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Santa Monica-Malibu Unified School District

Indoor Air Sampling Report

Lincoln Middle School
1501 California Avenue
Santa Monica, California

February 9, 2015

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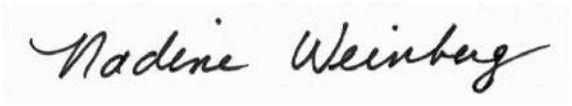
Philip Skorge
Project Manager



Nadine Weinberg
Associate Vice President / Principal Scientist

Prepared for:
Santa Monica-Malibu School District

Prepared by:
ARCADIS U.S., Inc.
3750 Schaufele Avenue
Suite 225
Long Beach
California 90808
Tel 562 496 3000
Fax 562 429 2452

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Acronyms and Abbreviations

ARB	Air Resources Board
CHPS	California Collaborative for High Performance Schools
DTSC	California Department of Toxic Substances Control
ELAP	Environmental Laboratory Accreditation Program
IAQ	indoor air quality
LMS	Lincoln Middle School
µg/m^3	micrograms per cubic meter
VOC	volatile organic compound
USEPA	United States Environmental Protection Agency

1. Introduction

In accordance with the California Collaborative for High Performance Schools (CHPS) *Best Practices Manual Volume III: California Criteria for High Performance Schools* (2009), an indoor air quality (IAQ) investigation was conducted in December 2014 at newly constructed areas of Lincoln Middle School (the site). The IAQ investigation is also part of the Santa Monica-Malibu Unified School District's commissioning protocols for occupancy after major construction projects. Lincoln Middle School (LMS) is located at 1501 California Avenue in Santa Monica, California (Figure 1). A site plan is included as Figure 2.

Independent air monitoring protocols were implemented in accordance with the specific commissioning goals established as part of the CHPS program on sustainability and improved environments. CHPS was adopted and implemented as a board- and voter-approved resolution for Measure BB. Measure BB Program and Project Managers developed the commissioning standards and policies to ensure that design teams and construction professionals follow CHPS-accepted guidelines from concept to occupancy stages. Overall, the commissioning process is to confirm that specifications and designs are executed as specified, installed equipment and systems are adjusted and operating, and the process of installation conforms to the required guidelines.

1.1. Project Objectives

The goals of the IAQ investigation at LMS were to (1) establish the base line indoor and outdoor air quality for volatile organic compounds (VOCs) and formaldehyde as part of the commissioning process for the new building at LMS, and (2) compare these analytical results to applicable screening criteria and ambient (background) concentrations. In support of these objectives, indoor air and ambient samples were collected from multiple locations in the new building at LMS.

1.2. CHPS Protocol

The California CHPS began in 1999 after a discussion between the California Energy Commission and various utility companies on ways to improve the performance of California's schools. Over the years, the CHPS system has grown and was incorporated as a non-profit organization in 2002. The CHPS Best Practice Manual consists of six volumes covering planning, design, criteria, maintenance and operations, commissioning, and high performance re-locatable classrooms. The IAQ investigation presented in this report is covered in *Best Practices Manual Volume III:*

California Criteria for High Performance Schools (2009) and meets the requirements outlined in the LMS Project Manual Specifications (June 2009). The CHPS Criteria define what makes up a high performance school including rating the building on healthy, comfortable, efficient, safe, secure, adaptable, and easy to maintain spaces (CHPS 2009). Using the CHPS Criteria, schools are designated as CHPS Designed, CHPS Verified, or CHPS Verified Leader depending on how well the buildings score against the criteria.

The goal established by the CHPS (2009) for IAQ is to "Achieve good indoor air quality to protect student and staff health, performance, and attendance". As such, schools are graded on heating, ventilation, and air conditioning performance; ventilation and dust collection during remodeling; pre-conditioning (i.e., allowing any materials that have VOCs to off-gas prior to use); vacuuming and cleaning prior to occupancy; a building flush-out where 100% of the indoor air is flushed with outside air for 24 hours; thermal comfort; air filtration; low-emitting materials; controllability of systems; chemical and pollutant source control; and mercury reduction. The final scoring matrix is contained in the commissioning of the building. Details of the IAQ investigation undertaken during the CHPS commissioning process are presented in Section 2.

2. Indoor Air Quality Sampling

The IAQ investigation included conducting baseline indoor air quality testing after construction ended and prior to full occupancy. Testing protocols were consistent with United States Environmental Protection Agency (USEPA) guidance.

On December 15, 2014, ARCADIS collected two indoor air samples for formaldehyde analysis and two indoor air samples for VOC analysis (four indoor air samples in total) at the Lincoln Middle School (Figures 3a and 3b). Indoor samples for VOC and formaldehyde analysis were collected from (1) Room 153, the first floor Chorus Room, and (2) Room 256, the second floor science classroom. ARCADIS also collected one parent-duplicate sample combination for both formaldehyde analysis and VOC analysis (four total ambient samples) from the outside deck on the second floor (Figure 3b). Depending on collection methods, samples were analyzed for a suite of 75 VOCs via USEPA standard Method TO-15 or for formaldehyde via USEPA Method TO-11A. Outdoor samples were located to obtain information on conditions immediately surrounding the school. Outdoor air quality data provide an estimate of the typical concentrations individuals may breathe. In addition, outdoor air is typically brought into indoor air through heating and ventilation systems and, therefore, can significantly

influence indoor air concentrations. Indoor air results provide information on concentrations individuals may breathe while in a specific room or space.

2.1. Site Reconnaissance

Before beginning sampling activities, field staff completed a building survey to identify sample locations and gain a better understanding of the building layout and construction. Field staff also noted materials located in each room. Since sampling occurred after construction was completed and before occupancy, each room was found to be empty of materials.

2.2. Sample Locations

Indoor air sample locations were chosen with input from school and commissioning staff. Sampling locations were selected to be representative of various areas and functions within the new building and included representative locations on each floor. Indoor air samples were collected from four locations as presented on Figures 3a and 3b. Ambient air (outdoor) samples were located to obtain background air quality data for the area immediately surrounding the building considering potential outdoor sources (such as roadways and parking lots). Ambient air samples were collected from two locations, as presented on Figure 3b; (samples from one location were analyzed for VOCs and samples from the other location were analyzed for formaldehyde). As shown on Figure 1, Freeway 10 is located south of the site. Washington Avenue and Wilshire Boulevard, both major streets, are located north and south of the site, respectively.

2.3. Sample Methods

Consistent with the LMS Project Manual Specifications (June 2009), indoor air samples were collected to comply with the CHPS criteria. Summa canisters were used to collect air samples for VOCs, while sorbent tubes were used to evaluate formaldehyde. Summa canisters and sorbent tubes were placed in each room and samples were collected, as described below. Samples were collected in accordance with the requirements of USEPA Method TO-15 for VOC analysis and USEPA Method TO-11A for formaldehyde analysis.

Air Sampling

Six-liter Summa canisters with attached flow regulators were pre-set by the laboratory to provide uniform sample collection over a period of approximately 5 to 6 hours. All indoor and ambient air samples were collected at breathing height (approximately 4 to 5 feet above ground surface). The valve on the Summa canister was closed when a vacuum of approximately 5 inches of mercury remained in the canister (which occurred after approximately 5 to 6 hours); leaving a vacuum in the canister provided a means for the laboratory to verify the canister did not leak during transit.

SKC Formaldehyde Sorbent Tubes Cat. No. 226-119 containing 2,4-dinitrophenylhydrazine coated high-purity silica gel were used to collect air samples for formaldehyde analysis. Each sorbent tube was connected to a sampling pump set to draw air across the sorbent tube at a rate of 200 milliliters/minute. At the end of the sample period, the pump was turned off and the sorbent tube was sealed for shipment back to the analytical laboratory.

Laboratory Analyses

Summa canister and sorbent tube samples were submitted under chain-of-custody protocols to ALS Environmental in Simi Valley, California, an independent state of California Environmental Laboratory Accreditation Program (ELAP) certified laboratory. The Summa canisters were shipped in boxes under ambient conditions. The sorbent tubes were shipped on ice in a cooler. ALS Environmental analyzed the Summa canister samples for VOCs in accordance with USEPA Method TO-15 using standard detection limits. ALS Environmental analyzed the sorbent tubes for formaldehyde using USEPA Method TO-11A.

3. Indoor Air Data Results

Table 1 presents the concentrations of VOCs and formaldehyde reported in the outdoor and indoor air samples collected in December 2014. Nine chemicals were detected in outdoor air, and 20 chemicals were detected in indoor air.

Data from the VOC analysis (USEPA Method TO-15) were compared to conservative screening levels developed by USEPA and the Department of Toxic Substances Control (DTSC). USEPA and DTSC screening values are protective of an individual present in the building for 8 hours a day for 250 days per year for 25 years. The screening values are set at levels that ensure no adverse noncancer health effects and are protective of cancer at a risk of 1 in 1 million (i.e., potentially one additional cancer case per million individuals exposed) over the entire exposure period of 25 years.

Data from the formaldehyde analysis (USEPA Method TO-11A) were compared to the CHPS maximum allowable concentration levels as set by The U.S. Green Building Council's 2009 LEED document. In general, most of the chemicals detected in either outdoor or indoor air were below the conservative screening levels.

In outdoor air, the following chemicals were detected above a screening level in at least one location:

- Benzene (all locations)

In indoor air, the following chemicals were detected above a screening level in at least one location:

- Benzene (all locations)

For formaldehyde, indoor air concentrations were evaluated against the criteria outlined in Version 2.2 of *LEED for New Construction & Major Renovations* (U.S. Green Building Council 2005). Formaldehyde was detected in both outdoor and indoor air well below the LEED recommended concentration of 50 parts per billion (ppb) or 61 micrograms per cubic meter ($\mu g/m^3$).

4. Reliability of Data

Laboratory analytical data produced as part of the investigation were reviewed for completeness and technical compliance. Data were reviewed in accordance with USEPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (1999) and USEPA Region IX *VOLATILE ORGANIC COMPOUNDS (VOCs) in Air (Ambient Air/Soil Vapor/Stack Gas) Samples Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (2000). Where applicable, review of the data packages included checking the following:

- Chain-of-custody forms
- Holding times
- Canister Pressure upon receipt
- Blank contamination
- Laboratory Control Samples/ Blank spikes
- Surrogate recoveries
- Calibration summaries

Acceptable method reporting limits were achieved for the analyses of the air samples.

Review of the laboratory data package (P1405060; Appendix A) identified no quality assurance/quality control non-compliance issues.

All applicable precision and accuracy criteria were met. The data required no qualification. Therefore, the analytical data are considered reliable and acceptable as reported for use in this investigation.

5. Indoor Air Data Evaluation

Since benzene was detected in indoor and ambient air above screening levels, benzene concentrations were evaluated further to determine whether the source was related to outdoor sources, building products, or some other background source.

As shown in Table 1, benzene concentrations in outdoor air ranged from 0.88 µg/m^3 to 0.91 µg/m^3. In indoor air, benzene concentrations ranged from 0.80 µg/m^3 to 1.3 µg/m^3. These results confirm that benzene concentrations inside the building are similar to concentrations found outdoors. Benzene is commonly detected in outdoor and indoor air and is associated with many commercial products including gasoline (both gasoline stations and vehicle exhaust), cigarette smoke, and wood burning fires. USEPA (2011) has determined that residential indoor air background benzene concentrations typically range from nondetect to 4.7 µg/m^3 at the 50th percentile. Outdoor benzene concentrations in downtown Los Angeles ranged from 0.19 to 1.0 µg/m^3 in 2012 (ARB 2013). These results clearly indicate that both outdoor and indoor air benzene concentrations are associated with typical background sources, and no further action is needed to address the concentrations detected. In addition, there should be no restrictions on occupancy based on the detected benzene concentrations.

6. Conclusions and Recommendations

- Formaldehyde was detected in outdoor and indoor air at concentrations below the screening level.
- Benzene was detected in outdoor and indoor air at similar concentrations, indicating that results are associated with typical background levels.
- No further investigation of indoor air quality is necessary.

7. References

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Tables

Table 1: Summary of Indoor Air Analytical Results - Industrial Screening Criteria
Santa Monica Schools - Lincoln Middle School, Santa Monica, CA

CAS NO TO-15	Analyte / Sample ID: / Date:	USEPA Industrial Indoor Air RSL µg/m³	DTSC Industrial Alternative µg/m³	TO15-Outside RM 259 12/15/2014 µg/m³	TO15-Outside RM 259D 12/15/2014 µg/m³	TO15-RM 256 12/15/2014 µg/m³	TO15-RM 153 12/15/2014 µg/m³
115-07-1	Propene	13000	-	0.72 U	**1**	0.73 U	0.93
75-71-8	Dichlorodifluoromethane (CFC 12)	440	-	**2**	**2**	**2**	**2**
74-87-3	Chloromethane	390	-	0.72 U	0.71 U	0.73 U	0.71 U
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	-	-	0.72 U	0.71 U	0.73 U	0.71 U
75-01-4	Vinyl Chloride	2.8	0.16	0.72 U	0.71 U	0.73 U	0.71 U
106-99-0	1,3-Butadiene	0.41	0.072	0.72 U	0.71 U	0.73 U	0.71 U
74-83-9	Bromomethane	22	-	0.72 U	0.71 U	0.73 U	0.71 U
75-00-3	Chloroethane	44000	-	0.72 U	0.71 U	0.73 U	0.71 U
64-17-5	Ethanol	-	-	**7.8**	**9.6**	**7.3**	**16**
75-05-8	Acetonitrile	260	-	0.72 U	0.71 U	**1**	**52**
107-02-8	Acrolein	0.088	-	2.9 U	2.8 U	2.9 U	2.8 U
67-64-1	Acetone	140000	-	7.2 U	7.1 U	7.3 U	**24**
75-69-4	Trichlorofluoromethane (CFC 11)	3100	-	**1.2**	**1.2**	**1.2**	**1.2**
67-63-0	2-Propanol (Isopropyl Alcohol)	880	-	7.2 U	7.1 U	7.3 U	7.1 U
107-13-1	Acrylonitrile	0.18	0.042	0.72 U	0.71 U	0.73 U	0.71 U
75-35-4	1,1-Dichloroethene (1,1-DCE)	880	310	0.72 U	0.71 U	0.73 U	0.71 U
75-09-2	Dichloromethane (Methylene Chloride)	1200	12	0.72 U	0.71 U	0.73 U	0.71 U
107-05-1	3-Chloro-1-propene (Allyl Chloride)	2	-	0.72 U	0.71 U	0.73 U	0.71 U
76-13-1	1,1,2-Trichlorotrifluoroethane	130000	-	0.72 U	0.71 U	0.73 U	0.71 U
75-15-0	Carbon Disulfide	3100	-	7.2 U	7.1 U	7.3 U	7.1 U
156-60-5	trans-1,2-Dichloroethene		-	0.72 U	0.71 U	0.73 U	0.71 U
75-34-3	1,1-Dichloroethane (1,1-DCA)	7.7	3100	0.72 U	0.71 U	0.73 U	0.71 U
1634-04-4	Methyl tert-Butyl Ether	47	-	0.72 U	0.71 U	0.73 U	0.71 U
108-05-4	Vinyl Acetate	880	-	7.2 U	7.1 U	7.3 U	7.1 U
78-93-3	2-Butanone (MEK)	22000	-	7.2 U	7.1 U	7.3 U	7.1 U
156-59-2	cis-1,2-Dichloroethene		31	0.72 U	0.71 U	0.73 U	0.71 U
141-78-6	Ethyl Acetate	310	-	1.4 U	**7.9**	1.5 U	**3.2**
110-54-3	n-Hexane	3100	-	0.72 U	0.71 U	0.73 U	**0.83**
67-66-3	Chloroform	0.53	-	0.72 U	0.71 U	0.73 U	0.71 U
109-99-9	Tetrahydrofuran (THF)	8800	-	0.72 U	0.71 U	0.73 U	0.71 U
107-06-2	1,2-Dichloroethane	0.47	-	0.72 U	0.71 U	0.73 U	0.71 U
71-55-6	1,1,1-Trichloroethane (TCA)	22000	4400	0.72 U	0.71 U	0.73 U	0.71 U
71-43-2	Benzene	1.6	0.42	**0.88**	**0.91**	**1.3**	**0.8**
56-23-5	Carbon Tetrachloride	2	0.29	0.72 U	0.71 U	0.73 U	0.71 U
110-82-7	Cyclohexane	26000	-	1.4 U	1.4 U	1.5 U	1.4 U
78-87-5	1,2-Dichloropropane	1.2	-	0.72 U	0.71 U	0.73 U	0.71 U
75-27-4	Bromodichloromethane	0.33	310	0.72 U	0.71 U	0.73 U	0.71 U
79-01-6	Trichloroethene (TCE)	3	-	0.72 U	0.71 U	0.73 U	0.71 U
123-91-1	1,4-Dioxane	2.5	-	0.72 U	0.71 U	0.73 U	0.71 U
80-62-6	Methyl Methacrylate	3100	-	1.4 U	1.4 U	1.5 U	1.4 U
142-82-5	n-Heptane	-	-	0.72 U	0.71 U	0.73 U	**1.5**

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10061-01-5	cis-1,3-Dichloropropene	-	-	0.72 U	0.71 U	0.73 U	0.71 U
108-10-1	4-Methyl-2-pentanone	13000	-	0.72 U	0.71 U	0.73 U	0.71 U
10061-02-6	trans-1,3-Dichloropropene	-	-	0.72 U	0.71 U	0.73 U	0.71 U
79-00-5	1,1,2-Trichloroethane	0.77	-	0.72 U	0.71 U	0.73 U	0.71 U
108-88-3	Toluene	22000	1300	**2.3**	**2.5**	**3**	**4.8**
591-78-6	2-Hexanone	130	-	0.72 U	0.71 U	0.73 U	0.71 U
124-48-1	Dibromochloromethane	0.45	310	0.72 U	0.71 U	0.73 U	0.71 U
106-93-4	1,2-Dibromoethane	0.02	-	0.72 U	0.71 U	0.73 U	0.71 U
123-86-4	n-Butyl Acetate	-	-	0.72 U	0.71 U	0.73 U	0.71 U
111-65-9	n-Octane	-	-	0.72 U	0.71 U	0.73 U	0.81
127-18-4	Tetrachloroethene	47	2.08	0.72 U	0.71 U	0.73 U	0.71 U
108-90-7	Chlorobenzene	220	-	0.72 U	0.71 U	0.73 U	0.71 U
100-41-4	Ethylbenzene	4.9	-	0.72 U	0.71 U	0.73 U	**3**
179601-23-1	m,p-Xylenes	-	-	1.4 U	**1.4**	**1.7**	**13**
75-25-2	Bromoform	11	310	0.72 U	0.71 U	0.73 U	0.71 U
100-42-5	Styrene	4400	3900	0.72 U	0.71 U	0.73 U	0.71 U
95-47-6	o-Xylene	440	-	0.72 U	0.71 U	0.73 U	**4.4**
111-84-2	n-Nonane	88	-	0.72 U	0.71 U	0.88	**1.4**
79-34-5	1,1,2,2-Tetrachloroethane	0.21	310	0.72 U	0.71 U	0.73 U	0.71 U
98-82-8	Isopropylbenzene (Cumene)	1800	-	0.72 U	0.71 U	0.73 U	0.71 U
80-56-8	alpha-Pinene	-	-	0.72 U	0.71 U	0.73 U	**2.8**
103-65-1	n-Propylbenzene	4400	-	0.72 U	0.71 U	0.73 U	0.71 U
622-96-8	4-Ethyltoluene	-	-	0.72 U	0.71 U	0.73 U	0.71 U
108-67-8	1,3,5-Trimethylbenzene		150	0.72 U	0.71 U	0.73 U	0.71 U
95-63-6	1,2,4-Trimethylbenzene	31	-	0.72 U	0.71 U	0.73 U	**0.93**
100-44-7	Benzyl Chloride	0.25	-	0.72 U	0.71 U	0.73 U	0.71 U
541-73-1	1,3-Dichlorobenzene	-	-	0.72 U	0.71 U	0.73 U	0.71 U
106-46-7	1,4-Dichlorobenzene	1.1	-	0.72 U	0.71 U	0.73 U	0.71 U
95-50-1	1,2-Dichlorobenzene	880	-	0.72 U	0.71 U	0.73 U	0.71 U
5989-27-5	d-Limonene	-	-	0.72 U	0.71 U	0.73 U	**1.1**
96-12-8	1,2-Dibromo 3-Chloropropane	0.002	-	0.72 U	0.71 U	0.73 U	0.71 U
120-82-1	1,2,4-Trichlorobenzene	8.8	-	0.72 U	0.71 U	0.73 U	0.71 U
91-20-3	Naphthalene	0.36	-	0.72 U	0.71 U	0.73 U	0.71 U
87-68-3	Hexachlorobutadiene	0.56	15	0.72 U	0.71 U	0.73 U	0.71 U
TO-11A		**CHPS Schools µg/m³**		**TO11A-Outside RM 259 µg/m³**	**TO11A-Outside RM 259D µg/m³**	**TO11A-RM 256 µg/m³**	**TO11A-RM 153 µg/m³**
50-00-0	Formaldehyde	61		**18**	**3.3**	**5.1**	**18**

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Notes:
Analytes that were detected above the laboratory reporting limits are highlighted in **bold**
Exceedances of the USEPA Industrial RSL or DTSC Industrial Alternate are shaded
- = No screening level available for constituent
U = The compound was analyzed for but not detected.
The associated value is the laboratory reporting limit.
CAS = Chemical Abstract Service
CHPS = Collaborative for High Performance Schools
DTSC = California Department of Toxic Substances Control
RSL = Regional Screening Level
µg/m^3 = micrograms per cubic meter
USEPA = United States Environmental Protection Agency
USEPA Indoor Air Values for Commercial/Industrial Land Use from Region 9 Regional Screening Levels (USEPA, January 2015)
DTSC Alternate Values for Commercial/Industrial Land Use from Table 1, Human Health Risk Assessment Note 3 (DTSC, 2014)

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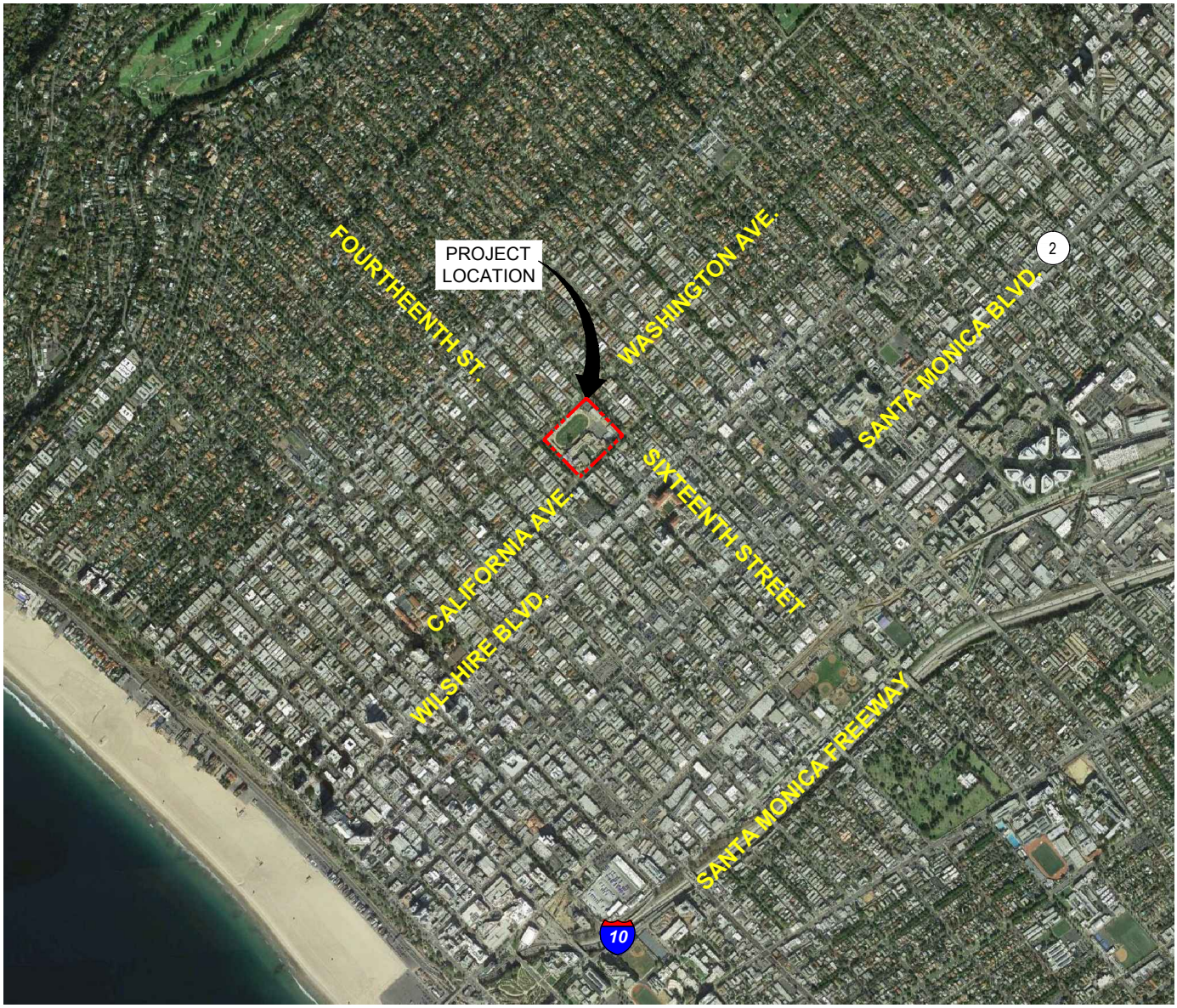
Figures



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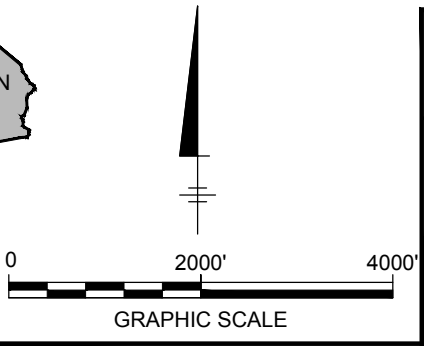

LINCOLN MIDDLE SCHOOL
1501 CALIFORNIA AVE, SANTA MONICA, CALIFORNIA
INDOOR AIR QUALITY INVESTIGATION

SITE LOCATION MAP

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FIGURE
1

RESIDENTIAL

WASHINGTON AVE.

RESIDENTIAL

FOURTEENTH STREET

SIXTEENTH STREET

RESIDENTIAL

SHOPS BLDG.

RETAINING WALL

FORMER UST

G

T

ELEVATOR

AUDITORIUM

GYMNASIUM

CALIFORNIA AVE.

RESIDENTIAL

RESIDENTIAL

LEGEND:

- SITE BOUNDARY
- FORMER UST EXCAVATION LIMIT
- T PAD-MOUNTED TRANSFORMER
- G GENERATOR

NOTE: UST LOCATION ESTIMATE AS PROVIDED BY OCEAN BLUE.

0 80' 160'

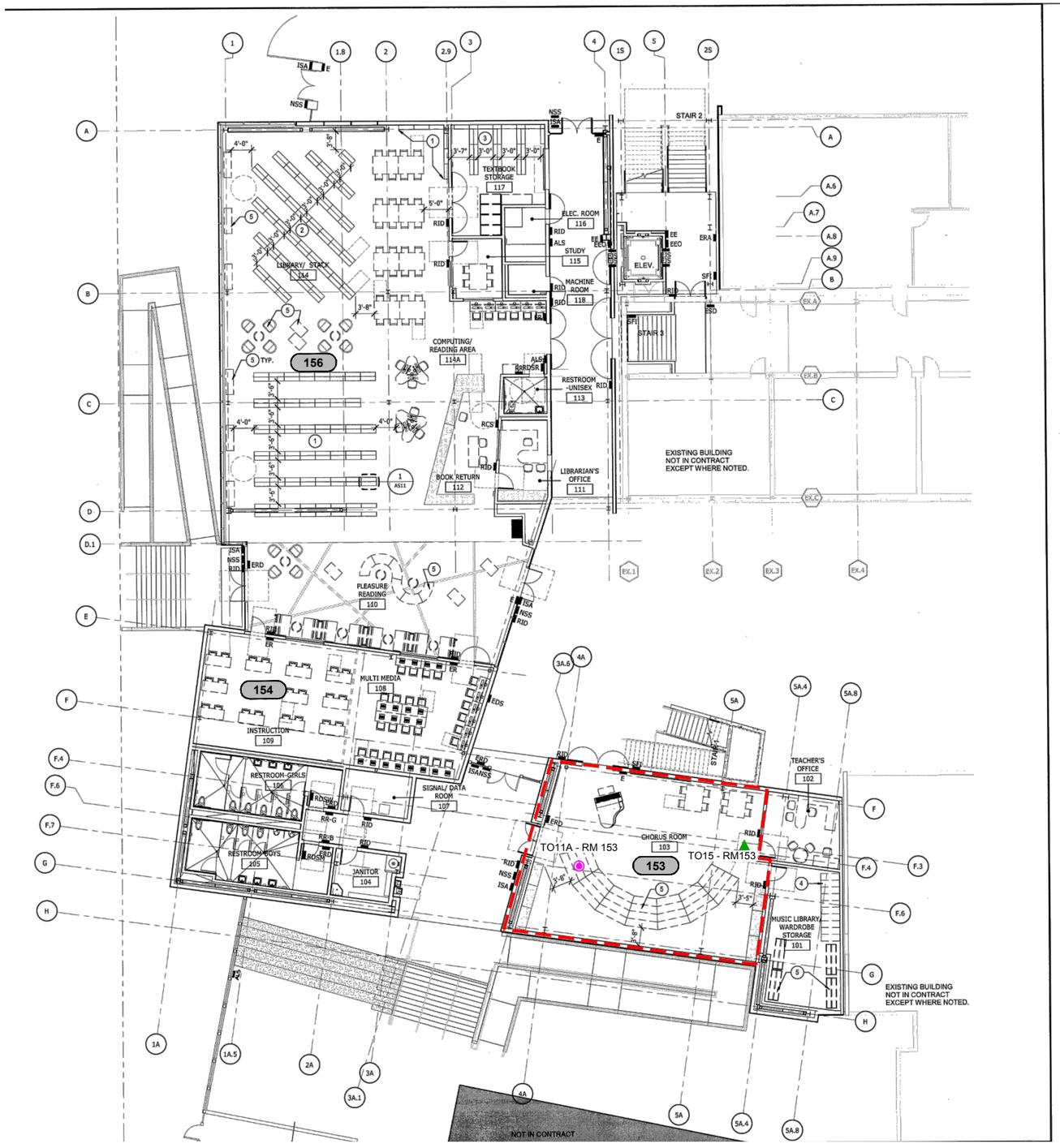
GRAPHIC SCALE

LINCOLN MIDDLE SCHOOL
1501 CALIFORNIA AVE, SANTA MONICA, CALIFORNIA
INDOOR AIR QUALITY INVESTIGATION

SITE PLAN

ARCADIS

FIGURE
2



FURNITURE PLAN LEGEND

- FURNITURE (NOT IN CONTRACT)
- LIBRARY BOOK SHELVES
- MILLWORK

CLEAR SPACES

- ACCESSIBLE SEAT AREA WHEELCHAIR CLEARANCE - 33"x48"
- 5'-0" ACCESSIBLE TURN AROUND AREA
- ACCESSIBLE DOOR CLEARANCE. REFER TO 6/G021

FURNITURE PLAN KEYNOTES

1. 3 HIGH LIBRARY SHELVES (42"H)
2. 5 HIGH LIBRARY SHELVES (60"H)
3. 7 HIGH STORAGE SHELVES (84"H)
4. MUSIC LIBRARY SHELVING. SEE DETAIL 4/A511
5. MOVEABLE FURNITURE OR EQUIPMENT SHOWN FOR CLARITY

SIGNAGE LEGEND

- ALS — ASSIST LISTENING SYSTEM SIGN
- EDS — ELEVATOR DIRECTIONAL SIGN
- EJS — ELEVATOR JAMB SYMBOL SIGN
- EEO — EMERGENCY ELEVATOR OPERATION SIGN
- EE — EMERGENCY EXIT SIGN
- E — EXIT SIGN
- EOS — EXIT ONLY SIGN
- ER — EXIT ROUTE SIGN
- ERD — EXIT RAMP DOWN
- ESD — EXIT STAIR DOWN SIGN
- ISA — INTERNATIONAL SYMBOL OF ACCESSIBLITY AS SPECIFIED
- NSS — NO SMOKE SIGN
- OCS — OCCUPANT SIGN
- RR-B — BOY'S RESTROOM SIGN
- RR-G — GIRL'S RESTROOM SIGN
- RR-M — MEN'S RESTROOM SIGN
- RR-W — WOMEN'S RESTROOM SIGN
- RR — UNISEX RESTROOM SIGN
- RDSM — MEN'S RESTROOM SIGN ON DOOR
- RDSW — WOMEN'S RESTROOM SIGN ON DOOR
- RDSR — UNISEX RESTROOM SIGN ON DOOR
- RID — ROOM ID SIGNAGE
- SFI — STAIR FLOOR INDICATOR SIGN
- ERA — EXTERIOR AREA FOR ASSISTED RESCUE. SEE DETAIL 4/G021

NOTE:

1. FOR ANCHORAGE OF STORAGE/LIBRARY SHELVING TO FLOOR, SEE DETAILS 1, 2, 3, AND 4/AS11.
2. FOR SIGNAGE DETAILS, SEE SHEETS G021, G022, AND G023

OVERVIEW

LEGEND:

- SITE BOUNDARY
- TO15 - RM 256 ▲ — AIR SAMPLE LOCATION - FOR VOC ANALYSIS (EPA TO15)
- TO11A - RM 256 ◉ — AIR SAMPLE LOCATION - FOR FORMELDEHYDE ANALYSIS (EPA TO11A)
- 255 — ROOM NUMBERS

0 25' 50'

GRAPHIC SCALE

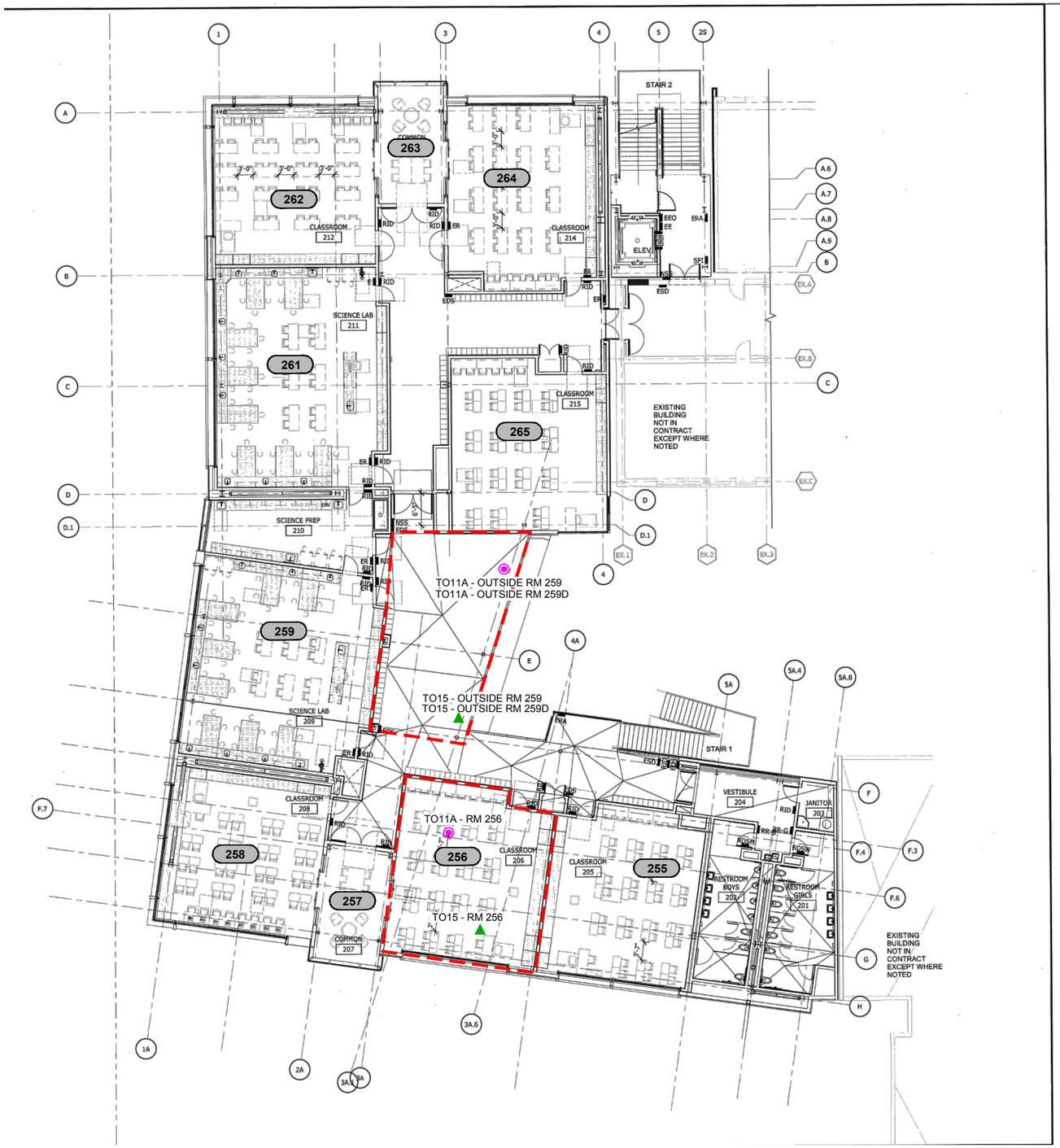
LINCOLN MIDDLE SCHOOL
1501 CALIFORNIA AVE, SANTA MONICA, CALIFORNIA
INDOOR AIR QUALITY INVESTIGATION

NEW WESTWING BUILDING FIRST FLOOR SAMPLES

ARCADIS

FIGURE **3a**

SOURCE: WIDOM, WEIN, COHEN, O'LEARY TERASAWA: LINCOLN MIDDLE SCHOOL PACKAGE 2 FIGURE, 06/29/2009



FURNITURE PLAN LEGEND

- FURNITURE (NOT IN CONTRACT)
- LIBRARY BOOK SHELVES
- MILLWORK

CLEAR SPACES

- ACCESSIBLE SEAT AREA WHEELCHAIR CLEARANCE - 33"x48"
- 5'-0" ACCESSIBLE TURN AROUND AREA
- ACCESSIBLE DOOR CLEARANCE. REFER TO 6/G021

FURNITURE PLAN KEYNOTES

1. 3 HIGH LIBRARY SHELVES (42"H)
2. 5 HIGH LIBRARY SHELVES (60"H)
3. 7 HIGH STORAGE SHELVES (84"H)
4. MUSIC LIBRARY SHELVING. SEE DETAIL 4/A511
5. MOVEABLE FURNITURE OR EQUIPMENT SHOWN FOR CLARITY

SIGNAGE LEGEND

- ALS — ASSIST LISTENING SYSTEM SIGN
- EDS — ELEVATOR DIRECTIONAL SIGN
- EJS — ELEVATOR JAMB SYMBOL SIGN
- EEO — EMERGENCY ELEVATOR OPERATION SIGN
- EE — EMERGENCY EXIT SIGN
- E — EXIT SIGN
- EOS — EXIT ONLY SIGN
- ER — EXIT ROUTE SIGN
- ERD — EXIT RAMP DOWN
- ESD — EXIT STAIR DOWN SIGN
- ISA — INTERNATIONAL SYMBOL OF ACCESSIBLITY AS SPECIFIED
- NSS — NO SMOKE SIGN
- OCS — OCCUPANT SIGN
- RR-B — BOY'S RESTROOM SIGN
- RR-G — GIRL'S RESTROOM SIGN
- RR-M — MEN'S RESTROOM SIGN
- RR-W — WOMEN'S RESTROOM SIGN
- RR — UNISEX RESTROOM SIGN
- RDSM — MEN'S RESTROOM SIGN ON DOOR
- RDSW — WOMEN'S RESTROOM SIGN ON DOOR
- RDSR — UNISEX RESTROOM SIGN ON DOOR
- RID — ROOM ID SIGNAGE
- SFI — STAIR FLOOR INDICATOR SIGN
- ERA — EXTERIOR AREA FOR ASSISTED RESCUE. SEE DETAIL 4/G021

NOTE:

1. FOR ANCHORAGE OF STORAGE/LIBRARY SHELVING TO FLOOR, SEE DETAILS 1, 2, 3, AND 4/A511.
2. FOR SIGNAGE DETAILS, SEE SHEETS G021, G022, AND G023

OVERVIEW

LEGEND:

- SITE BOUNDARY
- TO15 - RM 256 ▲ — AIR SAMPLE LOCATION - FOR VOC ANALYSIS (EPA TO15)
- TO11A - RM 256 ◉ — AIR SAMPLE LOCATION - FOR FORMELDEHYDE ANALYSIS (EPA TO11A)
- 255 — ROOM NUMBERS

0 25' 50'

GRAPHIC SCALE

LINCOLN MIDDLE SCHOOL
1501 CALIFORNIA AVE, SANTA MONICA, CALIFORNIA
INDOOR AIR QUALITY INVESTIGATION

NEW WESTWING BUILDING SECOND FLOOR SAMPLES

ARCADIS

FIGURE **3b**

SOURCE: WIDOM, WEIN, COHEN, O'LEARY TERASAWA: LINCOLN MIDDLE SCHOOL PACKAGE 2 FIGURE, 06/29/2009

Appendix A

Analytical Laboratory Report

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

December 19, 2014

Phil Skorge
ARCADIS U.S., Inc.
3750 Schaufele Ave
Long Beach, CA 90808

RE: SMMUSD-LMS

Dear Phil:

Enclosed are the results of the samples submitted to our laboratory on December 16, 2014. For your reference, these analyses have been assigned our service request number P1405060.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Aguilera

By Kate Aguilera at 1:07 pm, Dec 19, 2014

Kate Aguilera
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: ARCADIS U.S., Inc.
Project: SMMUSD-LMS

Service Request No: P1405060

CASE NARRATIVE

The samples were received intact under chain of custody on December 16, 2014 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Formaldehyde Analysis

The DNPH silica gel tube samples were analyzed for formaldehyde according to EPA Method TO-11A using high performance liquid chromatography (HPLC). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

Volatile Organic Compound Analysis

The summa canister samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is not included on the laboratory's AIHA-LAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP scope of accreditation.

The Summa canisters were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	838341
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	CA200007
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-14-5
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272014-4
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ARCADIS U.S., Inc. Service Request: P1405060
Project ID: SMMUSD-LMS

Date Received: 12/16/2014
Time Received: 11:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-15 - VOC Cans	TO-11A - Carbonyls
TO15-Outside RM 259	P1405060-001	Air	12/15/2014	13:46	AC00540	-1.90	3.62	X	
TO15-Outside RM 259D	P1405060-002	Air	12/15/2014	12:19	AC01834	-1.69	3.63	X	
TO15-RM 256	P1405060-003	Air	12/15/2014	13:40	AS00790	-2.14	3.59	X	
TO15-RM 153	P1405060-004	Air	12/15/2014	12:22	AC01915	-1.73	3.75	X	
TO11A-Outside RM 259	P1405060-006	Air	12/15/2014	15:58					X
TO11A-Outside RM 259D	P1405060-007	Air	12/15/2014	15:58					X
TO11A-RM 256	P1405060-008	Air	12/15/2014	15:52					X
TO11A-RM 153	P1405060-009	Air	12/15/2014	15:42					X

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No. P140560

Company Name & Address (Reporting Information)
ARCADIS
3750 Schaufele Ave., Ste 225
Long Beach, CA 90808

Project Name: SMMUSD-LMS

Project Number:

ALS Contact: Kate

Analysis Method

Project Manager: Phil Skorge

P.O. # / Billing Information
CM011144.8031
ACCOUNTS PAYABLE
630 Plaza Drive, Ste 100, Highlands Ranch CO

Phone: 510-435-1042

Fax:

Email Address for Result Reporting: Phil.Skorge@arcadis-us.com

Sampler (Print & Sign): Gretchen Kunze-Fahrney / gkunze

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	TO15		Comments e.g. Actual Preservative or specific instructions
~~TO15-R259~~		12-15-14	~~746~~ 820	~~AS00575~~	~~FCA00816~~	~~28.5~~	~~0~~		[redacted]		do not analyze
TO15-OutsideRM259	①-2.07		717 146	AC00540	FCA00540	29.5	5		✓		
TO15-OutsideRM259D	②-1.88		717 1219	AC01834	FCA00931	29.0	3		✓		
TO15-RM256	③-2.33		718 140	AS00790	FCA00679	29.0	5		✓		
TO15-RM153	④-1.95	↓	720 1222	AC01915	FCA00463	29.0	5		✓		
	⑤-0.61										

Report Tier Levels - please select

Tier I - Results (Default in not specified) ____ Tier III (Results + QC & Calibration Summaries) X

Tier II (Results + QC Summaries ____ Tier IV (Date Validation Package) 10% Surcharge ____

EDD required YES / No

Type: _____ Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
gkunze-fahrney	12/16/14			12/16/14	1100
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ____°C

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
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Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No: ~~P1405060~~

Company Name & Address (Reporting Information)
ARCADIS
3750 Schaufele Ave, Ste 225
Long Beach, CA 90808

Project Name: SMMUSD - LMS

Project Number:

Project Manager: Phil SKORGE

P.O. # / Billing Information:

Phone: 510-435-1042

Fax:

Email Address for Result Reporting:

Sampler (Print & Sign): Gretchen Kunze-Fahrney / [signature]

ALS Contact:

Analysis Method: TO11A

Client Sample ID	Laboratory ID Number	Date Collected 12-15-14	Time Collected	~~Canister ID~~ Pump (Bar code # - AC, SC, etc.)	~~Flow Controller ID~~ Minutes (Bar code # - FC #)	~~Canister~~ Start Pressure end "Hg Rate	~~Canister~~ End Pressure "Hg/psig	Sample Volume L/min	TO11A		Comments e.g. Actual Preservative or specific instructions
TO11A - Outside RM259	6	7:58	~~8~~358	R9264	480	.208	0.209	100.32	✓		start .214/MN
TO11A - Outside RM295D	1	7:58	358	7532	480	.211	0.210	101.04	✓		
~~TO11A - RM259~~		~~7:58~~	—	~~SS1774~~	—	6.203	—	—	~~✓~~		
TO11A - RM256	8	752	352	4377	480	.203	0.206	99.12	✓		
TO11A - RM53	9	742	342	R7438	480	.214	0.212	101.7	✓		

6 of 35

Report Tier Levels - please select
Tier I - Results (Default in not specified) ____
Tier II (Results + QC Summaries X
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Date Validation Package) 10% Surcharge ____

EDD required YES / No
Type: ____ Units: ____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	12/14/14		[signature]	12/16/14	1100
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature 3 °C

ALS Environmental
Sample Acceptance Check Form

Client: ARCADIS U.S., Inc. Work order: P1405060

Project: SMMUSD-LMS

Sample(s) received on: 12/16/14 Date opened: 12/16/14 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by ALS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 3° C Blank Temperature: ° C			
9	Was a **blank** received?	☒	☐	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☒	☐	☐
	Do they contain moisture?	☐	☒	☐
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1405060-001.01	6.0 L Ambient Can					
P1405060-002.01	6.0 L Ambient Can					
P1405060-003.01	6.0 L Silonite Can					
P1405060-004.01	6.0 L Ambient Can					
P1405060-005.01	6.0 L Silonite Can					
P1405060-006.01	Silica Gel DNPH Tube					
P1405060-007.01	Silica Gel DNPH Tube					
P1405060-008.01	Silica Gel DNPH Tube					

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS Environmental
Sample Acceptance Check Form

Client: ARCADIS U.S., Inc. Work order: P1405060

Project: SMMUSD-LMS

Sample(s) received on: 12/16/14 Date opened: 12/16/14 by: ADAVID

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1405060-009.01	Silica Gel DNPH Tube					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Project ID: **SMMUSD-LMS** ALS Project ID: P1405060

Formaldehyde

Test Code: EPA Method TO-11A
Instrument ID: Agilent Infinity LC 1220/LC3 Date(s) Collected: 12/15/14
Analyst: Madeleine Dangazyan Date Received: 12/16/14
Sample Type: Silica Gel DNPH Tube(s) Date Analyzed: 12/17/14
Test Notes: **BC** Desorption Volume: 1.0 ml

Client Sample ID	ALS Sample ID	Sample Volume Liter(s)	Result ng/Sample	**Result µg/m³**	MRL µg/m³	**Result ppbV**	MRL ppbV	Data Qualifier
TO11A-Outside RM 259	P1405060-006	100.32	1,800	**18**	1.0	**14**	0.81	
TO11A-Outside RM 259D	P1405060-007	101.04	330	**3.3**	0.99	**2.7**	0.81	
TO11A-RM 256	P1405060-008	99.12	510	**5.1**	1.0	**4.2**	0.82	
TO11A-RM 153	P1405060-009	101.7	1,800	**18**	0.98	**14**	0.80	
Method Blank	P141217-MB	NA	< 100	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
BC = Results reported are not blank corrected.
NA = Not applicable.

Method Path : J:\LC03\METHODS\
Method File : NAVY040814.M
Title : TO-11A Method for Aldehydes/Ketones by HPLC
Last Update : Wed Apr 09 12:43:45 2014
Response Via : Initial Calibration

Calibration Files
50 =0408140000005.D 100 =0408140000008.D 500 =0408140000011.D
1500 =0408140000014.D 5000 =0408140000017.D 10 =0408140000020.D

	Compound	50	100	500	1500	5000	10	Avg	%RSD
1)	Formaldehyde	2.098	2.167	2.252	2.205	2.297	2.335	2.226 E4	3.92

(#) = Out of Range

ALS Environmental

TO11A Aldehyde & Ketone DNPH Analysis by HPLC

Instrument : LC 03 **Printed :** 12/17/2014
Detector : UV-VIS 360 **Date Acquired :** 12/17/2014
Analyst : MD **Sample Amount :** 3.0uL
Client & Job# : ARCADIS U.S., Inc. P1405060

QC

Sample Information	MRL	TO-11A 5000ng/ml S28-071171404	% Diff	ACN blank lot DJ138	MB back lot 9253/9342 1.0mL	MB front lot 9253/9342 1.0mL			TO-11A 5000ng/ml S28-071171404	% Diff	% Diff	% Diff	% Diff
Dilution	1.0			1.0	1.0	1.0	1.0	1.0					
Sample Volume (L)	NA			NA	NA	NA	NA	NA					
Final Vol.(mL)	1.0			1.0	1.0	1.0	1.0	1.0					
Data File		12171400002.D		121714000003.D	121714000005.D	121714000004.D	0.0	0.0	12171400015.D		0.0	0.0	0.0
	ng/sample	ng/sample		ng/sample	ng/sample	ng/sample	ng/sample	ng/sample	ng/sample		ng/sample	ng/sample	ng/sample
Formaldehyde	100.00	4683.0	6.3%	ND	ND	ND			4585.9	8.3%			

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-Outside RM 259** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-001

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00540

Initial Pressure (psig): -1.90 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.43

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.72	ND	0.42	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.0**	0.72	**0.40**	0.14	
74-87-3	Chloromethane	ND	0.72	ND	0.35	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.72	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.72	ND	0.32	
74-83-9	Bromomethane	ND	0.72	ND	0.18	
75-00-3	Chloroethane	ND	0.72	ND	0.27	
64-17-5	Ethanol	**7.8**	7.2	**4.2**	3.8	
75-05-8	Acetonitrile	ND	0.72	ND	0.43	
107-02-8	Acrolein	ND	2.9	ND	1.2	
67-64-1	Acetone	ND	7.2	ND	3.0	
75-69-4	Trichlorofluoromethane	**1.2**	0.72	**0.21**	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.2	ND	2.9	
107-13-1	Acrylonitrile	ND	0.72	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	0.72	ND	0.18	
75-09-2	Methylene Chloride	ND	0.72	ND	0.21	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.72	ND	0.23	
76-13-1	Trichlorotrifluoroethane	ND	0.72	ND	0.093	
75-15-0	Carbon Disulfide	ND	7.2	ND	2.3	
156-60-5	trans-1,2-Dichloroethene	ND	0.72	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.72	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.72	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.2	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	7.2	ND	2.4	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-Outside RM 259** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-001

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00540

Initial Pressure (psig): -1.90 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.43

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.72	ND	0.18	
141-78-6	Ethyl Acetate	ND	1.4	ND	0.40	
110-54-3	n-Hexane	ND	0.72	ND	0.20	
67-66-3	Chloroform	ND	0.72	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	ND	0.72	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.72	ND	0.18	
71-55-6	1,1,1-Trichloroethane	ND	0.72	ND	0.13	
71-43-2	Benzene	**0.88**	0.72	**0.27**	0.22	
56-23-5	Carbon Tetrachloride	ND	0.72	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.42	
78-87-5	1,2-Dichloropropane	ND	0.72	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.72	ND	0.11	
79-01-6	Trichloroethene	ND	0.72	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.72	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35	
142-82-5	n-Heptane	ND	0.72	ND	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.72	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.72	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.72	ND	0.13	
108-88-3	Toluene	**2.3**	0.72	**0.61**	0.19	
591-78-6	2-Hexanone	ND	0.72	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.72	ND	0.084	
106-93-4	1,2-Dibromoethane	ND	0.72	ND	0.093	
123-86-4	n-Butyl Acetate	ND	0.72	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-Outside RM 259** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-001

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00540

Initial Pressure (psig): -1.90 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.43

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.72	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.72	ND	0.11	
108-90-7	Chlorobenzene	ND	0.72	ND	0.16	
100-41-4	Ethylbenzene	ND	0.72	ND	0.16	
179601-23-1	m,p-Xylenes	ND	1.4	ND	0.33	
75-25-2	Bromoform	ND	0.72	ND	0.069	
100-42-5	Styrene	ND	0.72	ND	0.17	
95-47-6	o-Xylene	ND	0.72	ND	0.16	
111-84-2	n-Nonane	ND	0.72	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.72	ND	0.10	
98-82-8	Cumene	ND	0.72	ND	0.15	
80-56-8	alpha-Pinene	ND	0.72	ND	0.13	
103-65-1	n-Propylbenzene	ND	0.72	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.72	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.72	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.72	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.72	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.72	ND	0.12	
5989-27-5	d-Limonene	ND	0.72	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	ND	0.074	
120-82-1	1,2,4-Trichlorobenzene	ND	0.72	ND	0.096	
91-20-3	Naphthalene	ND	0.72	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.72	ND	0.067	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-Outside RM 259D** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-002

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01834

Initial Pressure (psig): -1.69 Final Pressure (psig): 3.63

Canister Dilution Factor: 1.41

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	**1.0**	0.71	**0.58**	0.41	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.0**	0.71	**0.40**	0.14	
74-87-3	Chloromethane	ND	0.71	ND	0.34	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.71	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.71	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.71	ND	0.32	
74-83-9	Bromomethane	ND	0.71	ND	0.18	
75-00-3	Chloroethane	ND	0.71	ND	0.27	
64-17-5	Ethanol	**9.6**	7.1	**5.1**	3.7	
75-05-8	Acetonitrile	ND	0.71	ND	0.42	
107-02-8	Acrolein	ND	2.8	ND	1.2	
67-64-1	Acetone	ND	7.1	ND	3.0	
75-69-4	Trichlorofluoromethane	**1.2**	0.71	**0.21**	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.1	ND	2.9	
107-13-1	Acrylonitrile	ND	0.71	ND	0.32	
75-35-4	1,1-Dichloroethene	ND	0.71	ND	0.18	
75-09-2	Methylene Chloride	ND	0.71	ND	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.71	ND	0.23	
76-13-1	Trichlorotrifluoroethane	ND	0.71	ND	0.092	
75-15-0	Carbon Disulfide	ND	7.1	ND	2.3	
156-60-5	trans-1,2-Dichloroethene	ND	0.71	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.71	ND	0.17	
1634-04-4	Methyl tert-Butyl Ether	ND	0.71	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.1	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	7.1	ND	2.4	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-Outside RM 259D** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-002

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01834

Initial Pressure (psig): -1.69 Final Pressure (psig): 3.63

Canister Dilution Factor: 1.41

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.71	ND	0.18	
141-78-6	Ethyl Acetate	**7.9**	1.4	**2.2**	0.39	
110-54-3	n-Hexane	ND	0.71	ND	0.20	
67-66-3	Chloroform	ND	0.71	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	ND	0.71	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.71	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.71	ND	0.13	
71-43-2	Benzene	**0.91**	0.71	**0.29**	0.22	
56-23-5	Carbon Tetrachloride	ND	0.71	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.41	
78-87-5	1,2-Dichloropropane	ND	0.71	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.71	ND	0.11	
79-01-6	Trichloroethene	ND	0.71	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.71	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.34	
142-82-5	n-Heptane	ND	0.71	ND	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.71	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.71	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.71	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.71	ND	0.13	
108-88-3	Toluene	**2.5**	0.71	**0.67**	0.19	
591-78-6	2-Hexanone	ND	0.71	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.71	ND	0.083	
106-93-4	1,2-Dibromoethane	ND	0.71	ND	0.092	
123-86-4	n-Butyl Acetate	ND	0.71	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-Outside RM 259D** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-002

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01834

Initial Pressure (psig): -1.69 Final Pressure (psig): 3.63

Canister Dilution Factor: 1.41

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.71	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.71	ND	0.10	
108-90-7	Chlorobenzene	ND	0.71	ND	0.15	
100-41-4	Ethylbenzene	ND	0.71	ND	0.16	
179601-23-1	m,p-Xylenes	**1.4**	1.4	**0.33**	0.32	
75-25-2	Bromoform	ND	0.71	ND	0.068	
100-42-5	Styrene	ND	0.71	ND	0.17	
95-47-6	o-Xylene	ND	0.71	ND	0.16	
111-84-2	n-Nonane	ND	0.71	ND	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.71	ND	0.10	
98-82-8	Cumene	ND	0.71	ND	0.14	
80-56-8	alpha-Pinene	ND	0.71	ND	0.13	
103-65-1	n-Propylbenzene	ND	0.71	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.71	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.71	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.71	ND	0.14	
100-44-7	Benzyl Chloride	ND	0.71	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.71	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.71	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.71	ND	0.12	
5989-27-5	d-Limonene	ND	0.71	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.71	ND	0.073	
120-82-1	1,2,4-Trichlorobenzene	ND	0.71	ND	0.095	
91-20-3	Naphthalene	ND	0.71	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.71	ND	0.066	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-RM 256** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-003

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00790

Initial Pressure (psig): -2.14 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.73	ND	0.42	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.0**	0.73	**0.40**	0.15	
74-87-3	Chloromethane	ND	0.73	ND	0.35	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.73	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.73	ND	0.29	
106-99-0	1,3-Butadiene	ND	0.73	ND	0.33	
74-83-9	Bromomethane	ND	0.73	ND	0.19	
75-00-3	Chloroethane	ND	0.73	ND	0.28	
64-17-5	Ethanol	**7.3**	7.3	**3.9**	3.9	
75-05-8	Acetonitrile	**1.0**	0.73	**0.62**	0.43	
107-02-8	Acrolein	ND	2.9	ND	1.3	
67-64-1	Acetone	ND	7.3	ND	3.1	
75-69-4	Trichlorofluoromethane	**1.2**	0.73	**0.21**	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.3	ND	3.0	
107-13-1	Acrylonitrile	ND	0.73	ND	0.34	
75-35-4	1,1-Dichloroethene	ND	0.73	ND	0.18	
75-09-2	Methylene Chloride	ND	0.73	ND	0.21	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.73	ND	0.23	
76-13-1	Trichlorotrifluoroethane	ND	0.73	ND	0.095	
75-15-0	Carbon Disulfide	ND	7.3	ND	2.3	
156-60-5	trans-1,2-Dichloroethene	ND	0.73	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.73	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.73	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.3	ND	2.1	
78-93-3	2-Butanone (MEK)	ND	7.3	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-RM 256** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-003

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00790

Initial Pressure (psig): -2.14 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.73	ND	0.18	
141-78-6	Ethyl Acetate	ND	1.5	ND	0.41	
110-54-3	n-Hexane	ND	0.73	ND	0.21	
67-66-3	Chloroform	ND	0.73	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	ND	0.73	ND	0.25	
107-06-2	1,2-Dichloroethane	ND	0.73	ND	0.18	
71-55-6	1,1,1-Trichloroethane	ND	0.73	ND	0.13	
71-43-2	Benzene	**1.3**	0.73	**0.41**	0.23	
56-23-5	Carbon Tetrachloride	ND	0.73	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.42	
78-87-5	1,2-Dichloropropane	ND	0.73	ND	0.16	
75-27-4	Bromodichloromethane	ND	0.73	ND	0.11	
79-01-6	Trichloroethene	ND	0.73	ND	0.14	
123-91-1	1,4-Dioxane	ND	0.73	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.5	ND	0.36	
142-82-5	n-Heptane	ND	0.73	ND	0.18	
10061-01-5	cis-1,3-Dichloropropene	ND	0.73	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.73	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.73	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.73	ND	0.13	
108-88-3	Toluene	**3.0**	0.73	**0.80**	0.19	
591-78-6	2-Hexanone	ND	0.73	ND	0.18	
124-48-1	Dibromochloromethane	ND	0.73	ND	0.086	
106-93-4	1,2-Dibromoethane	ND	0.73	ND	0.095	
123-86-4	n-Butyl Acetate	ND	0.73	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-RM 256** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-003

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00790

Initial Pressure (psig): -2.14 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.73	ND	0.16	
127-18-4	Tetrachloroethene	ND	0.73	ND	0.11	
108-90-7	Chlorobenzene	ND	0.73	ND	0.16	
100-41-4	Ethylbenzene	ND	0.73	ND	0.17	
179601-23-1	m,p-Xylenes	**1.7**	1.5	**0.38**	0.34	
75-25-2	Bromoform	ND	0.73	ND	0.071	
100-42-5	Styrene	ND	0.73	ND	0.17	
95-47-6	o-Xylene	ND	0.73	ND	0.17	
111-84-2	n-Nonane	**0.88**	0.73	**0.17**	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.73	ND	0.11	
98-82-8	Cumene	ND	0.73	ND	0.15	
80-56-8	alpha-Pinene	ND	0.73	ND	0.13	
103-65-1	n-Propylbenzene	ND	0.73	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.73	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.73	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.73	ND	0.15	
100-44-7	Benzyl Chloride	ND	0.73	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.73	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.73	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.73	ND	0.12	
5989-27-5	d-Limonene	ND	0.73	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.73	ND	0.076	
120-82-1	1,2,4-Trichlorobenzene	ND	0.73	ND	0.098	
91-20-3	Naphthalene	ND	0.73	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.73	ND	0.068	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-RM 153** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-004

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01915

Initial Pressure (psig): -1.73 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	**0.93**	0.71	**0.54**	0.41	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.0**	0.71	**0.40**	0.14	
74-87-3	Chloromethane	ND	0.71	ND	0.34	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.71	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.71	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.71	ND	0.32	
74-83-9	Bromomethane	ND	0.71	ND	0.18	
75-00-3	Chloroethane	ND	0.71	ND	0.27	
64-17-5	Ethanol	**16**	7.1	**8.3**	3.8	
75-05-8	Acetonitrile	**52**	0.71	**31**	0.42	
107-02-8	Acrolein	ND	2.8	ND	1.2	
67-64-1	Acetone	**24**	7.1	**10**	3.0	
75-69-4	Trichlorofluoromethane	**1.2**	0.71	**0.21**	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	7.1	ND	2.9	
107-13-1	Acrylonitrile	ND	0.71	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	0.71	ND	0.18	
75-09-2	Methylene Chloride	ND	0.71	ND	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.71	ND	0.23	
76-13-1	Trichlorotrifluoroethane	ND	0.71	ND	0.093	
75-15-0	Carbon Disulfide	ND	7.1	ND	2.3	
156-60-5	trans-1,2-Dichloroethene	ND	0.71	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.71	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.71	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.1	ND	2.0	
78-93-3	2-Butanone (MEK)	ND	7.1	ND	2.4	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-RM 153** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-004

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01915

Initial Pressure (psig): -1.73 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.71	ND	0.18	
141-78-6	Ethyl Acetate	**3.2**	1.4	**0.88**	0.39	
110-54-3	n-Hexane	**0.83**	0.71	**0.24**	0.20	
67-66-3	Chloroform	ND	0.71	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	ND	0.71	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.71	ND	0.18	
71-55-6	1,1,1-Trichloroethane	ND	0.71	ND	0.13	
71-43-2	Benzene	**0.80**	0.71	**0.25**	0.22	
56-23-5	Carbon Tetrachloride	ND	0.71	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.41	
78-87-5	1,2-Dichloropropane	ND	0.71	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.71	ND	0.11	
79-01-6	Trichloroethene	ND	0.71	ND	0.13	
123-91-1	1,4-Dioxane	ND	0.71	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35	
142-82-5	n-Heptane	**1.5**	0.71	**0.37**	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.71	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.71	ND	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.71	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.71	ND	0.13	
108-88-3	Toluene	**4.8**	0.71	**1.3**	0.19	
591-78-6	2-Hexanone	ND	0.71	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.71	ND	0.083	
106-93-4	1,2-Dibromoethane	ND	0.71	ND	0.092	
123-86-4	n-Butyl Acetate	ND	0.71	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **TO15-RM 153** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P1405060-004

Test Code: EPA TO-15 Date Collected: 12/15/14
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 12/16/14
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01915

Initial Pressure (psig): -1.73 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	**0.81**	0.71	**0.17**	0.15	
127-18-4	Tetrachloroethene	ND	0.71	ND	0.10	
108-90-7	Chlorobenzene	ND	0.71	ND	0.15	
100-41-4	Ethylbenzene	**3.0**	0.71	**0.70**	0.16	
179601-23-1	m,p-Xylenes	**13**	1.4	**2.9**	0.33	
75-25-2	Bromoform	ND	0.71	ND	0.069	
100-42-5	Styrene	ND	0.71	ND	0.17	
95-47-6	o-Xylene	**4.4**	0.71	**1.0**	0.16	
111-84-2	n-Nonane	**1.4**	0.71	**0.26**	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.71	ND	0.10	
98-82-8	Cumene	ND	0.71	ND	0.14	
80-56-8	alpha-Pinene	**2.8**	0.71	**0.50**	0.13	
103-65-1	n-Propylbenzene	ND	0.71	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.71	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.71	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	**0.93**	0.71	**0.19**	0.14	
100-44-7	Benzyl Chloride	ND	0.71	ND	0.14	
541-73-1	1,3-Dichlorobenzene	ND	0.71	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.71	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.71	ND	0.12	
5989-27-5	d-Limonene	**1.1**	0.71	**0.20**	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.71	ND	0.073	
120-82-1	1,2,4-Trichlorobenzene	ND	0.71	ND	0.096	
91-20-3	Naphthalene	ND	0.71	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.71	ND	0.067	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P141216-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.50	ND	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
64-17-5	Ethanol	ND	5.0	ND	2.7	
75-05-8	Acetonitrile	ND	0.50	ND	0.30	
107-02-8	Acrolein	ND	2.0	ND	0.87	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0	
107-13-1	Acrylonitrile	ND	0.50	ND	0.23	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16	
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	1.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Client: **ARCADIS U.S., Inc.**

Client Sample ID: **Method Blank** ALS Project ID: P1405060

Client Project ID: **SMMUSD-LMS** ALS Sample ID: P141216-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: NA

Analyst: Wida Ang Date Analyzed: 12/16/14

Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28	
110-54-3	n-Hexane	ND	0.50	ND	0.14	
67-66-3	Chloroform	ND	0.50	ND	0.10	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14	
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24	
142-82-5	n-Heptane	ND	0.50	ND	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P141216-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	ND	0.11	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
111-84-2	n-Nonane	ND	0.50	ND	0.095	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
98-82-8	Cumene	ND	0.50	ND	0.10	
80-56-8	alpha-Pinene	ND	0.50	ND	0.090	
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10	
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	
5989-27-5	d-Limonene	ND	0.50	ND	0.090	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **ARCADIS U.S., Inc.**
Client Project ID: **SMMUSD-LMS** ALS Project ID: P1405060

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date(s) Collected: 12/15/14
Analyst: Wida Ang Date(s) Received: 12/16/14
Sample Type: 6.0 L Summa Canister(s) Date(s) Analyzed: 12/16/14
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P141216-MB	**102**	**102**	**98**	70-130	
Lab Control Sample	P141216-LCS	**100**	**101**	**99**	70-130	
TO15-Outside RM 259	P1405060-001	**102**	**101**	**98**	70-130	
TO15-Outside RM 259D	P1405060-002	**102**	**102**	**99**	70-130	
TO15-RM 256	P1405060-003	**102**	**101**	**99**	70-130	
TO15-RM 153	P1405060-004	**102**	**101**	**99**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P141216-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	200	**147**	**74**	50-128	
75-71-8	Dichlorodifluoromethane (CFC 12)	204	**171**	**84**	66-117	
74-87-3	Chloromethane	198	**191**	**96**	51-133	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	**178**	**86**	65-117	
75-01-4	Vinyl Chloride	202	**188**	**93**	61-127	
106-99-0	1,3-Butadiene	214	**209**	**98**	65-132	
74-83-9	Bromomethane	202	**184**	**91**	62-114	
75-00-3	Chloroethane	202	**190**	**94**	64-122	
64-17-5	Ethanol	1,020	**827**	**81**	57-131	
75-05-8	Acetonitrile	204	**159**	**78**	52-135	
107-02-8	Acrolein	214	**181**	**85**	64-124	
67-64-1	Acetone	1,080	**825**	**76**	60-113	
75-69-4	Trichlorofluoromethane	198	**194**	**98**	64-112	
67-63-0	2-Propanol (Isopropyl Alcohol)	420	**320**	**76**	62-129	
107-13-1	Acrylonitrile	208	**188**	**90**	69-133	
75-35-4	1,1-Dichloroethene	214	**191**	**89**	70-114	
75-09-2	Methylene Chloride	216	**173**	**80**	63-103	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	218	**155**	**71**	57-135	
76-13-1	Trichlorotrifluoroethane	216	**189**	**88**	69-116	
75-15-0	Carbon Disulfide	196	**166**	**85**	66-118	
156-60-5	trans-1,2-Dichloroethene	212	**191**	**90**	69-123	
75-34-3	1,1-Dichloroethane	208	**182**	**88**	65-118	
1634-04-4	Methyl tert-Butyl Ether	212	**145**	**68**	57-125	
108-05-4	Vinyl Acetate	1,020	**1010**	**99**	69-131	
78-93-3	2-Butanone (MEK)	216	**176**	**81**	63-121	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P141216-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
156-59-2	cis-1,2-Dichloroethene	214	**188**	**88**	69-119	
141-78-6	Ethyl Acetate	428	**400**	**93**	65-129	
110-54-3	n-Hexane	210	**196**	**93**	55-116	
67-66-3	Chloroform	216	**187**	**87**	68-111	
109-99-9	Tetrahydrofuran (THF)	206	**184**	**89**	69-120	
107-06-2	1,2-Dichloroethane	210	**185**	**88**	67-117	
71-55-6	1,1,1-Trichloroethane	208	**176**	**85**	74-116	
71-43-2	Benzene	220	**180**	**82**	61-109	
56-23-5	Carbon Tetrachloride	214	**205**	**96**	76-120	
110-82-7	Cyclohexane	422	**355**	**84**	72-115	
78-87-5	1,2-Dichloropropane	212	**182**	**86**	67-119	
75-27-4	Bromodichloromethane	216	**192**	**89**	78-124	
79-01-6	Trichloroethene	208	**184**	**88**	69-115	
123-91-1	1,4-Dioxane	218	**185**	**85**	69-127	
80-62-6	Methyl Methacrylate	420	**373**	**89**	76-128	
142-82-5	n-Heptane	214	**190**	**89**	66-118	
10061-01-5	cis-1,3-Dichloropropene	226	**203**	**90**	77-124	
108-10-1	4-Methyl-2-pentanone	218	**184**	**84**	66-134	
10061-02-6	trans-1,3-Dichloropropene	216	**199**	**92**	80-130	
79-00-5	1,1,2-Trichloroethane	212	**184**	**87**	75-119	
108-88-3	Toluene	212	**180**	**85**	68-114	
591-78-6	2-Hexanone	222	**174**	**78**	60-136	
124-48-1	Dibromochloromethane	220	**211**	**96**	75-132	
106-93-4	1,2-Dibromoethane	216	**194**	**90**	72-122	
123-86-4	n-Butyl Acetate	224	**190**	**85**	60-137	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

Client: **ARCADIS U.S., Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1405060
Client Project ID: **SMMUSD-LMS** ALS Sample ID: P141216-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/16/14
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	208	**181**	**87**	66-120	
127-18-4	Tetrachloroethene	198	**165**	**83**	67-120	
108-90-7	Chlorobenzene	216	**185**	**86**	69-114	
100-41-4	Ethylbenzene	212	**183**	**86**	71-117	
179601-23-1	m,p-Xylenes	420	**369**	**88**	71-118	
75-25-2	Bromoform	216	**227**	**105**	76-149	
100-42-5	Styrene	218	**191**	**88**	71-128	
95-47-6	o-Xylene	206	**179**	**87**	72-118	
111-84-2	n-Nonane	204	**172**	**84**	63-123	
79-34-5	1,1,2,2-Tetrachloroethane	202	**183**	**91**	73-124	
98-82-8	Cumene	204	**175**	**86**	71-118	
80-56-8	alpha-Pinene	208	**181**	**87**	71-123	
103-65-1	n-Propylbenzene	202	**175**	**87**	71-120	
622-96-8	4-Ethyltoluene	212	**193**	**91**	71-121	
108-67-8	1,3,5-Trimethylbenzene	212	**179**	**84**	72-121	
95-63-6	1,2,4-Trimethylbenzene	210	**188**	**90**	71-122	
100-44-7	Benzyl Chloride	218	**223**	**102**	79-143	
541-73-1	1,3-Dichlorobenzene	218	**198**	**91**	67-121	
106-46-7	1,4-Dichlorobenzene	212	**183**	**86**	68-121	
95-50-1	1,2-Dichlorobenzene	214	**191**	**89**	68-121	
5989-27-5	d-Limonene	210	**195**	**93**	69-137	
96-12-8	1,2-Dibromo-3-chloropropane	206	**211**	**102**	73-145	
120-82-1	1,2,4-Trichlorobenzene	210	**206**	**98**	60-135	
91-20-3	Naphthalene	196	**210**	**107**	63-142	
87-68-3	Hexachlorobutadiene	214	**192**	**90**	65-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

Response Factor Report Instrument #MS08

Method Path : I:\MS08\Methods\
Method File : R8101214.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Mon Oct 13 10:44:33 2014
Response Via : Initial Calibration

Calibration Files
0.08=10121404.D 0.10=10121405.D 0.20=10121406.D 0.40=10121407.D 1.0 =10121408.D 5.0 =10121409.D 25 =10121410.D
50 =10121411.D 100 =10121412.D

		Compound	0.08	0.10	0.20	0.40	1.0	5.0	25	50	100	Avg	%RSD
1)	IR	Bromochloromethane...	----------ISTD----------										
2)	T	Propene	1.899	1.667	1.763	1.875	1.770	1.703	1.532	1.377	1.267	1.650	13.17
3)	T	Dichlorodifluo...	2.530	2.373	2.691	2.637	2.950	3.054	2.655	2.391	2.037	2.591	11.88
4)	T	Chloromethane	1.101	1.190	1.980	1.625	1.963	2.220	2.014	1.755	1.433	1.698	22.95
5)	T	1,2-Dichloro-1...	1.302	1.332	1.421	1.372	1.557	1.607	1.422	1.321	1.149	1.387	9.92
6)	T	Vinyl Chloride	1.218	1.082	1.775	1.819	2.129	2.245	1.980	1.805	1.553	1.734	22.47
7)	T	1,3-Butadiene	0.911	0.924	1.058	1.142	1.578	1.767	1.595	1.466	1.247	1.299	24.17
8)	T	Bromomethane		0.728	1.088	1.083	1.235	1.333	1.180	1.105	0.957	1.089	16.89
9)	T	Chloroethane	0.725	0.782	0.834	0.889	1.094	1.206	1.066	0.984	0.845	0.936	17.14
10)	T	Ethanol	1.054	1.032	1.088	0.987	1.180	1.148	0.990	0.907	0.781	1.019	12.00
11)	T	Acetonitrile	3.258	3.029	3.130	2.729	2.897	2.962	2.555	2.381	2.156	2.789	13.06
12)	T	Acrolein	0.630	0.801	0.897	0.859	0.857	0.891	0.761	0.712	0.623	0.781	13.63
13)	T	Acetone				1.326	1.236	1.146	0.953	0.848	0.714	1.037	22.92
14)	T	Trichlorofluor...	2.025	1.947	2.097	2.073	2.300	2.397	2.041	1.913	1.685	2.053	10.18
15)	T	2-Propanol (Is...	4.681	4.364	4.388	3.580	4.069	4.268	3.658	3.287	2.597	3.877	16.96
16)	T	Acrylonitrile	1.417	1.320	1.572	1.584	1.895	2.021	1.817	1.703	1.486	1.646	14.08
17)	T	1,1-Dichloroet...	1.033	0.977	1.102	1.093	1.294	1.426	1.267	1.172	1.034	1.155	12.76
18)	T	2-Methyl-2-Pro...	3.417	3.442	3.619	2.790	3.815	4.157	3.543	3.067	2.169	3.335	17.67
19)	T	Methylene Chlo...			1.507	1.329	1.375	1.395	1.232	1.148	1.014	1.286	12.96
20)	T	3-Chloro-1-pro...	2.633	2.593	2.494	2.224	2.560	2.515	2.216	2.036	2.300	2.397	8.68
21)	T	Trichlorotrifl...	0.970	1.068	1.123	1.118	1.285	1.317	1.181	1.095	0.962	1.124	10.91
22)	T	Carbon Disulfide				6.072	5.886	3.944	4.054	3.818	3.380	4.525	25.42
23)	T	trans-1,2-Dich...	1.493	1.453	1.701	1.704	1.989	2.196	1.947	1.786	1.544	1.757	14.18
24)	T	1,1-Dichloroet...	2.139	2.060	2.333	2.313	2.626	2.683	2.297	2.131	1.844	2.270	11.71
25)	T	Methyl tert-Bu...	4.489	4.269	4.414	4.204	4.659	4.724	4.062	3.713	3.178	4.190	11.69
26)	T	Vinyl Acetate	0.294	0.262	0.319	0.334	0.424	0.436	0.355	0.327	0.280	0.337	17.81
27)	T	2-Butanone (MEK)	0.833	1.002	1.097	1.092	1.076	1.031	0.861	0.803	0.689	0.943	15.81
28)	T	cis-1,2-Dichlo...	1.560	1.562	1.680	1.689	1.946	2.047	1.763	1.634	1.401	1.698	11.73
29)	T	Diisopropyl Ether	1.091	0.964	1.114	1.139	1.546	1.545	1.273	1.159	0.982	1.201	17.95
30)	T	Ethyl Acetate	0.385	0.369	0.466	0.462	0.524	0.539	0.437	0.393	0.324	0.433	16.60
31)	T	n-Hexane				2.480	2.641	2.376	1.856	1.681	1.415	2.075	23.76
32)	T	Chloroform	2.107	2.041	2.127	2.114	2.331	2.403	2.057	1.892	1.612	2.076	11.14
33)	S	1,2-Dichloroet...	1.675	1.664	1.673	1.676	1.668	1.632	1.595	1.565	1.566	1.635	2.90
34)	T	Tetrahydrofura...	0.726	0.716	0.847	0.893	0.973	0.997	0.853	0.794	0.686	0.832	13.37
35)	T	Ethyl tert-But...	1.672	1.583	1.735	1.739	1.912	1.992	1.730	1.589	1.369	1.702	10.80
36)	T	1,2-Dichloroet...	1.655	1.546	1.729	1.672	1.898	1.958	1.656	1.515	1.276	1.656	12.30
37)	IR	1,4-Difluorobenzen...	----------ISTD----------										
38)	T	1,1,1-Trichlor...	0.388	0.385	0.413	0.400	0.455	0.480	0.440	0.416	0.355	0.415	9.32
39)	T	Isopropyl Acetate	0.150	0.140	0.160	0.158	0.173	0.182	0.157	0.142	0.114	0.153	13.01
40)	T	1-Butanol	0.272	0.254	0.275	0.278	0.305	0.319	0.294	0.273	0.238	0.279	8.87
41)	T	Benzene	1.087	1.034	1.035	0.990	1.089	1.115	0.973	0.909	0.757	0.999	11.15
42)	T	Carbon Tetrach...	0.292	0.313	0.306	0.302	0.355	0.384	0.353	0.332	0.283	0.324	10.45

10/14/14

Method Path : I:\MS08\Methods\
Method File : R8101214.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

43)	T	Cyclohexane	0.419	0.412	0.437	0.426	0.483	0.497	0.445	0.409	0.343	0.430	10.42
44)	T	tert-Amyl Meth...	0.846	0.797	0.836	0.804	0.882	0.936	0.863	0.800	0.679	0.827	8.63
45)	T	1,2-Dichloropr...	0.258	0.249	0.269	0.257	0.293	0.304	0.270	0.249	0.206	0.262	10.77
46)	T	Bromodichlorom...	0.311	0.304	0.326	0.329	0.371	0.401	0.371	0.349	0.294	0.339	10.55
47)	T	Trichloroethene	0.281	0.276	0.300	0.296	0.324	0.341	0.301	0.281	0.236	0.293	10.32
48)	T	1,4-Dioxane	0.188	0.185	0.217	0.220	0.240	0.258	0.236	0.218	0.185	0.216	12.07
49)	T	2,2,4-Trimethy...	1.264	1.190	1.225	1.197	1.328	1.386	1.268	1.157	0.955	1.219	10.02
50)	T	Methyl Methacr...	0.105	0.104	0.115	0.117	0.130	0.139	0.123	0.114	0.095	0.116	11.70
51)	T	n-Heptane	0.290	0.270	0.295	0.292	0.324	0.327	0.274	0.251	0.202	0.281	13.60
52)	T	cis-1,3-Dichlo...	0.385	0.381	0.390	0.396	0.450	0.495	0.448	0.415	0.345	0.412	11.02
53)	T	4-Methyl-2-pen...	0.248	0.249	0.255	0.252	0.280	0.294	0.262	0.242	0.200	0.254	10.36
54)	T	trans-1,3-Dich...	0.331	0.331	0.358	0.345	0.417	0.462	0.423	0.392	0.327	0.376	13.04
55)	T	1,1,2-Trichlor...	0.238	0.225	0.251	0.241	0.276	0.292	0.265	0.247	0.209	0.249	10.27
56)	IR	Chlorobenzene-d5 (...	----------	----------	----------	ISTD	----------	----------	----------	----------	----------	----------	
57)	S	Toluene-d8 (SS2)	2.243	2.234	2.259	2.278	2.279	2.276	2.270	2.237	2.238	2.257	0.85
58)	T	Toluene	2.579	2.453	2.605	2.527	2.789	2.903	2.502	2.271	1.896	2.503	11.68
59)	T	2-Hexanone	1.730	1.578	1.690	1.644	1.713	1.776	1.535	1.380	1.134	1.575	12.99
60)	T	Dibromochlorom...	0.546	0.540	0.598	0.606	0.709	0.799	0.740	0.695	0.608	0.649	13.92
61)	T	1,2-Dibromoethane	0.574	0.582	0.619	0.623	0.728	0.783	0.703	0.655	0.569	0.648	11.59
62)	T	n-Butyl Acetate	1.681	1.535	1.632	1.618	1.792	1.904	1.615	1.448	1.187	1.601	12.78
63)	T	n-Octane	0.558	0.563	0.586	0.574	0.667	0.671	0.569	0.510	0.415	0.568	13.61
64)	T	Tetrachloroethene	0.938	0.817	0.902	0.841	0.925	0.962	0.838	0.781	0.673	0.853	10.64
65)	T	Chlorobenzene	1.586	1.566	1.690	1.651	1.857	1.979	1.727	1.581	1.337	1.664	11.06
66)	T	Ethylbenzene	2.834	2.705	2.896	2.801	3.207	3.368	2.931	2.643	2.206	2.843	11.70
67)	T	m- & p-Xylenes	2.256	2.184	2.326	2.274	2.579	2.711	2.329	2.066	1.634	2.262	13.53
68)	T	Bromoform			0.478	0.478	0.566	0.666	0.636	0.593	0.493	0.559	13.91
69)	T	Styrene	1.711	1.601	1.765	1.728	1.929	2.125	1.896	1.744	1.480	1.775	10.65
70)	T	o-Xylene	2.351	2.206	2.355	2.334	2.643	2.799	2.434	2.196	1.805	2.347	12.02
71)	T	n-Nonane			1.512	1.470	1.671	1.709	1.426	1.235	0.978	1.429	17.78
72)	T	1,1,2,2-Tetrac...	0.967	0.922	1.020	1.027	1.151	1.252	1.120	1.020	0.846	1.036	11.90
73)	S	Bromofluoroben...	1.008	1.014	1.021	0.990	0.976	0.978	1.004	1.020	1.023	1.004	1.81
74)	T	Cumene	3.017	2.944	3.154	3.072	3.447	3.663	3.224	2.898	2.384	3.089	11.67
75)	T	alpha-Pinene	1.460	1.424	1.544	1.519	1.697	1.807	1.609	1.472	1.249	1.531	10.57
76)	T	n-Propylbenzene	3.565	3.419	3.656	3.594	4.088	4.333	3.744	3.350	2.697	3.605	12.83
77)	T	3-Ethyltoluene	3.043	2.878	3.089	3.080	3.477	3.665	3.361	2.841	2.396	3.092	12.24
78)	T	4-Ethyltoluene	2.596	2.590	2.773	2.680	3.018	3.289	2.696	2.598	2.037	2.698	12.62
79)	T	1,3,5-Trimethy...	2.438	2.362	2.477	2.483	2.780	2.979	2.620	2.377	1.961	2.497	11.43
80)	T	alpha-Methylst...	1.195	1.144	1.261	1.266	1.321	1.592	1.421	1.298	1.065	1.285	12.03
81)	T	2-Ethyltoluene	2.797	2.699	2.845	2.847	3.173	3.421	2.989	2.695	2.197	2.851	11.94
82)	T	1,2,4-Trimethy...	2.322	2.263	2.475	2.457	2.749	2.973	2.573	2.254	1.750	2.424	14.23
83)	T	n-Decane	1.407	1.316	1.463	1.442	1.608	1.666	1.355	1.128	0.792	1.353	19.42
84)	T	Benzyl Chloride	1.620	1.541	1.767	1.805	2.163	2.514	2.261	2.005	1.544	1.913	17.98
85)	T	1,3-Dichlorobe...	1.300	1.292	1.394	1.368	1.547	1.698	1.496	1.324	1.006	1.380	14.03
86)	T	1,4-Dichlorobe...	1.396	1.341	1.504	1.474	1.668	1.840	1.647	1.505	1.265	1.516	11.78
87)	T	sec-Butylbenzene	3.148	3.005	3.242	3.259	3.643	3.874	3.405	3.029	2.454	3.229	12.57
88)	T	4-Isopropyltol...	2.969	2.856	3.095	3.106	3.498	3.748	3.243	2.797	2.133	3.049	15.03
89)	T	1,2,3-Trimethy...	2.531	2.374	2.564	2.589	2.871	3.138	2.748	2.416	1.909	2.571	13.38
90)	T	1,2-Dichlorobe...	1.253	1.198	1.369	1.327	1.512	1.681	1.516	1.380	1.161	1.377	12.23
91)	T	d-Limonene	0.885	0.811	0.911	0.908	0.979	1.112	0.989	0.881	0.728	0.911	12.04
92)	T	1,2-Dibromo-3-...	0.355	0.372	0.442	0.471	0.537	0.635	0.605	0.563	0.499	0.498	19.62
93)	T	n-Undecane	1.452	1.339	1.483	1.479	1.661	1.790	1.508	1.312	1.045	1.452	14.61
94)	T	1,2,4-Trichlor...	0.767	0.739	0.963	0.967	1.112	1.292	1.217	1.138	0.983	1.020	18.52

10/14/14

Method Path : I:\MS08\Methods\
Method File : R8101214.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95)	T	Naphthalene	2.475	2.396	2.893	2.977	3.372	3.981	3.663	3.279	2.674	3.079	17.49
96)	T	n-Dodecane	1.274	1.194	1.336	1.394	1.510	1.655	1.431	1.233	0.974	1.333	14.77
97)	T	Hexachlorobuta...	0.637	0.662	0.689	0.692	0.757	0.839	0.775	0.723	0.621	0.710	9.91
98)	T	Cyclohexanone	0.875	0.842	0.892	0.882	0.918	0.938	0.842	0.771	0.654	0.846	10.29
99)	T	tert-Butylbenzene	2.400	2.362	2.534	2.506	2.798	2.970	2.594	2.267	1.779	2.468	13.69
100)	T	n-Butylbenzene	2.332	2.185	2.508	2.475	2.761	2.998	2.609	2.308	1.859	2.448	13.55

(#) = Out of Range

10/14/14

Evaluate Continuing Calibration Report

Data File: I:\MS08\Data\2014 12\16\12161402.D
Acq On : 16 Dec 2014 5:01 Operator: WA
Sample : CCV R8121614 25ng
Misc : S29-12011401/S29-12031408 (1/1/15)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Dec 16 06:45:14 2014
Quant Method : I:\MS08\Methods\R8101214.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Oct 13 10:44:33 2014
Response via : Initial Calibration
DataAcq Meth:TO15.M

12/16/14

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	IR	Bromochloromethane (IS1)	1.000	1.000	0.0	93	0.00
2	T	Propene	1.650	1.275	22.7	78	0.00
3	T	Dichlorodifluoromethane (CF	2.591	2.323	10.3	82	0.00
4	T	Chloromethane	1.698	1.729	-1.8	80	0.00
5	T	1,2-Dichloro-1,1,2,2-tetraf	1.387	1.265	8.8	83	0.00
6	T	Vinyl Chloride	1.734	1.734	0.0	82	0.00
7	T	1,3-Butadiene	1.299	1.352	-4.1	79	0.00
8	T	Bromomethane	1.089	1.047	3.9	83	0.00
9	T	Chloroethane	0.936	0.926	1.1	81	0.00
10	T	Ethanol	1.019	0.875	14.1	82	0.00
11	T	Acetonitrile	2.789	2.200	21.1	80	0.00
12	T	Acrolein	0.781	0.629	19.5	77	0.00
13	T	Acetone	1.037	0.832	19.8	81	0.00
14	T	Trichlorofluoromethane	2.053	1.904	7.3	87	0.00
15	T	2-Propanol (Isopropanol)	3.877	3.148	18.8	80	0.00
16	T	Acrylonitrile	1.646	1.565	4.9	80	0.00
17	T	1,1-Dichloroethene	1.155	1.081	6.4	80	0.00
18	T	2-Methyl-2-Propanol (tert-B	3.335	2.953	11.5	78	0.00
19	T	Methylene Chloride	1.286	1.068	17.0	81	0.00
20	T	3-Chloro-1-propene (Allyl C	2.397	1.807	24.6	76	0.00
21	T	Trichlorotrifluoroethane	1.124	1.036	7.8	82	0.00
22	T	Carbon Disulfide	4.525	3.565	21.2	82	0.00
23	T	trans-1,2-Dichloroethene	1.757	1.670	5.0	80	0.00
24	T	1,1-Dichloroethane	2.270	2.089	8.0	85	0.00
25	T	Methyl tert-Butyl Ether	4.190	3.035	27.6	70	0.00
26	T	Vinyl Acetate	0.337	0.352	-4.5	92	0.00
27	T	2-Butanone (MEK)	0.943	0.803	14.8	87	0.00
28	T	cis-1,2-Dichloroethene	1.698	1.570	7.5	83	0.00
29	T	Diisopropyl Ether	1.201	1.191	0.8	87	0.00
30	T	Ethyl Acetate	0.433	0.432	0.2	92	0.00
31	T	n-Hexane	2.075	2.018	2.7	101	0.00
32	T	Chloroform	2.076	1.888	9.1	86	0.00
33	S	1,2-Dichloroethane-d4(SS1)	1.635	1.639	-0.2	96	0.00
34	T	Tetrahydrofuran (THF)	0.832	0.781	6.1	85	0.00
35	T	Ethyl tert-Butyl Ether	1.702	1.554	8.7	84	0.00
36	T	1,2-Dichloroethane	1.656	1.539	7.1	87	0.00
37	IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	100	0.00
38	T	1,1,1-Trichloroethane	0.415	0.376	9.4	85	0.00
39	T	Isopropyl Acetate	0.153	0.142	7.2	90	0.00
40	T	1-Butanol	0.279	0.258	7.5	88	0.00
41	T	Benzene	0.999	0.864	13.5	89	0.00
42	T	Carbon Tetrachloride	0.324	0.309	4.6	87	0.00
43	T	Cyclohexane	0.430	0.381	11.4	86	0.00
44	T	tert-Amyl Methyl Ether	0.827	0.715	13.5	83	0.00
45	T	1,2-Dichloropropane	0.262	0.238	9.2	88	0.00
46	T	Bromodichloromethane	0.339	0.319	5.9	86	0.00
47	T	Trichloroethene	0.293	0.268	8.5	89	0.00
48	T	1,4-Dioxane	0.216	0.202	6.5	86	0.00
49	T	2,2,4-Trimethylpentane (Iso	1.219	1.050	13.9	83	0.00
50	T	Methyl Methacrylate	0.116	0.108	6.9	88	0.00
51	T	n-Heptane	0.281	0.261	7.1	95	0.00
52	T	cis-1,3-Dichloropropene	0.412	0.389	5.6	87	0.00
53	T	4-Methyl-2-pentanone	0.254	0.227	10.6	87	0.00
54	T	trans-1,3-Dichloropropene	0.376	0.364	3.2	86	0.00

Evaluate Continuing Calibration Report

Data File: I:\MS08\Data\2014 12\16\12161402.D
Acq On : 16 Dec 2014 5:01 Operator: WA
Sample : CCV R8121614 25ng
Misc : S29-12011401/S29-12031408 (1/1/15)
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Dec 16 06:45:14 2014
Quant Method : I:\MS08\Methods\R8101214.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Mon Oct 13 10:44:33 2014
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55	T	1,1,2-Trichloroethane	0.249	0.226	9.2	85	0.00
56	IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	98	0.00
57	S	Toluene-d8 (SS2)	2.257	2.289	-1.4	99	0.00
58	T	Toluene	2.503	2.245	10.3	88	0.00
59	T	2-Hexanone	1.575	1.372	12.9	88	0.00
60	T	Dibromochloromethane	0.649	0.659	-1.5	87	0.00
61	T	1,2-Dibromoethane	0.648	0.614	5.2	86	0.00
62	T	n-Butyl Acetate	1.601	1.449	9.5	88	0.00
63	T	n-Octane	0.568	0.521	8.3	90	0.00
64	T	Tetrachloroethene	0.853	0.750	12.1	88	0.00
65	T	Chlorobenzene	1.664	1.512	9.1	86	0.00
66	T	Ethylbenzene	2.843	2.587	9.0	87	0.00
67	T	m- & p-Xylenes	2.262	2.099	7.2	89	0.00
68	T	Bromoform	0.559	0.580	-3.8	90	0.00
69	T	Styrene	1.775	1.655	6.8	86	0.00
70	T	o-Xylene	2.347	2.154	8.2	87	0.00
71	T	n-Nonane	1.429	1.278	10.6	88	0.00
72	T	1,1,2,2-Tetrachloroethane	1.036	0.978	5.6	86	0.00
73	S	Bromofluorobenzene (SS3)	1.004	0.994	1.0	97	0.00
74	T	Cumene	3.089	2.810	9.0	86	0.00
75	T	alpha-Pinene	1.531	1.413	7.7	86	0.00
76	T	n-Propylbenzene	3.605	3.311	8.2	87	0.00
77	T	3-Ethyltoluene	3.092	2.746	11.2	80	0.00
78	T	4-Ethyltoluene	2.698	2.601	3.6	95	0.00
79	T	1,3,5-Trimethylbenzene	2.497	2.279	8.7	85	0.00
80	T	alpha-Methylstyrene	1.285	1.278	0.5	88	0.00
81	T	2-Ethyltoluene	2.851	2.612	8.4	86	0.00
82	T	1,2,4-Trimethylbenzene	2.424	2.294	5.4	88	0.00
83	T	n-Decane	1.353	1.250	7.6	91	0.00
84	T	Benzyl Chloride	1.913	2.024	-5.8	88	0.00
85	T	1,3-Dichlorobenzene	1.380	1.315	4.7	86	0.00
86	T	1,4-Dichlorobenzene	1.516	1.412	6.9	84	0.00
87	T	sec-Butylbenzene	3.229	2.954	8.5	85	0.00
88	T	4-Isopropyltoluene (p-Cymen	3.049	2.876	5.7	87	0.00
89	T	1,2,3-Trimethylbenzene	2.571	2.419	5.9	86	0.00
90	T	1,2-Dichlorobenzene	1.377	1.293	6.1	84	0.00
91	T	d-Limonene	0.911	0.898	1.4	89	0.00
92	T	1,2-Dibromo-3-Chloropropane	0.498	0.515	-3.4	84	0.00
93	T	n-Undecane	1.452	1.290	11.2	84	0.00
94	T	1,2,4-Trichlorobenzene	1.020	1.017	0.3	82	0.00
95	T	Naphthalene	3.079	3.076	0.1	83	0.00
96	T	n-Dodecane	1.333	1.071	19.7	74	0.00
97	T	Hexachlorobutadiene	0.710	0.665	6.3	84	0.00
98	T	Cyclohexanone	0.846	0.746	11.8	87	0.00
99	T	tert-Butylbenzene	2.468	2.284	7.5	86	0.00
100	T	n-Butylbenzene	2.448	2.299	6.1	87	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0