Table of Contents - Validation Report File

(May 2017 – Grenada Manufacturing LLC – Data Validation Reports.PDF)

Note: This file shows the sample key and eight (8) data validation reports conducted for sampling undertaken per the Revised Facility Interim Air Monitoring Plan by the Grenada Manufacturing LLC (dated April 17, 2017)

Indoor Air and Ambient Air Sample Key
Revised Facility Interim Air Monitoring
Grenada Manufacturing
Grenada, Mississippi

DRAFT

ARCADIS Design & Consultancy for natural and built assets

Sample ID	Sample Location ID	Location / Column	Worker Shift	Sample Duration‡	Sample Dates	Analysis
Program A - Indoor Air - Zone B: Production Area						
550 JU	B-4	D-14	1st	8-hrs	5/2/2017	RAD 145*
B-4 (050217) 1ST			1st	8-hrs	5/2/2017	TO-15
118 JX			1st	8-hrs	5/9/2017	RAD 145
431 JX			1st	8-hrs	5/16/2017	RAD 145
557 JU			2nd	8-hrs	5/2/2017	RAD 145*
B-4 (050217) 2ND			2nd	8-hrs	5/2/2017	TO-15
123 JX			2nd	8-hrs	5/9/2017	RAD 145
438 JX			2nd	8-hrs	5/16/2017	RAD 145
540 JU			3rd	8-hrs	5/1/2017	RAD 145*
B-4 (050117) 3RD			3rd	8-hrs	5/1/2017	TO-15
111 JX			3rd	8-hrs	5/8/2017	RAD 145
104 QK			3rd	8-hrs	5/16/2017	RAD 145
088 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
425 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 130
539 JU	B-6	B-19	1st	8-hrs	5/2/2017	RAD 145*
120 JX			1st	8-hrs	5/9/2017	RAD 145
432 JX			1st	8-hrs	5/16/2017	RAD 145
556 JU			2nd	8-hrs	5/2/2017	RAD 145*
418 JX			2nd	8-hrs	5/9/2017	RAD 145
098 QK			2nd	8-hrs	5/16/2017	RAD 145
539 JU			3rd	8-hrs	5/1/2017	RAD 145*
119 JX			3rd	8-hrs	5/8/2017	RAD 145
109 QK**			3rd	8-hrs	5/16/2017	RAD 145
093 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
424 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 130
551 JU	B-9	E-10	1st	8-hrs	5/2/2017	RAD 145*
117 JX			1st	8-hrs	5/9/2017	RAD 145
433 JX			1st	8-hrs	5/16/2017	RAD 145
558 JU			2nd	8-hrs	5/2/2017	RAD 145*
419 JX			2nd	8-hrs	5/9/2017	RAD 145
099 QK			2nd	8-hrs	5/16/2017	RAD 145
542 JU			3rd	8-hrs	5/1/2017	RAD 145*
116 JX			3rd	8-hrs	5/8/2017	RAD 145
106 QK			3rd	8-hrs	5/16/2017	RAD 145
091 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
426 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 130
Program C - Indoor Air - Zone B: Production Area						
548 JU	A-5	CMM Room / C-12	1st	8-hrs	5/2/2017	RAD 145*
103 JX			2nd	8-hrs	5/2/2017	RAD 145*
538 JU			3rd	8-hrs	5/1/2017	RAD 145*
096 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
R-A-5			All	30-days	5/1/2017 - 5/30/2017	RAD 130
552 JU	B-3	F-16	1st	8-hrs	5/2/2017	RAD 145*
104 JX			2nd	8-hrs	5/2/2017	RAD 145*
543 JU			3rd	8-hrs	5/1/2017	RAD 145*
092 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
R-B-3			All	30-days	5/1/2017 - 5/30/2017	RAD 130
553 JU	B-8	G-18	1st	8-hrs	5/2/2017	RAD 145*
105 JX			2nd	8-hrs	5/2/2017	RAD 145*
544 JU			3rd	8-hrs	5/1/2017	RAD 145*
090 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130

Indoor Air and Ambient Air Sample Key
Revised Facility Interim Air Monitoring
Grenada Manufacturing
Grenada, Mississippi

ARCADIS Design & Consultancy for natural and built assets

Sample ID	Sample Location ID	Location / Column	Worker Shift	Sample Duration‡	Sample Dates	Analysis
Ambient Air						
554 JU	AMB-R-N	North side of facility	1st	8-hrs	5/2/2017	RAD 145*
115 JX			1st	8-hrs	5/9/2017	RAD 145
435 JX			1st	8-hrs	5/16/2017	RAD 145
106 JX			2nd	8-hrs	5/2/2017	RAD 145*
421 JX			2nd	8-hrs	5/9/2017	RAD 145
101 QK			2nd	8-hrs	5/16/2017	RAD 145
547 JU			3rd	8-hrs	5/1/2017	RAD 145*
114 JX			3rd	8-hrs	5/8/2017	RAD 145
108 QK			3rd	8-hrs	5/16/2017	RAD 145
097 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
428 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 130
Amb-R-N			All	30-days	5/1/2017 - 5/30/2017	RAD 130
555 JU	AMB-R-S	South side of facility	1st	8-hrs	5/2/2017	RAD 145*
122 JX			1st	8-hrs	5/9/2017	RAD 145
434 JX			1st	8-hrs	5/16/2017	RAD 145
107 JX			2nd	8-hrs	5/2/2017	RAD 145*
420 JX			2nd	8-hrs	5/9/2017	RAD 145
100 QK			2nd	8-hrs	5/16/2017	RAD 145
545 JU			3rd	8-hrs	5/1/2017	RAD 145*
121 JX			3rd	8-hrs	5/8/2017	RAD 145
105 QK**			3rd	8-hrs	5/16/2017	RAD 145
095 QK			All	7-days	5/1/2017 - 5/8/2017	RAD 130
427 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 130
Amb-R-S			All	30-days	5/1/2017 - 5/30/2017	RAD 130
108 JX	AMB-R-E	East side of facility	1st	8-hrs	5/9/2017	RAD 145
437 JX			1st	8-hrs	5/16/2017	RAD 145
423 JX			2nd	8-hrs	5/9/2017	RAD 145
103 QK			2nd	8-hrs	5/16/2017	RAD 145
109 JX			3rd	8-hrs	5/8/2017	RAD 145
111 QK			3rd	8-hrs	5/16/2017	RAD 145
430 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 145
Amb-R-E			All	30-days	5/1/2017 - 5/30/2017	RAD 130
113 JX	AMB-R-W	West side of facility	1st	8-hrs	5/9/2017	RAD 145
436 JX			1st	8-hrs	5/16/2017	RAD 145
422 JX			2nd	8-hrs	5/9/2017	RAD 145
102 QK			2nd	8-hrs	5/16/2017	RAD 145
112 JX			3rd	8-hrs	5/8/2017	RAD 145
110 QK			3rd	8-hrs	5/16/2017	RAD 145
429 JX			All	14-days	5/1/2017 - 5/15/2017	RAD 130
Amb-R-W			All	30-days	5/1/2017 - 5/30/2017	RAD 130
QA/QC						
541 JU	B-4	D-14	3rd	8-hrs	5/1/2017	RAD 145*
546 JU	B-3	F-16	3rd	8-hrs	5/1/2017	RAD 145*
089 QK	B-4	D-14	All	7-days	5/1/2017 - 5/8/2017	RAD 130
094 QK	B-3	F-16	All	7-days	5/1/2017 - 5/8/2017	RAD 130
110 JX	B-4	D-14	3rd	8-hrs	5/8/2017	RAD 145
107 QK	B-9	E-10	3rd	8-hrs	5/16/2017	RAD 145
DUP-5	B-3	F-16	All	30-days	5/1/2017 - 5/30/2017	RAD 130

ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

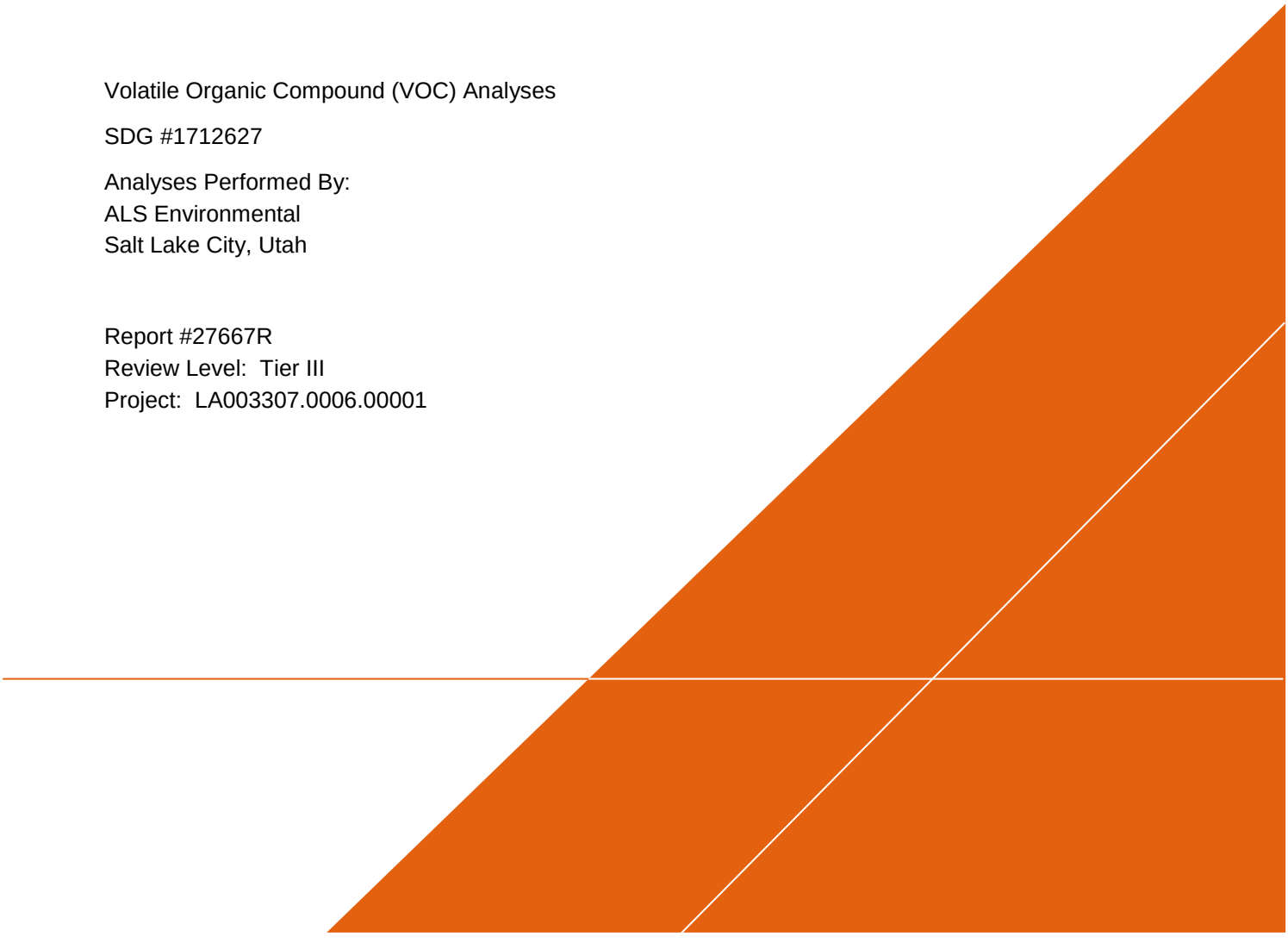
Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1712627

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27667R
Review Level: Tier III
Project: LA003307.0006.00001



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1712627 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
538 JU	1712627001	Air	5/1/2017		X			
539 JU	1712627002	Air	5/2/2017		X			
540 JU	1712627003	Air	5/1/2017		X			
541 JU	1712627004	Air	5/1/2017	540JU	X			
542 JU	1712627005	Air	5/1/2017		X			
543 JU	1712627006	Air	5/1/2017		X			
546 JU	1712627007	Air	5/1/2017	543 JU	X			
544 JU	1712627008	Air	5/1/2017		X			
547 JU	1712627009	Air	5/1/2017		X			
545 JU	1712627010	Air	5/1/2017		X			
548 JU	1712627011	Air	5/2/2017		X			
549 JU	1712627012	Air	5/1/2017		X			
550 JU	1712627013	Air	5/2/2017		X			
551 JU	1712627014	Air	5/2/2017		X			
552 JU	1712627015	Air	5/2/2017		X			
553 JU	1712627016	Air	5/2/2017		X			
554 JU	1712627017	Air	5/2/2017		X			
555 JU	1712627018	Air	5/2/2017		X			
103 JX	1712627019	Air	5/2/2017		X			
556 JU	1712627020	Air	5/2/2017		X			
557 JU	1712627021	Air	5/2/2017		X			
558 JU	1712627022	Air	5/2/2017		X			
104 JX	1712627023	Air	5/2/2017		X			
105 JX	1712627024	Air	5/2/2017		X			

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
106 JX	1712627025	Air	5/2/2017		X			
107 JX	1712627026	Air	5/2/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using Radiello cartidges and analysis was performed using the Solvent Panel Scan method. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Solvent Panel Scan (SOP: IH-AN-Solvent Panel)	Air	60 days from collection to analysis	Cool to <6ºC

All samples were analyzed within the specified holding time.

The following sample preparation and analysis non-conformance was noted:

- Samples were collected using Radiello 145 media specified for thermal desorption sample preparation techniques. The laboratory mistakenly prepared and analyzed the samples using the Radiello 130 solvent panel scan method. Due to the addition of the desorbent solution and the limited sample exposure duration, the sample results were reported at elevated reporting limits.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
538 JU 539 JU 540 JU 541 JU 542 JU 543 JU 546 JU 544 JU 547 JU 545 JU 548 JU 549 JU 550 JU 551 JU 552 JU 553 JU 554 JU 555 JU 103 JX 556 JU	1,2-Dichloroethane	> UL	> UL
	Benzene		
	Toluene		
	1,1,2-Trichloroethane		
	Tetrachloroethene		
	cis-1,2-Dichloroethene		
557 JU 558 JU 104 JX 105 JX 106JX 107 JX	1,2-Dichloroethane	AC	> UL
	1,1,2-Trichloroethene		
	Tetrachloroethene		
	Benzene	> UL	AC

Note:

AC Acceptable

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result ($\mu g/m^3$)	Duplicate Result ($\mu g/m^3$)	RPD
540 JU / 541 JU	All compounds	U	U	AC
543 JU / 546 JU	All compounds	U	U	AC

Note:

AC Acceptable

There were no target compounds detected in the parent and field duplicate samples and the results are considered to be in agreement.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: Solvent Panel Scan	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: May 17, 2017

PEER REVIEW: Dennis Capria

DATE: May 19, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

W 1712627

ANALYTICAL REQUEST FORM

1712627

1. [X] REGULAR Status

[ ] RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5-2-17 Purchase Order No. LACO3307.005 4. Quote No. _____

3. Company Name ARCADIS ALS Project Manager PAUL POPE

Address 132 E. WASHINGTON ST, STE 680
INDIANAPOLIS, IN 46204

5. **Sample Collection**

Person to Contact ROB UPPENCAMP / SARAH JONKER Sampling Site GRENADA MANUFACTURING

Telephone (317) 231-6500 Industrial Process STAMPING

Fax Telephone (317) 231-6514 Date of Collection 5-1-17 / 5-2-17

E-mail Address ROBERT.UPPENCAMP / SARAH.JONKER @ARCADIS.COM Time Collected _____

Date of Shipment 5-3-17

Billing Address (if different from above) Chain of Custody No. 1 of 2

ACCTS PAYABLE - ARCADIS
HIGHLANDS RANCH, CO

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume	ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
538JU	SORBENT TUBE RAD 145	5-1-17 2130 / 5-2-17 0603	TO-15; PROJECT LIST	ug/m3	
539JU	"	5-1-17 2140 / 5-2-17 0609	"	"	
540JU	"	5-1-17 2155 / 5-2-17 0615	"	"	
541JU	"	5-1-17 2155 / 5-2-17 0615	"	"	
542JU	"	5-1-17 2205 / 5-2-17 0630	"	"	
543JU	"	5-1-17 2215 / 5-2-17 0633	"	"	
546JU	"	5-1-17 2215 / 5-2-17 0633	"	"	
544JU	"	5-1-17 2230 / 5-2-17 0637	"	"	
547JU	"	5-1-17 2240 / 5-2-17 0650	"	"	
545JU	"	5-1-17 2250 / 5-2-17 0641	"	"	
548JU	"	5-2-17 0606 / 5-2-17 1343	"	"	
549JU	"	5-2-17 0609 / 5-2-17 1346	"	"	
550JU	"	5-2-17 0615 / 5-2-17 1348	"	"	
551JU	"	5-2-17 0638 / 5-2-17 1357	"	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m^3 3. ppm 4. % 5. (µg/m^3) 6. _____ (other) Please indicate one or more units in the column entitled Units**

Comments TO-15 PROJECT LIST: BENZENE, 1,1-DICHLOROETHENE, 1,2-DICHLOROETHANE, CIS-1,2-DICHLOROETHENE, TRANS-1,2-DICHLOROETHENE, METHYLENE CHLORIDE, TETRACHLOROETHENE, TRICHLOROETHENE, 1,1,2-TRICHLOROETHANE, TOLUENE, VINYL CHLORIDE

Possible Contamination and/or Chemical Hazards TCE

7. **Chain of Custody (Optional)**

Relinquished by	/ARCADIS	Date/Time	1500 / 5-3-17
Received by		Date/Time	5/5/17 9:42am
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

[For lab use only]

ANALYTICAL REQUEST FORM

1. ☒ **REGULAR Status**

☐ **RUSH Status Requested - ADDITIONAL CHARGE**
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5-2-17 Purchase Order No. LA003307.0005 4. Quote No. _____

3. Company Name ARCADIS ALS Project Manager PAUL POPE

Address 132 E. WASHINGTON ST, STE 660
INDIANAPOLIS, IN 46204

Person to Contact ROB UPPENCAMP / SARAH JONKER

Telephone (317) 231-6560

Fax Telephone (317) 231-6514

E-mail Address ROBERT.UPPENCAMP@ARCADIS.COM
SARAH.JONKER

Billing Address (if different from above)
ACCTS PAYABLE - ARCADIS
HIGHLANDS RANCH, CO

5. Sample Collection

Sampling Site GRENADA MANUFACTURING

Industrial Process STAMPING

Date of Collection 5-1-17 / 5-2-17

Time Collected _____

Date of Shipment 5-3-17

Chain of Custody No. 2 of 2

6. How did you first learn about ALS?

7. REQUEST FOR ANALYSES

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
552 JU	SORBENT TUBE GAS VAS	5-2-17 0633	5-2-17 1357	TO-15; PROJECT LIST	ug/m3	
553 JU	"	5-2-17 0637	5-2-17 1405	"	"	
554 JU	"	5-2-17 0641	5-2-17 1408	"	"	
555 JU	"	5-2-17 0650	5-2-17 1415	"	"	
103 JX	"	5-2-17 1343	5-2-17 2152	"	"	
556 JU	"	5-2-17 1346	5-2-17 2155	"	"	
557 JU	"	5-2-17 1348	5-2-17 2158	"	"	
558 JU	"	5-2-17 1357	5-2-17 2207	"	"	
104 JX	"	5-2-17 1400	5-2-17 2209	"	"	
105 JX	"	5-2-17 1405	5-2-17 2211	"	"	
106 JX	"	5-2-17 1408	5-2-17 2214	"	"	
107 JX	"	5-2-17 1415	5-2-17 2221	"	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m^3 3. ppm 4. % 5. (µg/m^3) 6. _____ (other) Please indicate one or more units in the column entitled Units**

Comments TO-15 PROJECT LIST; SEE Pg #1 FOR LIST

Possible Contamination and/or Chemical Hazards TCE

7. Chain of Custody (Optional)

Relinquished by	ARCADIS	Date/Time	5-3-17 / 1500
Received by		Date/Time	5/5/17 9:42
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

ANALYTICAL REPORT
Amended-20170517

Report Date: May 17, 2017

Sarah Jonker
Arcadis
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Indianapolis, IN 46204

Phone: (317) 231-6500

E-mail: Sarah.Jonker@arcadis.com

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **538JU** Collected: 05/01/2017
Lab ID: 1712627001 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 513 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.051	<0.013	2.0
Benzene	<2.0	<0.049	<0.015	2.0
Trichloroethene	<2.0	<0.057	<0.011	2.0
Toluene	<2.0	<0.053	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.065	<0.012	2.0
Tetrachloroethene	<2.0	<0.066	<0.0097	2.0
cis-1,2-Dichloroethene	<2.0	<0.052	<0.013	2.0

Sample ID: **539 JU** Collected: 05/02/2017
Lab ID: 1712627002 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 509 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.051	<0.013	2.0
Benzene	<2.0	<0.049	<0.015	2.0
Trichloroethene	<2.0	<0.057	<0.011	2.0
Toluene	<2.0	<0.053	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.065	<0.012	2.0
Tetrachloroethene	<2.0	<0.067	<0.0098	2.0
cis-1,2-Dichloroethene	<2.0	<0.053	<0.013	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **540 JU** Collected: 05/01/2017
Lab ID: 1712627003 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 500 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.052	<0.013	2.0
Benzene	<2.0	<0.050	<0.016	2.0
Trichloroethene	<2.0	<0.058	<0.011	2.0
Toluene	<2.0	<0.054	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.067	<0.012	2.0
Tetrachloroethene	<2.0	<0.068	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.054	<0.014	2.0

Sample ID: **541 JU** Collected: 05/01/2017
Lab ID: 1712627004 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 500 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.052	<0.013	2.0
Benzene	<2.0	<0.050	<0.016	2.0
Trichloroethene	<2.0	<0.058	<0.011	2.0
Toluene	<2.0	<0.054	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.067	<0.012	2.0
Tetrachloroethene	<2.0	<0.068	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.054	<0.014	2.0

Sample ID: **542 JU** Collected: 05/01/2017
Lab ID: 1712627005 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 505 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.051	<0.013	2.0
Benzene	<2.0	<0.050	<0.015	2.0
Trichloroethene	<2.0	<0.057	<0.011	2.0
Toluene	<2.0	<0.054	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.066	<0.012	2.0
Tetrachloroethene	<2.0	<0.067	<0.0099	2.0
cis-1,2-Dichloroethene	<2.0	<0.053	<0.013	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **543 JU** Collected: 05/01/2017
Lab ID: 1712627006 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 498 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.052	<0.013	2.0
Benzene	<2.0	<0.050	<0.016	2.0
Trichloroethene	<2.0	<0.058	<0.011	2.0
Toluene	<2.0	<0.054	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.067	<0.012	2.0
Tetrachloroethene	<2.0	<0.068	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.054	<0.014	2.0

Sample ID: **546 JU** Collected: 05/01/2017
Lab ID: 1712627007 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/08/2017 (190204)
Sampling Info: **Exposure 498 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.052	<0.013	2.0
Benzene	<2.0	<0.050	<0.016	2.0
Trichloroethene	<2.0	<0.058	<0.011	2.0
Toluene	<2.0	<0.054	<0.014	2.0
1,1,2-Trichloroethane	<2.0	<0.067	<0.012	2.0
Tetrachloroethene	<2.0	<0.068	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.054	<0.014	2.0

Sample ID: **544 JU** Collected: 05/01/2017
Lab ID: 1712627008 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 487 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.060	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.013	2.0
Tetrachloroethene	<2.0	<0.070	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **547 JU** Collected: 05/01/2017
Lab ID: 1712627009 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: Exposure 490 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.059	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.012	2.0
Tetrachloroethene	<2.0	<0.069	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

Sample ID: **545 JU** Collected: 05/01/2017
Lab ID: 1712627010 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: Exposure 471 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.055	<0.014	2.0
Benzene	<2.0	<0.053	<0.017	2.0
Trichloroethene	<2.0	<0.062	<0.011	2.0
Toluene	<2.0	<0.057	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.071	<0.013	2.0
Tetrachloroethene	<2.0	<0.072	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.057	<0.014	2.0

Sample ID: **548 JU** Collected: 05/02/2017
Lab ID: 1712627011 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: Exposure 457 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.057	<0.014	2.0
Benzene	<2.0	<0.055	<0.017	2.0
Trichloroethene	<2.0	<0.063	<0.012	2.0
Toluene	<2.0	<0.059	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.073	<0.013	2.0
Tetrachloroethene	<2.0	<0.074	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.059	<0.015	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **549 JU** Collected: 05/01/2017
Lab ID: 1712627012 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 457 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.057	<0.014	2.0
Benzene	<2.0	<0.055	<0.017	2.0
Trichloroethene	<2.0	<0.063	<0.012	2.0
Toluene	<2.0	<0.059	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.073	<0.013	2.0
Tetrachloroethene	<2.0	<0.074	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.059	<0.015	2.0

Sample ID: **550 JU** Collected: 05/02/2017
Lab ID: 1712627013 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 453 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.057	<0.014	2.0
Benzene	<2.0	<0.055	<0.017	2.0
Trichloroethene	<2.0	<0.064	<0.012	2.0
Toluene	<2.0	<0.060	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.074	<0.013	2.0
Tetrachloroethene	<2.0	<0.075	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.059	<0.015	2.0

Sample ID: **551 JU** Collected: 05/02/2017
Lab ID: 1712627014 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 447 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.058	<0.014	2.0
Benzene	<2.0	<0.056	<0.018	2.0
Trichloroethene	<2.0	<0.065	<0.012	2.0
Toluene	<2.0	<0.060	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.075	<0.014	2.0
Tetrachloroethene	<2.0	<0.076	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.060	<0.015	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **552 JU** Collected: 05/02/2017
Lab ID: 1712627015 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 444 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.059	<0.014	2.0
Benzene	<2.0	<0.056	<0.018	2.0
Trichloroethene	<2.0	<0.065	<0.012	2.0
Toluene	<2.0	<0.061	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.075	<0.014	2.0
Tetrachloroethene	<2.0	<0.076	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.060	<0.015	2.0

Sample ID: **553 JU** Collected: 05/02/2017
Lab ID: 1712627016 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 448 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.058	<0.014	2.0
Benzene	<2.0	<0.056	<0.017	2.0
Trichloroethene	<2.0	<0.065	<0.012	2.0
Toluene	<2.0	<0.060	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.074	<0.014	2.0
Tetrachloroethene	<2.0	<0.076	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.060	<0.015	2.0

Sample ID: **554 JU** Collected: 05/02/2017
Lab ID: 1712627017 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 447 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.058	<0.014	2.0
Benzene	<2.0	<0.056	<0.018	2.0
Trichloroethene	<2.0	<0.065	<0.012	2.0
Toluene	<2.0	<0.060	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.075	<0.014	2.0
Tetrachloroethene	<2.0	<0.076	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.060	<0.015	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **555 JU** Collected: 05/02/2017
Lab ID: 1712627018 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 445 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.058	<0.014	2.0
Benzene	<2.0	<0.056	<0.018	2.0
Trichloroethene	<2.0	<0.065	<0.012	2.0
Toluene	<2.0	<0.061	<0.016	2.0
1,1,2-Trichloroethane	<2.0	<0.075	<0.014	2.0
Tetrachloroethene	<2.0	<0.076	<0.011	2.0
cis-1,2-Dichloroethene	<2.0	<0.060	<0.015	2.0

Sample ID: **103 JX** Collected: 05/02/2017
Lab ID: 1712627019 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 489 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.059	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.012	2.0
Tetrachloroethene	<2.0	<0.069	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

Sample ID: **556 JU** Collected: 05/02/2017
Lab ID: 1712627020 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 489 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.059	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.012	2.0
Tetrachloroethene	<2.0	<0.069	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **557 JU** Collected: 05/02/2017
Lab ID: 1712627021 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 490 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.059	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.012	2.0
Tetrachloroethene	<2.0	<0.069	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

Sample ID: **558 JU** Collected: 05/02/2017
Lab ID: 1712627022 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 490 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.059	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.012	2.0
Tetrachloroethene	<2.0	<0.069	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

Sample ID: **104 JX** Collected: 05/02/2017
Lab ID: 1712627023 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 489 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.059	<0.011	2.0
Toluene	<2.0	<0.055	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.068	<0.012	2.0
Tetrachloroethene	<2.0	<0.069	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

ANALYTICAL REPORT

Amended-20170517

Workorder: **34-1712627**
Client Project ID: Grenada Manufacturing 050117
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **105 JX** Collected: 05/02/2017
Lab ID: 1712627024 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 486 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.060	<0.011	2.0
Toluene	<2.0	<0.056	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.069	<0.013	2.0
Tetrachloroethene	<2.0	<0.070	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

Sample ID: **106 JX** Collected: 05/02/2017
Lab ID: 1712627025 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 486 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.060	<0.011	2.0
Toluene	<2.0	<0.056	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.069	<0.013	2.0
Tetrachloroethene	<2.0	<0.070	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

Sample ID: **107 JX** Collected: 05/02/2017
Lab ID: 1712627026 Sampling Location: Grenada Manufacturin Received: 05/05/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/09/2017 (190204)
Sampling Info: **Exposure 486 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.053	<0.013	2.0
Benzene	<2.0	<0.051	<0.016	2.0
Trichloroethene	<2.0	<0.060	<0.011	2.0
Toluene	<2.0	<0.056	<0.015	2.0
1,1,2-Trichloroethane	<2.0	<0.069	<0.013	2.0
Tetrachloroethene	<2.0	<0.070	<0.010	2.0
cis-1,2-Dichloroethene	<2.0	<0.055	<0.014	2.0

ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

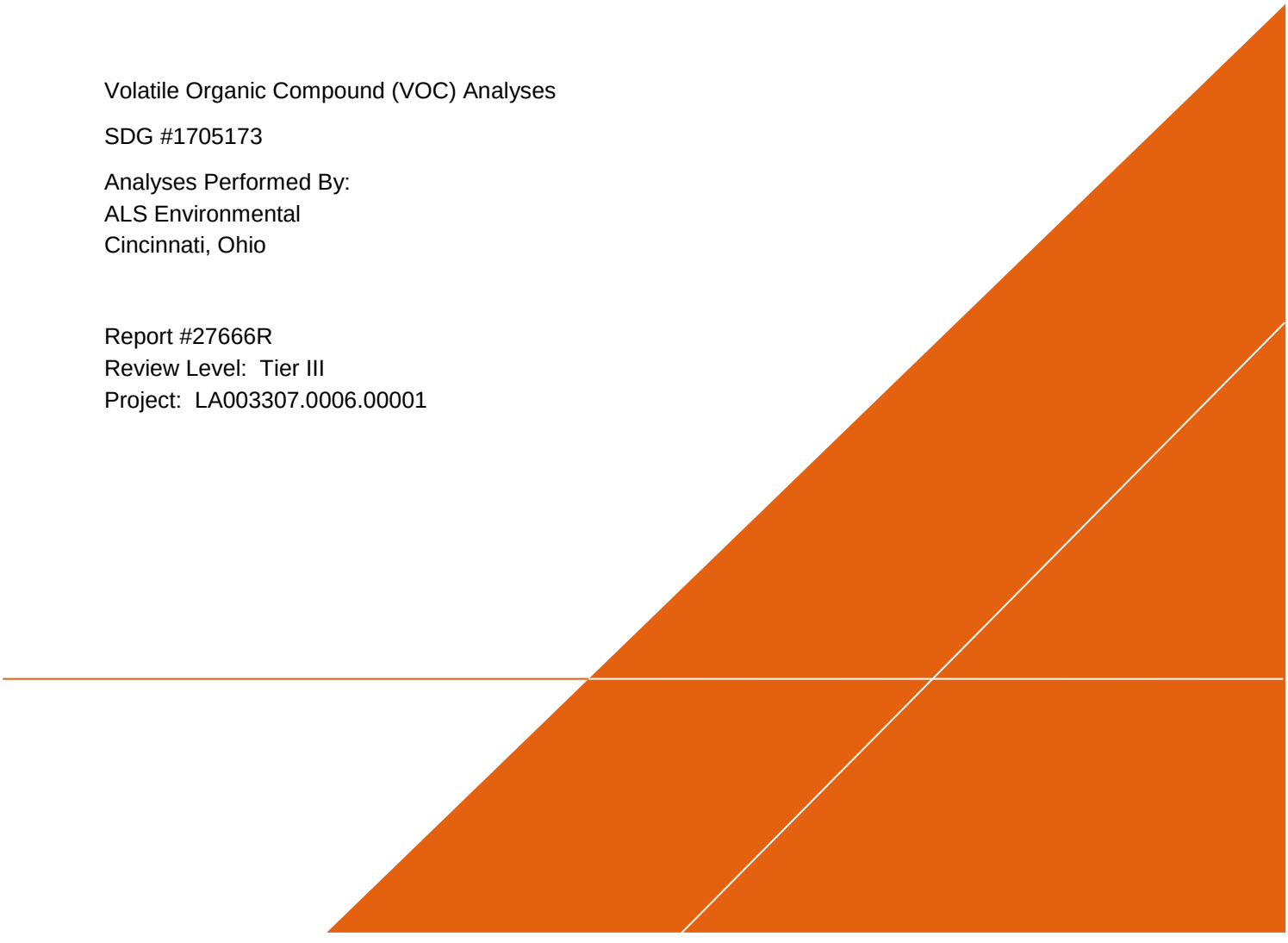
Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1705173

Analyses Performed By:
ALS Environmental
Cincinnati, Ohio

Report #27666R
Review Level: Tier III
Project: LA003307.0006.00001



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1705173 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
B-4 (050117) 3RD	1705173-01	Air	5/1/2017		X			
B-4 (050217) 1ST	1705173-02	Air	5/2/2017		X			
B-4 (050217) 2ND	1705173-03	Air	5/2/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999 and USEPA Region II SOP HW-31- Validating Air Samples Volatile Organic Analysis of Ambient Air In Canister by Method TO-15 of October 2006.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation	Return Canister Pressure
EPA TO-15	Air	30 days from collection to analysis	Ambient temperature	< -1" Hg

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

A field duplicate sample was not collected in association with this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: EPA TO-15	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-1"Hg)		X		X	
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

VOCs: EPA TO-15	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					

%RSD Percent relative difference

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

DATE: May 23, 2017

PEER REVIEW: Dennis Capria

DATE: May 30, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

eurofins | Air Toxics

4388 GLENDALE MILFORD RD
BLUE ASH, OH 45242
513-733-5336

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Sample Transportation Notice

Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

Page 1 of 1

ALS ENVIRONMENTAL

Project Manager ROB UPPENCAMP

Collected by: (Print and Sign) RANDALL WOODRUFF

Company ARCADIS Email ROBERT.UPPENCAMP@ARCADIS.COM

Address 132 E. WASHINGTON ST STE 600 City INDIANAPOLIS State IN Zip 46204

Phone 317-231-6500 Fax 317-231-6514

Project Info:

P.O. # LA003307.0005

Project # LA003307.0005

Project Name GRENADA MANUFACTURING

Turn Around Time:

☒ Normal

☐ Rush

specify

Lab Use Only

Pressurized by:

Date:

Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
	B-4 (050117) 3RD	109084	05-1-17 05-2-17	2200-0550	TO-15; PROJECT LIST	-30	-1		
	B-4 (050217) 1ST	109219	5-2-17	0618-1348	"	-30	-3.75		
	B-4 (050217) 2ND	101818	5-2-17	1353-2158	"	-30	-1		

Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time	Notes:
ARCADIS 5-3-17/1500		
Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time	
Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time	

Lab Use Only

Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact? Yes No None	Work Order #

Form 1293 rev.11

ALS Environmental

Date: *17-May-17*

Client: Arcadis
Project: LA0033007.0005 **Work Order:** 1705173
Sample ID: B-4 (050117) 3RD **Lab ID:** 1705173-01
Collection Date: 5/1/2017 **Matrix:** AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,2-Trichloroethane	ND		0.50	ppbv	1	5/8/2017 06:19 PM
1,1-Dichloroethene	ND		0.50	ppbv	1	5/8/2017 06:19 PM
1,2-Dichloroethane	ND		0.50	ppbv	1	5/8/2017 06:19 PM
Benzene	ND		0.50	ppbv	1	5/8/2017 06:19 PM
cis-1,2-Dichloroethene	ND		0.50	ppbv	1	5/8/2017 06:19 PM
Methylene chloride	**17**		**0.50**	**ppbv**	1	5/8/2017 06:19 PM
Tetrachloroethene	ND		0.50	ppbv	1	5/8/2017 06:19 PM
Toluene	**8.3**		**0.50**	**ppbv**	1	5/8/2017 06:19 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	5/8/2017 06:19 PM
Trichloroethene	**2.6**		**0.20**	**ppbv**	1	5/8/2017 06:19 PM
Vinyl chloride	ND		0.50	ppbv	1	5/8/2017 06:19 PM
Surr: Bromofluorobenzene	*95.3*		*60-140*	*%REC*	1	5/8/2017 06:19 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,2-Trichloroethane	ND		2.73	µg/m3	1	5/8/2017 06:19 PM
1,1-Dichloroethene	ND		1.98	µg/m3	1	5/8/2017 06:19 PM
1,2-Dichloroethane	ND		2.02	µg/m3	1	5/8/2017 06:19 PM
Benzene	ND		1.60	µg/m3	1	5/8/2017 06:19 PM
cis-1,2-Dichloroethene	ND		1.98	µg/m3	1	5/8/2017 06:19 PM
Methylene chloride	**59.1**		**1.74**	**µg/m3**	1	5/8/2017 06:19 PM
Tetrachloroethene	ND		3.39	µg/m3	1	5/8/2017 06:19 PM
Toluene	**31.2**		**1.88**	**µg/m3**	1	5/8/2017 06:19 PM
trans-1,2-Dichloroethene	ND		1.98	µg/m3	1	5/8/2017 06:19 PM
Trichloroethene	**13.8**		**1.07**	**µg/m3**	1	5/8/2017 06:19 PM
Vinyl chloride	ND		1.28	µg/m3	1	5/8/2017 06:19 PM
Surr: Bromofluorobenzene	*95.3*		*60-140*	*%REC*	1	5/8/2017 06:19 PM

Note:

ALS Environmental

Date: *17-May-17*

Client: Arcadis
Project: LA0033007.0005
Work Order: 1705173
Sample ID: B-4 (050217) 1ST
Lab ID: 1705173-02
Collection Date: 5/2/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,2-Trichloroethane	ND		0.50	ppbv	1	5/9/2017 11:58 AM
1,1-Dichloroethene	ND		0.50	ppbv	1	5/9/2017 11:58 AM
1,2-Dichloroethane	ND		0.50	ppbv	1	5/9/2017 11:58 AM
Benzene	ND		0.50	ppbv	1	5/9/2017 11:58 AM
cis-1,2-Dichloroethene	**1.2**		**0.50**	**ppbv**	1	5/9/2017 11:58 AM
Methylene chloride	ND		0.50	ppbv	1	5/9/2017 11:58 AM
Tetrachloroethene	ND		0.50	ppbv	1	5/9/2017 11:58 AM
Toluene	**8.0**		**0.50**	**ppbv**	1	5/9/2017 11:58 AM
trans-1,2-Dichloroethene	**8.9**		**0.50**	**ppbv**	1	5/9/2017 11:58 AM
Trichloroethene	**9.6**		**0.20**	**ppbv**	1	5/9/2017 11:58 AM
Vinyl chloride	ND		0.50	ppbv	1	5/9/2017 11:58 AM
Surr: Bromofluorobenzene	*94.2*		*60-140*	*%REC*	1	5/9/2017 11:58 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,2-Trichloroethane	ND		2.73	µg/m3	1	5/9/2017 11:58 AM
1,1-Dichloroethene	ND		1.98	µg/m3	1	5/9/2017 11:58 AM
1,2-Dichloroethane	ND		2.02	µg/m3	1	5/9/2017 11:58 AM
Benzene	ND		1.60	µg/m3	1	5/9/2017 11:58 AM
cis-1,2-Dichloroethene	**4.72**		**1.98**	**µg/m3**	1	5/9/2017 11:58 AM
Methylene chloride	ND		1.74	µg/m3	1	5/9/2017 11:58 AM
Tetrachloroethene	ND		3.39	µg/m3	1	5/9/2017 11:58 AM
Toluene	**30.3**		**1.88**	**µg/m3**	1	5/9/2017 11:58 AM
trans-1,2-Dichloroethene	**35.2**		**1.98**	**µg/m3**	1	5/9/2017 11:58 AM
Trichloroethene	**51.4**		**1.07**	**µg/m3**	1	5/9/2017 11:58 AM
Vinyl chloride	ND		1.28	µg/m3	1	5/9/2017 11:58 AM
Surr: Bromofluorobenzene	*94.2*		*60-140*	*%REC*	1	5/9/2017 11:58 AM

Note:

ALS Environmental

Date: *17-May-17*

Client: Arcadis
Project: LA0033007.0005 **Work Order:** 1705173
Sample ID: B-4 (050217) 2ND **Lab ID:** 1705173-03
Collection Date: 5/2/2017 **Matrix:** AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,2-Trichloroethane	ND		0.50	ppbv	1	5/8/2017 07:48 PM
1,1-Dichloroethene	ND		0.50	ppbv	1	5/8/2017 07:48 PM
1,2-Dichloroethane	ND		0.50	ppbv	1	5/8/2017 07:48 PM
Benzene	ND		0.50	ppbv	1	5/8/2017 07:48 PM
cis-1,2-Dichloroethene	**1.0**		**0.50**	**ppbv**	1	5/8/2017 07:48 PM
Methylene chloride	ND		0.50	ppbv	1	5/8/2017 07:48 PM
Tetrachloroethene	ND		0.50	ppbv	1	5/8/2017 07:48 PM
Toluene	**0.62**		**0.50**	**ppbv**	1	5/8/2017 07:48 PM
trans-1,2-Dichloroethene	ND		0.50	ppbv	1	5/8/2017 07:48 PM
Trichloroethene	**6.3**		**0.20**	**ppbv**	1	5/8/2017 07:48 PM
Vinyl chloride	ND		0.50	ppbv	1	5/8/2017 07:48 PM
Surr: Bromofluorobenzene	*95.3*		*60-140*	*%REC*	1	5/8/2017 07:48 PM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,2-Trichloroethane	ND		2.73	µg/m3	1	5/8/2017 07:48 PM
1,1-Dichloroethene	ND		1.98	µg/m3	1	5/8/2017 07:48 PM
1,2-Dichloroethane	ND		2.02	µg/m3	1	5/8/2017 07:48 PM
Benzene	ND		1.60	µg/m3	1	5/8/2017 07:48 PM
cis-1,2-Dichloroethene	**4.00**		**1.98**	**µg/m3**	1	5/8/2017 07:48 PM
Methylene chloride	ND		1.74	µg/m3	1	5/8/2017 07:48 PM
Tetrachloroethene	ND		3.39	µg/m3	1	5/8/2017 07:48 PM
Toluene	**2.34**		**1.88**	**µg/m3**	1	5/8/2017 07:48 PM
trans-1,2-Dichloroethene	ND		1.98	µg/m3	1	5/8/2017 07:48 PM
Trichloroethene	**33.6**		**1.07**	**µg/m3**	1	5/8/2017 07:48 PM
Vinyl chloride	ND		1.28	µg/m3	1	5/8/2017 07:48 PM
Surr: Bromofluorobenzene	*95.3*		*60-140*	*%REC*	1	5/8/2017 07:48 PM

Note:

ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

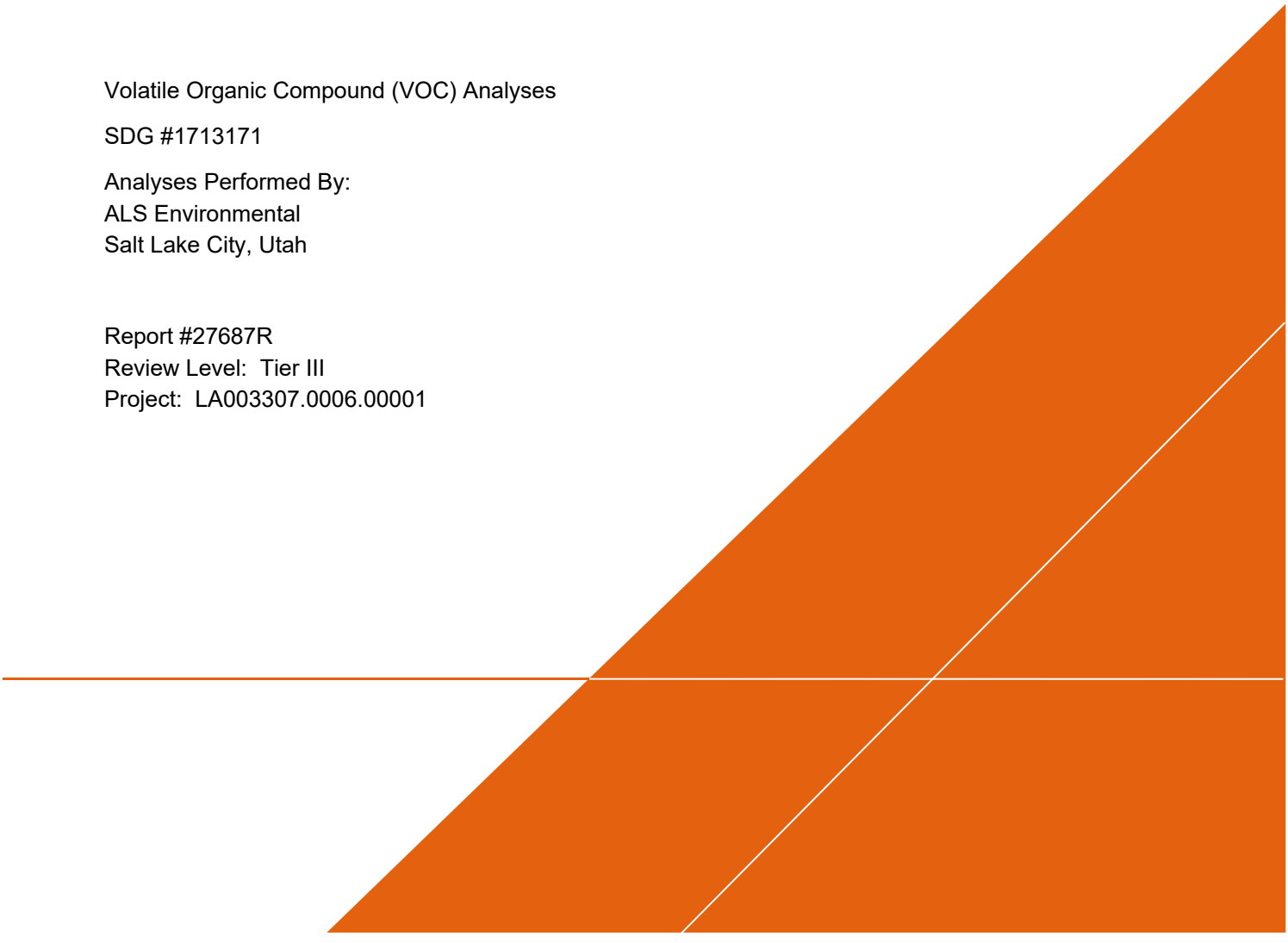
Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1713171

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27687R
Review Level: Tier III
Project: LA003307.0006.00001



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1713171 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
118 JX	1713171001	Air	5/9/2017		X			
120 JX	1713171002	Air	5/9/2017		X			
117 JX	1713171003	Air	5/9/2017		X			
122 JX	1713171004	Air	5/9/2017		X			
115 JX	1713171005	Air	5/9/2017		X			
113 JX	1713171006	Air	5/9/2017		X			
108 JX	1713171007	Air	5/9/2017		X			
111 JX	1713171008	Air	5/9/2017		X			
110 JX	1713171009	Air	5/9/2017	111 JX	X			
119 JX	1713171010	Air	5/9/2017		X			
116 JX	1713171011	Air	5/9/2017		X			
121 JX	1713171012	Air	5/9/2017		X			
114 JX	1713171013	Air	5/9/2017		X			
112 JX	1713171014	Air	5/9/2017		X			
109 JX	1713171015	Air	5/9/2017		X			
123 JX	1713171016	Air	5/9/2017		X			
418 JX	1713171017	Air	5/9/2017		X			
419 JX	1713171018	Air	5/9/2017		X			
420 JX	1713171019	Air	5/9/2017		X			
421 JX	1713171020	Air	5/9/2017		X			
422 JX	1713171021	Air	5/9/2017		X			
423 JX	1713171022	Air	5/9/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using sorbent tubes and analysis was performed using EPA Method TO-17. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA Method TO-17	Air	30 days from collection to analysis	Cool to <6ºC

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result ($\mu g/m^3$)[1]	Duplicate Result ($\mu g/m^3$)[1]	RPD
111 JX / 110 JX	Benzene	3.8	3.5	8.2%
	Trichloroethene	210 EJ	190 EJ	10.0%
	Toluene	34	37	8.5%
	cis-1,2-Dichloroethene	61	61	0.0%

Sample ID/Duplicate ID	Compound	Sample Result ($\mu g/m^3$)[1]	Duplicate Result ($\mu g/m^3$)[1]	RPD

Note:

[1] cis-1,2-Dichloroethene results are reported in units of ng/sample. Uptake rates are not available to determine results in units of $\mu g/m^3$.

The calculated RPDs between the parent sample and field duplicate were acceptable.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis ($\mu g/m^3$)	Diluted Analysis ($\mu g/m^3$)	Reported Analysis ($\mu g/m^3$)
118 JX	Trichloroethene	230 E	--	230 EJ
120 JX	Trichloroethene	180 E	--	180 EJ
111 JX	Trichloroethene	210 E	--	210 EJ
110 JX	Trichloroethene	190 E	--	190 EJ
120 JX	Trichloroethene	280 E	--	280 EJ
418 JX	Trichloroethene	240 E	--	240 EJ

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: EPA Method TO-17	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

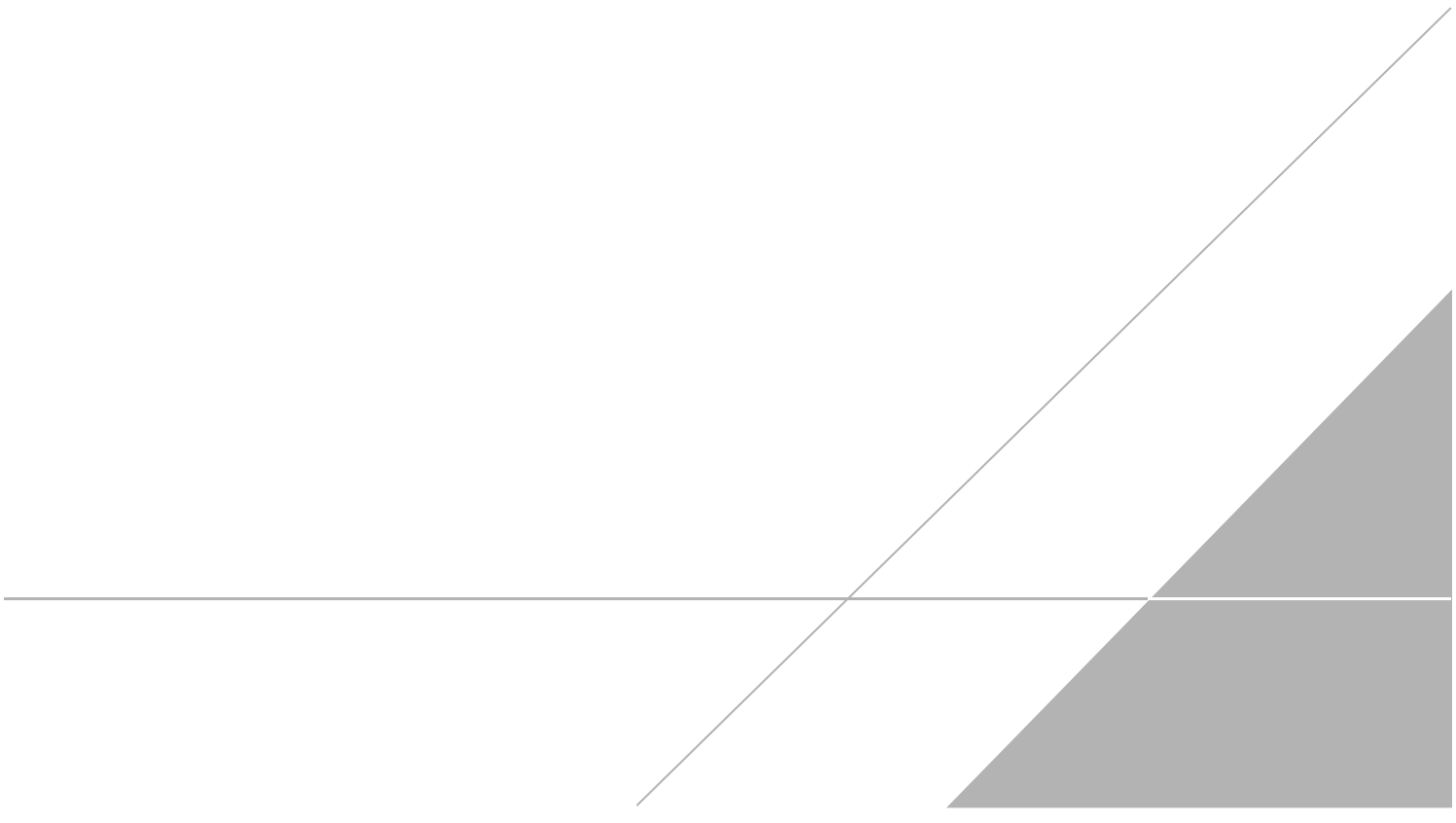
DATE: May 23, 2017

PEER REVIEW: Dennis Capria

DATE: May 30, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



18642/1

W 1713171

ANALYTICAL REQUEST FORM

1713171

1. ☐ REGULAR Status

☐ RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5-10-17 Purchase Order No. LA003307.0005 4. Quote No. _____

3. Company Name ARCADIS ALS Project Manager PAUL POPE

Address 132 E. WASHINGTON ST, STE 600
INDIANAPOLIS, IN 46204

5. **Sample Collection**

Sampling Site GRENADA MANUFACTURING

Person to Contact ROB UPPENCAMP / SARAH JONKER Industrial Process STAMPING

Telephone (317) 231-6500 Date of Collection 5/8/17 - 5/9/17

Fax Telephone (317) 231-6514 Time Collected _____

E-mail Address Robert.Uppencamp@Arcadis.com Date of Shipment 5/10/17
sarah.jonker

Billing Address (if different from above) Chain of Custody No. _____

ACCTS PAYABLE - ARCADIS
HIGHLANDS RANCH, CO

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
118JX	SORBENT TUBE (RAD 145)	5-9-17 0615	5-9-17 1405	RAD145 ~~TO-15; PROJECT LIST~~	µg/m³	
120JX	"	5-9-17 0637	5-9-17 1410	"	"	
117JX	"	5-9-17 0642	5-9-17 1418	"	"	
122JX	"	5-9-17 0650	5-9-17 1425	"	"	
115JX	"	5-9-17 0705	5-9-17 1435	"	"	
113JX	"	5-9-17 0712	5-9-17 1448	"	"	
108JX	"	5-9-17 0730	5-9-17 1453	"	"	
111JX	"	5-8-17 2200	5-9-17 0615	"	"	
110JX	"	[redacted] "	[redacted] "	"	"	
119JX	"	5-8-17 2132	5-9-17 0637	"	"	
116JX	"	5-8-17 2205	5-9-17 0642	"	"	
121JX	"	5-8-17 2248	5-9-17 0650	"	"	
114JX	"	5-8-17 2258	5-9-17 0705	"	"	
112JX	"	5-8-17 2300	5-9-17 0712	"	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. ____ (other) Please indicate one or more units in the column entitled Units**

Comments *** RAD 145 Analysis!

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Brett Matheme / ARCADIS	Date/Time	5/10/17 / 1420
Received by	[signature]	Date/Time	05-11-17 1020
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

[For lab use only]

ANALYTICAL REQUEST FORM

1. ☐ **REGULAR Status**

☐ **RUSH Status Requested - ADDITIONAL CHARGE**
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5-10-17 Purchase Order No. LA003307.0005 4. Quote No. _____

3. Company Name ARCADIS ALS Project Manager PAUL POPE

Address 132 E. WASHINGTON ST, STE 600
INDIANAPOLIS, IN 46204

Person to Contact ROB UPPENCAMP / SARAH JONKER

Telephone (317) 231-6500

Fax Telephone (317) 231-6514

E-mail Address robert.uppencamp@arcadis.com
sarah.jonker

Billing Address (if different from above)
ACCTS-PAYABLE
HIGHLANDS RANCH, CO

5. **Sample Collection**

Sampling Site GRENADA MANUFACTURING

Industrial Process STAMPING

Date of Collection 5/8/17 - 5/9/17

Time Collected _____

Date of Shipment 5/10/17

Chain of Custody No. _____

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
109JX	SORBENT TUBE RAD 145	5-8-17 2320	5-9-17 0730	~~RAD145TO-15 ; PROJECT LIST~~	µg/m³	
123JX	"	5-9-17 1405	5-9-17 2150	"	"	
418JX	"	5-9-17 1410	5-9-17 2156	"	"	
419JX	"	5-9-17 1418	5-9-17 2202	"	"	
420JX	"	5-9-17 1425	5-9-17 2215	"	"	
421JX	"	5-9-17 1435	5-9-17 2221	"	"	
422JX	"	5-9-17 1448	5-9-17 2228	"	"	
423JX	"	5-9-17 1453	5-9-17 2232	"	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. _____ (other) Please indicate one or more units in the column entitled Units**

Comments
~~**~~RAD 145 Analysis!

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Brett Matheme / ARCADIS	Date/Time	5/10/17 / 1420
Received by	[signature]	Date/Time	05-11-17 10:32
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

ANALYTICAL REPORT
Amended-20170522

Workorder: 34-1713171
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **118JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171001 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 470 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 15:15 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**56**	**4.3**	**1.3**	25	1	
Trichloroethene	**2900**	**230**	**43**	25	1	E J
Toluene	**520**	**37**	**9.8**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	**69**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **120 JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171002 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 458 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 15:54 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**49**	**3.9**	**1.2**	25	1	
Trichloroethene	**2200**	**180**	**33**	25	1	E J
Toluene	**290**	**21**	**5.7**	25	1	
Tetrachloroethene	ND	<2.1	<0.32	25	1	
cis-1,2-Dichloroethene	**210**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **117JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171003 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 456 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 16:35 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**50**	**3.9**	**1.2**	25	1	

Results Continued on Next Page

ANALYTICAL REPORT
Amended-20170522

Workorder: 34-1713171
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **117JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171003 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 456 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 16:35 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Trichloroethene	**1100**	**86**	**16**	25	1	
Toluene	**190**	**14**	**3.6**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	**46**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **122JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171004 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 455 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 17:14 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**36**	**2.8**	**0.88**	25	1	
Trichloroethene	ND	<2.0	<0.38	25	1	
Toluene	**110**	**8.1**	**2.2**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **115JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171005 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 450 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 17:53 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**36**	**2.9**	**0.90**	25	1	
Trichloroethene	ND	<2.1	<0.38	25	1	

Results Continued on Next Page

ANALYTICAL REPORT
Amended-20170522

Workorder: 34-1713171
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **115JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171005 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 450 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 17:53 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Toluene	**100**	**7.4**	**2.0**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **113JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171006 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 456 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 18:32 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**35**	**2.8**	**0.87**	25	1	
Trichloroethene	ND	<2.0	<0.38	25	1	
Toluene	**120**	**8.7**	**2.3**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **108JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171007 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 443 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 19:11 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**32**	**2.6**	**0.82**	25	1	
Trichloroethene	ND	<2.1	<0.39	25	1	
Toluene	**330**	**25**	**6.6**	25	1	

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Workorder: 34-1713171
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **108JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171007 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 443 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 19:11 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Tetrachloroethene	ND	<2.2	<0.33	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **111JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171008 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 443 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 19:50 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**46**	**3.8**	**1.2**	25	1	
Trichloroethene	**2500**	**210**	**39**	25	1	E J
Toluene	**450**	**34**	**9.0**	25	1	
Tetrachloroethene	ND	<2.2	<0.33	25	1	
cis-1,2-Dichloroethene	**61**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **110JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171009 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 443 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 20:29 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**43**	**3.5**	**1.1**	25	1	
Trichloroethene	**2300**	**190**	**35**	25	1	E J
Toluene	**500**	**37**	**9.9**	25	1	
Tetrachloroethene	ND	<2.2	<0.33	25	1	

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Client: Arcadis, Inc.
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Sample ID: **110JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171009 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 443 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 20:29 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
cis-1,2-Dichloroethene	**61**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **119JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171010 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 520 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 21:08 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**42**	**2.9**	**0.92**	25	1	
Trichloroethene	**1900**	**130**	**25**	25	1	
Toluene	**190**	**12**	**3.2**	25	1	
Tetrachloroethene	ND	<1.9	<0.28	25	1	
cis-1,2-Dichloroethene	**200**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **116JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171011 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 517 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 21:48 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**50**	**3.5**	**1.1**	25	1	
Trichloroethene	**1100**	**76**	**14**	25	1	
Toluene	**200**	**13**	**3.4**	25	1	
Tetrachloroethene	ND	<1.9	<0.28	25	1	
cis-1,2-Dichloroethene	**44**	NA	NA	NA	1	

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Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **116JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171011 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 517 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 21:48 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **121JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171012 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 482 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 22:27 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**43**	**3.2**	**1.0**	25	1	
Trichloroethene	ND	<1.9	<0.36	25	1	
Toluene	**130**	**9.0**	**2.4**	25	1	
Tetrachloroethene	ND	<2.0	<0.30	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **114JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171013 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 487 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 23:06 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**36**	**2.7**	**0.83**	25	1	
Trichloroethene	ND	<1.9	<0.35	25	1	
Toluene	**100**	**6.8**	**1.8**	25	1	
Tetrachloroethene	ND	<2.0	<0.30	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	

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Client: Arcadis, Inc.
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Analytical Results

Sample ID: **114JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171013 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 487 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 23:06 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **112JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171014 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 492 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/16/2017 23:45 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**44**	**3.2**	**1.0**	25	1	
Trichloroethene	ND	<1.9	<0.35	25	1	
Toluene	**130**	**8.8**	**2.3**	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **109JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171015 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 490 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/17/2017 00:24 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**31**	**2.2**	**0.70**	25	1	
Trichloroethene	ND	<1.9	<0.35	25	1	
Toluene	**310**	**21**	**5.6**	25	1	
Tetrachloroethene	ND	<2.0	<0.30	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

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Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **123JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171016 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 465 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3596 (HBN: 190874) | **Percent Solid:** NA
Analyzed: 05/17/2017 01:03 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**59**	**4.5**	**1.4**	25	1	
Trichloroethene	**3500**	**280**	**51**	25	1	E J
Toluene	**820**	**59**	**16**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	**72**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **418JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171017 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 466 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 13:20 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**55**	**4.2**	**1.3**	25	1	
Trichloroethene	**3000**	**240**	**44**	25	1	E J
Toluene	**370**	**26**	**7.0**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	**240**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **419JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171018 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 464 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 13:59 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**54**	**4.2**	**1.3**	25	1	

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Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **419JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171018 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 464 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 13:59 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Trichloroethene	**1100**	**91**	**17**	25	1	
Toluene	**200**	**15**	**3.9**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	**39**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **420JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171019 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 470 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 14:38 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**35**	**2.7**	**0.85**	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	
Toluene	**70**	**4.9**	**1.3**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **421JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171020 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 466 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 15:17 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**38**	**2.9**	**0.91**	25	1	
Trichloroethene	**36**	**2.9**	**0.53**	25	1	

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Workorder: 34-1713171
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **421JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171020 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 466 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 15:17 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Toluene	**65**	**4.7**	**1.2**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **422 JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171021 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 460 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 15:56 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**38**	**3.0**	**0.93**	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	
Toluene	**130**	**9.1**	**2.4**	25	1	
Tetrachloroethene	ND	<2.1	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **423JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171022 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 459 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 16:36 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**29**	**2.3**	**0.71**	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	
Toluene	**240**	**18**	**4.7**	25	1	

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Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **423JX** | Sampling Site: Grendada Manufacturi | Collected: 05/09/2017
Lab ID: 1713171022 | Media: Radiello, Code 145 | Received: 05/11/2017
Matrix: Air | Sampling Parameter: Air Volume 459 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3598 (HBN: 190948) | **Percent Solid:** NA
Analyzed: 05/17/2017 16:36 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Tetrachloroethene	ND	<2.1	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Comments

Workorder: 1713171

EPA TO-17 Mod.: All results are semi-quantitative.

Quality Control: Radiello, Volatile Organics - (HBN: 190874)

QC limits are advisory for this method and data presented as client information only.

Quality Control: Radiello, Volatile Organics - (HBN: 190948)

QC limits are advisory for this method and data presented as client information only.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Radiello, Volatile Organics	/S/ Lisa M. Reid 05/18/2017 14:29	/S/ Jorden Baum 05/18/2017 15:15

Laboratory Contact Information

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ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1714518

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27758R
Review Level: Tier III
Project: LA003307.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1714518 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
104 QK	1714518001	Air	5/17/2017		X			
105 QK	1714518002	Air	5/17/2017		X			
106 QK	1714518003	Air	5/17/2017		X			
107 QK	1714518004	Air	5/17/2017	106 QK	X			
108 QK	1714518005	Air	5/17/2017		X			
109 QK	1714518006	Air	5/17/2017		X			
110 QK	1714518007	Air	5/17/2017		X			
111 QK	1714518008	Air	5/17/2017		X			
431 JX	1714518009	Air	5/16/2017		X			
432 JX	1714518010	Air	5/16/2017		X			
433 JX	1714518011	Air	5/16/2017		X			
434 JX	1714518012	Air	5/16/2017		X			
435 JX	1714518013	Air	5/16/2017		X			
436 JX	1714518014	Air	5/16/2017		X			
437 JX	1714518015	Air	5/16/2017		X			
438 JX	1714518016	Air	5/16/2017		X			
098 QK	1714518017	Air	5/16/2017		X			
099 QK	1714518018	Air	5/16/2017		X			
100 QK	1714518019	Air	5/16/2017		X			
101 QK	1714518020	Air	5/16/2017		X			
102 QK	1714518021	Air	5/16/2017		X			
103 QK	1714518022	Air	5/16/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using sorbent tubes and analysis was performed using EPA Method TO-17. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
EPA Method TO-17	Air	30 days from collection to analysis	Cool to <6ºC

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result ($\mu g/m^3$)[1]	Duplicate Result ($\mu g/m^3$)[1]	RPD
106 QK / 107 QK	Benzene	1.8 U	2.0	AC
	Trichloroethene	26	65	85.7%
	Toluene	29	1.7 U	NC
	cis-1,2-Dichloroethene	U	56	NC

Sample ID/Duplicate ID	Compound	Sample Result ($\mu g/m^3$)[1]	Duplicate Result ($\mu g/m^3$)[1]	RPD

Note:

AC = Acceptable

NC = Not compliant

[1] cis-1,2-Dichloroethene results are reported in units of ng/sample. Uptake rates are not available to determine results in units of $\mu g/m^3$. A RL was not provided.

The compounds trichloroethene, toluene, and cis-1,2-dichloroethene associated with sample locations 106 QK and 107 QK exhibited non-compliant field duplicate sample results. The associated sample results were qualified as estimated.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: EPA Method TO-17	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

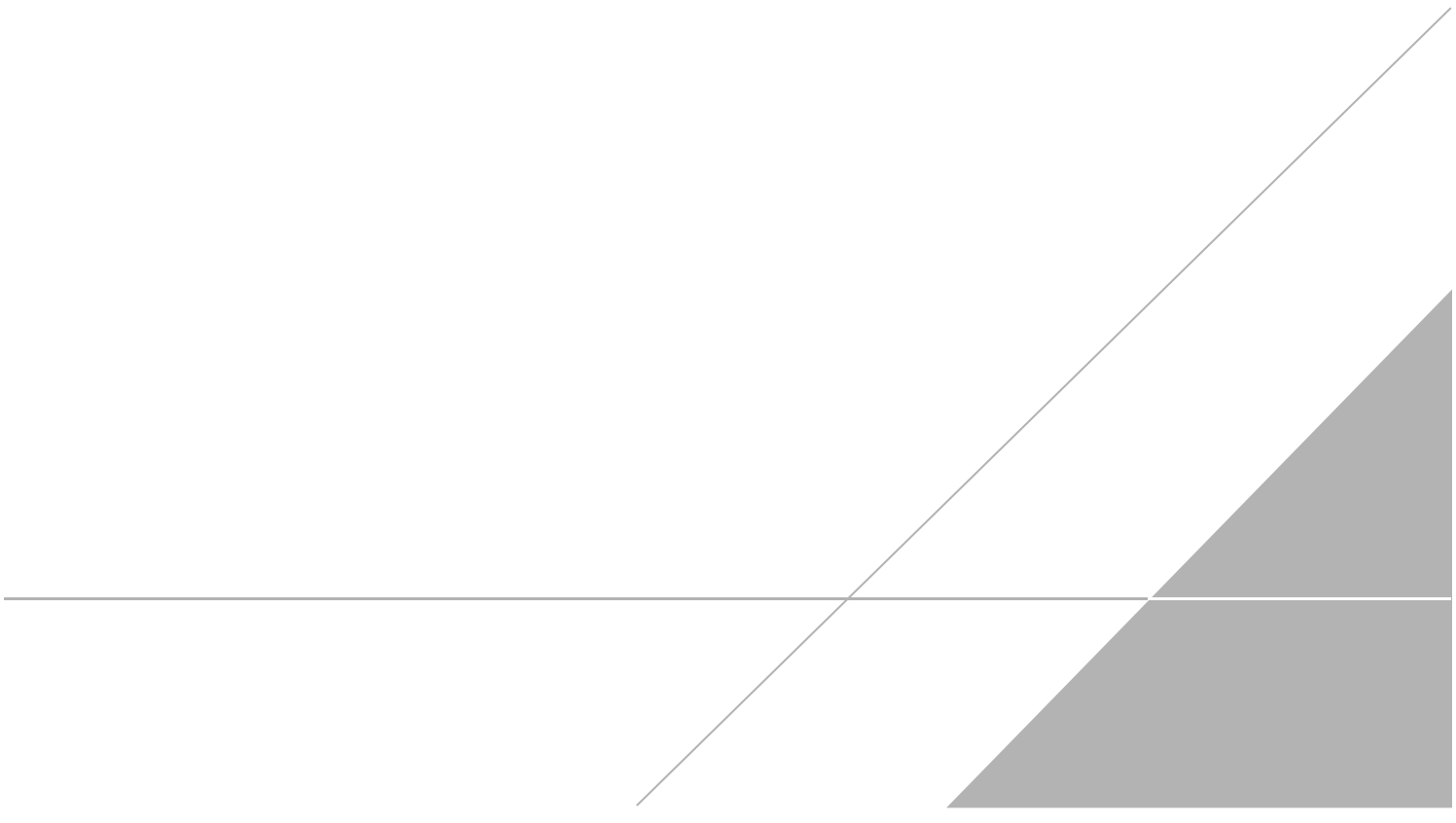
DATE: June 6, 2017

PEER REVIEW: Dennis Capria

DATE: June 7, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



W 1714518

ANALYTICAL REQUEST FORM

1714518

1. ☐ REGULAR Status

☐ RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____
DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5/19/17 Purchase Order No. LA003307.0005

3. Company Name ARCADIS

Address 132 E. WASHINGTON ST., STE 600

INDIANAPOLIS, IN 46204

Person to Contact ROB HAPPENCAMP/SARAH JONKER

Telephone (317) 231-6500

Fax Telephone (317) 231-6514

E-mail Address Robert.happencamp@arcadis.com
sarah.jonker

Billing Address (if different from above)

ACCTS PAYABLE- ARCADIS

HIGHLANDS RANCH, CO

4. Quote No. _____

ALS Project Manager PAUL POPE

5. Sample Collection

Sampling Site GRENADA MANUFACTURING

Industrial Process STAMPING

Date of Collection 5/16/17 - 5/17/17

Time Collected _____

Date of Shipment 5/19/17

Chain of Custody No. BM

6. How did you first learn about ALS?

7. REQUEST FOR ANALYSES

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
104 QK	SORBENT TUBE (RAD145)	5-16 2150	5-17 0610	RAD145	µg/m³	
105 QK	"	5-16 2155	5-17 0617	RAD 145	"	
106 QK	"	5-16 2159	5-17 0616	RAD 145	"	
107 QK	"	5-16 2159	5-17 0624	RAD 145	"	
108 QK	"	5-16 2204	5-17 0624	RAD145	"	
109 QK	"	5-16 2210	5-17 0628	RAD 145	"	
110 QK	"	5-16 2220	5-17 0631	RAD145	"	
111 QK	"	5-16 2225	5-17 0635	RAD 145	"	
~~424 JX~~	SORBENT TUBE (RAD130)	5-1 2140	5-15 2100	RAD 130	"	
425 JX	"	5-1 2155	5-15 2105	RAD 130	"	
426 JX	"	5-1 2205	5-15 2112	RAD 130	"	
427 JX	"	5-1 2240	5-15 2116	RAD 130	"	
428 JX	"	5-1 2250	5-15 2122	RAD130	"	
~~424 JX~~	"	5-1 2300	5-15 2130	RAD130	"	
430 JX	"	5-1 2320	5-15 2135	RAD 130	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. _____ (other) Please indicate one or more units in the column entitled Units**

Comments * note 104 QK - 111 QK are RAD 145

* note 424 JX - 430 JX are RAD 130

Possible Contamination and/or Chemical Hazards _____

7. Chain of Custody (Optional)

Relinquished by	Brett Matthews / ARCADIS	Date/Time	5-19-17 @ 16:00
Received by	[signature]	Date/Time	05-24-17 10.00
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

For lab use only

ANALYTICAL REQUEST FORM

1. ☐ REGULAR Status

☐ RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5/19/17 Purchase Order No. LA003307.0005

3. Company Name ARCADIS

Address 132 E. WASHINGTON ST., STE 600
INDIANAPOLIS, IN 46204

Person to Contact ROB UPPENCAMP / SARAH JONKER

Telephone (317) 231-6600

Fax Telephone (317) 231-6514

E-mail Address Robert.uppencamp@arcadis.com
sarah.jonker@...

Billing Address (if different from above)
ACCTS PAYABLE - ARCADIS
HIGHLANDS RANCH, CO

4. Quote No. _____

ALS Project Manager PAUL POPE

5. **Sample Collection**

Sampling Site GRENADA MANUFACTURING

Industrial Process STAMPING

Date of Collection 5/16/17 - 5/17/17

Time Collected _____

Date of Shipment 5/19/17

Chain of Custody No. _____

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume	ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
RADIAN 431JX	SORBENT TUBE (RAD145)	5/16 0620 - 1400	RAD 145	µg/m³	
" 432JX	"	5/16 0628 - 1408	"	"	
433JX	"	5/16 0635 - 1412	"	"	
434JX	"	5/16 0642 - 1415	"	"	
435JX	"	5/16 0648 - 1420	"	"	
436JX	"	5/16 0655 - 1426	"	"	
437JX	"	5/16 0700 - 1428	"	"	
438JX	"	5/16 1400 - 2150	"	"	
098QK	"	5/16 1408 - 2155	"	"	
099QK	"	5/16 1412 - 2159	"	"	
100QK	"	5/16 1415 - 2204	"	"	
101QK	"	5/16 1420 - 2210	"	"	
102QK	"	5/16 1426 - 2220	"	"	
103QK	"	5/16 1428 - 2226	"	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. _____ (other) Please indicate one or more units in the column entitled Units**

Comments *** RAD145 ANALYSIS ***

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Brett Matherne / ARCADIS	Date/Time	5/19/17 / 16:00
Received by	Jennifer Jessee	Date/Time	05 JA-17 10:00
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **104 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518001 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 502 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 12:30 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**29**	**2.1**	**0.65**	25	1	
Trichloroethene	**1000**	**75**	**14**	25	1	
Toluene	**570**	**38**	**10**	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	**57**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **105 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518002 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 497 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 13:09 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**29**	**2.1**	**0.65**	25	1	
Trichloroethene	ND	<1.9	<0.35	25	1	
Toluene	**270**	**18**	**4.8**	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **106 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518003 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 496 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 13:48 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.8	<0.57	25	1	

Results Continued on Next Page

ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **106 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518003 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 496 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 13:48 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Trichloroethene	**350** J	**26** J	**4.9** J	25	1	
Toluene	**440** J	**29** J	**7.8** J	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	ND UJ	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **107 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518004 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 496 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 14:27 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**27**	**2.0**	**0.62**	25	1	
Trichloroethene	**870** J	**65** J	**12** J	25	1	
Toluene	ND UJ	<1.7 UJ	<0.45 UJ	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	**56** J	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **108 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518005 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 500 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 15:07 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**26**	**1.9**	**0.60**	25	1	
Trichloroethene	ND	<1.8	<0.34	25	1	

Results Continued on Next Page

ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **108 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518005 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 500 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 15:07 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Toluene	**320**	**21**	**5.6**	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **109 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518006 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 498 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 15:46 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**26**	**1.9**	**0.58**	25	1	
Trichloroethene	**1200**	**90**	**17**	25	1	
Toluene	**290**	**19**	**5.2**	25	1	
Tetrachloroethene	ND	<2.0	<0.29	25	1	
cis-1,2-Dichloroethene	**150**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **110 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518007 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 491 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 16:25 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.8	<0.57	25	1	
Trichloroethene	ND	<1.9	<0.35	25	1	
Toluene	**220**	**15**	**3.9**	25	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **110 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518007 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 491 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 16:25 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Tetrachloroethene	ND	<2.0	<0.30	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **111 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/17/2017
Lab ID: 1714518008 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 491 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 17:04 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.8	<0.57	25	1	
Trichloroethene	ND	<1.9	<0.35	25	1	
Toluene	**530**	**36**	**9.6**	25	1	
Tetrachloroethene	ND	<2.0	<0.30	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **431 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518009 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 460 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 17:43 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.0	<0.61	25	1	
Trichloroethene	**1500**	**120**	**23**	25	1	
Toluene	**91**	**6.6**	**1.7**	25	1	
Tetrachloroethene	ND	<2.1	<0.32	25	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **431 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518009 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 460 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 17:43 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
cis-1,2-Dichloroethene	**72**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **432 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518010 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 460 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 18:22 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.0	<0.61	25	1	
Trichloroethene	**830**	**67**	**12**	25	1	
Toluene	**56**	**4.1**	**1.1**	25	1	
Tetrachloroethene	ND	<2.1	<0.32	25	1	
cis-1,2-Dichloroethene	**120**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **433 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518011 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 457 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 19:01 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.0	<0.62	25	1	
Trichloroethene	**180**	**14**	**2.7**	25	1	
Toluene	**52**	**3.8**	**1.0**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **433 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518011 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 457 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 19:01 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **434 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518012 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 453 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 19:40 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.0	<0.62	25	1	
Trichloroethene	ND	<2.0	<0.38	25	1	
Toluene	**140**	**10**	**2.8**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **435 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518013 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 452 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 20:19 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.0	<0.62	25	1	
Trichloroethene	ND	<2.0	<0.38	25	1	
Toluene	**97**	**7.1**	**1.9**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **435 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518013 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 452 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3610 (HBN: 191669) | **Percent Solid:** NA
Analyzed: 05/26/2017 20:19 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **436 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518014 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 452 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 13:31 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.0	<0.62	25	1	
Trichloroethene	ND	<2.0	<0.38	25	1	
Toluene	**190**	**14**	**3.7**	25	1	
Tetrachloroethene	ND	<2.2	<0.32	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **437 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518015 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 428 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 14:10 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<2.1	<0.66	25	1	
Trichloroethene	ND	<2.2	<0.40	25	1	
Toluene	**170**	**13**	**3.5**	25	1	
Tetrachloroethene	ND	<2.3	<0.34	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **438 JX** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518016 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 470 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 14:49 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	
Trichloroethene	**1400**	**110**	**21**	25	1	
Toluene	**100**	**7.2**	**1.9**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	**70**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **098 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518017 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 467 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 15:27 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	
Trichloroethene	**760**	**60**	**11**	25	1	
Toluene	**48**	**3.4**	**0.91**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	**130**	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **099 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518018 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 467 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 16:06 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **099 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518018 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 467 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 16:06 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Trichloroethene	**160**	**13**	**2.4**	25	1	
Toluene	**38**	**2.7**	**0.72**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **100 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518019 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 469 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 16:46 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	
Toluene	**57**	**4.0**	**1.1**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **101 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518020 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 469 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable | **Analysis:** Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 17:25 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **101 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518020 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 469 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 17:25 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Toluene	**53**	**3.8**	**1.0**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **102 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518021 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 469 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 18:04 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	
Toluene	**57**	**4.1**	**1.1**	25	1	
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Sample ID: **103 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518022 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 469 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 18:43 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	ND	<1.9	<0.60	25	1	
Trichloroethene	ND	<2.0	<0.37	25	1	
Toluene	**71**	**5.0**	**1.3**	25	1	

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ANALYTICAL REPORT
Amended-20170608

Workorder: 34-1714518
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **103 QK** | Sampling Site: Grenada Manufacturin | Collected: 05/16/2017
Lab ID: 1714518022 | Media: Radiello, Code 145 | Received: 05/24/2017
Matrix: Air | Sampling Parameter: Air Volume 469 Minutes

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable
Analysis: Radiello, Volatile Organics Air | **Instrument ID:** 5975-X
Batch: IVOA/3611 (HBN: 191710) | **Percent Solid:** NA
Analyzed: 05/30/2017 18:43 | **Report Basis:** Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Tetrachloroethene	ND	<2.1	<0.31	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Comments

Workorder: 1714518

EPA TO-17 Mod.: All results are semi-quantitative.

Report amended to correct sampling dates per client request. No data was changed.

Quality Control: Radiello, Volatile Organics - (HBN: 191669)

QC limits are advisory for this mehod and data presented as client informaion only.

Quality Control: Radiello, Volatile Organics - (HBN: 191710)

QC limits are advisory for this method and data presented as client information only.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Radiello, Volatile Organics	/S/ Lisa M. Reid 05/31/2017 16:16	/S/ Jorden Baum 06/01/2017 10:47

Laboratory Contact Information

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ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

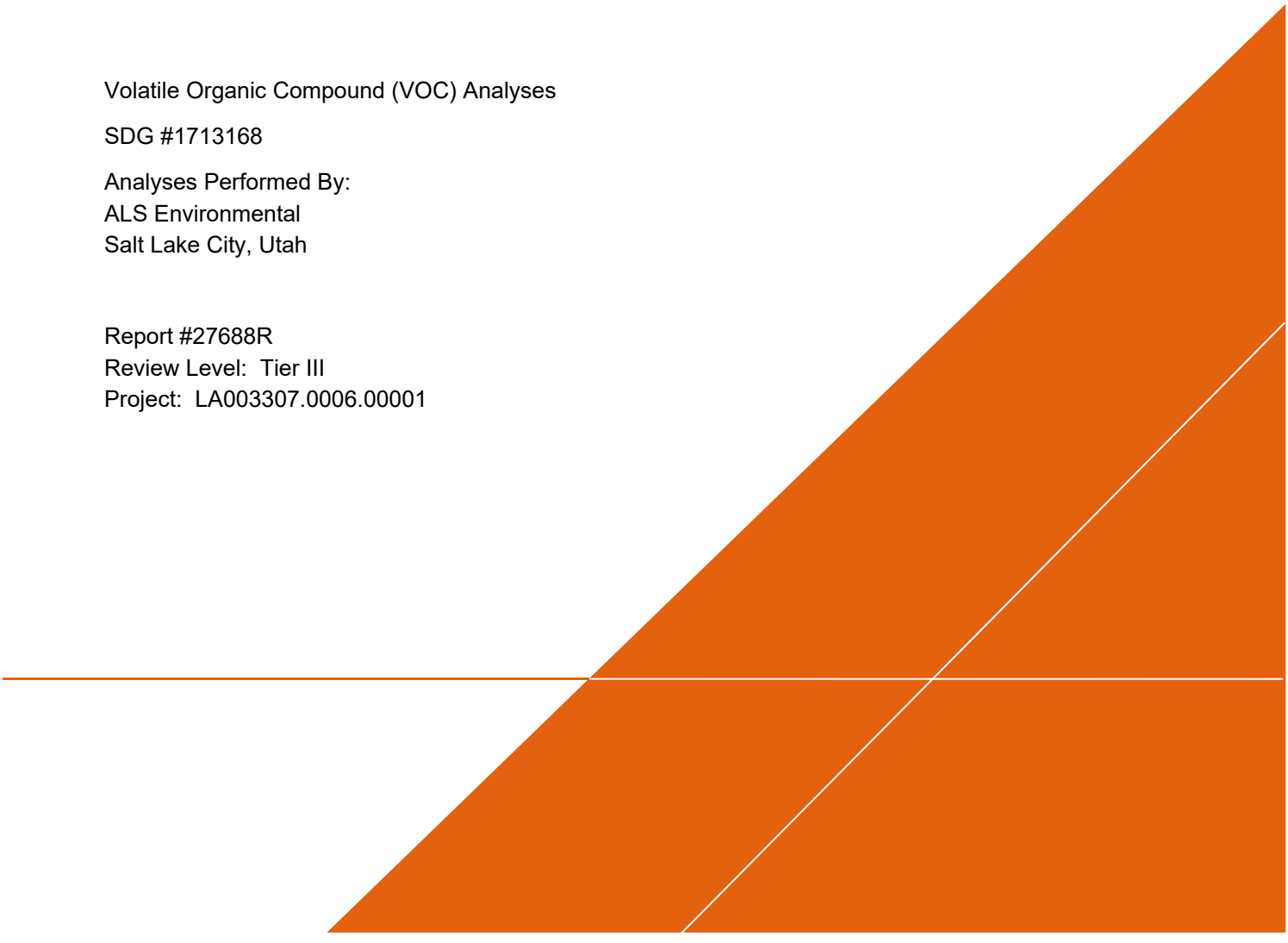
Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1713168

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27688R
Review Level: Tier III
Project: LA003307.0006.00001



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1713168 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
096 QK	1713168001	Air	5/1/2017		X			
093 QK	1713168002	Air	5/1/2017		X			
088 QK	1713168003	Air	5/1/2017		X			
089 QK	1713168004	Air	5/1/2017	088 QK	X			
091 QK	1713168005	Air	5/1/2017		X			
092 QK	1713168006	Air	5/1/2017		X			
094 QK	1713168007	Air	5/1/2017	092 QK	X			
090 QK	1713168008	Air	5/1/2017		X			
095 QK	1713168009	Air	5/1/2017		X			
097 QK	1713168010	Air	5/1/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using Radiello cartidges and analysis was performed using the Solvent Panel Scan method. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Solvent Panel Scan (SOP: IH-AN-Solvent Panel)	Air	60 days from collection to analysis	Cool to <6ºC

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

<table>
<tr><th>Sample Locations</th><th>Compound</th><th>LCS Recovery</th><th>LCSD Recovery</th></tr>
<tr><td rowspan="4">096 QK
093 QK
088 QK
089 QK
091 QK
092 QK
094 QK
090 QK
095 QK
097 QK</td><td>Toluene</td><td rowspan="4">> UL</td><td rowspan="3">> UL</td></tr>
<tr><td>1,1,2-Trichloroethane</td></tr>
<tr><td>Tetrachloroethene</td></tr>
<tr><td>cis-1,2-Dichloroethene</td><td>AC</td></tr>
</table>

Note:

AC Acceptable

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J

Control Limit	Sample Result	Qualification
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
096 QK 093 QK 088 QK 089 QK 091 QK 092 QK 094 QK 090 QK 095 QK 097 QK	Toluene

The criteria used to evaluate the RPD between the LCS/LCSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent

sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (mg/m^3)	Duplicate Result (mg/m^3)	RPD
088 QK / 089 QK	Trichloroethene	0.046	0.045	2.2%
	Toluene	0.0051	0.0049	AC
	cis-1,2-Dichloroethene	0.0055	0.0053	
092 QK / 094 QK	Trichloroethene	0.029	0.022	27.5%
	Toluene	0.0039	0.0037	AC

Note:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: Solvent Panel Scan	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X	X		
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

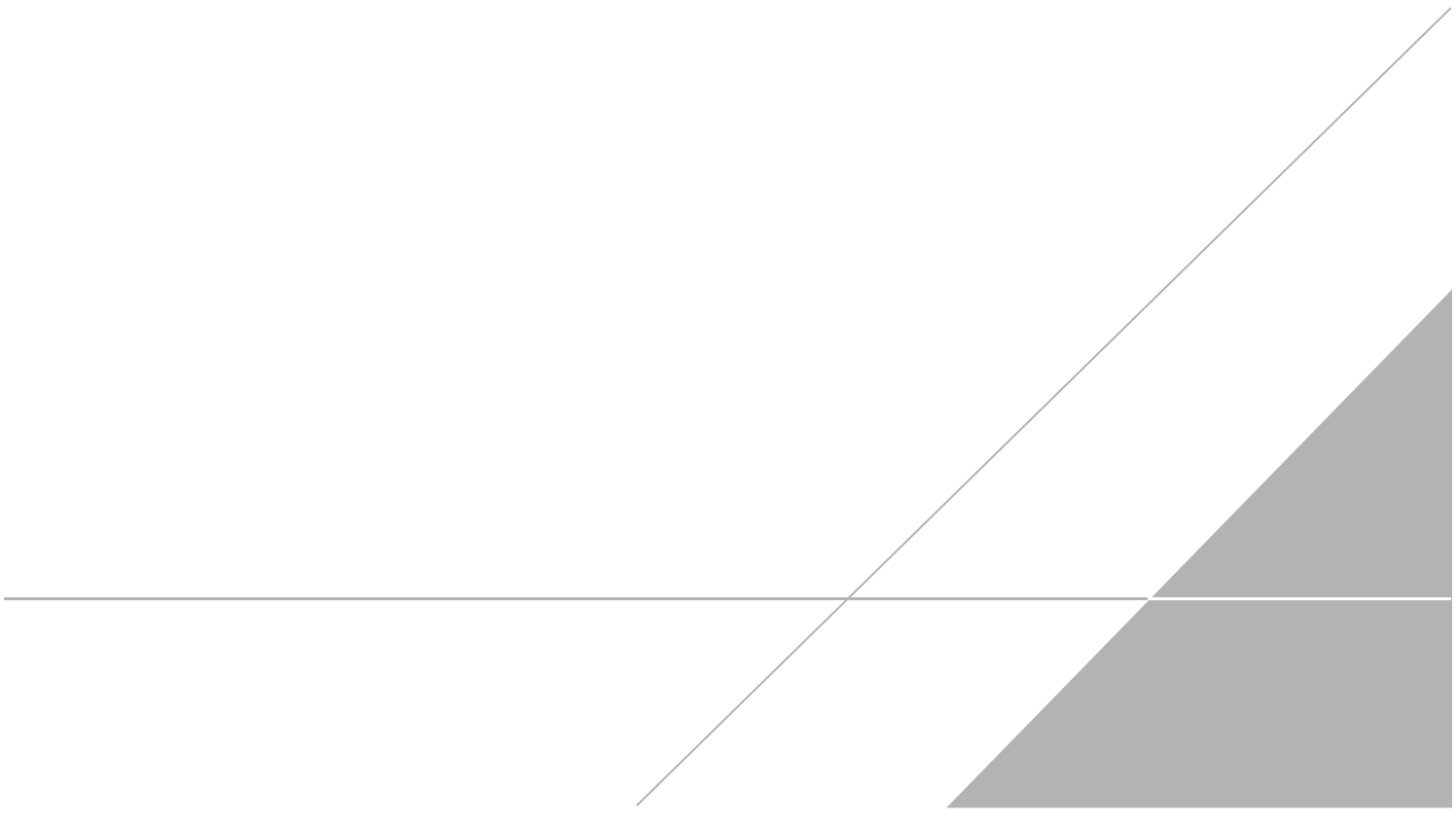
DATE: May 22, 2017

PEER REVIEW: Dennis Capria

DATE: May 23, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



ANALYTICAL REQUEST FORM

1713168

1. ☐ REGULAR Status

☐ RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____
DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5-10-17 Purchase Order No. LA003307.0005 4. Quote No. _____

3. Company Name ARCADIS ALS Project Manager PAUL POPE

Address 132 E. WASHINGTON 5. **Sample Collection**

INDIANAPOLIS, IN 46204 Sampling Site GRENADA MANUFACTURING

Person to Contact ROBERT UPPENCAMP/SARAH JONKER Industrial Process STAMPING

Telephone (317) 231-6500 Date of Collection ~~5-8~~

Fax Telephone (317) 231-6514 Time Collected _____

E-mail Address robert.uppencamp @ arcadis.com Date of Shipment 5/10/17
~~sarah.jonker~~

Billing Address (if different from above) Chain of Custody No. _____

ACCTS - PAYABLE - ARCADIS 6. How did you first learn about ALS?

HIGHLANDS RANCH, CO

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
096QK	SORBENT TUBE RAD 130	5-1-17 2130	5-8-17 2148	RAD 130	µg/m³	
093QK	"	5-1-17 2140	5-8-17 2152		"	
088QK	"	5-1-17 2155	5-8-17 2200		"	
089QK	"	~~5-1-17~~ 2155	5-8-17 2200		"	
091QK	"	5-1-17 2205	5-8-17 2215		"	
092QK	"	5-1-17 2215	5-8-17 2220		"	
094QK	"	5-1-17 2215	5-8-17 2220		"	
090QK	"	5-1-17 2230	5-8-17 ~~2232~~ 2232		"	
095QK	"	5-1-17 2240	5-8-17 2248		"	
097QK	"	5-1-17 2250	5-8-17 2258		"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. ____ (other) Please indicate one or more units in the column entitled Units**

Comments ### RAD 130 Analysis!

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Brett Matheme / ARCADIS	Date/Time	5/10/17 1420
Received by	Laura Jessee	Date/Time	05/11/17 10:00
Relinquished by		Date/Time	
Received by		Date/Time	

ANALYTICAL REPORT

Report Date: May 18, 2017

Sarah Jonker
Arcadis
132 E Washington St.
Suite 600
Indianapolis, IN 46204

Phone: (317) 231-6500

E-mail: Sarah.Jonker@arcadis.com

Workorder: **34-1713168**
Client Project ID: Grenada Manufacturing
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **096 QK** Collected: 05/01/2017
Lab ID: 1713168001 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10098 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00077	2.0
Trichloroethene	**14**	**0.020**	**0.0037**	2.0
Toluene	**3.3** J	**0.0044** J	**0.0012** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00060	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00049	2.0
cis-1,2-Dichloroethene	**2.5** J	**0.0034** J	**0.00085** J	2.0

Sample ID: **093 QK** Collected: 05/01/2017
Lab ID: 1713168002 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10092 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**28**	**0.040**	**0.0074**	2.0
Toluene	**2.4** J	**0.0033** J	**0.00087** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	**14** J	**0.019** J	**0.0048** J	2.0

ANALYTICAL REPORT

Workorder: **34-1713168**
Client Project ID: Grenada Manufacturing
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **088 QK** Collected: 05/01/2017
Lab ID: 1713168003 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10085 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**32**	**0.046**	**0.0085**	2.0
Toluene	**3.8** J	**0.0051** J	**0.0014** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	**4.1** J	**0.0055** J	**0.0014** J	2.0

Sample ID: **089 QK** Collected: 05/01/2017
Lab ID: 1713168004 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10085 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**31**	**0.045**	**0.0084**	2.0
Toluene	**3.7** J	**0.0049** J	**0.0013** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	**4.0** J	**0.0053** J	**0.0013** J	2.0

Sample ID: **091 QK** Collected: 05/01/2017
Lab ID: 1713168005 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10090 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**52**	**0.075**	**0.014**	8.0
Toluene	**3.9** J	**0.0052** J	**0.0014** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	**8.5** J	**0.011** J	**0.0028** J	2.0

ANALYTICAL REPORT

Workorder: **34-1713168**
Client Project ID: Grenada Manufacturing
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **092 QK** Collected: 05/01/2017
Lab ID: 1713168006 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10085 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**20**	**0.029**	**0.0054**	2.0
Toluene	**2.9** J	**0.0039** J	**0.0010** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	<2.0	<0.0027	<0.00067	2.0

Sample ID: **094 QK** Collected: 05/01/2017
Lab ID: 1713168007 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10087 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**15**	**0.022**	**0.0041**	2.0
Toluene	**2.7** J	**0.0037** J	**0.00097** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	<2.0	<0.0027	<0.00067	2.0

Sample ID: **090 QK** Collected: 05/01/2017
Lab ID: 1713168008 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: Exposure 10080 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	**10**	**0.014**	**0.0027**	2.0
Toluene	<2.0 UJ	<0.0027 UJ	<0.00071 UJ	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	<2.0	<0.0027	<0.00067	2.0

ANALYTICAL REPORT

Workorder: **34-1713168**
Client Project ID: Grenada Manufacturing
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **095 QK** Collected: 05/01/2017
Lab ID: 1713168009 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: **Exposure 10088 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	<2.0	<0.0029	<0.00053	2.0
Toluene	<2.0 UJ	<0.0027 UJ	<0.00071 UJ	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	<2.0	<0.0027	<0.00067	2.0

Sample ID: **097 QK** Collected: 05/01/2017
Lab ID: 1713168010 Sampling Location: Grenada Manufacturin Received: 05/11/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/15/2017 (190665)
Sampling Info: **Exposure 10088 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0026	<0.00064	2.0
Benzene	<2.0	<0.0025	<0.00078	2.0
Trichloroethene	<2.0	<0.0029	<0.00053	2.0
Toluene	<2.0 UJ	<0.0027 UJ	<0.00071 UJ	2.0
1,1,2-Trichloroethane	<2.0	<0.0033	<0.00061	2.0
Tetrachloroethene	<2.0	<0.0034	<0.00050	2.0
cis-1,2-Dichloroethene	<2.0	<0.0027	<0.00067	2.0

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Solvent Panel Scan	/S/ David Teynor 05/18/2017 12:03	/S/ Jessica Helland 05/18/2017 14:55

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

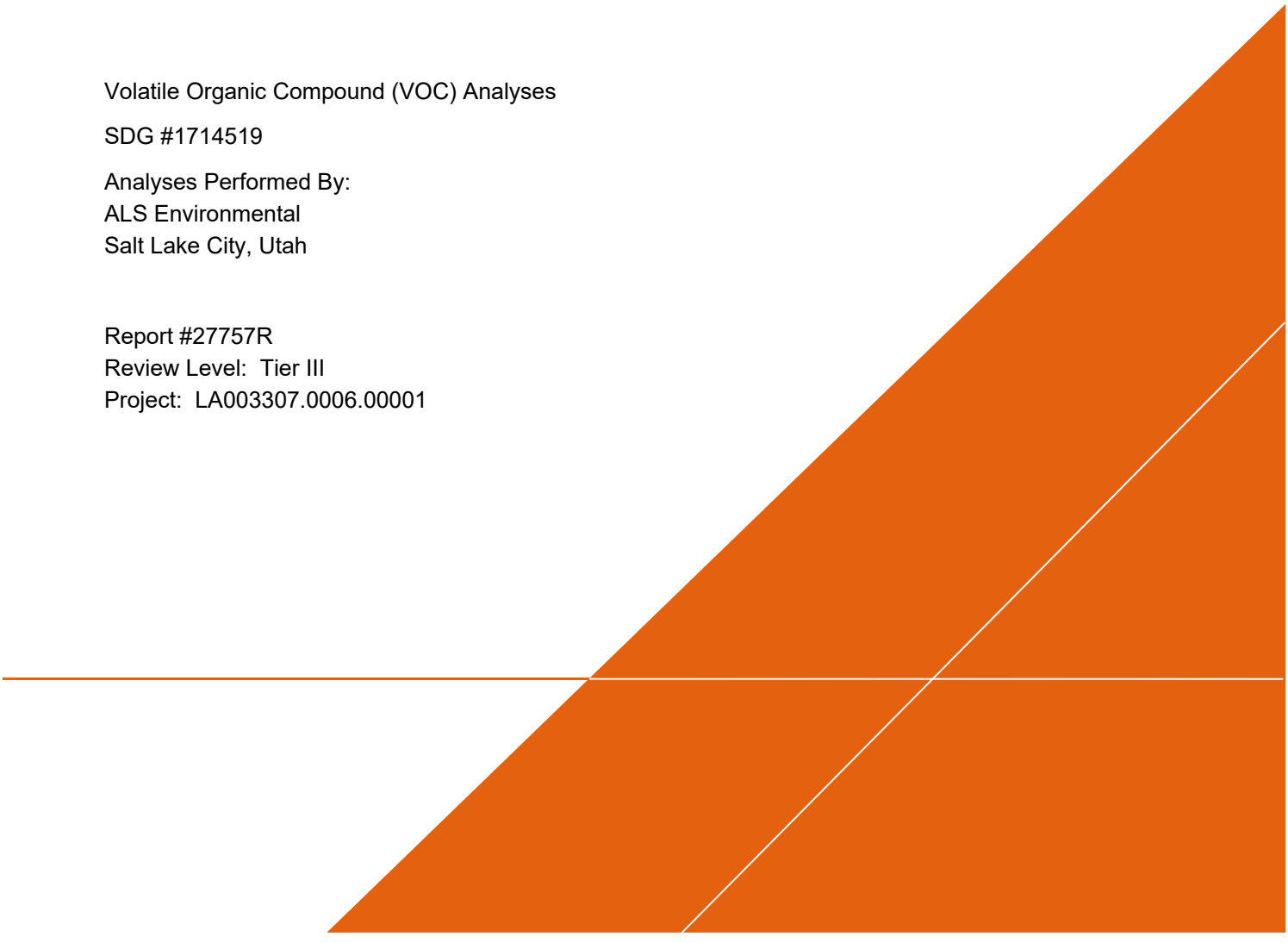
Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1714519

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27757R
Review Level: Tier III
Project: LA003307.0006.00001



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1714519 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
424 JX	1714519001	Air	5/15/2017		X			
425 JX	1714519002	Air	5/15/2017		X			
426 JX	1714519003	Air	5/15/2017		X			
427 JX	1714519004	Air	5/15/2017		X			
428 JX	1714519005	Air	5/15/2017		X			
429 JX	1714519006	Air	5/15/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using Radiello cartidges and analysis was performed using the Solvent Panel Scan method. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Solvent Panel Scan (SOP: IH-AN-Solvent Panel)	Air	60 days from collection to analysis	Cool to <6ºC

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
424 JX 425 JX 426 JX 427 JX 428 JX	Benzene	> UL	> UL
	Toluene		
	1,1,2-Trichloroethane		
	cis-1,2-Dichloroethene		
429 JX	Tetrachloroethene	AC	

Note:

AC Acceptable

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

A field duplicate sample was not collected in association with this SDG.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: Solvent Panel Scan	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)					X
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

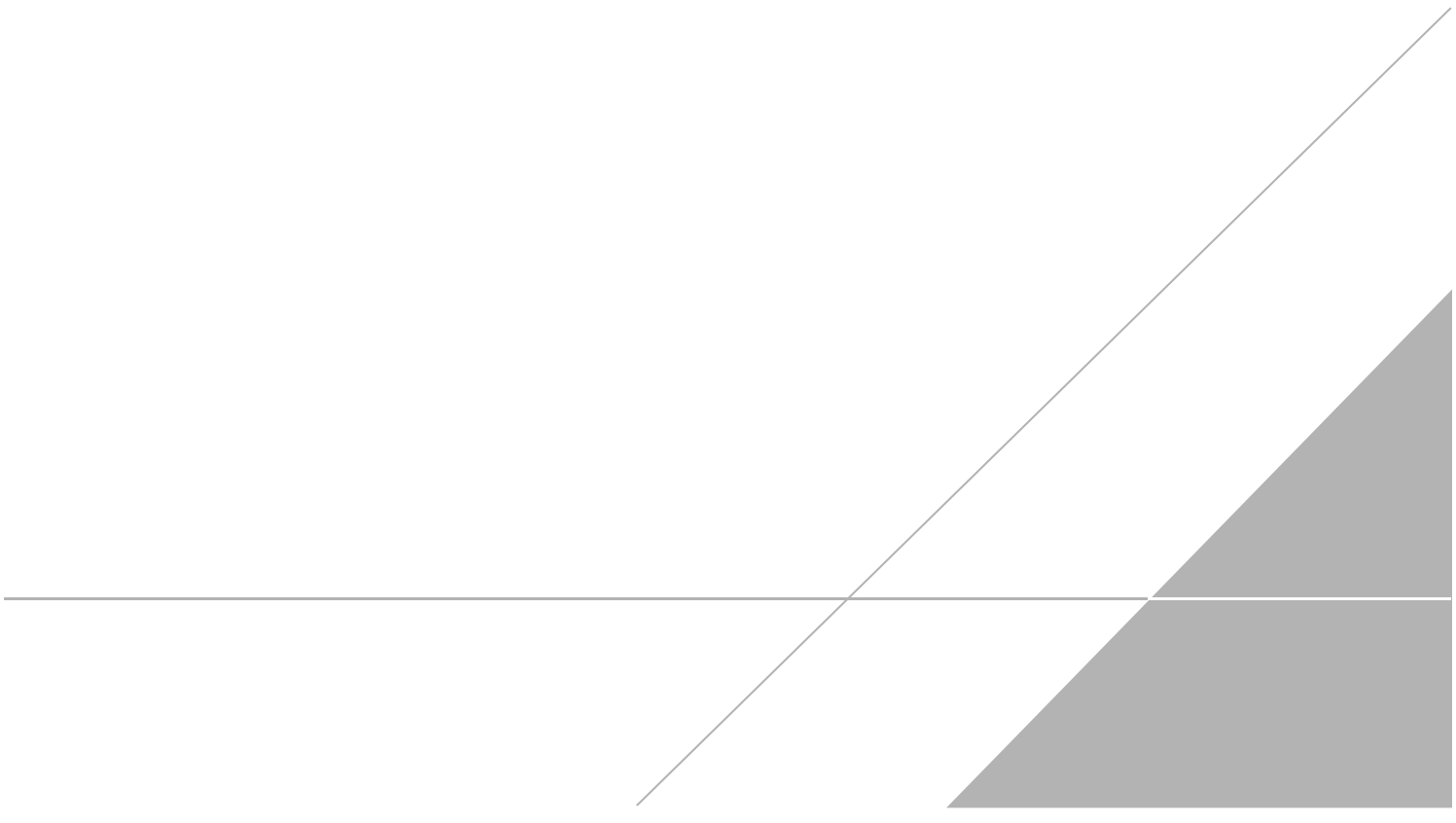
DATE: June 6, 2017

PEER REVIEW: Dennis Capria

DATE: June 7, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



W 1714519

ANALYTICAL REQUEST FORM

1714519

1. ☐ REGULAR Status

☐ RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5/19/17 Purchase Order No. LA003307.0005

3. Company Name ARCADIS

Address 132 E. WASHINGTON ST., STE 600
INDIANAPOLIS, IN 46204

Person to Contact ROB UPPENCAMP/SARAH JONKER

Telephone (317) 231-6500

Fax Telephone (317) 231-6514

E-mail Address Robert.uppencamp@arcadis.com
sarah.jonker

Billing Address (if different from above)
ACCTS PAYABLE- ARCADIS
HIGHLANDS RANCH, CO

4. Quote No. _____

ALS Project Manager PAUL POPE

5. **Sample Collection**

Sampling Site GRENADA MANUFACTURING

Industrial Process STAMPING

Date of Collection 5/16/17 - 5/17/17

Time Collected _____

Date of Shipment 5/19/17

Chain of Custody No. NA

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
104 QK	SORBENT TUBE (RAD145)	5-16 2150	5-17 0610	RAD145	µg/m³	
105 QK	"	5-16 2155	5-17 0612	RAD 145	"	
106 QK	"	5-16 2159	5-17 0616	RAD 145	"	
107 QK	"	5-16 2159	5-17 0624	RAD 145	"	
108 QK	"	5-16 2204	5-17 0624	RAD 145	"	
109 QK	"	5-16 2210	5-17 0628	RAD 145	"	
110 QK	"	5-16 2220	5-17 0631	RAD 145	"	
111 QK	"	5-16 2225	5-17 0635	RAD 145	"	
424 JX	SORBENT TUBE (RAD130)	5-1 2140	5-15 2100	RAD 130	"	
425 JX	"	5-1 2155	5-15 2105	RAD 130	"	
426 JX	"	5-1 2205	5-15 2112	RAD 130	"	
427 JX	"	5-1 2240	5-15 2116	RAD 130	"	
428 JX	"	5-1 2250	5-15 2122	RAD130	"	
429 JX	"	5-1 2300	5-15 2130	RAD 130	"	
430 JX	"	5-1 2320	5-15 2135	RAD 130	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. _____ (other) Please indicate one or more units in the column entitled Units**

Comments * note 104 QK - 111 QK are RAD 145

* note 424 JX - 430 JX are RAD 130

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Brett Matheme / ARCADIS	Date/Time	5-19-17 @ 16:00
Received by	[signature]	Date/Time	05-24-17 10.00
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

ANALYTICAL REPORT
Amended-20170607

Report Date: June 07, 2017

Sarah Jonker
Arcadis
132 E Washington St.
Suite 600
Indianapolis, IN 46204

Phone: (317) 231-6500

E-mail: Sarah.Jonker@arcadis.com

Workorder: **34-1714519**
Client Project ID: Grenada Manufacturing 051617
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **424 JX** Collected: 05/15/2017
Lab ID: 1714519001 Sampling Location: Grenada Manufacturin Received: 05/24/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/31/2017 (191686)
Sampling Info: Exposure 20120 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0013	<0.00032	2.0
Benzene	<2.0	<0.0012	<0.00039	2.0
Trichloroethene	**43**	**0.0012**	**0.00039**	4.0
Toluene	**5.4** J	**0.0036** J	**0.00097** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0017	<0.00030	2.0
Tetrachloroethene	<2.0	<0.0017	<0.00025	2.0
cis-1,2-Dichloroethene	**20** J	**0.013** J	**0.0034** J	2.0

Sample ID: **425 JX** Collected: 05/15/2017
Lab ID: 1714519002 Sampling Location: Grenada Manufacturin Received: 05/24/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/31/2017 (191686)
Sampling Info: Exposure 20110 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0013	<0.00032	2.0
Benzene	<2.0	<0.0012	<0.00039	2.0
Trichloroethene	**59**	**0.0012**	**0.00039**	8.0
Toluene	**7.7** J	**0.0052** J	**0.0014** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0017	<0.00030	2.0
Tetrachloroethene	<2.0	<0.0017	<0.00025	2.0
cis-1,2-Dichloroethene	**9.0** J	**0.0060** J	**0.0015** J	2.0

ANALYTICAL REPORT

Amended-20170607

Workorder: **34-1714519**
Client Project ID: Grenada Manufacturing 051617
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **426 JX** Collected: 05/15/2017
Lab ID: 1714519003 Sampling Location: Grenada Manufacturin Received: 05/24/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/31/2017 (191686)
Sampling Info: Exposure 20107 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0013	<0.00032	2.0
Benzene	<2.0	<0.0012	<0.00039	2.0
Trichloroethene	**63**	**0.0012**	**0.00039**	8.0
Toluene	**5.8** J	**0.0039** J	**0.0010** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0017	<0.00030	2.0
Tetrachloroethene	<2.0	<0.0017	<0.00025	2.0
cis-1,2-Dichloroethene	**9.0** J	**0.0060** J	**0.0015** J	2.0

Sample ID: **427 JX** Collected: 05/15/2017
Lab ID: 1714519004 Sampling Location: Grenada Manufacturin Received: 05/24/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/31/2017 (191686)
Sampling Info: Exposure 20076 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0013	<0.00032	2.0
Benzene	<2.0	<0.0012	<0.00039	2.0
Trichloroethene	<2.0	<0.0014	<0.00027	2.0
Toluene	<2.0	<0.0013	<0.00036	2.0
1,1,2-Trichloroethane	<2.0	<0.0017	<0.00030	2.0
Tetrachloroethene	<2.0	<0.0017	<0.00025	2.0
cis-1,2-Dichloroethene	<2.0	<0.0013	<0.00034	2.0

Sample ID: **428 JX** Collected: 05/15/2017
Lab ID: 1714519005 Sampling Location: Grenada Manufacturin Received: 05/24/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 05/31/2017 (191686)
Sampling Info: Exposure 20076 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0013	<0.00032	2.0
Benzene	<2.0	<0.0012	<0.00039	2.0
Trichloroethene	<2.0	<0.0014	<0.00027	2.0
Toluene	**2.5** J	**0.0017** J	**0.00045** J	2.0
1,1,2-Trichloroethane	<2.0	<0.0017	<0.00030	2.0
Tetrachloroethene	<2.0	<0.0017	<0.00025	2.0
cis-1,2-Dichloroethene	<2.0	<0.0013	<0.00034	2.0

ANALYTICAL REPORT

Amended-20170607

Workorder: **34-1714519**
Client Project ID: Grenada Manufacturing 051617
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **429 JX** Collected: 05/15/2017
Lab ID: 1714519006 Sampling Location: Grenada Manufacturin Received: 05/24/2017

Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 05/31/2017 (191686)
Sampling Info: **Exposure 20070 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.0013	<0.00032	2.0
Benzene	<2.0	<0.0012	<0.00039	2.0
Trichloroethene	<2.0	<0.0014	<0.00027	2.0
Toluene	<2.0	<0.0013	<0.00036	2.0
1,1,2-Trichloroethane	<2.0	<0.0017	<0.00030	2.0
Tetrachloroethene	<2.0	<0.0017	<0.00025	2.0
cis-1,2-Dichloroethene	<2.0	<0.0013	<0.00034	2.0

Comments

Workorder: **1714519**

Report Amended to correct sampling dates per client request. No data was changed.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Solvent Panel Scan	/S/ David Teynor 06/01/2017 09:57	/S/ Thomas J. Masoian 06/01/2017 11:15

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1715149

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27768R
Review Level: Tier III
Project: LA003307.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1715149 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
430 JX	1715149001	Air	5/15/2017		X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using sorbent tubes and analysis was performed using EPA Method TO-17. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

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1. Holding Times

The specified holding times for the following methods are presented in the following table.

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All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

A field duplicate sample was not collected in association with this SDG.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis ($\mu g/m^3$)	Diluted Analysis ($\mu g/m^3$)	Reported Analysis ($\mu g/m^3$)
430 JX	Toluene	6.9 E	--	6.9 EJ

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: EPA Method TO-17	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)					X
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

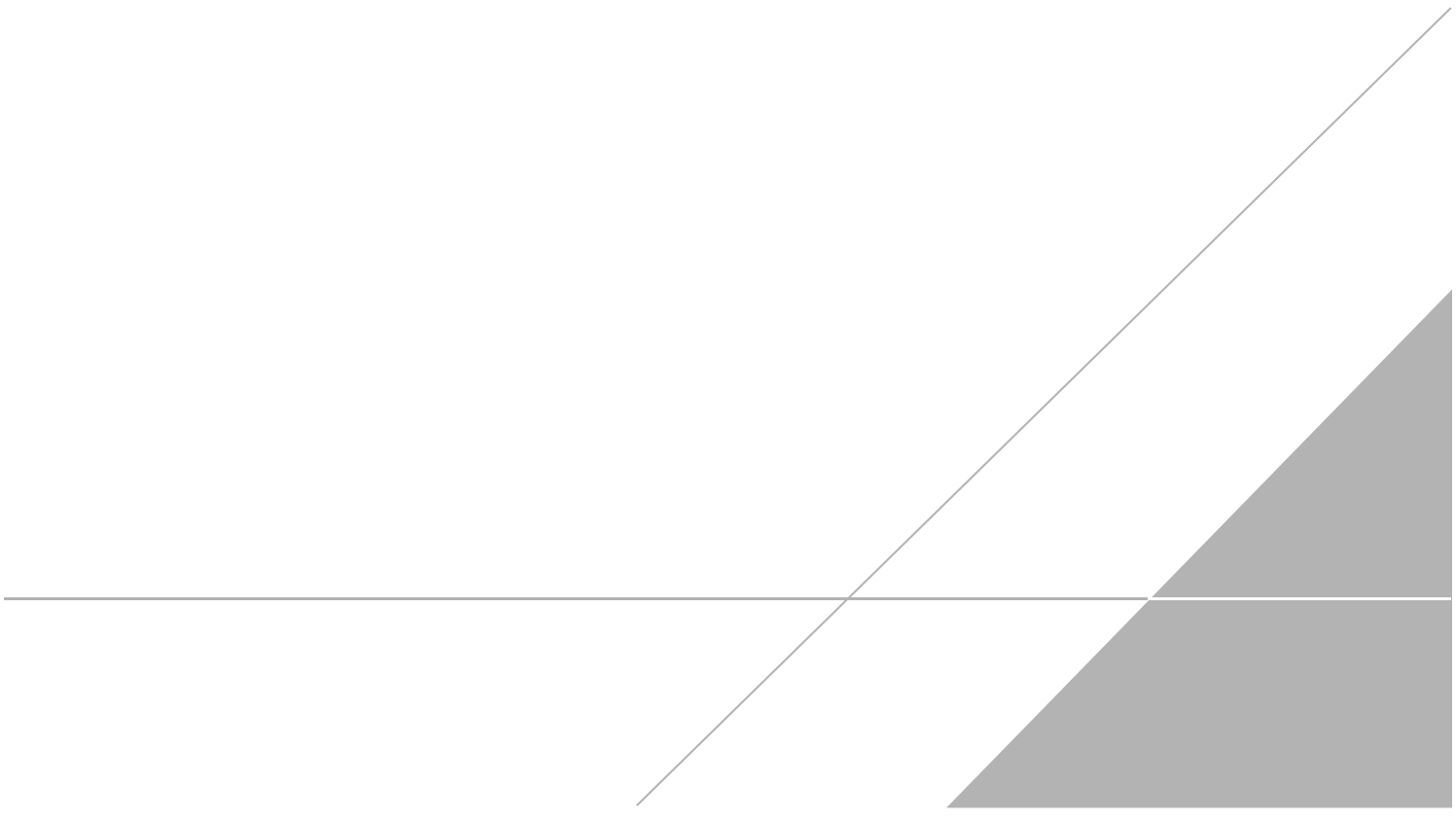
DATE: June 7, 2017

PEER REVIEW: Dennis Capria

DATE: June 7, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



18042/1

1715148 INT 05-31-17
1714579
1715149

W 1715149

ANALYTICAL REQUEST FORM

1. ☐ **REGULAR Status**

☐ **RUSH Status Requested - ADDITIONAL CHARGE**
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5/19/17 Purchase Order No. LA003307.0005

3. Company Name ARCADIS
Address 132 E. WASHINGTON ST., STE 600
INDIANAPOLIS, IN 46204
Person to Contact ROB UPPENCAMP/SARAH JONKER
Telephone (317) 231-6500
Fax Telephone (317) 231-6514
E-mail Address Robert.uppencamp@arcadis.com
sarah.jonker
Billing Address (if different from above)
ACCTS PAYABLE- ARCADIS
HIGHLANDS RANCH, CO

4. Quote No. _____
ALS Project Manager PAUL POPE

5. **Sample Collection**
Sampling Site GRENADA MANUFACTURING
Industrial Process STAMPING
Date of Collection 5/16/17 - 5/17/17
Time Collected _____
Date of Shipment 5/19/17
Chain of Custody No. WM

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume		ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
104 QK	SORBENT TUBE (RAD145)	5-16 2150	5-17 0610	RAD145	µg/m3	
105 QK	"	5-16 2155	5-17 0617	RAD 145	"	
106 QK	"	5-16 2159	5-17 0616	RAD 145	"	
107 QK	"	5-16 2159	5-17 0626	RAD 145	"	
108 QK	"	5-16 2204	5-17 0624	RAD 145	"	
109 QK	"	5-16 2210	5-17 0628	RAD 145	"	
110 QK	"	5-16 2220	5-17 0631	RAD 145	"	
111 QK	"	5-16 2225	5-17 0635	RAD 145	"	
424 JX	SORBENT TUBE (RAD130)	5-1 2140	5-15 2100	RAD 130	"	
425 JX	"	5-1 2155	5-15 2105	RAD 130	"	
426 JX	"	5-1 2205	5-15 2112	RAD 130	"	
427 JX	"	5-1 2240	5-15 2116	RAD 130	"	
428 JX	"	5-1 2250	5-15 2122	RAD130	"	
429 JX	"	5-1 2300	5-15 2130	RAD130	"	
430 JX	"	5-1 2320	5-15 2135	RAD 130 → 145	"	

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m^3 3. ppm 4. % 5. µg/m^3 6. ____ (other) Please indicate one or more units in the column entitled Units**

Comments * note 104 QK - 111 QK are RAD 145 per Paul Pope 05-31-17 FM

* note 424 JX - 430 JX are RAD 130

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Brett Matherne / ARCADIS	Date/Time	5-19-17 @ 16:00
Received by	Jennifer Jessell	Date/Time	05-24-17 10:00
Relinquished by		Date/Time	
Received by		Date/Time	

ANALYTICAL REPORT
Amended-20170607

Workorder: 34-1715149
Client: Arcadis, Inc.
Project Manager: Paul E. Pope

Analytical Results

Sample ID: **430 JX**
Lab ID: 1715149001
Matrix: Air

Sampling Site: Grenada Manufacturin
Media: Radiello, Code 145
Sampling Parameter: Air Volume 20055 Minutes

Collected: 05/15/2017
Received: 05/31/2017

Analysis Method - Radiello, Volatile Organics

Preparation: Not Applicable

Analysis: Radiello, Volatile Organics Air
Batch: IVOA/3614 (HBN: 191841)
Analyzed: 06/01/2017 14:12

Instrument ID: 5975-X
Percent Solid: NA
Report Basis: Wet

Analyte	Result (ng/sample)	Result (ug/m³)	Result (ppb)	RL (ng/sample)	Dilution	Qual
Benzene	**160**	**0.28**	**0.087**	25	1	
Trichloroethene	**95**	**0.17**	**0.032**	25	1	
Toluene	**4200**	**6.9**	**1.8**	25	1	E J
Tetrachloroethene	**52**	**0.10**	**0.015**	25	1	
cis-1,2-Dichloroethene	ND	NA	NA	NA	1	
1,2-Dichloroethane	ND	NA	NA	NA	1	
1,1,2-Trichloroethane	ND	NA	NA	NA	1	

Comments

Workorder: 1715149

Compound flagged with an "E" qualifier had peak saturation.

EPA TO-17 Mod.: All results are semi-quantitative.

Report amended to correct sampling date per client request. No data was changed.

Quality Control: Radiello, Volatile Organics - (HBN: 191841)

QC limits are advisory for this method and data presented as client information only.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Radiello, Volatile Organics	/S/ Lisa M. Reid 06/02/2017 13:37	/S/ Jorden Baum 06/02/2017 14:44

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ARCADIS Design & Consultancy for natural and built assets

Grenada Manufacturing

DATA REVIEW

Grenada, Mississippi

Volatile Organic Compound (VOC) Analyses

SDG #1715286

Analyses Performed By:
ALS Environmental
Salt Lake City, Utah

Report #27784R
Review Level: Tier III
Project: LA003307.0006.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #1715286 for samples collected in association with the Grenada Manufacturing site, located in Grenada, Mississippi. The review was conducted as a Tier III evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis			
					VOC	SVOC	MET	MISC
R-A-5	1715286001	Air	5/30/2017		X			
R-B-3	1715286002	Air	5/30/2017		X			
Amb-R-S	1715286003	Air	5/30/2017		X			
Amb-R-N	1715286004	Air	5/30/2017		X			
Amb-R-W	1715286005	Air	5/30/2017		X			
Amb-R-E	1715286006	Air	5/30/2017		X			
DUP-5	1715286007	Air	5/30/2017	R-B-3	X			

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Samples were collected using Radiello cartidges and analysis was performed using the Solvent Panel Scan method. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSIS

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Solvent Panel Scan (SOP: IH-AN-Solvent Panel)	Air	60 days from collection to analysis	Cool to <6ºC

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts are ± 40% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
R-A-5 R-B-3	1,2-Dichloroethane	AC	> UL
	Tetrachloroethene		
Amb-R-S Amb-R-N Amb-R-W Amb-R-E DUP-5	Benzene	> UL	> UL
	Toluene		
	1,1,2-Trichloroethane		
	cis-1,2-Dichloroethene		

Note:

AC Acceptable

The criteria used to evaluate the LCS/LCSD recoveries are presented in the following table. In the case of an LCS/LCSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R

Control Limit	Sample Result	Qualification
	Detect	J

7. Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 25% for air matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for air matrices.

Laboratory duplicate analysis was not performed using a sample from this SDG.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for air matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (mg/m^3)	Duplicate Result (mg/m^3)	RPD
R-B-3/ DUP-5	Trichloroethene	0.013	0.020	42.4%
	Toluene	0.0033	0.0035	5.9%
	cis-1,2-Dichlororethene	0.0014	0.0016	13.3%

The calculated RPDs between the parent sample and field duplicate were acceptable.

9. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: Solvent Panel Scan	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE: 

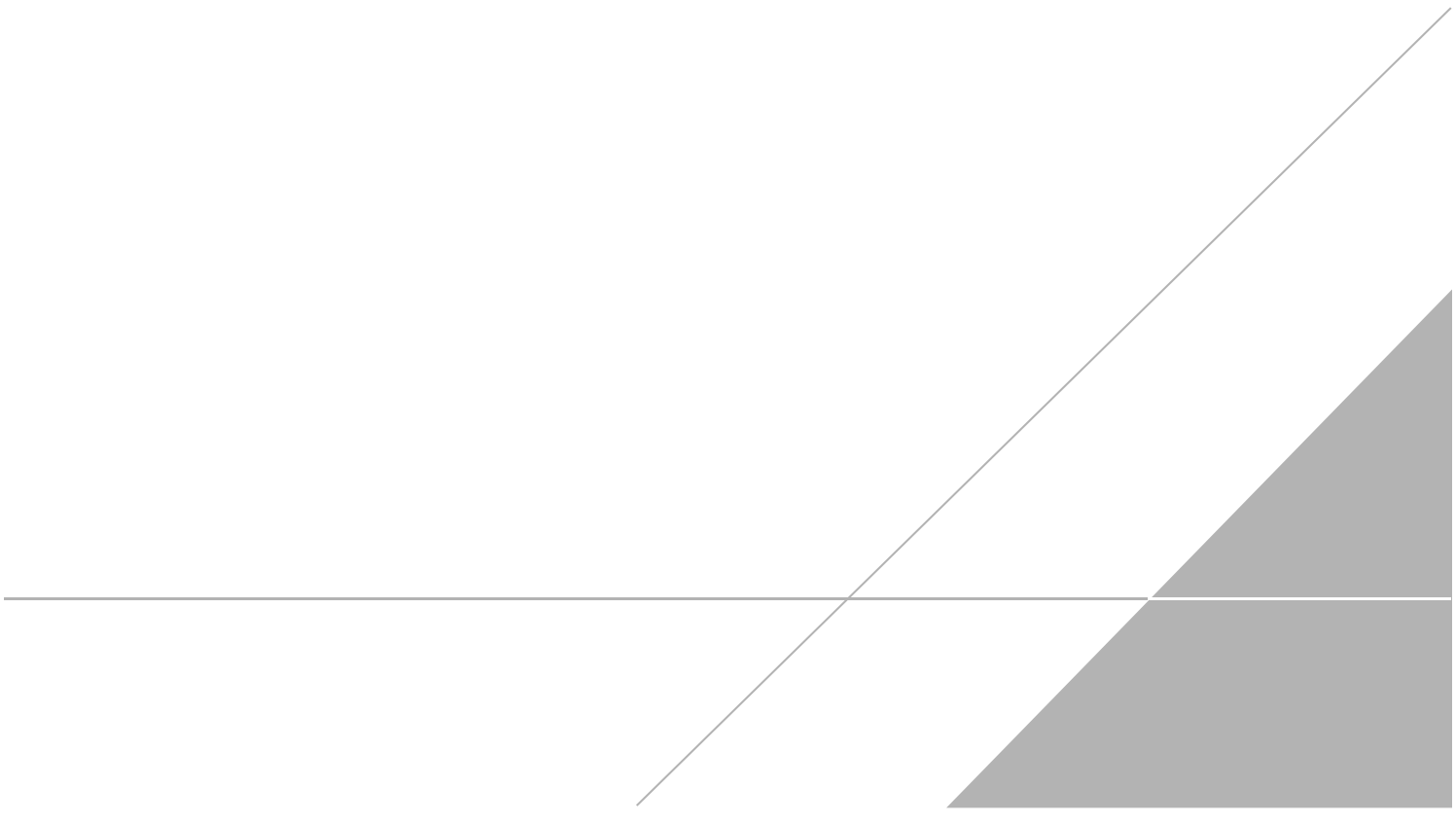
DATE: June 9, 2017

PEER REVIEW: Dennis Capria

DATE: June 14, 2017

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



W 1715286

ANALYTICAL REQUEST FORM

1715286

1. ☐ **REGULAR Status**

☐ **RUSH Status Requested - ADDITIONAL CHARGE**
RESULTS REQUIRED BY _____ DATE
CONTACT ALS SALT LAKE PRIOR TO SENDING SAMPLES

2. Date 5/31/17 Purchase Order No. LAC03307.0005 4. Quote No. _____

3. Company Name Arcadis ALS Project Manager Paul Pope

Address 132 E. Washington St., Ste. 600
Indianapolis, IN 46204

5. **Sample Collection**

Person to Contact Rob Uppencamp / Sarah Jonker Sampling Site Cascade Manufacturing

Telephone (317) 231-6500 Industrial Process Stamping

Fax Telephone (317) 231-6814 Date of Collection 5/30/17

E-mail Address Robert.Uppencamp@arcadis.com Time Collected _____

Sarah.Jonker Date of Shipment 5/31/17

Billing Address (if different from above) Chain of Custody No. _____

Accts Payable Arcadis
Highlands Ranch, CO

6. How did you first learn about ALS?

7. **REQUEST FOR ANALYSES**

Client Sample Number	Matrix*	Sample/Area Volume	ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
R-A-5	Sorbent Tube Rad 130	5-1-17 2130 5-30-17 1456	Rad 130 - Project specific list	µg/m³	
R-B-3		5-1-17 2215 5-30-17 1508			
Dup-6 (did not receive)		5-1-17 2215 5-30-17 1508			
Amb-R-S		5-1-17 2240 5-30-17 1603			
Amb-R-N		5-1-17 2250 5-30-17 1550			
Amb-R-W		5-8-17 2300 5-30-17 1556			
Amb-R-E		5-8-17 2320 5-31-17 1538			
DUP-5					

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other

** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. ____ (other). Please indicate one or more units in the column entitled Units**

Comments Received # DUP-5 → not listed, Did not receive DUP-6 for 06-01-17

Possible Contamination and/or Chemical Hazards _____

7. **Chain of Custody (Optional)**

Relinquished by	Arcadis	Date/Time	5/31/17 1445
Received by		Date/Time	06-01-17 9:10
Relinquished by		Date/Time	
Received by		Date/Time	

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
ALS Environmental

ANALYTICAL REPORT

Report Date: June 08, 2017

Sarah Jonker
Arcadis
132 E Washington St.
Suite 600
Indianapolis, IN 46204

Phone: (317) 231-6500

E-mail: Sarah.Jonker@arcadis.com

Workorder: **34-1715286**
Client Project ID: Grenada Manufacturing 053017
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **R-A-5** Collected: 05/30/2017
Lab ID: 1715286001 Sampling Location: Grenada Manufacturin Received: 06/01/2017
Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: **Exposure 41366 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00060	<0.00019	2.0
Trichloroethene	**41**	**0.0074**	**0.0014**	8.0
Toluene	**22** J	**0.0073** J	**0.0019** J	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	**8.9** J	**0.0029** J	**0.00073** J	2.0

Sample ID: **R-B-3** Collected: 05/30/2017
Lab ID: 1715286002 Sampling Location: Grenada Manufacturin Received: 06/01/2017
Method: **Solvent Panel Scan** **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: **Exposure 41215 Minutes**

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00061	<0.00019	2.0
Trichloroethene	**74**	**0.013**	**0.0024**	10
Toluene	**10** J	**0.0033** J	**0.00087** J	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	**4.3** J	**0.0014** J	**0.00035** J	2.0

ANALYTICAL REPORT

Workorder: **34-1715286**
Client Project ID: Grenada Manufacturing 053017
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **Amb-R-S** Collected: 05/30/2017
Lab ID: 1715286003 Sampling Location: Grenada Manufacturin Received: 06/01/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: Exposure 41333 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00060	<0.00019	2.0
Trichloroethene	<2.0	<0.00070	<0.00013	2.0
Toluene	<2.0	<0.00065	<0.00017	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	<2.0	<0.00065	<0.00016	2.0

Sample ID: **Amb-R-N** Collected: 05/30/2017
Lab ID: 1715286004 Sampling Location: Grenada Manufacturin Received: 06/01/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: Exposure 41340 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00060	<0.00019	2.0
Trichloroethene	<2.0	<0.00070	<0.00013	2.0
Toluene	**2.4** J	**0.00077** J	**0.00020** J	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	<2.0	<0.00065	<0.00016	2.0

Sample ID: **Amb-R-W** Collected: 05/30/2017
Lab ID: 1715286005 Sampling Location: Grenada Manufacturin Received: 06/01/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: Exposure 41336 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00060	<0.00019	2.0
Trichloroethene	<2.0	<0.00070	<0.00013	2.0
Toluene	<2.0	<0.00065	<0.00017	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	<2.0	<0.00065	<0.00016	2.0

ANALYTICAL REPORT

Amended-20170608

Workorder: **34-1715286**
Client Project ID: Grenada Manufacturing 053017
Purchase Order: LA003307.0005
Project Manager: Paul Pope

Analytical Results

Sample ID: **Amb-R-E** Collected: 05/30/2017
Lab ID: 1715286006 Sampling Location: Grenada Manufacturin Received: 06/01/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: Exposure 41298 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00061	<0.00019	2.0
Trichloroethene	<2.0	<0.00070	<0.00013	2.0
Toluene	**14** J	**0.0045** J	**0.0012** J	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	<2.0	<0.00065	<0.00016	2.0

Sample ID: **DUP-5** Collected: 05/30/2017
Lab ID: 1715286007 Sampling Location: Grenada Manufacturin Received: 06/01/2017

Method: Solvent Panel Scan **Media:** Radiello 130, Badge **Analyzed:** 06/06/2017 (192069)
Sampling Info: Exposure 41215 Minutes

Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
1,2-Dichloroethane	<2.0	<0.00063	<0.00016	2.0
Benzene	<2.0	<0.00061	<0.00019	2.0
Trichloroethene	**58**	**0.020**	**0.0038**	8.0
Toluene	**11** J	**0.0035** J	**0.00093** J	2.0
1,1,2-Trichloroethane	<2.0	<0.00081	<0.00015	2.0
Tetrachloroethene	<2.0	<0.00082	<0.00012	2.0
cis-1,2-Dichloroethene	**5.1** J	**0.0016** J	**0.00042** J	2.0

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Solvent Panel Scan	/S/ David Teynor 06/07/2017 15:04	/S/ Thomas J. Masoian 06/08/2017 09:25

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