SCS TRACER ENVIRONMENTAL







Baseline PM_{10} Monitoring Report: Silver Lake Reservoir Conduit Bypass Project

Particulate/Dust Monitoring Program

Presented to:

ESA

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(760) 744-9611

March 26th, 2015

Offices Nationwide
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1.0 PROJECT SUMMARY

1.1 INTRODUCTION

The SLRC Bypass Project is part of the SLRC Storage Replacement Project. This project is intended to replace the water storage provided by the Ivanhoe and Silver Lake Reservoirs and makes possible the preservation of these two bodies of water. The SLRC Bypass Project consists of approximately 4,600 linear feet of 66-inch diameter welded steel pipe, a regulator station, and a pressure relief station. The project, as originally proposed in the Environmental Impact Report for the SLRC Storage Replacement Project, was to have consisted of a large underground tunnel beneath West Silver Lake Drive. In an effort to minimize the construction impacts on the Silver Lake community, the LADWP is pursuing an in-reservoir approach which consists of open trench construction along a portion of West Silver Lake Drive and along the bottom of Silver Lake Reservoir.

This air monitoring project was designed to measure the concentrations of particulate matter with a mean aerodynamic diameter of 10 microns or less (PM_{10}) in the vicinity of the Silver Lake Reservoir at four distinct locations surrounding the reservoir in the absence of construction activities.

Baseline sampling occurred at all four locations for two consecutive days (March 11th and 12th, 2015). The following sections provide the details of the sampling that took place and provides the results attained from this baseline monitoring project.

1.2 PARAMETERS

Particulate concentration data has been obtained through the use of four semi-portable, programmable, mass-flow controlled PM_{10} samplers. The sampler of choice for this project is the BGI PQ167 (U.S. EPA Reference Method: RFPS-1298-124). The PQ167 sampler is highly reliable and easy to calibrate. The PQ167 sampler continuously monitors flow rate and adjusts the pump speed to maintain a consistent flow rate of 16.7 liters per minute (lpm). This flow rate is critical for the separation of PM_{10} from particulates of greater size. The PQ167 stores all of the valid sampling run parameters and calculates the total volume for each sampling event.

1.3 SITE LOCATIONS

The following are actual sampling locations for the above mentioned monitors during this baseline sampling project (See Figure 1-1):

Baseline Monitoring Site #1:
Latitude: 34° 06.243’
Longitude: 118° 15.894’

Baseline Monitoring Site #2:
Latitude: 34° 05.928’
Longitude: 118° 15.731’

Baseline Monitoring Site #3:
Latitude: 34° 05.559’
Longitude: 118° 15.854’

Baseline Monitoring Site #4:
Latitude: 34° 05.932’
Longitude: 118° 15.975’

These locations were chosen based on the following priorities:

- Representativeness of background concentrations in the vicinity of the Silver Lake and Ivanhoe Reservoirs; and
- Security.

FIGURE 1-1: FIELD SAMPLING LOCATIONS

1.4 ORGANIZATION

The project is organized as described in the following paragraphs. The description provides individual personnel assigned to the project as well as their responsibilities.

Paul Schafer serves as the overall Project Manager and is responsible for all aspects of the program. This includes oversight of operation, maintenance and data reporting activities as well as correspondence with ESA and the Los Angeles Department of Water and Power (LADWP) personnel. In this capacity he is responsible for direct oversight of the field and data technicians. He is also responsible for facilitating repairs of instruments as well as QA/QC compliance on the program.

Tyler Thomason provided field technician support to the program. Tyler was responsible for onsite operations to include site visits, QA/QC checks and collection of sample media.

Tyler Thomason provides lab and database support to the program. He is responsible for analytical procedures as well as updating the database.

2.0 APPLICABLE DATA CAPTURE SUMMARIES

2.1 INTRODUCTION

This section contains various applicable data capture summary tables.

2.2 INVALID DATA

This section contains a table listing all the invalid samples for this project period along with the reason for the invalidation.

TABLE 2-1: INVALID DATA FOR PM_{10}

Sampling Day	Sampling Location	Reason

Total Invalid Samples: 0

There were no invalid samples during this reporting period.

2.3 PM_{10} DATA

This section contains the table of sampling parameters (Table 2-2) as well as the table of time averaged PM_{10} concentrations (Table 2-3). Concentration data is reported in micrograms per cubic meter ($\mu g/m^3$).

TABLE 2-2: SAMPLE PARAMETERS

Date	Sample ID	Sampling Site	Start Time	Stop Time	Total Time (min)	Sample Volume (m^3)
03/11/15	001	1	08:10	16:10	480	8.02
03/11/15	002	2	07:35	15:35	480	8.02
03/11/15	003	3	07:45	15:45	480	8.02
03/11/15	004	4	07:55	15:55	480	8.02
03/12/15	005	1	06:20	14:20	480	8.02
03/12/15	006	2	06:00	14:00	480	8.02
03/12/15	007	3	06:10	14:10	480	8.02
03/12/15	008	4	06:15	14:15	480	8.02

TABLE 2-3: MEASURED TIME AVERAGED PM-10 CONCENTRATIONS

Date	Sample ID	Sampling Site	Sample Volume (m^3)	Sample Mass (mg)	Sample Concentration (µg/m^3)
03/11/15	001	1	8.02	0.74	92.3
03/11/15	002	2	8.02	0.58	72.4
03/11/15	003	3	8.02	0.68	84.8
03/11/15	004	4	8.02	0.60	74.9
03/12/15	005	1	8.02	0.43	53.6
03/12/15	006	2	8.02	0.24	29.9
03/12/15	007	3	8.02	0.44	54.9
03/12/15	008	4	8.02	0.25	31.2

3.0 QUALITY ASSURANCE AND QUALITY CONTROL DATA SUMMARIES

3.1 CALIBRATION FORMS AND SITE LOGS

Site Logs and calibration forms relative to the operations performed during this monitoring period are included in Appendix A and B respectively. The information these records contain include:

- Results of Calibrations;
- Adherence to all applicable protocols; and
- Diligence of operators to assure the quality of the data generated.

4.0 RESULTS AND CONCLUSIONS

4.1 INTERPRETATION OF RESULTS

When interpreting the results of the baseline monitoring data the following relationships are investigated:

1. Relative difference to established benchmarks (the California State Standard for 24-hr PM_{10} concentration if 50 µg/m^3),

2. Spatial Differences: What are the differences in concentration relative to sampling location, and

3. Temporal Differences: What are the differences in concentration relative to the time of the sampling?

The following section will provide some commentary on the data collected relative to these relationships.

4.2 CONCLUSIONS

1. Many of the baseline samples exceeded the CA State benchmark of 50 µg/m^3. In fact, 6 of the 8 samples taken during this project exceeded this benchmark. The highest concentration measured was at Site #1 on March 21, 2015 and resulted in a concentration of 185% (92.3 µg/m^3) of the benchmark. However, it should be noted that the samples taken where 8-hr time averaged samples and concentrations would likely change with a 24-hr sampling period. The project was designed to measure concentrations during the period of the day that construction activities are likely to occur for comparison purposes to monitoring during construction activities.

2. Spatial differences in concentration were fairly significant. On both sampling days, Sites 1 and 3 had significantly higher concentrations than Sites 2 and 4. This indicates that Sites 1 and 3 were impacted by a local source(s) to a greater degree than Sites 2 and 4 during the period sampled. Sites 2 and 4 appear to be indicative of regional background levels while Sites 1 and 3 appear to be influenced to a greater degree by more local particulate sources.

3. Temporal differences in concentration were also fairly significant during these two sampling days. Samples taken on March 11th appeared to have a significantly higher regional background relative to the samples taken on March 12th. Meteorological variables such as a lower inversion layer on the 11th likely contributed to the difference in regional background levels on the two days.

4.3 DATA LIMITATIONS

There are several limitations associated with this sampling project. The major limitations are as follows:

- The results correspond to one particular period of time. These results would not necessarily be reproducible at another given period of time.
- Meteorological parameters significantly influence pollutant concentrations. These variables need to be considered.
- The data obtained in this sampling project are time averaged concentrations. Different averaging periods may lead to varying results.
- The project area is urban and multiple sources exist at varying times which are significant distances apart. The proximity of a sampler to a specific source greatly influences the impacts of that source on the sample. The individual impacts of each source cannot be defined.
- Some sources of particulate generation may be directly upwind from a given sampling site while other sources may not be given a prevailing wind direction. Also, although we are able to determine prevailing wind direction, wind direction is variable throughout a day.

Appendix A

Sample Logs

SCS Tracer Environmental

ESA-DWP Air Sampling Log

Sampling Date: 3/11/2015 | Site #: Silver lake | Operator: Tyler T.

Sample #:	1	Filter #:	1
Start Time	0810	Start Flow	16.7
Stop Time	1610	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #1
N 34° 06.243'
W 118° 15.894'

Notes: 3/11/2015

Sample #:	2	Filter #:	2
Start Time	0735	Start Flow	16.7
Stop Time	1535	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background Site #2
N 34° 05.928'
W 118° 15.731'

Notes: 3/11/2015

Sample #:	3	Filter #:	3
Start Time	0745	Start Flow	16.7
Stop Time	1545	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #3
N 34° 05.559'
W 118° 15.854'

Notes: 3/11/2015

SCS Tracer Environmental

ESA-DWP Air Sampling Log

Sampling Date: | Site #: | Operator:

Sample #:	4	Filter #:	4
Start Time	0755	Start Flow	16.7
Stop Time	1555	Stop Flow	16.7
Elapsed Time	480min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #4
N 34° 05.932'
W 118° 15.975'

Notes: 3/11/2015

Sample #:	5	Filter #:	5
Start Time	0620	Start Flow	16.7
Stop Time		Stop Flow	16.7
Elapsed Time		Avg. Flow	16.7
		Tot. Vol.	8.016L

Location: Background site #1
N 34° 06.243'
W 118° 15.894'

Notes: 3/12/2015

Sample #:	6	Filter #:	6
Start Time	0600	Start Flow	16.7
Stop Time		Stop Flow	16.7
Elapsed Time		Avg. Flow	16.7
		Tot. Vol.	8.016L

Location: Background site #2
N 34° 05.928'
W 118° 15.731

Notes: 3/12/2015

SCS Tracer Environmental

ESA-DWP Air Sampling Log

Sampling Date | Site # | Operator

Sample #:	7	Filter #:	7
Start Time	0610	Start Flow	16.7
Stop Time	1410	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #3
N 34° 05.559'
W 118° 15.854'

Notes: 3/12/2015

Sample #:	8	Filter #:	8
Start Time	0615	Start Flow	16.7
Stop Time	1415	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #4
N 34° 05.932'
W 118° 15.894'

Notes: 3/12/2015

Sample #:		Filter #:	
Start Time		Start Flow	
Stop Time		Stop Flow	
Elapsed Time		Avg. Flow	
		Tot. Vol.	

Location:

Notes:

Appendix B

Calibration Forms

BGI INCORPORATED 58 GUINAN STREET WALTHAM, MA 02451

NIST Traceable Calibration Facility, ISO 9001:2008 Registered

deltaCal

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

(Refer to instruction manual for further details of calibration)

deltaCal Serial Number: **510** DATE: 18-Sep-14

Calibration Operator: Brian DeVoe

Critical Venturi Flow Meter: Max Uncertainity = 0.346%

Serial Number: 1 *CEESI NVLAP NIST Data File 04BGI151*

Serial Number: 2 *CEESI NVLAP NIST Data File 04BGI152*

Serial Number: 3 *CEESI NVLAP NIST Data File 04BGI153*

Serial Number: 4 *CEESI NVLAP NIST Data File 02BGI004*

Room Temperature: Uncertainity=0.071% Room Temperature: 21.1 C

Brand: Ever-Safe Serial Number: 016076

NIST Traceability No. 516837

deltaCal:

Ambient Temperature (set): 21.1 C

Aux (filter) Temperature (set): 21.1 C

Barometric Pressure and Absolute Pressure

Vaisala Model PTB330(50-1100) Digital Accuracy: 0.03371%

S/N D4310002

NIST Traceable (Princo Primary Standard Model 453 S/N W12537) Certificate No. P-7485

deltaCal:

Barometric pressure (set): 758.5 mm of Hg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Q= 4.16203 ΔP ^ 0.52082 Overall Uncertainty: 0.35%

Date Placed In Service Sep 2014

(To be filled in by operator upon receipt)

Recommended Recalibration Date ~~4~~ Sep 2015

(12 months from date placed in service)

Revised: July 2012

To Check a deltaCal 18-Sep-14 Brian DeVoe

2-20 Lpm VER 3.41P

BP= 758.5 mm of Hg

Maximum allowable error at any flow rate is .75%.

Serial No. 510

	Reading Abs. P Crit. Vent. mm of Hg	Room Temp	Crit. Vent. Temp	CV Qa Flow Lpm	Qa deltaCal Indicated	**% Error**
# 2	201.08	21.1	21.00	2.23	2.22	**-0.28**
	492.22	21.1	21.00	5.52	5.48	**-0.69**
# 1	252.22	21.1	21.00	9.80	9.75	**-0.55**
	398.09	21.1	21.00	15.59	15.53	**-0.37**
	487.48	21.1	21.00	19.13	19.12	**-0.06**
					Average %	**-0.39**

Certificate No.: 073040-091-123014

Mettler Toledo
Service Business Unit Laboratory
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

ISO 9001: 2008 Registered

Calibration Certificate

Customer

Company:	SCS Tracer Environmental		
Address:	970 Los Vallecitos Blvd		
	Ste 100		
City:	San Marcos	*State/Province:*	California
Zip/Postal:	92069		

Device

Manufacturer:	Mettler Toledo	*Asset No.:*	
Serial No.:	B222975626	*Dept./Room:*	
Max Capacity:	22 g	*Readability:*	0.000001 g
Model:	XP26	*Work Order No:*	330596013

Procedure Statement: The device referenced in this document has been metrologically tested in accordance with METTLER TOLEDO Work Instruction VW0152A. All translations into other languages are based on the referenced work instruction, which is in English. This certificate refers to: As Found and As Left

Test Date:	30-Dec-2014	*Next Cal. Due Date:*	31-Jan-2016
Service Technician:	Denise Gogola	*Signature:*	ELECTRONIC SIGNATURE

Reference Weights

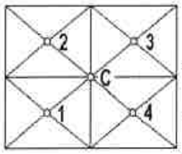
Traceability of Test Equipment: All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1

Weight Set No.:	358	*Date of Issue:*	26-Sep-2014
Calibration Due Date:	30-Sep-2015	*NIST Traceability No.*	MT5061/MT001086
Class:	E2		

Measuring Results

Eccentricity



		As Found		As Left	
Test Weight	*Position*	*Displayed Value*	*Deviation*	*Displayed Value*	*Deviation*
C: 10 g	*Center*	0.000000 g	N/A	0.000000 g	N/A
1: 10 g	*Left Front*	-0.000011 g	-0.000011 g	-0.000007 g	-0.000007 g
2: 10 g	*Left Rear*	0.000000 g	0.000000 g	0.000000 g	0.000000 g
3: 10 g	*Right Rear*	0.000000 g	0.000000 g	0.000000 g	0.000000 g
4: 10 g	*Right Front*	-0.000011 g	-0.000011 g	-0.000007 g	-0.000007 g
Eccentric Load Deviation:		0.000011 g		0.000007 g	
Manufacturer Specifications:		0.00002 g		0.00002 g	
Manufacturer Specifications Rounded to Resolution of Eccentric Load Deviation:		0.000020		0.000020	
Specifications Met:		YES		YES	

Sensitivity

	As Found			As Left		
	Displayed Value			*Displayed Value*		
Reference Weight	*Without Reference Weight*	*With Reference Weight*	*Deviation*	*Without Reference Weight*	*With Reference Weight*	*Deviation*
20.000028 g	0.000000 g	20.000093 g	0.000065 g	0.000000 g	20.000044 g	0.000016 g
	Sensitivity Offset:		0.000065 g	*Sensitivity Offset:*		0.000016 g
	Manufacturer Specifications:		N/A	*Manufacturer Specifications:*		0.00008 g
	Manufacturer Specifications Rounded to Resolution of Sensitivity Offset:		N/A	*Manufacturer Specifications Rounded to Resolution of Sensitivity Offset:*		0.000080 g
	Specifications Met:		N/A	*Specifications Met:*		YES

Linearity - Differential Method

Test Weight: 5.000000 g

	Preload Weight	As Found: Displayed Value: Preload	As Found: Displayed Value: Test Weight	As Found: Deviation *	As Left: Displayed Value: Preload	As Left: Displayed Value: Test Weight	As Left: Deviation *
1	0 g	0.000000 g	5.000032 g	0.0000057 g	0.000000 g	5.000029 g	0.0000025 g
2	5 g	4.999990 g	10.000016 g	0.0000054 g	4.999987 g	10.000015 g	0.0000040 g
3	10 g	9.999959 g	14.999981 g	0.0000011 g	9.999955 g	14.999981 g	0.0000035 g
4	15 g	14.999939 g	19.999964 g	-0.0000002 g	14.999966 g	19.999989 g	0.0000000 g
		Linearity Deviation:		0.0000057 g	*Linearity Deviation:*		0.0000040 g
		Manufacturer Specifications:		0.000006 g	*Manufacturer Specifications:*		0.000006 g
		Manufacturer Specifications Rounded to Resolution of Linearity Deviation:		0.0000060 g	*Manufacturer Specifications Rounded to Resolution of Linearity Deviation:*		0.0000060 g
		Specifications Met:		YES	*Specifications Met:*		YES

* This Linearity Deviation is zero point offset and sensitivity error compensated.

Remarks

Calibrated unit for optimum performance.