Sonoma Technology, Inc.
Air Quality Research and Innovative Solutions

TENTH QUARTERLY REPORT OF AMBIENT AIR QUALITY MONITORING AT SUNSHINE CANYON LANDFILL AND VAN GOGH ELEMENTARY SCHOOL

(March 1, 2010–May 31, 2010)

Quarterly Report
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EXECUTIVE SUMMARY

ES.1 BACKGROUND

Continuous monitoring of meteorological and air quality parameters began at the Sunshine Canyon Landfill and Van Gogh Elementary School in the nearby community of Granada Hills in fall 2007. PM_{10} (particulate matter less than 10 microns in aerodynamic diameter) is measured hourly, and wind speed, wind direction, and black carbon (BC, a surrogate for diesel particulate matter) are measured as 5-minute averages and reported as hourly averages. The collected data undergo quarterly validation and are evaluated for completeness. PM_{10} concentrations are compared with federal and state PM_{10} standards. When PM_{10} exceedances occur, additional comparisons are made with the historical, regional, and annual ambient PM_{10} concentrations. At least annually, the PM_{10} and BC data undergo analysis to characterize the impact of landfill operations on ambient air quality on a neighborhood scale. 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.

ES.2 STATISTICS

Data capture for the monitoring period March 1, 2010, through May 31, 2010, was excellent for PM_{10} and wind parameters at both sites. About 9% of the quarterly BC data were missing at each site because the instruments were re-installed on March 8, after upgrades were performed. There were no exceedances of the 150 $\mu g/m^3$ 24-hr federal PM_{10} standard. The more stringent 24-hr California state PM_{10} standard (50 $\mu g/m^3$) was exceeded on 8% of the days at the Van Gogh School site and 11% of the days at the Landfill site. Average BC concentrations at the Landfill site were one-third lower than during last year's March-May quarter, with a substantially lower maximum concentration. Concentrations at the Van Gogh School were similar to those measured in the previous year's March-May quarter.

ES.3 MONITORING INFRASTRUCTURE

The recently completed infrastructure upgrades at the Sunshine Canyon Landfill and the Van Gogh Elementary School ambient air quality monitoring sites have resulted in a much improved operating environment for the monitoring instruments.

1. INTRODUCTION

This report provides a summary of data completeness, ambient PM_{10} concentrations, average and maximum black carbon (BC) concentrations, instrument flow rate verification (quality control) data, and field operations for the recent quarterly period March 1, 2010, through May 31, 2010. Data from this quarterly period represent the second three months of the third year of continuous monitoring at the Sunshine Canyon Landfill and Van Gogh Elementary School monitoring sites.

2. DATA COMPLETENESS

Table 2-1 gives completeness statistics for all measured variables for the period March 1, 2010, through May 31, 2010. About 9% of the BC data were missing at both monitoring sites. The Aethalometers™ were removed on January 25, 2010, and sent to the manufacturer for upgrades and service, and the instruments were reinstalled on March 8, 2010. The first eight days of March account for all the missing BC data. Data capture rates for PM_{10} were 100% at both sites. About 6% of the meteorological data were missing from the Van Gogh School site. The meteorological data capture failures occurred between March 8 and March 16, when the configuration of the new data acquisition system was being reviewed and altered. About 1% of the PM_{10} data from the Van Gogh School was validated as suspect. This was the result of two periods in mid-April when the BAM reported a constant value for consecutive hours ("sticking points"). Machine operational parameters were normal, as were flow and leak checks bracketing these times, so these data were not invalidated.

Table 2-1. Data completeness statistics for the recent monitoring quarter, March 1, 2010, through May 31, 2010 ("WS/WD" is wind speed/wind direction).

Monitoring Location	Dates	Percent Data Capture[a] (%)			Percent Data Valid or Suspect (%)[b]			Percent Data Suspect (%)[c]		
		PM_{10}	BC	WS/ WD	PM_{10}	BC	WS/ WD	PM_{10}	BC	WS/ WD
Sunshine Canyon Landfill	3/1/10-5/31/10	100%	91%	99%	99%	100%	100%	0%	0%	0%
Van Gogh Elementary School	3/1/10-5/31/10	100%	91%	94%	99%	100%	100%	1%	0%	0%

[a] Percent Data Capture is the percentage of collected data values divided by the total number of expected data intervals in the date range (e.g., for the raw BC 5-minute data, 12 data values are expected per hour and 288 data values are expected per day).
[b] Percent Data Valid or Suspect is the percentage of data values that are either valid or suspect, divided by the number of captured data values.
[c] Percent Data Suspect is the percentage of data values labeled as suspect divided by the number of captured data values.

3. PM_{10} EXCEEDANCES

The federal and state PM_{10} exceedances for the current quarter, the corresponding quarters of the previous two years, and the baseline year are summarized in **Table 3-1**. There were no exceedances of the 24-hr federal PM_{10} standard during the current quarter at either the Sunshine Canyon Landfill or Van Gogh School. During the quarterly period in the preceding years of 2008 and 2009, there was one exceedance of the federal standard in each year's quarterly period, with the PM_{10} exceedance on May 21, 2008, recorded at both sites. From March 1 through May 31, 2010, the California state 24-hr standard was exceeded on 8% and 11% of the days at the Van Gogh School and the Sunshine Canyon Landfill sites, respectively. At the Landfill site, the number of days exceeding the state standard in this quarter of 2010 is substantially lower than in previous years' March-May quarterly periods.

Table 3-1. Number of exceedances of federal and state 24-hr PM_{10} standards during the current quarter and the March 1–May 31 quarterly periods of the baseline year (November 22, 2001, to November 21, 2002), 2008, and 2009.

			Van Gogh School				Sunshine Canyon Landfill			
Regulatory Level	Avg. Period	PM_{10} Standard	3/1/02-5/31/02	3/1/08-5/31/08	3/1/09-5/31/09	3/1/10-5/31/10	3/1/02-5/31/02	3/1/08-5/31/08	3/1/09-5/31/09	3/1/10-5/31/10
Federal	24-hr	150 $\mu g/m^3$	0	1 (5/21/08)	0	0	0	1 (5/21/08)	1 (5/6/09)	0
State	24-hr	50 $\mu g/m^3$	17/55 (31%)	6/92 (7%)	18/90 (20%)	7/89 (8%)	21/56 (38%)	20/89 (22%)	24/89 (27%)	10/90 (11%)

4. AVERAGE AND MAXIMUM BLACK CARBON CONCENTRATIONS

While no federal or state standards exist for BC concentrations in ambient air, BC is a measurable component of ambient air that correlates well with diesel particulate matter (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.

Table 4-1 provides the 24-hr average and maximum 24-hr BC concentrations for March 1, 2010, through May 31, 2010, and compares these concentrations with data from corresponding quarters of the two most recent years and the baseline year (2001-2002). Average BC concentrations at the Landfill site were one-third lower than during last year's March-May quarter, with a substantially lower maximum concentration. Concentrations at the Van Gogh School were similar to the previous year's levels.

Table 4-1. Comparison of 24-hr black carbon concentrations for the current quarter with those measured in the March 1–May 31 quarterly periods from the original baseline year (November 22, 2001, to November 21, 2002), 2008, and 2009.

	BC Concentrations ($\mu g/m^3$)							
	Van Gogh School				Sunshine Canyon Landfill			
	3/1/02-5/31/02	3/1/08-5/31/08	3/1/09-5/31/09	3/1/10-5/31/10	3/1/02-5/31/02	3/1/08-5/31/08	3/1/09-5/31/09	3/1/10-5/31/10
Average 24-Hr	0.72	0.51	0.72	0.61	0.72	0.65	0.90	0.60
Maximum 24-Hr	2.22	1.26	1.64	1.68	2.18	1.73	2.97	1.81

5. LANDFILL GAS SAMPLING

No landfill gas (LFG) sampling occurred during this quarterly period. The ambient air quality monitoring work conducted over the previous years at these sites has demonstrated that Landfill impacts on the neighboring communities have seasonal, as well as diurnal, components. With the limited number of LFG samples prescribed by the Conditions of Approval, we have chosen to focus the LFG sampling efforts during the early Fall periods of the year (September, October) when wind conditions generally change from onshore (southerly) to offshore (northerly) flow, and when early morning meteorological conditions favor downslope air flow patterns that may carry LFGs from the Landfill to the neighboring communities.

6. MONITORING SITE INFRASTRUCTURE UPGRADE UPDATE

The recently completed infrastructure upgrades at the two monitoring sites have resulted in a much improved operating environment for the monitoring instruments. The new air conditioning units, combined with the added insulation, have maintained near-optimal operating temperatures in the monitoring trailers during times of high ambient temperatures. Maintaining an adequate environment in the enclosures, particularly with regard to temperature range, is important for the proper operation of the BAM used for PM_{10} monitoring, the Aethalometer™ that tracks ambient BC concentrations, and the computer-based data acquisition system (DAS) that controls the instrumentation and logs and transmits the data. The new data acquisition systems have improved the reliability of the monitoring stations by greatly reducing the number of system conflicts and restarts that were common to the previous, multiple-DAS approach.

7. FIELD OPERATIONS

Tables 7-1 and 7-2 list dates and major tasks associated with visits to the Sunshine Canyon Landfill and Van Gogh School sites, respectively, between March 1, 2010, and May 31, 2010. **Table 7-3** shows the PM_{10} and BC monitors' flow rates, as reported by the monitors and measured with a NIST-traceable flow standard.

Table 7-1. Sunshine Canyon Landfill monitoring site visits and field maintenance and operations from March 1, 2010, through May 31, 2010.

Date of Site Visit	Description of Work
Monday, March 8, 2010	Installed new RM Young wind sensor, refurbished Aethalometer™, DR DAS data acquisition system. Audited all instruments.
Friday, March 12, 2010	Regular preventive maintenance and follow-up check on installation. Found wind sensor out of alignment (not plumb). Reoriented wind sensor to plumb and checked N/S alignment.
Tuesday, April 6, 2010	Flow checks on PM_{10} and BC samplers. Collected PM_{10} and BC data. Cleaned BAM capstan, roller, nozzle, and vane. Replaced Aethalometer™ bug-screened inlet with new version from Magee Scientific.
Tuesday, May 4, 2010	Flow checks on PM_{10} and BC samplers. Collected PM_{10} and BC data.
Friday, May 14, 2010	BAM data flatlined. Broken tape, made visit to replace and re-tension filter tape.
Friday, May 21, 2010	Flow checks on PM_{10} and BC samplers. Collected PM_{10} and BC data.

Table 7-2. Van Gogh School monitoring site visits and field maintenance and operations from March 1, 2010, through May 31, 2010.

Date of Site Visit	Description of Work
Monday, March 8, 2010	Installed new RM Young wind sensor, refurbished Aethalometer™, DR DAS data acquisition system. Audited all instruments.
Friday, March 12, 2010	Regular preventive maintenance and follow-up check on installation. Flow checks on PM_{10} and BC samplers.
Tuesday, April 6, 2010	BAM data flatlined—out of filter tape. Replaced and self-tested. Flow checks on PM_{10} and BC samplers. Collected PM_{10} and BC data. Cleaned BAM capstan, roller, nozzle, and vane. Replaced Aethalometer™ bug-screened inlet with new version from Magee Scientific.
Tuesday, May 4, 2010	Flow checks on PM_{10} and BC samplers. Collected PM_{10} and BC data.
Friday, May 21, 2010	Flow checks on PM_{10} and BC samplers. Collected PM_{10} and BC data.

Table 7-3. Flow rates for the BAM PM_{10} monitors and Aethalometer™ BC monitors at the Sunshine Canyon Landfill and Van Gogh School sites from March 1, 2010, through May 31, 2010. BAM flow rates are volumetric (local temperature and pressure) and Aethalometer™ flow rates are at Standard Temperature and Pressure. Reference flows were measured with a NIST-traceable flow standard. BAM target flow rate is 16.7 lpm volumetric to meet the 10-micron cut point of the inlet, with an acceptable range of 16.0 to 17.3 lpm. The Aethalometer™ has no size cut point.

Location	Date	Flow Rates (lpm)					
		BAM as Found	Reference	BAM as Left	Reference	Aethalometer™ as Found	Reference
Sunshine Canyon Landfill	3/12/10	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
	4/6/10	16.6	16.5	16.6	16.5	3.6	3.7
	5/4/10	16.7	16.7	16.7	16.7	3.7	3.8
	5/21/10	16.7	16.7	16.7	16.7	3.5	3.6
Van Gogh Elementary School	3/12/10	16.7	16.1	16.7	16.1	3.8	3.6
	4/6/10	16.7	16.6	16.7	16.6	3.8	3.9
	5/4/10	16.7	16.9	16.7	16.9	3.8	3.9
	5/21/10	16.7	16.7	16.7	16.7	3.7	3.5

[a] Measured, but technician error resulted in failed write to digital log.