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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.

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. Its width could hold roughly 10 PM_{10} particles. 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)

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

Wind

Wind Speed and Wind Direction 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 2023 Quarter

PM_{10} Exceedances

Total PM_{10} Spring Quarter Exceedances over 15 Years	16	**Landfill Site** Federal Exceedances	1	**Community Site** Federal Exceedances	345	**Landfill Site** State Exceedances	85	**Community Site** State Exceedances
Total Exceedances in the 62nd Quarter	1	**Landfill Site** Federal Exceedances	0	**Community Site** Federal Exceedances	26	**Landfill Site** State Exceedances	0	**Community Site** State Exceedances

PM_{10}

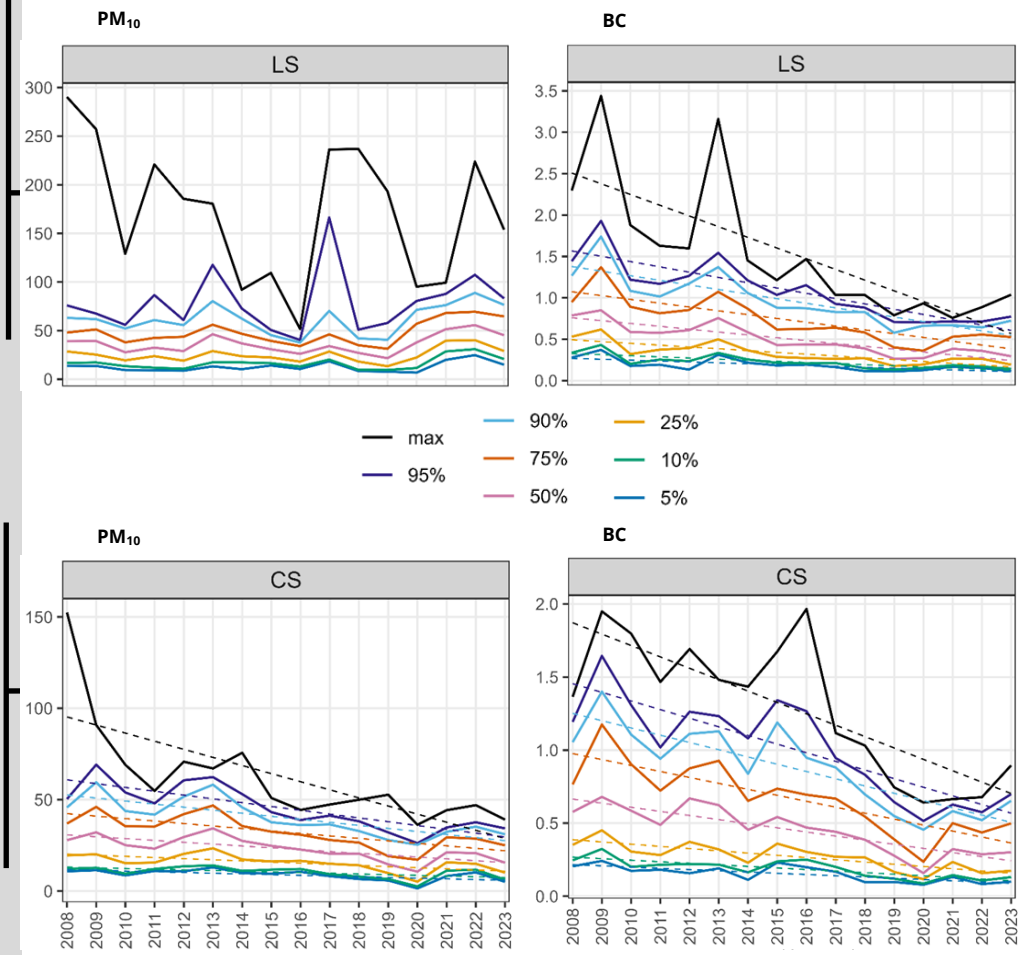
Landfill Site

There is no statistically significant trend in any percentile or maximum PM_{10} concentrations. However, all percentiles and the maximum concentration decreased from the previous spring quarter.

Community Site

There is a statistically significant decreasing trend for all percentiles and the maximum. Additionally, all percentiles and the maximum concentration decreased from the previous spring quarter.

Average and Maximum Black Carbon and PM_{10} Concentrations



Black Carbon

Landfill Site

There is a statistically significant decreasing trend in all percentiles at the Landfill site during spring quarters over the observational record.

Community Site

There is a statistically significant declining trend in spring quarter 24-hr BC concentrations at all percentiles and the maximum concentration. However, all percentiles and the maximum 24-hr BC concentration increased from the previous spring quarter.

Data Completeness

	Data Capture			*Valid Data Used for Analysis*		
	PM_{10}	BC	Wind Speed & Direction	PM_{10}	BC	Wind Speed & Direction
Landfill Site	90.44%	99.82%	97.85%	85.38%	99.95%	100%
Community Site	99.95%	99.28%	98.87%	99.91%	100%	100%

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

March 1, 2023 – May 31, 2023

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Executive Summary

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. 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 (DPM). 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 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. PM_{10} and BC data are analyzed in an in-depth annual report that characterizes landfill operation impacts on ambient air quality as observed at the Community site. This is done by quantifying PM_{10} and BC concentrations and 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 Sixty-Second Quarterly Report summarizes the March 1, 2023 – May 31, 2023 (2023 spring quarter) monitoring results from the sixteenth year of continuous data collection.

Statistics

For this quarter, the percentage of hourly PM_{10} data captured was 90.44% at the Landfill site and 99.95% at the Community site. Of the captured PM_{10} data, 14.62% were invalidated at the Landfill site and 0.09% were invalidated at the Community site. The beta attenuation monitor (BAM) instrument at the Landfill site experienced persistent moisture inlet issues throughout the 2023 winter and spring quarters, which contributed to 55.58% of PM_{10} data being flagged as suspect. The BAM instrument was sent out for manufacturer repair on April 21 and resumed PM_{10} data collection on May 3. Therefore, data between April 21 and May 3 were invalidated, which contributed to the unusually high amount of invalid data (14.62%). At the Community site, 2.04% of data were deemed suspect.

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

Hourly BC data capture was 99.82% at the Landfill site and 99.28% at the Community site. Of the captured hourly BC data, 0.05% of data were deemed invalid at the Landfill site and no data were deemed invalid at the Community site. Of the captured hourly BC data, 5.08% were deemed suspect at the Landfill site and 7.16% were deemed suspect at the Community site.

One-min WS and WD data capture was 97.85% at the Landfill site and 98.87% at the Community site. Of the captured 1-min WS and WD data, none were deemed invalid at the Landfill or Community sites, and <0.01% were deemed suspect at the Landfill site. No data were deemed suspect at the Community site.

During this quarter, the state 24-hr PM_{10} standard (50 µg/m^3) was exceeded on 37% of days (26 days out of the valid 71 days of the quarter) at the Landfill site, and on no days at the Community site (there were 92 valid days of PM_{10} data at the Community site this quarter). There was one federal exceedance of the 24-hr PM_{10} 150 µg/m^3 standard on April 19 at the Landfill site, and no federal exceedances at the Community site. The 24-hr average BC concentration was 0.37 µg/m^3 at the Landfill site and 0.34 µg/m^3 at the Community site. Both sites exhibited the lowest 24-hr average BC concentrations of all monitored spring quarters (2008–2023).

1. Introduction

This report summarizes data completeness, ambient PM_{10} concentrations, average and maximum ambient BC as a surrogate for DPM concentrations, instrument flow rate verification (quality control) data, and field operations for the quarterly period of March 1 - May 31, 2023. Collected data are validated and evaluated quarterly for completeness. This is the sixteenth year that continuous monitors collected data in the spring at the Sunshine Canyon Landfill site (previously called the Berm site) and the Van Gogh Elementary School Community site. Monitoring site locations are shown in Figure 1. PM_{10} is measured with a 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.

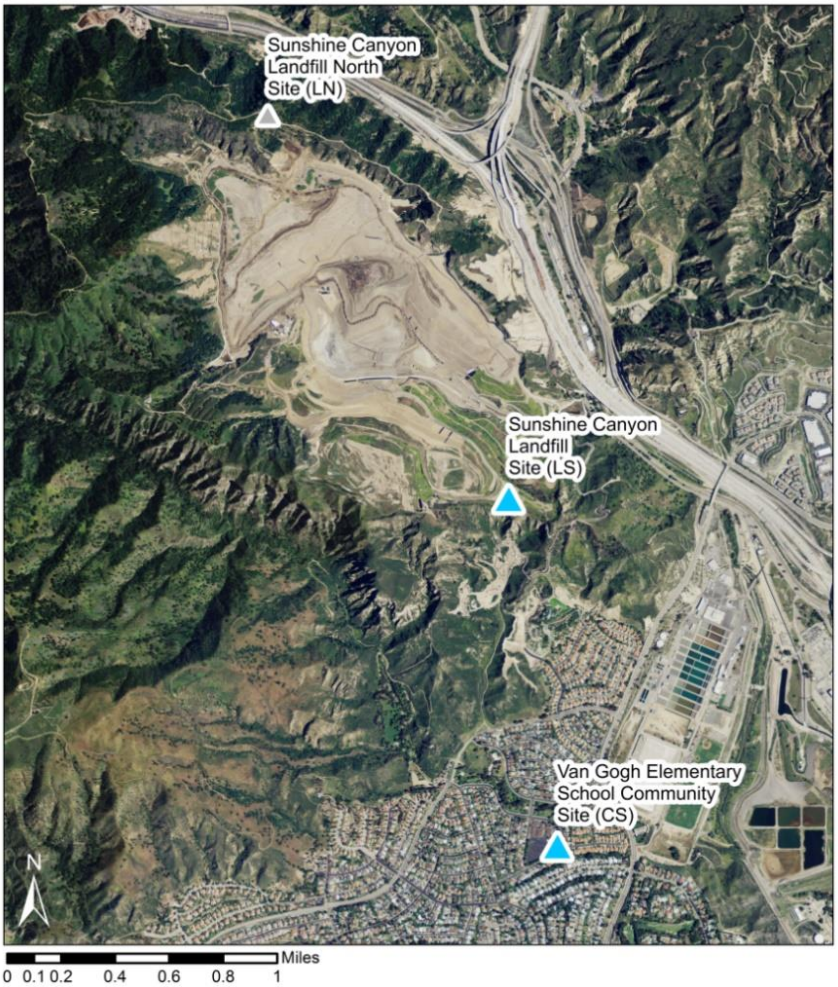

Figure 1. Sunshine Canyon Landfill, including the Landfill and Community monitoring sites (blue triangles). The Sunshine Canyon Landfill North site (gray triangle) collected data from Dec. 1, 2015, through May 31, 2017, and has been decommissioned.

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 2023 spring quarter are shown in Table 1. Data deemed suspect are included in subsequent analyses (e.g., regional comparisons), while invalid data are not. The percent data capture for PM_{10} was 90.44% at the Landfill site and 99.95% at the Community site. The percent of captured PM_{10} data invalidated was 14.62% at the Landfill site and 0.09% at the Community site. The percent of hourly PM_{10} values deemed suspect was 55.58% at the Landfill site and 2.04% at the Community site.

The BAM at the Landfill site experienced multiple issues throughout the 2023 winter and spring quarters that compromised data collection operations and data quality. An air conditioning unit on the trailer that houses the BAM experienced multiple malfunctions, winter storms caused power outages, and water from heavy rains and odor misting saturated the BAM sampling inlet, condensation jar, and sampling lines - all of which led to a high abundance of suspect data. In the spring quarter, a component in the BAM instrument was found to be dirty and damaged due to water inlet issues. The component was cleaned, but data quality issues persisted. As a result, the BAM instrument was sent to the manufacturer for repair on April 21. Operational data collection of PM_{10} samples resumed on May 3. Therefore, data between April 21 and May 3 were invalidated, which contributed to the unusually high amount of invalid data for the quarter (14.62%).

Table 1. Data completeness statistics for hourly PM_{10}, hourly BC, and 1-min WS and WD data for the 2023 spring 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
Landfill Site	03/01/23-05/31/23	90.44	99.82	97.85	85.38	99.95	100	55.58	5.08	<0.01
Community Site	03/01/23-05/31/23	99.95	99.28	98.87	99.91	100	100	2.04	7.16	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 99.82% at the Landfill site and 99.28% at the Community site, and 0.05% of data were deemed invalid at the Landfill site. No data were deemed invalid at the Community site.

The percent of hourly BC data deemed suspect was 5.08% at the Landfill site and 7.16% at the Community site.

At the Landfill site, the wind data capture percentage was 97.85%, no data were invalidated, and <0.01% of data were deemed suspect. At the Community site, the wind data capture percentage was 98.87%, and no data were invalidated or deemed suspect.

3. PM_{10} Exceedances

Federal and state PM_{10} exceedances for the baseline spring quarter (2002), previous 15 spring quarters (2008–2022), and current spring quarter (2023) are summarized in Table 2 for the Landfill site and Table 3 for the Community site. In this quarter, the state PM_{10} standard of 50 µg/m^3 was exceeded on 37% of days (26 of 71 days) at the Landfill site, and no days at the Community site.

Table 2. Number of federal and state 24-hr PM_{10} standard exceedances during the spring quarters for the baseline year (2002) and 2008 to 2023 at the Landfill site. In the "Federal 24-hr" column, values represent the number of exceedances and the date(s) when exceedances occurred. In the "State 24-hr" column, values represent the 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 with valid concentrations. The most recent spring quarter is **bold**.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m^3	State 24-hr 50 µg/m^3
03/01/02–05/31/02	Baseline Year	0	21/56 (38%)
03/01/08–05/31/08	2008 Spring	1 (05/21/08)	20/89 (22%)
03/01/09–05/31/09	2009 Spring	1 (05/06/09)	24/89 (27%)
03/01/10–05/31/10	2010 Spring	0	10/90 (11%)
03/01/11–05/31/11	2011 Spring	1 (04/30/11)	8/49 (16%)
03/01/12–05/31/12	2012 Spring	1 (05/22/12)	15/89 (17%)
03/01/13–05/31/13	2013 Spring	2 (03/21/13, 04/08/13)	34/91 (37%)
03/01/14–05/31/14	2014 Spring	0	19/92 (21%)
03/01/15–05/31/15	2015 Spring	0	5/91 (5%)
03/01/16–05/31/16	2016 Spring	0	1/49 (2%)
03/01/17–05/31/17	2017 Spring	6 (03/27/17, 04/20/17, 04/21/17, 04/25/17, 04/27/17, 04/28/17)	26/86 (24%)
03/01/18–05/31/18	2018 Spring	1 (04/12/18)	5/87 (6%)
03/01/19-05/31/19	2019 Spring	1 (04/09/19)	6/87 (7%)
03/01/20-05/31/20	2020 Spring	0	24/72 (34%)
03/01/21-05/31/21	2021 Spring	0	50/88 (57%)
03/01/22-05/31/22	2022 Spring	1 (04/05/22)	51/86 (59%)
03/01/23-05/31/23	**2023 Spring**	**1 (04/19/23)**	**26/71 (37%)**

Table 3. Number of federal and state 24-hr PM_{10} standard exceedances during the spring quarters for the baseline year (2002) and 2008 to 2023 at the Community site. In the "Federal 24-hr" column, values represent the number of exceedances and the date(s) when exceedances occurred. In the "State 24-hr" column, values represent the 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 with valid concentrations. The most recent spring quarter is **bold**.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m³	State 24-hr 50 µg/m³
03/01/02–05/31/02	Baseline Year	0	17/55 (31%)
03/01/08–05/31/08	2008 Spring	1 (05/21/08)	6/92 (7%)
03/01/09–05/31/09	2009 Spring	0	17/88 (19%)
03/01/10–05/31/10	2010 Spring	0	7/91 (8%)
03/01/11–05/31/11	2011 Spring	0	3/92 (3%)
03/01/12–05/31/12	2012 Spring	0	9/70 (13%)
03/01/13–05/31/13	2013 Spring	0	18/92 (20%)
03/01/14–05/31/14	2014 Spring	0	6/92 (7%)
03/01/15–05/31/15	2015 Spring	0	1/91 (1%)
03/01/16–05/31/16	2016 Spring	0	0/69 (0%)
03/01/17–05/31/17	2017 Spring	0	0/90 (0%)
03/01/18–05/31/18	2018 Spring	0	0/92 (0%)
03/01/19-05/31/19	2019 Spring	0	1/91 (2%)
03/01/20-05/31/20	2020 Spring	0	0/58 (0%)
03/01/21-05/31/21	2021 Spring	0	0/92 (0%)
03/01/22-05/31/22	2022 Spring	0	0/92 (0%)
03/01/23-05/31/23	**2023 Spring**	**0**	**0/92 (0%)**

The federal 24-hr PM_{10} standard (150 µg/m³) was exceeded at the Landfill site on April 19 (Figure 2), and was not exceeded at the Community site during the quarter.

Figure 2. PM_{10} concentrations at Federal Reference Methods/Federal Equivalent Methods (FRM/FEM) sites across the Los Angeles Area on April 19, 2023. Colors correspond to 24-hr PM_{10} concentrations in µg/m^3. Note that no sites within the map domain besides the Landfill site recorded 24-hr PM_{10} concentrations above the federal standard.

The federal exceedance that occurred on April 19 at the Landfill site was distinctive within the greater Los Angeles area. The 24-hr concentration at the Community site was approximately 34.0 µg/m^3, which is far lower than the 24-hr concentration of 153.78 µg/m^3 recorded at the Landfill site. We assume that landfill activity played a key role in the April 19 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 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 (MATES V) conducted by the South Coast Air Quality Management District (South Coast AQMD) 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 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 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 available BC data shown in this Quarterly Report have been compensated (data was unavailable from the baseline year).

The 24-hr average and maximum compensated BC concentrations collected during the 2023 spring quarter, the compensated BC data from the 15 previous spring quarters, and the uncompensated data from the baseline year are provided in **Table 4** for the Landfill site and **Table 5** for the Community site. The 2023 spring quarter 24-hr average BC concentration at the Landfill site is the third lowest on record. The 24-hr maximum BC concentration at the Landfill site is higher than in the last four spring quarters but is still among the lowest from all spring quarters. The 24-hr average and maximum BC concentrations at the Community site are higher than the previous four spring quarters, but are still among the lowest from all spring quarters.

Table 4. 24-hr BC concentrations for spring quarters from the baseline year (2002) and each year from 2008 to 2023 at the Landfill site. Uncompensated BC values are reported for the 2002 spring quarter. The most recent spring quarter is shown in **bold**.

Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
		Average 24-Hr	Maximum 24-Hr
03/01/02–05/31/02	Baseline Year	0.72[a]	2.18[a]
03/01/08–05/31/08	2008 Spring	0.80	2.30
03/01/09–05/31/09	2009 Spring	1.01	3.44
03/01/10–05/31/10	2010 Spring	0.64	1.88
03/01/11–05/31/11	2011 Spring	0.62	1.63
03/01/12–05/31/12	2012 Spring	0.65	1.60
03/01/13–05/31/13	2013 Spring	0.84	3.17
03/01/14–05/31/14	2014 Spring	0.64	1.46
03/01/15–05/31/15	2015 Spring	0.50	1.22
03/01/16–05/31/16	2016 Spring	0.50	1.47
03/01/17–05/31/17	2017 Spring	0.47	1.04
03/01/18–05/31/18	2018 Spring	0.45[b]	1.04[b]
03/01/19-05/31/19	2019 Spring	0.32	0.79
03/01/20-05/31/20	2020 Spring	0.32	0.93
03/01/21-05/31/21	2021 Spring	0.41	0.76
03/01/22-05/31/22	2022 Spring	0.40	0.89
03/01/23-05/31/23	**2023 Spring**	**0.37**	**1.04**

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

Table 5. 24-hr BC concentrations for spring quarters from the baseline year (2002) and each year from 2008 to 2023 at the Community site. Uncompensated BC values are reported for the 2002 spring quarter. The most recent spring quarter is shown in bold.

Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
		Average 24-Hr	Maximum 24-Hr
03/01/02–05/31/02	Baseline Year	0.72[a]	2.22[a]
03/01/08–05/31/08	2008 Spring	0.61	1.37
03/01/09–05/31/09	2009 Spring	0.81	1.95
03/01/10–05/31/10	2010 Spring	0.64	1.80
03/01/11–05/31/11	2011 Spring	0.54	1.47
03/01/12–05/31/12	2012 Spring	0.66	1.70
03/01/13–05/31/13	2013 Spring	0.66	1.49
03/01/14–05/31/14	2014 Spring	0.49	1.44
03/01/15–05/31/15	2015 Spring	0.61	1.68
03/01/16–05/31/16	2016 Spring	0.56	1.97
03/01/17–05/31/17	2017 Spring	0.49	1.12
03/01/18–05/31/18	2018 Spring	0.42	1.04
03/01/19-05/31/19	2019 Spring	0.31	0.75
03/01/20-05/31/20	2020 Spring	0.21	0.64
03/01/21-05/31/21	2021 Spring	0.36	0.66
03/01/22-05/31/22	2022 Spring	0.30	0.68
03/01/23-05/31/23	**2023 Spring**	**0.34**	**0.90**

[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-hr average PM_{10} and BC data from the spring quarters in 2008 through 2023 (presented as notched box-whisker plots[5]), and percentile trends for these metrics, are shown in Figures 3 through 6.

[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.

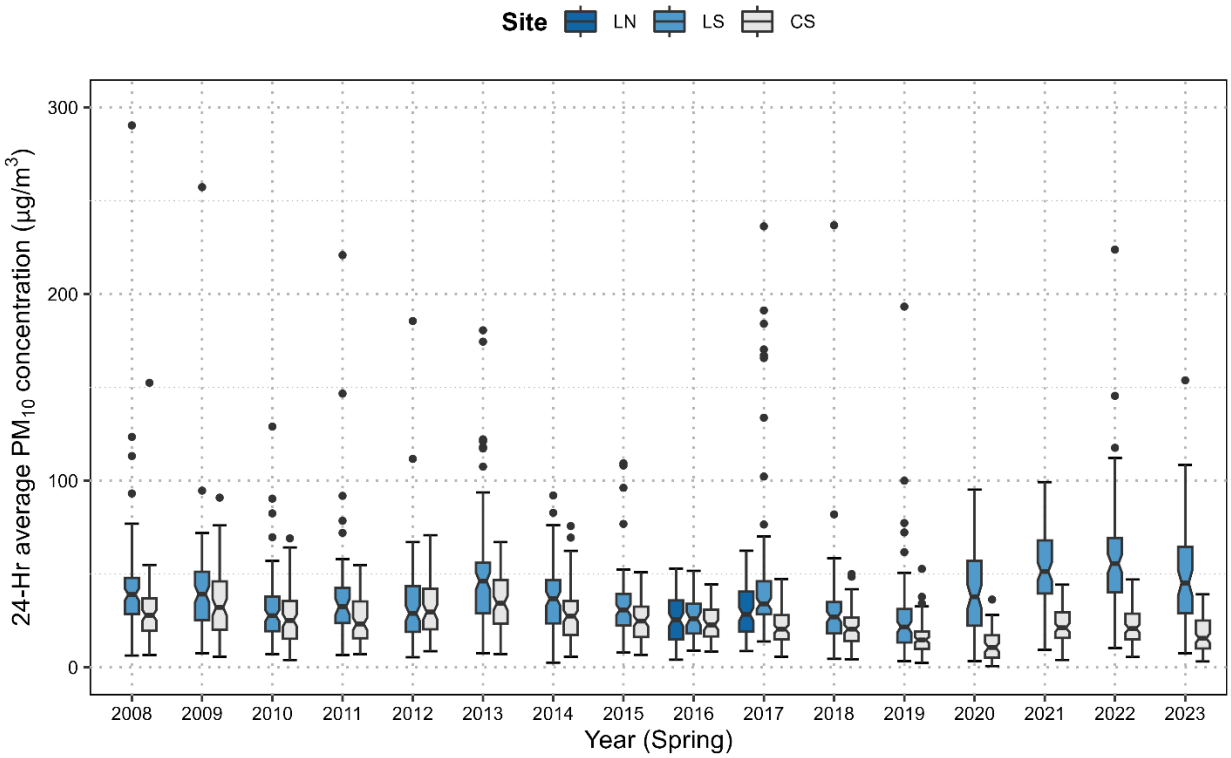

Figure 3. Distribution of 24-hr average PM_{10} concentrations at the Sunshine Canyon Landfill North, Landfill, and Community sites during spring (March-May) quarters from 2008 to 2023.

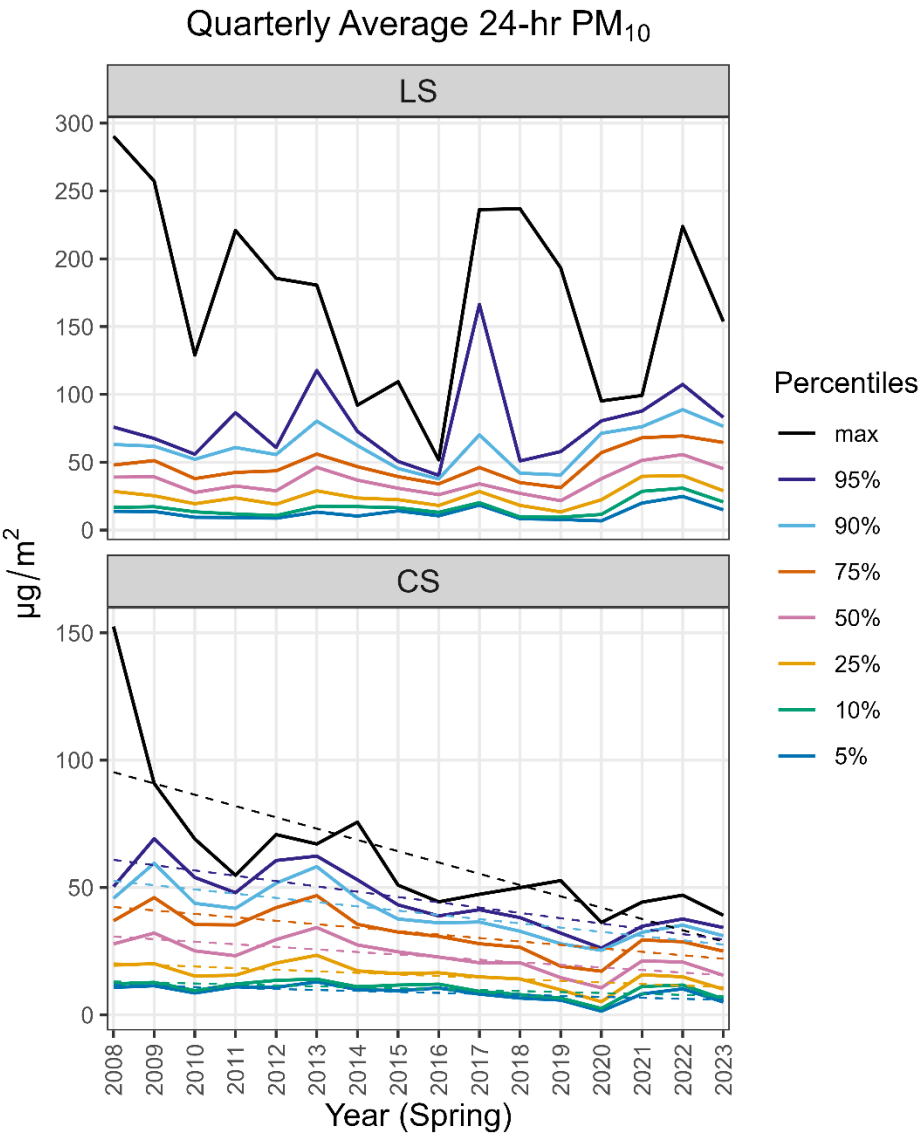

Figure 4. Trends of 24-hr average PM_{10} maxima and percentiles at the Sunshine Canyon Landfill site (top) and Community site (bottom) during spring (March-May) quarters from 2008 to 2023. The dashed lines denote statistically significant linear trends. Statistical significance was defined at the 95% confidence level (*p-value* ≤0.05). Note: the y-axis scale is larger at the Landfill site than the Community site.

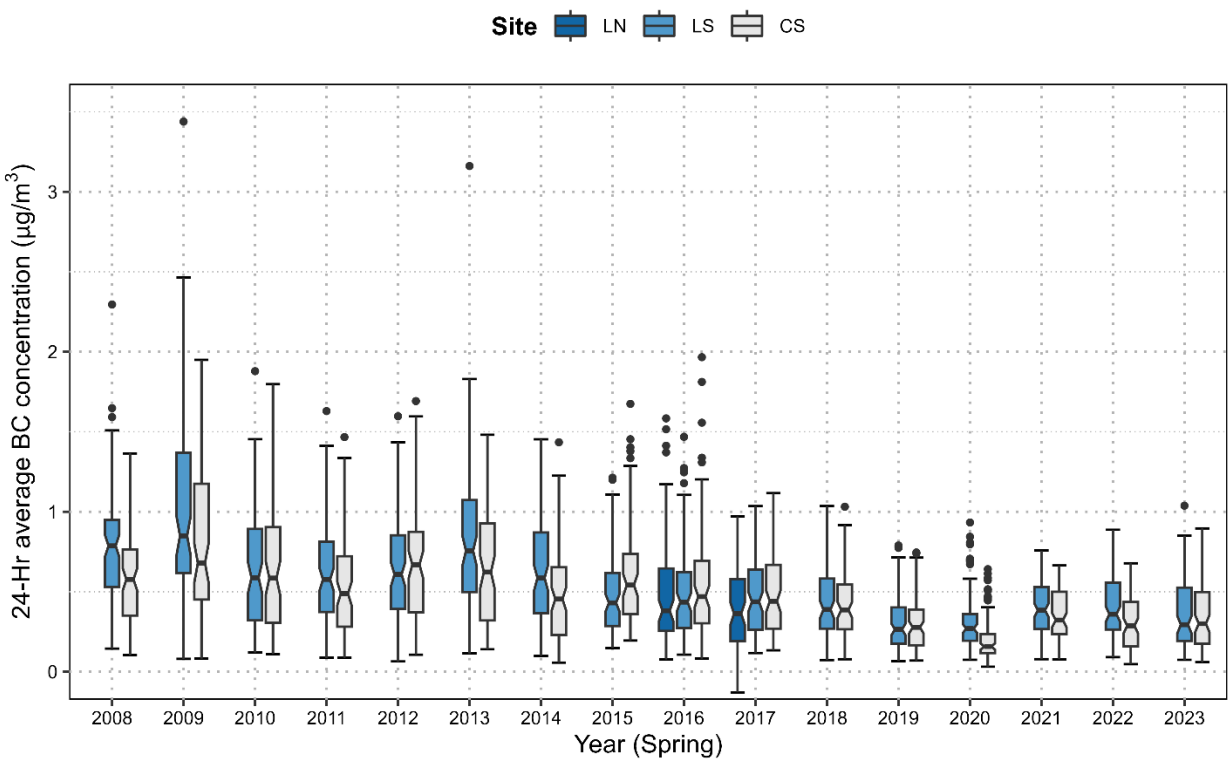

Figure 5. Distribution of 24-hr average BC concentrations at the Sunshine Canyon Landfill North, Landfill, and Community sites during spring (March-May) quarters from 2008 to 2023.

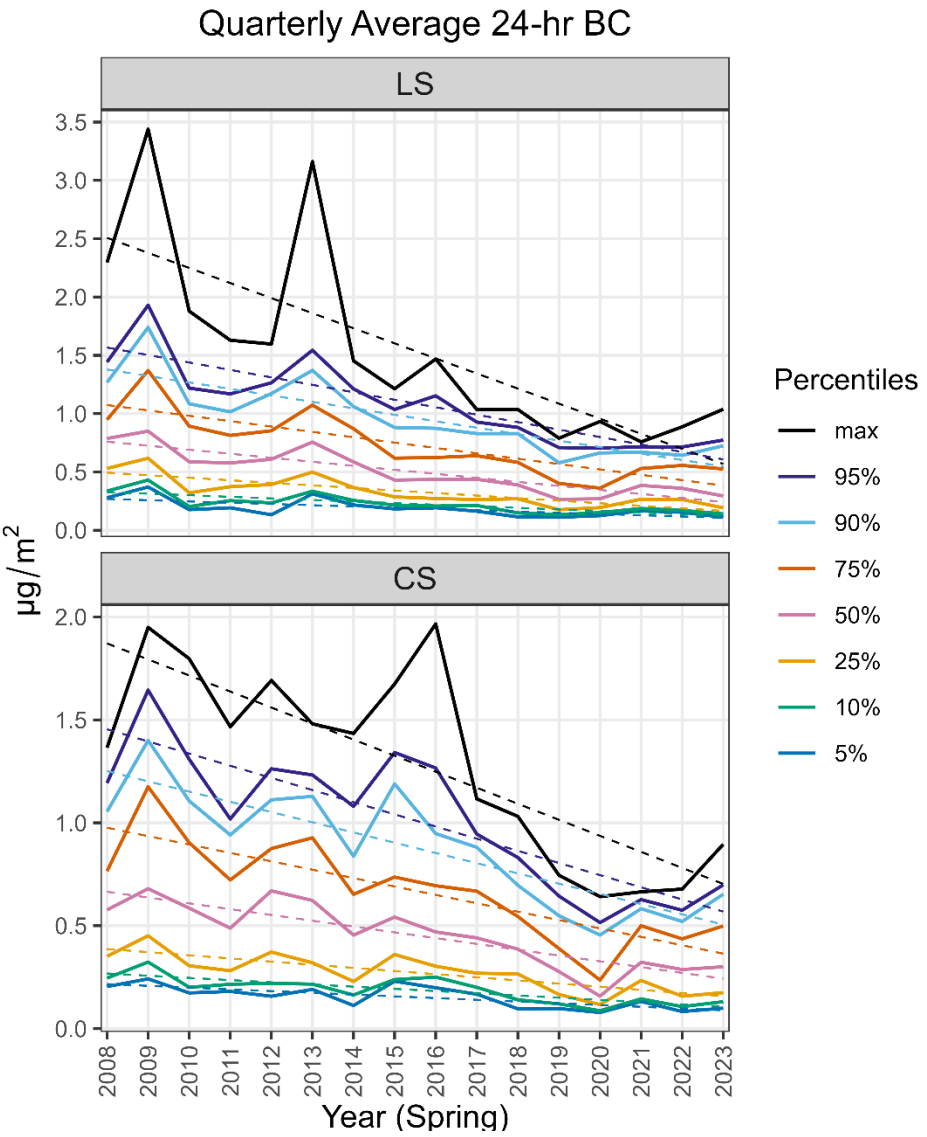

Figure 6. Trends of 24-hr average BC maxima and percentiles at the Sunshine Canyon Landfill site (top) and Community site (bottom) during spring (March-May) quarters from 2008 to 2023. The dashed lines denote statistically significant decreasing linear trends. Statistical significance was defined at the 95% confidence level (*p-value* ≤0.05). Note: the y-axis scale is larger at the Landfill site than the Community site.

At this time of year, the median 24-hr average PM_{10} concentrations measured at the Community site are usually lower than the Landfill site (Figure 3). This remained true in the 2023 spring quarter. As indicated by the non-overlapping notches (and the entire interquartile range) in the box-whisker plot, the difference between the median 24-hr PM_{10} concentrations at the Community and Landfill sites is statistically significant. At the Landfill site, there is no statistically significant trend in any percentile or maximum PM_{10} concentrations (Figure 4). At the Community site, there is a statistically significant decreasing trend for all percentiles and the maximum.

During spring 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 5). In the spring 2023 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 16 recorded consecutive years, but the range of 24-hr average BC values has generally decreased over time at both monitoring sites. Compared to the previous spring quarter, the Landfill site saw lower median 24-hr average BC concentrations and the Community site saw slightly higher median 24-hr average BC concentrations in spring 2023.

There is a statistically significant decreasing trend in all percentiles and the maximum concentration at the Landfill site during spring quarters over the observational record. The 5th through 75th percentiles decreased at the Landfill site from the spring quarter of 2022 to the spring quarter of 2023. At the Community site, there is a statistically significant declining trend in spring quarter 24-hr BC concentrations at all percentiles and the maximum concentration. However, all percentiles and the maximum 24-hr BC concentration increased from the previous spring quarter.

5. Field Operations

Tables 6 and 7 list dates and major tasks associated with visits to the Landfill and Community sites during the 2023 spring quarter.

Table 6. Landfill monitoring site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
4/10/2023	Collected PM_{10} and BC data Restarted aethalometer Cleaned roller, vane, and nozzle on BAM Replaced tape on BAM Performed flow checks on BAM and aethalometer Noted that the shelter A/C is not working and that the odor misting system is blowing moisture onto the shelter
4/20/2023	Component on BAM found to be dirty and damaged Cleaned component on BAM
4/21/2023	Swapped BAM instruments (BAM H8933 for BAM A12783) Performed flow checks on newly installed BAM
5/3/2023	Found BAM sampling $PM_{2.5}$ instead of PM_{10} Changed BAM setup to sample PM_{10}
7/12/2023[a]	Collected PM_{10} and BC data Serviced the HVAC system

[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 7. Community site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
4/10/2023	Collected PM_{10} and BC data Restarted aethalometer Cleaned roller, vane, and nozzle on BAM Replaced tape on BAM Performed flow checks on BAM and aethalometer Noted that the shelter door is warped and will not close
4/11/2023	Collected PM_{10} data
7/12/2023 [a]	Collected PM_{10} and BC data Restarted BAM

[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.

Aethalometer and BAM flow rates measured with a National Institute of Standards and Technology (NIST)-traceable flow standard are shown in Table 8. 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 8. 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)	4/10/2023	16.7	16.7	16.90	16.7	4.0	4.13
Sunshine Canyon Community (CS)	4/10/2023	16.7	16.7	16.77	16.7	4.0	4.19

6. References

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