 2008–2026 at the Community site. Uncompensated BC values are reported for the 2002 spring quarter. The most recent spring quarter is bolded.

Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
		Average 24-Hr	Maximum 24-Hr
3/1/02–5/31/02	Baseline Year (2002)	0.72[a]	2.22[a]
3/1/08–5/31/08	2008 Spring	0.61	1.37
3/1/09–5/31/09	2009 Spring	0.81	1.95
3/1/10–5/31/10	2010 Spring	0.64	1.80
3/1/11–5/31/11	2011 Spring	0.54	1.47
3/1/12–5/31/12	2012 Spring	0.66	1.70
3/1/13–5/31/13	2013 Spring	0.66	1.49
3/1/14–5/31/14	2014 Spring	0.49	1.44
3/1/15–5/31/15	2015 Spring	0.61	1.68
3/1/16–5/31/16	2016 Spring	0.56	1.97
3/1/17–5/31/17	2017 Spring	0.49	1.12
3/1/18–5/31/18	2018 Spring	0.42	1.04
3/1/19-5/31/19	2019 Spring	0.31	0.75
3/1/20–5/31/20	2020 Spring	0.21	0.64
3/1/21–5/31/21	2021 Spring	0.36	0.66
3/1/22–5/31/22	2022 Spring	0.30	0.68
3/1/23–5/31/23	2023 Spring	0.34	0.90
3/1/24–5/31/24	2024 Spring	0.31	0.85
3/1/25–5/31/25	2025 Spring	0.28	0.57
3/1/26–5/31/26	**2026 Spring**	**0.23**	**0.69**

Note: a. Uncompensated BC values.

Figure 5 shows the pollution roses for BC concentrations collected at each monitoring site during the 2026 spring quarter. BC concentrations are the highest at the Landfill site (relative the other sites) and occur predominately when the wind is blowing from the south (from the Los Angeles Basin). However, while less frequent, high concentrations occur at the Landfill site when the wind is blowing from the direction of the landfill. At the Landfill North site, the predominate wind direction is from the landfill; however, concentration levels under these wind conditions are significantly lower compared to the other monitoring sites. The Community site sees a significantly different wind and

concentration pattern as it relates to the location of the landfill. The highest concentrations are captured when the wind is from the south/southwest/southeast (from the Los Angeles Basin).

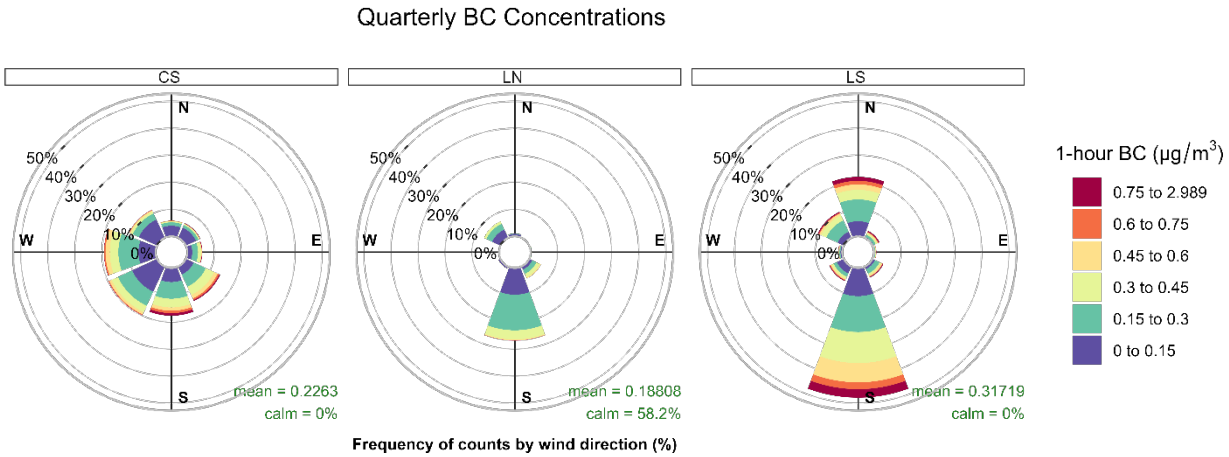

Figure 5. 1-hour black carbon pollution roses for the spring quarter. On the left is the pollution rose for the Community site (CS), the middle plot shows the Landfill North site (LN), and on the right is the pollution rose for the Landfill site (LS).

Distributions of 24-hr average PM_{10} and BC data from spring quarters 2008–2026 (shown as notched box-and-whisker plots)[5] and percentile trends for these metrics are shown in **Figure 6 through Figure 9**. Note, percentile trends are not available for the Landfill North site as measurement become this quarter.

[5] A notched box-and-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.

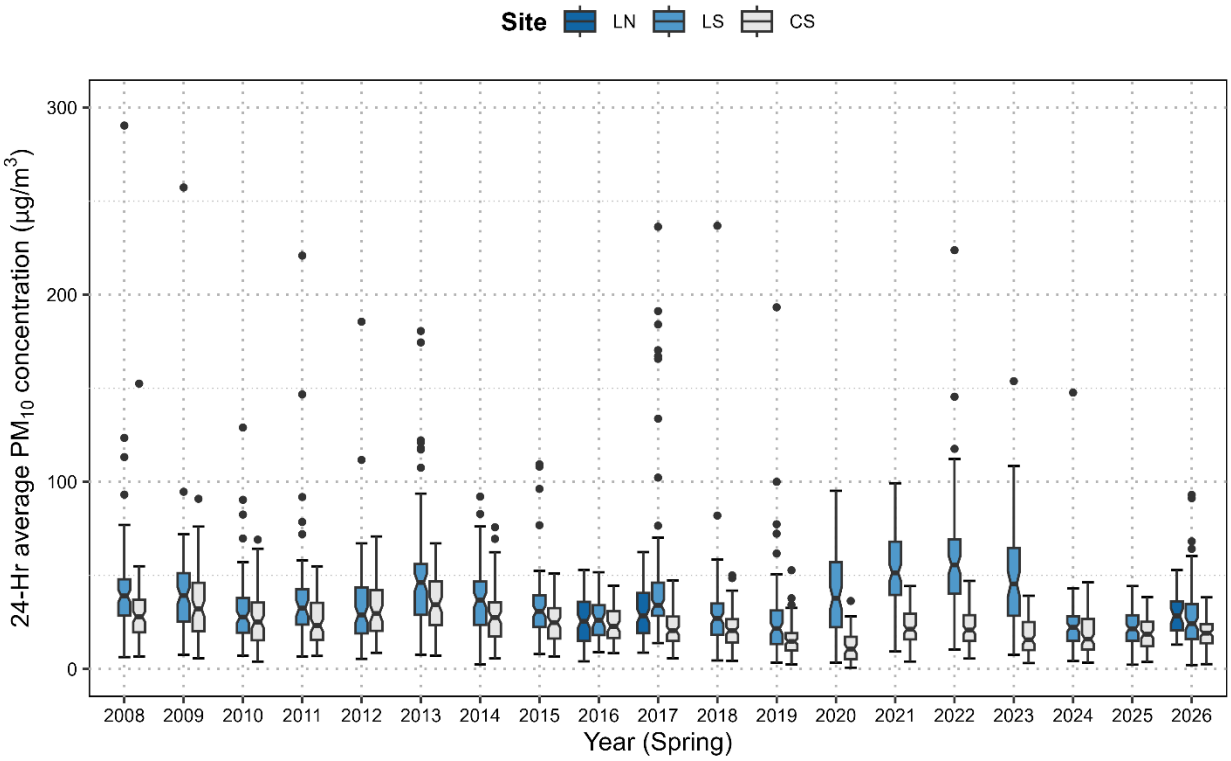

Figure 6. Distribution of 24-hr average PM_{10} concentrations at the Sunshine Canyon Landfill North (LN), Landfill (LS), and Community (CS) sites during spring (March-May) quarters from 2008–2026.

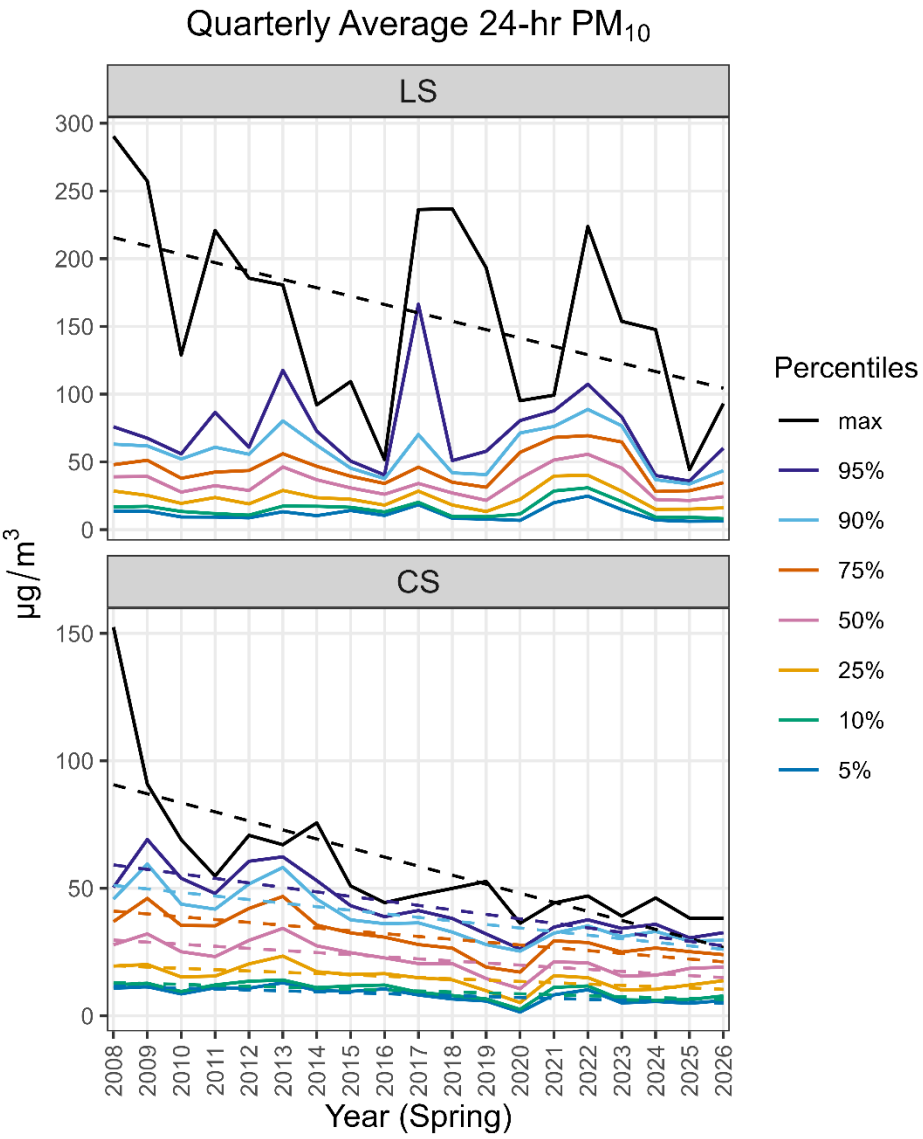

Figure 7. Trends of 24-hr average PM_{10} maximum and percentiles at the Landfill site (top) and Community site (bottom) during spring (March-May) quarters from 2008–2026. The dashed lines denote statistically significant linear trends. Statistical significance was defined at the 95% confidence level ($p \leq 0.05$). Note: the y-axis scale is larger in the Landfill site plot than the Community site plot.

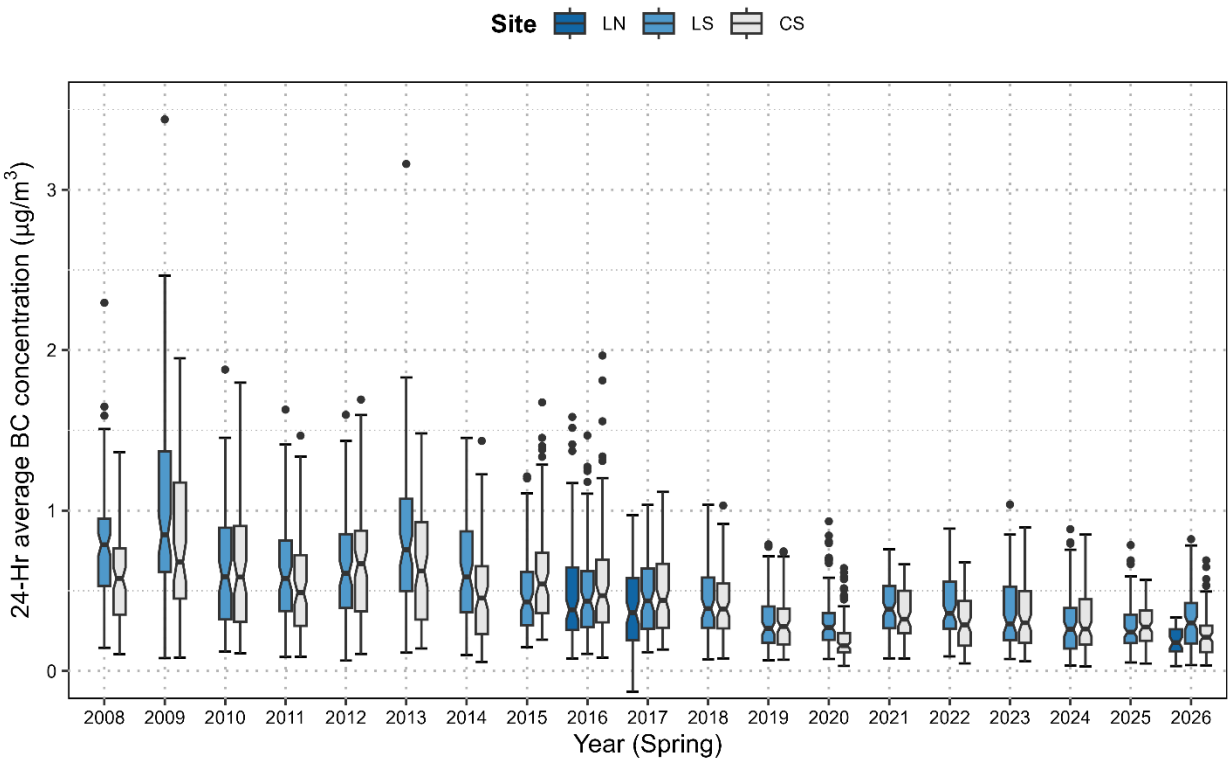

Figure 8. Distribution of 24-hr average BC concentrations at the Landfill North (LN), Landfill (LS), and Community sites (CS) during spring (March-May) quarters from 2008–2026.

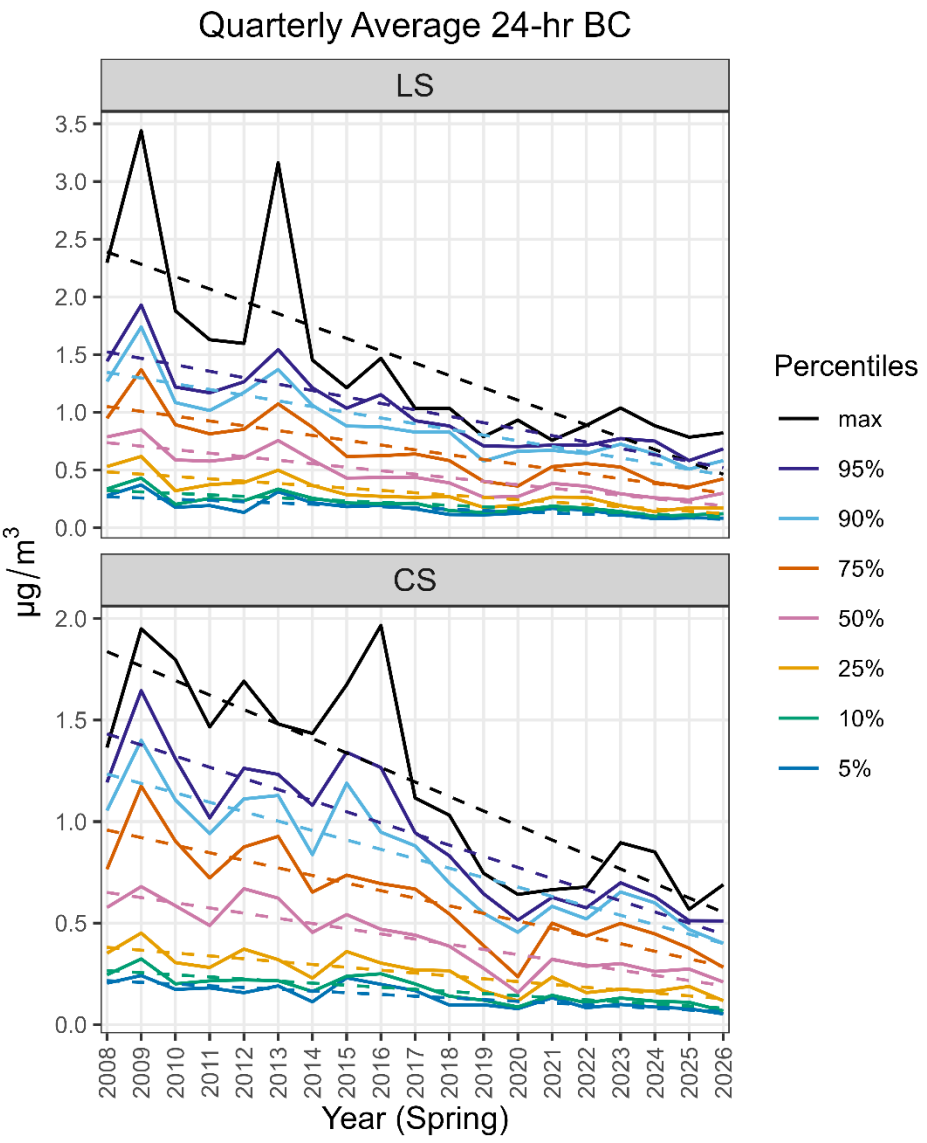

Figure 9. Trends of 24-hr average BC maximum and percentiles at the Landfill site (top) and Community site (bottom) during spring (March-May) quarters from 2008–2026. The dashed lines denote statistically significant decreasing linear trends. Statistical significance was defined at the 95% confidence level ($p \leq 0.05$). Note: the y-axis scale is larger in the Community site plot than the Landfill site plot.

The median 24-hr average PM_{10} concentrations measured at the Community site are usually lower during spring than those measured at the Landfill site (Figure 6). This situation remained true in 2026. As indicated by the nonoverlapping notches in the box-and-whisker plot, the difference between the median 24-hr PM_{10} concentrations at the Community and Landfill sites, as well as the Community and Landfill North sites is statistically significant. The overlapping notches in the box-and-whisker plots indicate no statistically significant difference between the median 24-hr PM_{10} concentrations at the Landfill and Landfill North sites. At the Landfill site, there was a gradually

increasing trend across all percentiles since the 2025 spring quarter. At the Community site, there is a statistically significant decreasing trend across all percentiles (Figure 7).

During spring quarters, the median 24-hr average BC concentrations are not usually significantly different between the Landfill North, Landfill, and Community sites, as indicated by the overlapping notches in the box-and-whisker plot (Figure 8). In the 2026 spring quarter, the median 24-hr average BC concentration at the Landfill site was higher than at the Landfill North and Community sites. As BC concentrations at both sites continue to decrease, as indicated by the quarterly trends, it is expected that median 24-hr average BC concentrations will converge to similar values. There is some year-to-year variability in median 24-hr average BC concentrations over the 19 recorded consecutive years, but the range of 24-hr average BC values has generally decreased over time at both monitoring sites.

There is a statistically significant decreasing trend in all 24-hr average BC percentiles and the maximum concentration at both the Landfill and Community sites during spring quarters over the observational record (Figure 9).

5. 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**.

Nastri W., Whynot J., Ahangar F., Bassett M., Bermudez R., and others (2021) MATES V Multiple Air Toxics Exposure Study in the South Coast AQMD. Final Report by South Coast Air Quality Management District, Diamond Bar, CA, August. Available at **https://www.aqmd.gov/docs/default-source/planning/mates-v/mates-v-final-report-9-24-21.pdf?sfvrsn=6**.