

# Fiftieth Quarterly Report of Ambient Air Quality Monitoring at Sunshine Canyon Landfill and Van Gogh Elementary School

March 1, 2020 – May 31, 2020

## Prepared by

Samantha Kramer  
Ningxin Wang  
Bryan Penfold

Sonoma Technology  
1450 N. McDowell Blvd., Suite 200  
Petaluma, CA 94954  
Ph 707.665.9900 | F 707.665.9800  
[sonomatech.com](http://sonomatech.com)

## Prepared for

Planning Department, City of Los Angeles  
City Hall, Room 525  
200 N. Spring St.  
Los Angeles, CA 90012  
and  
Los Angeles County Dept. of Regional  
Planning  
320 West Temple St., 13th Floor  
Los Angeles, CA 90012

Quarterly Report

STI-915026-7413

July 31, 2020

This document contains blank pages to accommodate double-sided printing.

# Contents

Figures .....	iv
Tables .....	iv
Executive Summary .....	1
1. Introduction.....	3
2. Data Completeness .....	5
3. PM <sub>10</sub> Exceedances.....	7
4. Average and Maximum Black Carbon Concentrations and PM <sub>10</sub> Concentrations.....	9
5. Field Operations.....	17
6. References.....	21

# Figures

1. View of Sunshine Canyon Landfill and the surrounding monitoring stations: Sunshine Canyon Landfill and Community site .....	3
2. Distribution of 24-hr average PM <sub>10</sub> concentrations at the Sunshine Canyon Landfill North site, Landfill site, and Community site during spring (March-May) quarters from 2008 to 2020 .....	11
3. Trends of 24-hr average PM <sub>10</sub> maxima and percentiles at the Sunshine Canyon Landfill site and Community site during spring (March-May) quarters from 2008 to 2020 .....	12
4. Distribution of 24-hr average BC concentrations at the Sunshine Canyon Landfill North site, Landfill site, and Community site during spring (March-May) quarters from 2008 to 2020 .....	13
5. Trends of 24-hr average BC maxima and percentiles at the Sunshine Canyon Landfill site and Community site during spring (March-May) quarters from 2008 to 2020 .....	14

# Tables

1. Data completeness statistics for hourly PM <sub>10</sub> , hourly BC, and 1-min wind speed and wind direction data for the 2020 spring quarter monitoring period .....	5
2. Number of exceedances of federal and state 24-hr PM <sub>10</sub> standards during the spring quarters of the baseline year (2002) and years from 2008 to 2020 .....	8
3. Twenty-four-hour BC concentrations for the spring quarter of the baseline year (2002) and each year from 2008 to 2020 .....	10
4. Landfill monitoring site (LS) visits, field maintenance, and operations.....	17
5. Community site (CS) visits, field maintenance, and operations .....	18
6. Flow rates for the BAM PM <sub>10</sub> and Aethalometer BC monitors at the Landfill and Community sites .....	19

# 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. At these sites, particulate matter less than 10 microns in aerodynamic diameter (PM<sub>10</sub>), wind speed (WS) and wind direction (WD), and black carbon (BC), as a surrogate for diesel particulate matter (DPM), are measured. 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.<sup>1</sup> Similar conditions cover the County of Los Angeles' portion of the landfill.<sup>2</sup>

PM<sub>10</sub> concentrations are compared with federal and state PM<sub>10</sub> standards. When PM<sub>10</sub> concentrations are above the standard (i.e., an exceedance), additional comparisons are made with the historical, regional, and annual ambient PM<sub>10</sub> concentrations. The PM<sub>10</sub> 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<sub>10</sub> 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 Fiftieth Quarterly Report summarizes the March 2020–May 2020 (2020 spring quarter) monitoring results from the fourteenth year of continuous data collection. Due to restrictions caused by COVID-19 to access and maintain the instruments onsite, a high rate of invalid PM<sub>10</sub> data was observed during this quarter.

## Statistics

---

For this quarter, the percent data capture for PM<sub>10</sub> was 100.0% at the Landfill site and 100.0% at the Community site. Of the captured PM<sub>10</sub> data, approximately 21.6% were invalidated at the Landfill site, and approximately 36.7% were invalidated at the Community site. Portions of PM<sub>10</sub> data at both sites were invalidated because the beta attenuation monitors (BAM) ran out of tape, and access to monitoring sites for instrument maintenance was restricted as a result of the COVID-19 pandemic. None of the PM<sub>10</sub> data were deemed suspect at either the Landfill site or the Community site.

---

<sup>1</sup> Section C.10.a of Ordinance No. 172,933.

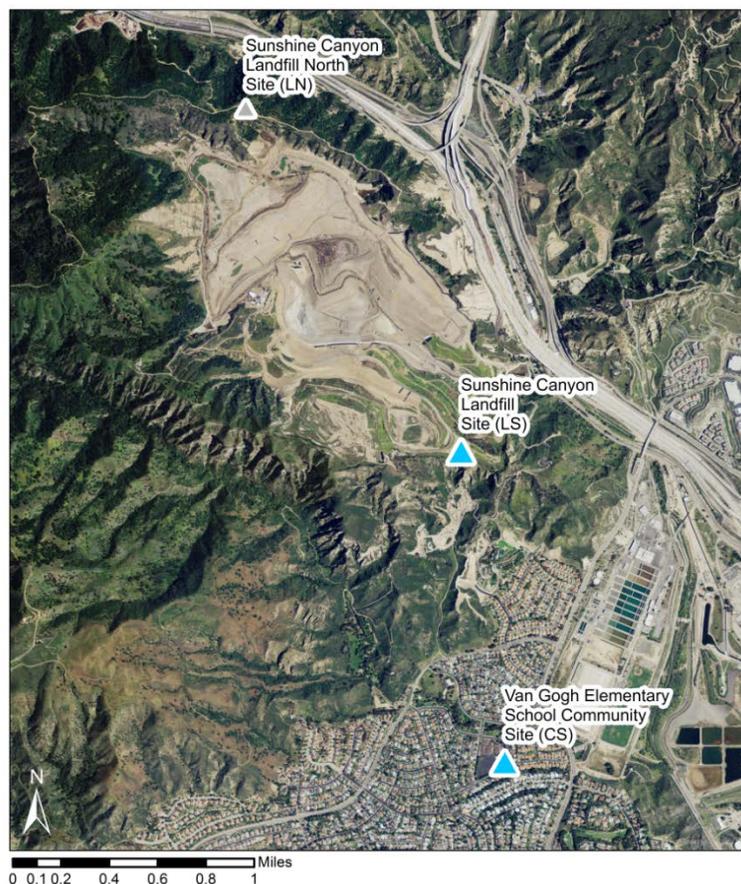
<sup>2</sup> County Condition 81.

Hourly BC data capture was 99.8% at the Landfill site and 99.7% at the Community site. Of the captured hourly BC data, no data were deemed invalid at either the Landfill site or the Community site. Of the BC data, approximately 5.7% were deemed suspect at the Landfill site, and approximately 2.0% were deemed suspect at the Community site.

During this quarter, the state 24-hr PM<sub>10</sub> standard (50 µg/m<sup>3</sup>) was exceeded on 34% of days (24 days out of the valid 72 days of the quarter) at the Landfill site and none at the Community site. The federal 24-hr PM<sub>10</sub> standard (150 µg/m<sup>3</sup>) was not exceeded on any days at the Landfill site nor on any days at the Community site. In the spring 2020 quarter, the Community site recorded the lowest median 24-hr average BC concentration, and both sites exhibited smaller ranges of 24-hr average BC concentrations than in previous years.

# 1. Introduction

This report summarizes data completeness, ambient particulate matter less than 10 microns in aerodynamic diameter (PM<sub>10</sub>) 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 March 1, 2020, through May 31, 2020. The collected data are validated and evaluated for completeness quarterly. This is the fourteenth year that continuous data were collected in the spring from continuous monitors at the Sunshine Canyon Landfill site (LS; previously called the Berm site) and the Van Gogh Elementary School Community site (CS). The monitoring site locations are shown in [Figure 1](#). PM<sub>10</sub> is measured with a beta attenuation monitor (BAM), and BC is measured with an Aethalometer. The Sunshine Canyon Landfill North (LN) 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 (LS) and Community site (CS). The Sunshine Canyon Landfill North site (LN, 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.<sup>3</sup> Similar conditions cover the County of Los Angeles' portion of the landfill.<sup>4</sup>

---

<sup>3</sup> Section C.10.a of Ordinance No. 172,933.

<sup>4</sup> County Condition 81.

## 2. Data Completeness

Completeness statistics for all measured variables during the 2020 spring 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<sub>10</sub> was 100.0% at the Landfill site and 100.0% at the Community site. Approximately 21.6% and 36.7% of the captured PM<sub>10</sub> data were invalidated at the Landfill and Community sites, respectively. The high percentage of data invalidation reflects the limited access to sites for scheduled instrument maintenance due to COVID-19. No hourly PM<sub>10</sub> values were deemed suspect at either of the monitoring sites in this quarter.

**Table 1.** Data completeness statistics for hourly PM<sub>10</sub>, hourly BC, and 1-min wind speed and wind direction data for the 2020 spring quarter monitoring period.

Monitoring Location	Dates	Data Capture (%) <sup>a</sup>			Data Valid or Suspect (%) <sup>b</sup>			Data Suspect (%) <sup>c</sup>		
		PM <sub>10</sub>	BC	WS/WD	PM <sub>10</sub>	BC	WS/WD	PM <sub>10</sub>	BC	WS/WD
Sunshine Canyon Landfill (LS)	03/01/20 - 05/31/20	100.0	99.8	99.8	78.4	100.0	98.9	0.0	5.7	0.002
Community Site (CS)	03/01/20 - 05/31/20	100.0	99.7	99.8	63.3	100.0	98.9	0.0	2.0	0.0

<sup>a</sup> 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.

<sup>b</sup> 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.

<sup>c</sup> 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 99.8% at the Landfill site and 99.7% at the Community site. No hourly BC data were invalidated at the Landfill site or Community site. At the Landfill site, 5.7% of hourly BC data were deemed suspect; at the Community site, 2.0% hourly BC data were deemed suspect.

The wind data capture percentages were 99.8% at both the Landfill site and the Community site. Among those captured data, approximately 1.1% of the data were invalidated at the Landfill site, with less than 0.1% deemed suspect. Approximately 1.1% of the data were invalidated at the Community site, while no data were deemed suspect.



## 3. PM<sub>10</sub> Exceedances

The federal and state PM<sub>10</sub> exceedances for the spring quarter of the baseline year (2002), the spring quarters of the previous 12 years (2008–2019), and the current spring quarter (2020) are summarized in [Table 2](#). In this quarter, the state PM<sub>10</sub> standard of 50 µg/m<sup>3</sup> was exceeded on 34% of days (24 days) at the Landfill site and on no days at the Community site. This is the third highest percentage of state PM<sub>10</sub> exceedances for the spring quarters on record at the Landfill site.

The federal 24-hr PM<sub>10</sub> standard (150 µg/m<sup>3</sup>) was not exceeded on any days at either the Landfill site or the Community site. Over the 14 spring quarters of PM<sub>10</sub> measurements, including the baseline year (2001-2002), there were federal 24-hr exceedances during eight quarters at the Landfill site and one quarter at the Community site.

**Table 2.** Number of exceedances of federal and state 24-hr PM<sub>10</sub> standards during the spring quarters of the baseline year (2002) and years from 2008 to 2020. 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<sub>10</sub> concentrations were measured. The most recent spring quarter is shown in **bold**.

Site	Quarter Period	Quarter Name	Exceedances of PM <sub>10</sub> Standard	
			Federal 24-hr 150 µg/m <sup>3</sup>	State 24-hr 50 µg/m <sup>3</sup>
Sunshine Canyon Landfill (LS)	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%)
	<b>03/01/20–05/31/20</b>	<b>2020 Spring</b>	<b>0</b>	<b>24/72 (34%)</b>
Community Site (CS)	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%)
	<b>03/01/20–05/31/20</b>	<b>2020 Spring</b>	<b>0</b>	<b>0/58 (0%)</b>

## 4. Average and Maximum Black Carbon Concentrations and PM<sub>10</sub> 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 risk in the Los Angeles basin (South Coast Air Quality Management District, 2015).

BC is measured by using an Aethalometer, which passes air through a filter tape trapping the suspended particles. A light beam projected through the deposit is attenuated by light-absorbing particles. Aethalometers are subject to a saturation effect, where 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). 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 had not been performed in quarterly reports prior to the 29<sup>th</sup> 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 29<sup>th</sup> Quarterly Report. All BC data shown in this Quarterly Report have been compensated, with the exception of data from the baseline year, because the raw data for the baseline year are unavailable.

The 24-hr average and maximum compensated BC concentrations collected during the 2020 spring quarter, the compensated BC data from the spring quarters of the 12 previous years, and the uncompensated data from the baseline year are provided in [Table 3](#). The 2020 spring quarter 24-hr BC concentration average at the Landfill site ties 2019 spring quarter for the lowest on record. The Landfill site maximum 24-hr BC value is the second lowest on record. At the Community site, the 2020 spring quarter 24-hr BC concentration average and maximum 24-hr BC concentration are the lowest recorded over the fourteen year observational period.

Distributions of 24-hour average PM<sub>10</sub> and BC data from spring quarters from 2008 through 2020 (presented as notched box-whisker plots<sup>5</sup>), and percentile trends for these metrics, are shown in Figures 2 through 5.

**Table 3.** Twenty-four-hour BC concentrations for the spring quarter of the baseline year (2002) and each year from 2008 to 2020. Uncompensated BC values are reported for the 2002 spring quarter. The most recent spring quarter is shown in **bold**.

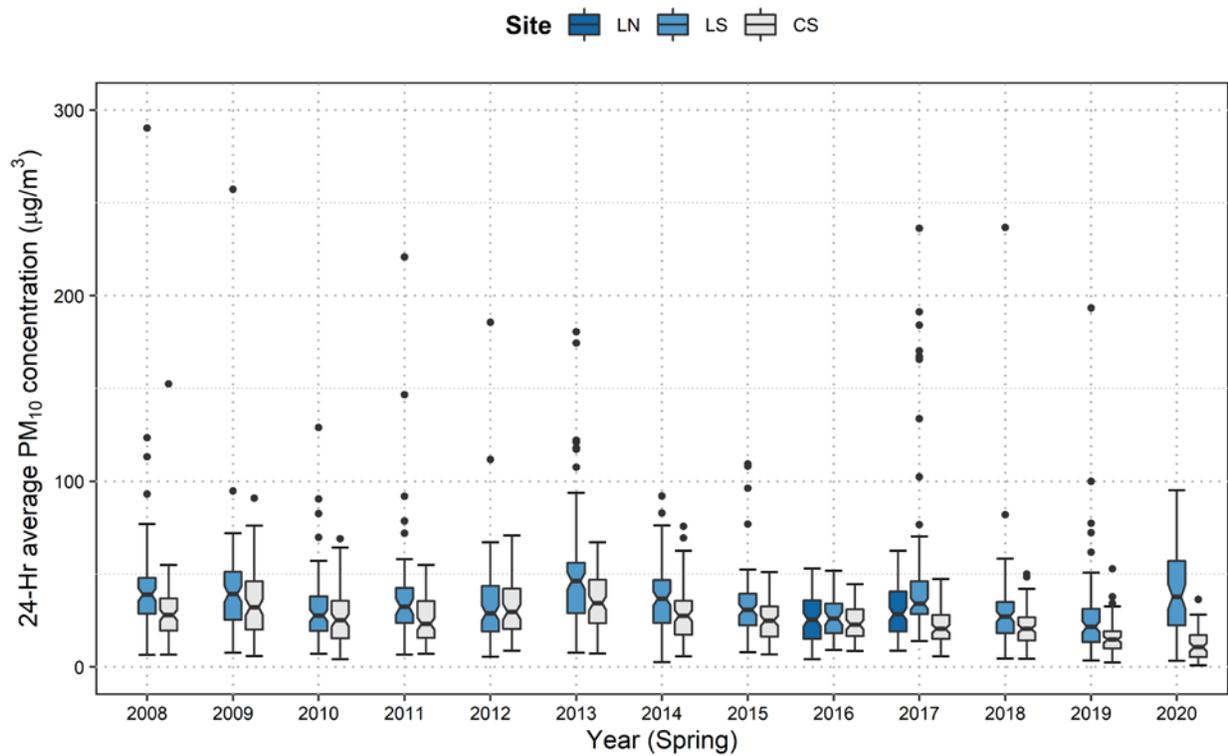
Site	Quarterly Period	Quarter Name	BC Concentrations (µg/m <sup>3</sup> )	
			Average 24-Hr	Maximum 24-Hr
Sunshine Canyon Landfill (LS)	03/01/02–05/31/02	Baseline Year	0.72 <sup>a</sup>	2.18 <sup>a</sup>
	03/01/08–05/31/08	2008 Spring	0.80	2.30
	03/01/09–05/31/09	2009 Spring	1.01	3.44
	03/01/10–05/31/10	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 <sup>b</sup>	1.04 <sup>b</sup>
	03/01/19–05/31/19	2019 Spring	0.32	0.79
	<b>03/01/20–05/31/20</b>	<b>2020 Spring</b>	<b>0.32</b>	<b>0.93</b>
Community Site (CS)	03/01/02–05/31/02	Baseline Year	0.72 <sup>a</sup>	2.22 <sup>a</sup>
	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

<sup>5</sup> A notched box-whisker plot shows the entire distribution of concentrations for each year. Each box illustrates the 25<sup>th</sup> (lower box extent), 50<sup>th</sup> (median, midline), and 75<sup>th</sup> (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 25<sup>th</sup> or 75<sup>th</sup> 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.

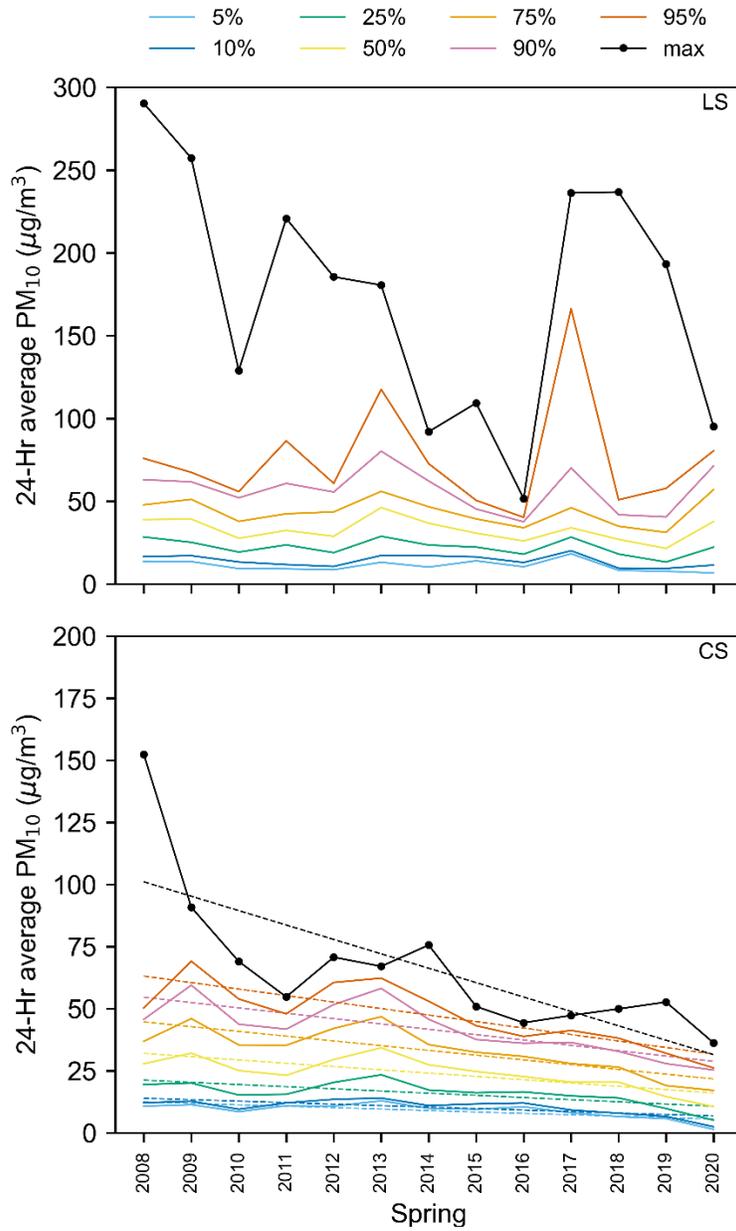
Site	Quarterly Period	Quarter Name	BC Concentrations (µg/m <sup>3</sup> )	
			Average 24-Hr	Maximum 24-Hr
	03/01/16–05/31/16	2016 Spring	0.56	1.97
	03/01/17–05/31/17	2017 Spring	0.49	1.12
	03/01/18–05/31/18	2018 Spring	0.42	1.04
	03/01/19–05/31/19	2019 Spring	0.31	0.75
	<b>03/01/20–05/31/20</b>	<b>2020 Spring</b>	<b>0.21</b>	<b>0.64</b>

<sup>a</sup> Uncompensated BC values.

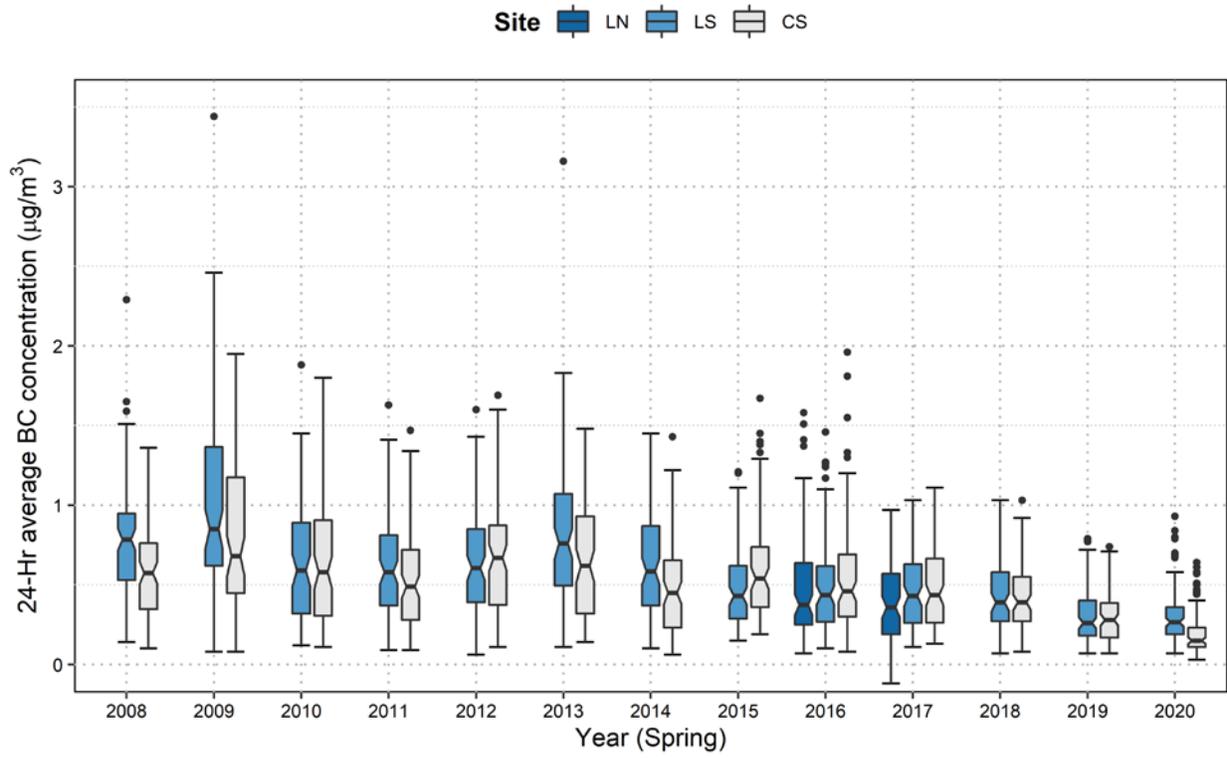
<sup>b</sup> Data taken from the secondary Aethalometer between April 20 and May 24, 2019, were used without corrections.



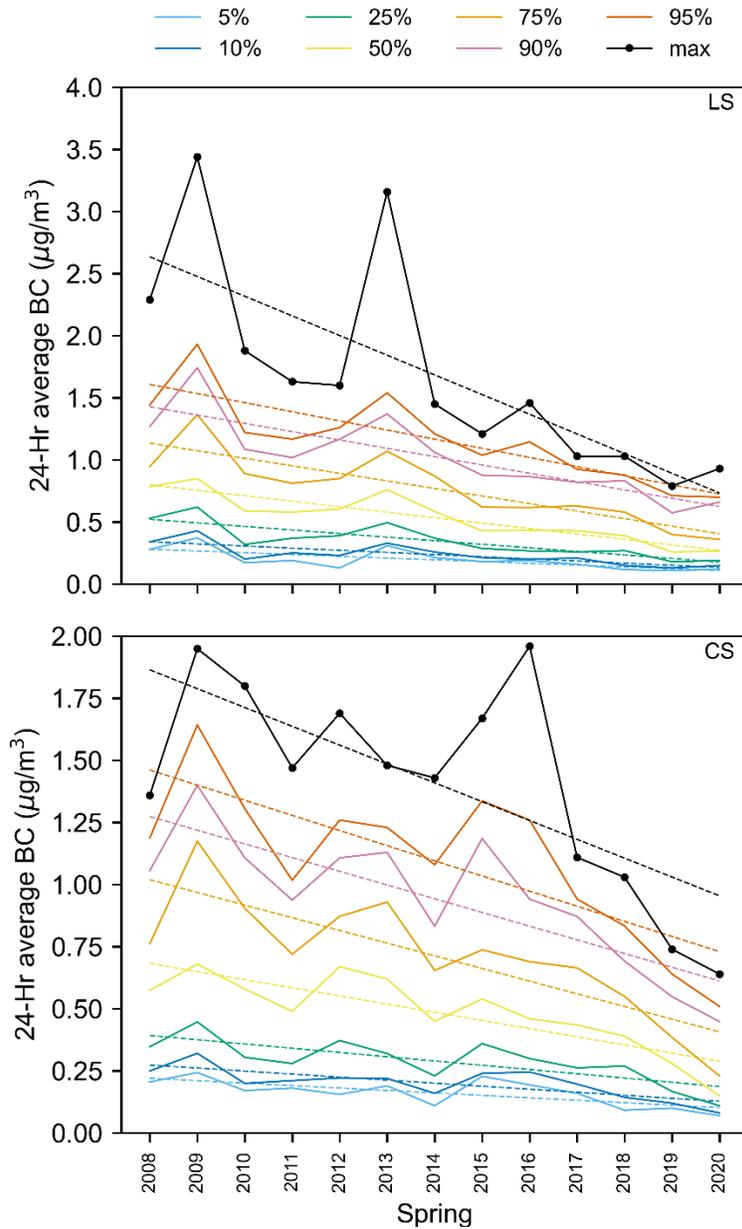
**Figure 2.** Distribution of 24-hr average PM<sub>10</sub> concentrations at the Sunshine Canyon Landfill North site (LN), Landfill site (LS), and Community site (CS) during spring (March-May) quarters from 2008 to 2020.



**Figure 3.** Trends of 24-hr average PM<sub>10</sub> maxima and percentiles at the Sunshine Canyon Landfill site (LS, top) and Community site (CS, bottom) during spring (March-May) quarters from 2008 to 2020. A dashed line denotes a statistically significant decreasing linear trend. Statistical significance was defined at the 95% confidence level (*p-value* ≤ 0.05).



**Figure 4.** Distribution of 24-hr average BC concentrations at the Sunshine Canyon Landfill North site (LN), Landfill site (LS), and Community site (CS) during spring (March-May) quarters from 2008 to 2020.



**Figure 5.** Trends of 24-hr average BC maxima and percentiles at the Sunshine Canyon Landfill site (LS, top) and Community site (CS, bottom) during spring (March-May) quarters from 2008 to 2020. A dashed line denotes a statistically significant decreasing linear trend. Statistical significance was defined at the 95% confidence level ( $p\text{-value} \leq 0.05$ ).

At this time of year, the median 24-average PM<sub>10</sub> concentrations measured at the Community site are usually lower than those measured at the Landfill site (Figure 2). In the 2020 spring quarter, the median 24-hr average PM<sub>10</sub> concentration was indeed higher at the Landfill site. 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<sub>10</sub> concentrations at the Community and the Landfill sites is

statistically significant. At the Landfill site, there is no statistically significant trend in the 24-hr average PM<sub>10</sub> percentiles (Figure 3).<sup>6</sup> The 10<sup>th</sup> through 95<sup>th</sup> percentiles have increased since the 2019 spring quarter; however, the maximum 24-hr average PM<sub>10</sub> concentration in the 2020 spring quarter is the third lowest on record and has decreased since the previous spring quarter. At the Community site, there is a statistically significant decreasing trend for all the 24-hr average PM<sub>10</sub> percentiles and the maximum 24-hr average PM<sub>10</sub> concentrations. The 5<sup>th</sup> to 95<sup>th</sup> percentiles and 24-hr average maximum PM<sub>10</sub> concentrations are the lowest of all recorded spring quarters at the Community site.

During the 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 4). In the spring 2020 quarter, the median 24-hr average BC concentration at the Landfill site was statistically higher than that at the Community site, as indicated by the non-overlapping notches in the box-whisker plot. There is some year-to-year variability in median 24-hr average BC concentrations over the 13 recorded consecutive years, and the range of 24-hr average BC values has generally decreased over time at both monitoring sites. In the spring 2020 quarter, the Community site recorded the lowest median 24-hr average BC concentration, and both sites exhibited smaller ranges of 24-hr average BC concentrations than in previous years.

There is a statistically significant decreasing trend in 24-hr average BC concentrations, the 5<sup>th</sup> through 95<sup>th</sup> percentiles, and the maximum 24-hour BC concentrations, at the Landfill site during spring quarters over the observational record (Figure 5). The maximum 24-hr average BC recorded in 2020 spring quarter at the Landfill site is the second lowest measured. At the Community site, there is also a statistically significant declining trend in spring quarter 24-hr average BC concentrations, at the 5<sup>th</sup> to 95<sup>th</sup> percentiles, and the 24-hr maximum BC, over the 13 recorded consecutive years. The 5<sup>th</sup> to 95<sup>th</sup> percentiles and 24-hr maximum BC recorded in 2020 spring quarter are the lowest measured at the Community site.



## 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 2020 spring quarter.

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

Date of Site Visit	Description of Work
03/24/2020	Collected PM <sub>10</sub> and BC data. Restarted Aethalometer and BAM. Checked Aethalometer and BAM tape supplies. Noted possible moisture damage to Aethalometer tape. Replaced Aethalometer tape. Cleaned BAM roller, vane, and nozzle.
05/01/2020	Gap in access to site due to COVID-19. Collected PM <sub>10</sub> and BC data. Restarted Aethalometer. Checked Aethalometer and BAM tape supplies. BAM found with no tape. Replaced BAM tape. Performed flow check on Aethalometer and BAM samplers. Cleaned Aethalometer roller and cleaned dust from chamber. Cleaned BAM roller, vane, and nozzle. Performed self-test and leak test on BAM. Self-test and leak test passed.
05/21/2020	Collected PM <sub>10</sub> and BC data. Restarted Aethalometer. Checked Aethalometer and BAM tape supplies. Cleaned Aethalometer roller. Performed flow check on Aethalometer and BAM. Cleaned BAM roller, vane, and nozzle. Performed self-test and leak test on BAM. Self-test and leak test passed.
07/02/2020 <sup>a</sup>	Collected PM <sub>10</sub> and BC data. Restarted Aethalometer. Checked Aethalometer and BAM tape supplies. Performed flow check on Aethalometer and BAM. Cleaned BAM roller, vane, and nozzle. Performed leak test on BAM. Leak test passed.

<sup>a</sup> 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 (CS) visits, field maintenance, and operations.

Date of Site Visit	Description of Work
03/25/2020	Remote PM <sub>10</sub> data collected. No access to site due to COVID-19.
05/21/2020	Collected PM <sub>10</sub> and BC data. Restarted Aethalometer. BAM not running. BAM returned to normal operation. Checked Aethalometer and BAM tape supplies. BAM out of tape. Replaced BAM tape. Cleaned Aethalometer roller. Performed flow check on Aethalometer and BAM. Performed self-test and leak test on BAM. Self-test and leak test passed.
05/29/2020	Failed HVAC unit changed. Note recent inside temperatures reached 40°C.
07/02/2020 <sup>a</sup>	Collected PM <sub>10</sub> and BC data. Restarted Aethalometer. Checked Aethalometer and BAM tape supplies. Aethalometer tape loose. Aethalometer tap re-tensioned and tested. Performed flow test on Aethalometer and BAM. Cleaned BAM roller, vane, and nozzle. Performed leak test on BAM. Leak test passed.

<sup>a</sup> 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 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<sub>10</sub> 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)	03/24/2020	16.7	16.7	16.7	16.7	4.0	4.0
	05/01/2020	16.7	17.01	16.7	17.01	4.0	4.1
	05/21/2020	16.7	17.2	16.7	17.2	4.0	3.98
	07/02/2020	16.7	17.1	16.7	17.1	4.0	4.2
Community Site (CS)	05/21/2020	16.7	16.84	16.7	16.84	4.0	4.12
	07/02/2020 <sup>a</sup>	16.7	16.83	16.7	16.83	4.1	4.0

<sup>a</sup> 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, May. 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>.